

Landscape and Grounds Maintenance Worker Curriculum



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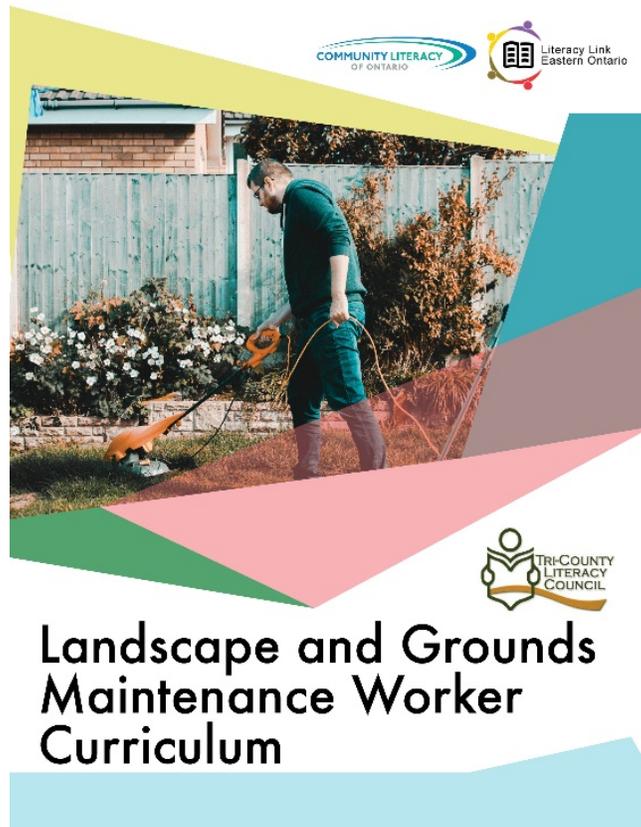
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Introduction

As part of our 2019/2020 business plan, [Community Literacy of Ontario](#) partnered with the Tri-County Literacy Council (TCLC) to research, write and adapt the ***Landscaping and Grounds Maintenance Curriculum***.

Curricula for adults enrolled in Ontario's Literacy and Basic Skills agencies are always in high demand, and the staff at [Tri-County Literacy Council](#) have extensive experience in curriculum development and delivery.

We are honoured to have worked with TCLC on this important initiative. Thank you for your hard work and dedication!

The ***Landscaping and Grounds Maintenance Curriculum*** is now freely available on CLO's website at: www.communityliteracyofontario.ca/resources/publications/#Curriculum

CLO and the Tri-County Literacy Council are very excited to have this opportunity to support adult learners and LBS programs!

We sincerely hope that this curriculum is helpful to you in the important work you do.

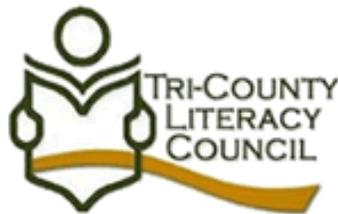
About Community Literacy of Ontario

Community Literacy of Ontario (CLO) is a provincial network of community-based Literacy and Basic Skills (LBS) agencies. We are located in Barrie, Ontario. You can learn more about our organization and access our amazing resources by visiting our [website](#) and following us on [Facebook](#) and [Twitter](#).



About the Tri-County Literacy Council

[Tri-County Literacy Council](#) (TCLC) is a community-based, non-profit organization, mandated to enrich our community by addressing literacy needs. The agency has over 30 years of experience serving clients including those “hard-to-serve” clients, such as persons with mental health issues, learning disabilities, and persons under-skilled and unable to obtain/maintain employment. As well as its expertise in training, the agency has taken a leadership role in several projects. Some of these include the Labour Adjustment Initiative, Provincial Curriculum Development, and the design of curriculum for seniors across Canada.



Thank you to Literacy Link Eastern Ontario

Community Literacy of Ontario is grateful to [Literacy Link Eastern Ontario](#) (LLEO) for allowing its *Landscaping and Grounds Maintenance* curriculum to be revised, adapted and updated by CLO and Tri-County Literacy Council. We want to express our thanks to Doug Noyes, LLEO’s Executive Director, for his strong support. Literacy Link Eastern Ontario has in-depth experience with creating occupational curricula and is considered as a strong leader in this area.

Over the past years, LLEO has been involved in developing occupation-specific curricula for adult learners. In fact, Literacy Link Eastern Ontario has developed over 18 different [occupational curriculum](#). As a network and a region, LLEO is proud to have developed valuable curriculum resources for LBS learners across the province.





**Landscape and Grounds Maintenance Worker
Curriculum
Preface - Notes to the Practitioner**

Preface

Notes to the Practitioner

This curriculum is designed for an instructor to guide/teach a group of adult learners, or for an adult learner to work through independently or with the guidance of a tutor. This curriculum contains links and information that were active at the time of publication. Please be aware that links may become inactive or change since technology is constantly changing and developing. Also, instructors are encouraged to invite community members/leaders to act as guest speakers in their areas of expertise throughout the training. For example, when discussing plants, it would be appropriate to invite a horticulturalist from a local nursery to address learners.

The Ontario Adult Literacy Curriculum Framework (OALCF) is the cornerstone of Employment Ontario's LBS Program, helping adults to achieve their goals of further education, employment, and independence. The OALCF is a competency-based framework that supports the development of adult literacy programming delivered through the Literacy and Basic Skills (LBS) Program. There are 6 competencies and 3 of these competencies are further broken down into task groups. Each unit of this curriculum begins with a chart that articulates each activity in the unit to the OALCF by level. The learning activities throughout each module are numbered, beginning at #1 in each unit. At the end of this curriculum, you will find a **Practitioner Answer Key**, where the answers to each activity are provided.

It is up to the Instructor to determine each learner's specific learning needs. Like most curricula, there might be some sections of this curriculum that a learner may already know or that may not be of interest to a learner. In this case, you may wish to augment the training with supplementary material. It is further recommended that the instructor find a balance between using a variety of teaching methods (handouts, discussion, hands-on, digital resources, lectures, etc.) in order to accommodate the different learning styles of the learners. An effective instructor will vary these activities and be prepared for **teachable moments** – when a good opportunity for learning something (possibly an item not directly included in the course content) appears as a result of a discussion, question or comment.

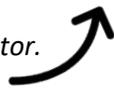
“A teachable moment is an unplanned opportunity that arises in the classroom when a teacher has a chance to offer insight to his or her students. A teachable moment is not something that you can plan for; rather, it is a fleeting opportunity that must be sensed and seized by the teacher. Often it will require a brief digression that temporarily sidetracks the original lesson plan so that the teacher can explain a concept that has captured the students' attention. Taking the time to explore this tangent is almost always worthwhile.” (Thoughtco.com).

Some learners may not make it through this entire curriculum and that is just fine. They may only use certain sections of the curriculum they find more relevant to them. Overall, it is more important that the learners begin to build a solid foundation of skills as they begin their journey to employment. As much as possible, have your learners point out the essential skills learned throughout this curriculum and encourage them to see how their skills are transferable. Curiosity, openness to learning and self-confidence will be essential building blocks in this process.

Sample OALCF Skill Competency Chart by Task

This OALCF Skill Competency Chart will be found at the beginning of each unit and will outline all of the activities included in the unit. The activities are articulated to the Ontario Adult Literacy Curriculum Framework by Task Group and skill level.

	Competency	Find and Use Information			Communicate Ideas and Information			Understand and Use Numbers				Use digital technology	Manage learning	Engage with others
	Task Group	Read continuous text	Interpret documents	Extract info from films etc.	Interact with others	Write continuous text	Complete and create documents	Manage money	Manage time	Use measures	Manage data			
Activity #	Task Group #	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D	E	F
1	Name of activity				2				1					
2	Name of activity	1						1						
3	Name of activity			1										
4	Name of activity		2											
5	Name of activity	2										2		
6	Name of activity	2			1									

*These numbers refer to the skill level indicator. 



Landscape and Grounds Maintenance Worker Curriculum

Unit 1: Introduction to Landscaping and Grounds Maintenance

Unit 1: Introduction

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Unit 1: Introduction

OALCF Skill Competency Chart by Task

The Ontario Adult Literacy Curriculum Framework (OALCF) is a competency-based framework that supports the development of adult literacy programming delivered through the Literacy and Basic Skills (LBS) Program. This chart aligns each activity in the unit to the Ontario Adult Literacy Curriculum Framework. Each activity is listed and articulated by Task Group and skill level.

OALCF CHART	Competency	Find and Use Information			Communicate Ideas and Information			Understand and Use Numbers				Use digital technology	Manage learning	Engage with others
	Task Group	Read continuous text	Interpret documents	Extract info from films etc.	Interact with others	Write continuous text	Complete and create	Manage money	Manage time	Use measures	Manage data			
Activity #	Task Group #	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D	E	F
1	Definitions	1				2								
2	NOC Codes	2				1						2		
3	Venn Diagrams	1	1			1					1			
4	Goal Setting	1				2	1							
5	Soft Skills	2				2								
6	Speaking Well	1				1								
7	Role Play	1												
8	Answering Questions	1												
9	Communication Skills	1	1			1								
10	Work vs Life					1								
11	Listen Up	1				1								
12	Paraphrasing	1				1								
13	Time Log	2	2			1			1					

What is a Landscape Labourer?

Landscape labourers assist in the preparation and maintenance of outdoor gardens and garden structures. Labourers who work with plant materials are referred to as “**softscape**” workers. Workers who help build garden structures, such as pathways, patios, fences and retaining walls are referred to as “**hardscape**” labourers. Workers who help maintain both softscape and hardscape structures are referred to as grounds maintenance workers.

Softscape workers may perform some or all of the following duties:

- Spread sand, soil and fertilizer
- Prepare beds for planting
- Weed beds between plantings
- Plant and space flowers, seedlings, shrubs and trees
- Cut and water lawns
- Dig and edge planting beds
- Cut and lay sod
- Cut back overgrown shrubs
- Use hand and power tools, such as lawn mowers and hedge clippers
- General site clean-up
- Drive vans and trucks between job sites

Hardscape workers may perform some or all of the following duties:

- Spread sand, gravel and concrete
- Prepare the foundation work for paths, patios, fences, etc.
- Cut stone
- Mix cement
- Install paving stones
- Perform basic carpentry tasks
- Install sprinkler systems
- Use hand and power tools

Grounds Maintenance workers perform general maintenance/repairs of sites:

- Water and fertilize sod, plants and trees
- Weed planting beds
- Cut grass
- Pest and disease control
- Trim hedges
- Rake leaves
- Pick up litter
- Use hand and power tools
- Repair hardscape features: fences, pathways and retaining walls



Common Work Tasks

Softscape and hardscape labourers may work with plants, a variety of garden tools and/or construction materials, but they perform many of the same job tasks.

- Digging
- Raking
- Levelling
- Measuring
- Cutting
- Hauling, moving and spreading materials
- Using and maintaining tools
- Site clean-up



Working Conditions

Seasonal Work

Many of the jobs for landscape labourers are seasonal. Working outside and in many different types of weather can be a challenge for some workers. Work may be part-time or full-time. Workers are in high demand in the spring, summer and fall months. The work is fast-paced and varied during the busy seasons. Working extended hours and weekend shifts may be required. There are many seasonal tasks that must be done at a specific time; for example, winterizing shrubs in the late fall. Some workers may be laid off over the winter months. Private landscaping companies that also offer snow removal services may hire workers on a year-round basis. Full-time workers in government institutions and some educational facilities may also work through the winter.

Physical Requirements

Many of the tasks you will be performing as a landscape labourer require physical strength, like hauling heavy loads of gravel or soil, lifting large plants and carrying heavy paving stones. Other tasks, such as planting, involve repetitive motions in a kneeling position for long periods of time.



Occupational Outlook

Employment Opportunities

Generally, across Canada, employment opportunities are excellent. It's a good time to get your foot in the door and gain experience in an industry that is expected to grow in the future. Gaining access to this type of work is easier than some other industries. The seasonal nature of the job opens opportunities for replacement workers since some workers don't return to their jobs in the spring. Most employers are willing to take on new hires and provide on-the-job training.

Wages

The wages are low for inexperienced workers. In 2019, you can expect to earn anywhere from minimum wage (\$14.00 in Ontario) to \$15.00 an hour as a new hire, and up to \$17.00 an hour or more with experience.

Advancement

Nearly one quarter of workers in landscaping and grounds maintenance are self-employed. Other workers are employed by private landscaping companies, private institutions, public works departments, schools, golf courses and cemeteries.

Training

Most of the training you will need to do your job well will be given to you verbally by your supervisor. In smaller companies, your supervisor may be the owner of the business. In larger companies and/or government departments, your supervisor will most likely be someone who has hands-on experience and additional education in landscaping and grounds maintenance. It is important that you listen carefully and follow all directions closely. It is also important that you learn to work as part of a team since some of your training will come from your co-workers. Most often, your supervisor will be someone like you – someone who started his or her career as a landscape labourer.

Learning More

The Ontario Job Bank is an excellent resource that can help you learn more about this occupation, find a job, plan your career, get training and advice, explore job profiles and more. Visit <http://Ontario.ca/jobs>.

Definitions

Learning Activity # 1 – Definitions

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.2 Write texts to explain and describe information and ideas

1. Write a definition of a softscape labourer. Use all of the words in the box in your answer.

outside	plants	digs	trims	hands
works	spreads	moves	helps	installs

2. Write a definition of a hardscape labourer. Use all of the words in the following box to write your answer.

outside	builds	helps	decks
hands	patios	works	

3. Write a definition of a grounds maintenance labourer. Use all of the words in the box in your answer.

cares for	repairs	sweeps	worker
hands	outside	trims	

4. List some of the common work tasks that **all** landscape labourers do.

5. Who employs landscape and grounds maintenance workers?

6. Do you have any specific skills that might be useful in this field? For example, can you use a power lawn mower?

7. Write a short paragraph (four or five sentences) telling why you are interested in working as a landscape or grounds maintenance worker.



What are the Essential Skills?

People often become overwhelmed when thinking about skills. It seems there are so many. This is true. Most likely, part of your plan for the previous activity involved increasing some of your skills. Fortunately, thinking about your skills has become a little easier.

The Government of Canada, in partnership with many stakeholders has identified nine [Essential Skills](#). These are skills necessary for both home life, as well as for employment. These Essential Skills are woven into this curriculum.

“Through extensive research, the Government of Canada and other national and international agencies have identified and validated these key Essential Skills for work, life, and learning. These skills provide the foundation for learning all other skills.”

Employment and Social Development Canada

The nine Essential Skills are:

1. **Reading**
2. **Writing**
3. **Document Use**
4. **Digital Technology**
5. **Oral Communication**
6. **Numeracy**
7. **Working with Others**
8. **Thinking**
9. **Continuous learning**



Essential Skills Profiles

Essential Skills researchers examined hundreds of different jobs in Canada and created [Essential Skills profiles](#) (descriptions) for each position. You can search these profiles to learn more about the skills required for different jobs. The detailed profiles contain:

- A short description of the occupation.
- A list of the most important Essential Skills.
- Examples of tasks that show how each Essential Skill is used.
- Ratings that indicate the level of difficulty for the skills.
- The physical aspects of performing the job and the attitudes that workers feel are needed to do the job well.

Landscaping and Grounds Maintenance Profile

The three most important Essential Skills for this group are:

- Reading text
- Oral communication
- Problem solving

Learning Activity # 2 – NOC Codes

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

D2 Perform well-defined, multi-step digital tasks

The [National Occupational Classification](#) (or NOC) is Canada's national system of organizing and describing occupations, and contains much useful information including:

- Job descriptions
- Educational requirements
- Required skills
- Related occupations

Using a computer or tablet, go online and use the Google Search to search for the Essential Skills Profile for Landscaping and Grounds Maintenance Labourers. The **National Occupational Code** is 8612. Read the profile and answer the following questions.

1. Give three examples of reading text skills that may be needed for this job.
 - a) _____
 - b) _____
 - c) _____
2. Give three examples of oral communication skills that may be needed for this job.
 - a) _____
 - b) _____
 - c) _____
3. Give three examples of problem-solving skills that may be needed for this job. There are no specific examples for landscape labourers in the profile, so take your time and try to think of some problems that might occur on the job.
 - a) _____
 - b) _____
 - c) _____

Learning Activity # 3 – Venn Diagrams

OALCF Competency Task Groups and Levels

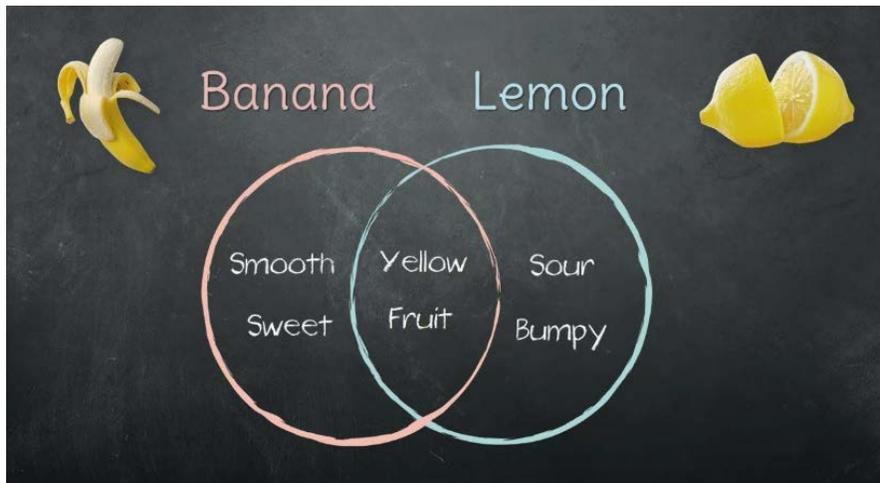
A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

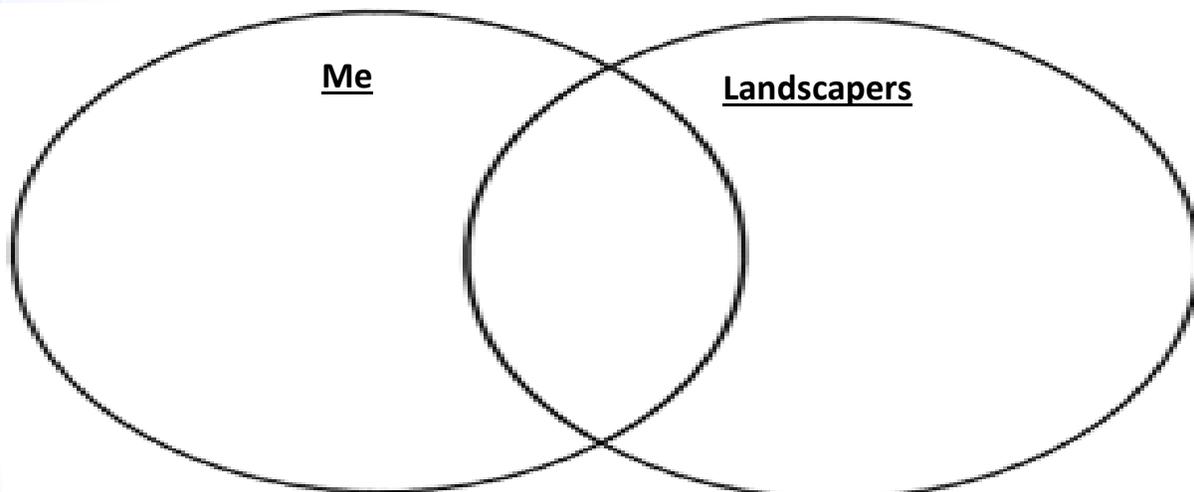
C4.1 Make simple comparisons and calculations

A Venn diagram is a visual representation that enables one to organise information visually, so they can see the relationships between two or three sets of items. They can then identify similarities and differences. A Venn diagram consists of **overlapping** circles. Each circle contains all the elements of a set. The section of overlap contains the data that applies to both sets.

Here is a very simple example of a Venn diagram comparing the qualities of a banana and a lemon. As you can see, they share two similar qualities.



1. Now complete the following Venn diagram, outlining the skills or qualities needed to work in Landscaping or Grounds Maintenance, and the skills and qualities that you already possess.



2. What similarities in skills did you find between skills you have and skills a landscape worker needs to possess?

Goal Setting

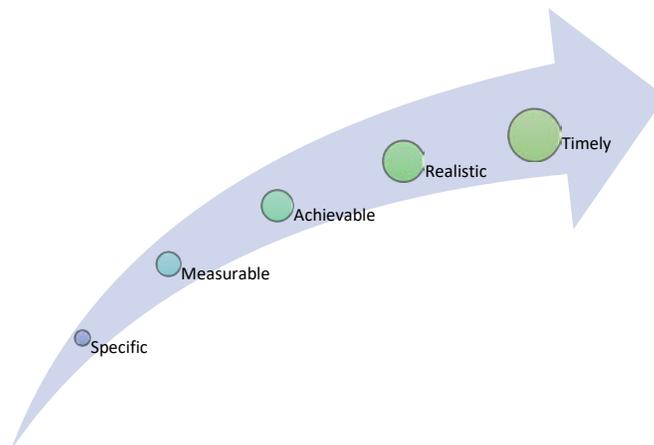
Goals are part of every aspect of business and life. Goals provide a sense of direction, motivation and clear focus, and they can clarify importance. By setting goals for yourself, you are providing yourself with a target to aim for.

A SMART goal is used to help guide goal setting. SMART is an acronym that stands for **Specific, Measurable, Achievable, Realistic, and Timely**. Therefore, a **SMART** goal incorporates all of these criteria to help focus your efforts and increase the chances of achieving your goal.

SMART goals are:

- **Specific:** Well defined and clear
- **Measurable:** With specific criteria that measure your progress towards the accomplishment of the goal
- **Achievable:** Attainable and not impossible to achieve
- **Realistic:** Within reach, realistic, and relevant to you
- **Timely:** With a clearly defined timeline, including a starting date and a target date

Now it's time to look at setting some SMART goals. At some point in life, most people set goals of some kind, but sometimes it helps to write down your goal to help you stay on track. You've learned about the Essential Skills, and those needed to work in the landscape and grounds maintenance field. Take a moment to think about your skills, and a possible goal to set that is related to employment.



Learning Activity # 4 – Goal Setting

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.2 Write texts to explain and describe information and ideas

B3.1a Make straightforward entries to complete very simple documents

1. Write your specific goal. Think about how you can make your goal specific, measurable, attainable, realistic, and completed on time. (SMART)

2. Look at the following chart. Circle Y for Yes and N for No.

Is my goal clear? (Specific)	Y	N
How will I know when I reach my goal? (Measurable)	Y	N
Is my goal attainable (given knowledge, skills, ability)? (Attainable)	Y	N
Is my goal within my reach? (Realistic)	Y	N
Does my goal have a reasonable time limit? (Time)	Y	N

3. What are the benefits to you for reaching this goal?

4. Why is this goal important to you?

5. Who will you share your goal with for feedback and to help keep you on track?

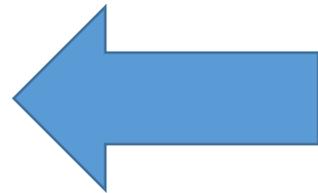
A New Hire

What skills do employers look for when they are hiring an entry-level worker? In developing this curriculum, we asked them this question. The employers agreed that the following skills and qualities are important when they make a decision to hire:

- An interest in the job
- Attitude and appearance
- Willingness to learn
- Ability to follow oral instructions
- Ability to remember instructions
- Ability to work well with others
- Initiative

Employers agreed that the following skills would be **important** but not necessary in their decision to hire:

- Possession of a clean, valid driver's license
- Knowledge of site directions
- Ability to understand information from simple sketches
- Basic carpentry/masonry skills
- Knowledge of basic measurement math and common angles
- Familiarity with basic plant materials



Soft Skills

Attitude

Attitude is a feeling or emotion toward a fact, a state or a person. It is a way of thinking that is reflected in your actions. Those actions can be conveyed through your voice, facial expression and body language. In a work environment, it is important that you keep a positive attitude about yourself, others and your job.

Attitude affects the way you approach any situation. It's important that you show people that you can work well with your supervisor and other members of your crew. If you are respectful and co-operative with others, they will be the same way with you.

Appearance

Employers in this industry do know that working outside can be dirty work. Moving sod, cutting brick and kneeling in soil all day can be hard on your appearance. Working in the hot sun can also leave you feeling a little less than fresh. It's important that you start your day off right. Show up for work in clean clothes, showered and ready to go. Remember, your job is outdoors, and you will be seen by members of the public and company customers. If you look untidy and sloppy, people will think your work will be untidy and sloppy too. Unfair as it is, you are often judged on your appearance, so make a good impression.

Show Up on Time

One of the biggest complaints employers have is workers not showing up on time, or not showing up at all. The best thing you can do for yourself as an employee is to show up on time. Showing up 15 minutes early is a good practice to develop. Arriving on time or a few minutes early shows your boss that you are responsible, considerate and that you value your job. Lateness sends a negative message to your employer. Lateness tells your employer that you don't really care about your job. It might not be true, but it will cross your employer's mind. Remember, there are a lot of people standing in line behind you, waiting for their chance to show your employer how dedicated **they** are.

Be Willing to Learn

In an entry-level position, employers don't expect you to come with all the skills you need, but they do expect you to come with a willingness to learn.

How do you show willingness to learn?

- **Ask questions**

"How do you know when to...?"

"Why does the ...?"

"How much do I ...?"



Asking questions isn't a bad thing. A lot of people don't ask questions when they need to or when they should. Asking questions is a good way to learn!

- **Read more about it**

There are many books, magazines, websites and television shows about landscaping and gardening. Sometimes learning more about a subject makes the subject more interesting.

- **Take courses or training**

Keep upgrading your skills. If there is something you'd like to learn about, ask someone to show you, or ask where you could find the information. Your coworkers are a valuable resource in helping you learn more. Don't be afraid to ask them for help, advice or information.

Work Hard

Employers pay you to work. That's the bottom line. They don't pay you to stand around looking for something to do. Dig in and do whatever it takes to get the job done. There is a difference between hard work and working hard. Working in the landscaping and grounds maintenance field is hard work. In the summer, it's dirty, hot, sweaty work. In the winter, it's cold, uncomfortable work. Your muscles hurt. You push, pull, carry, drag, dig, pound and bend all day. Your body is a tool to get the job done.

Working hard means that you take your job seriously and you give 100% all the time. You arrive on time and start work immediately. You work until you are given a break. You don't extend your breaks longer than they are supposed to be. You get back to work and give it your all. You work hard right up until your shift is over.

Anticipate What Needs to be Done Next

Employers want you to anticipate what needs to be done. If you finish the task you are given, look around for something else to do. If you are unsure as to whether your boss wants you to do it, just quickly ask: *"I see the shipment of annuals has come in, do you want me to water them?"* Offering suggestions like this will make your employer's job easier. They don't have to stop and think about what task to assign you next.



Learning Activity #5 – Soft Skills

OALCF Competency Task Groups and Levels**A1.2 Read texts to locate and connect ideas and information****B2.2 Write texts to explain and describe information and ideas**

1. Why is a positive attitude important in a job situation?

2. Sam, a landscape labourer says, *“I’m going to get dirty and sweaty anyway, what does it matter if I show up to work unwashed and in dirty clothes?”* As the owner of a small landscaping company, what would you say to Sam to explain to him why this is a problem?

3. What message does arriving late for work send to your employer about you?

4. How do you plan to show an employer that you have good soft skills?

5. Other than those mentioned, can you list some more soft skills that employers might look for?

Speaking at Work

You may speak to many different people at work. What you say and how you say it depends on **who** you are speaking to and why you are speaking to them. The main things that affect the way you speak to people are:

- Your working **relationship** with them
- Your **attitude** towards them
- Your **reason** for speaking to them
- Your **appreciation** of any problems they might have in understanding you

As a labourer, you will have to speak to your supervisor, your co-workers, other workers in the industry, customers and sometimes members of the public. Speaking is used to:

- Ask for information
- Pass on information
- Seek advice
- Give an opinion
- Give instructions or directions



Learning Activity #6 – Speaking Well

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

Read the following examples of an employee talking to different people. Who do you think she is talking to? Choose one of the following workers:

- Manager
- Team leader
- Co-worker
- Member of the public
- Trainee

1. “The play area is on the left, on the far side of the park. If you stay on this path, you’ll see it.”

2. “I reckon we did a great job today. The Super’s going to be pleased.

3. “I’ve completed my training and I was wondering – are there any vacancies for a team leader’s job at the moment?”

4. “I’ve finished potting; what should I do now?”

5. “This is a dibber. It’s used for making small holes in the compost to plant seedlings in.”

Speaking to the Public

Working outside, there will be times when you will have to speak to members of the public. You need to be aware of the impression you make. Your aim is to give a positive impression of yourself and the organization you work for. This means having good knowledge of your subject and knowing how to speak properly.

When you speak to a customer or a member of the public:



Do's

- Offer help
- Speak politely
- Use words people know
- Use positive body language
- Use polite expressions
- Use appropriate language and tone



Don'ts

- Don't use slang/swear
- Don't use informal language
- Don't mumble
- Don't give unclear answers
- Don't be too technical



Learning Activity #7 – Role Play

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B1.2 Indicate and maintain interactions with one or more person to discuss, explain or exchange information and opinions

Choose one of the following situations and, with a partner, role play the scenario. Remember the do's and don'ts of speaking.

- You are a Manager, telling your employee his/her instructions for the day's work including, cutting the grass, planting some petunias and trimming the hedges.
- As a team leader you are speaking to your customer about their overdue bill. You are requesting they catch up on their payments within a week.
- You are a trainee asking your team leader/supervisor to repeat his/her explanation of the steps involved in setting up the new garden and hardscape structure.



Learning Activity #8 – Answering Questions

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

Read the following examples of an employee answering questions from the public. Mark an x beside the responses that are **NOT** acceptable.

- _____ “Can I help you?”
- _____ “What do you want?”
- _____ “The lilac path is to your left.”
- _____ “You can’t walk here!”
- _____ “Careful, you’ll fall on your bottom.”
- _____ “Meh, I don’t know.”
- _____ “I’m not sure, but I’ll find out for you.”
- _____ “There is an accessible washroom near the park. I’ll get you the key.”
- _____ “Do ya know where to go?”

Learning to Listen

Like other skills, including reading, writing and speaking, your listening skills can be improved with study and practice.

Listening is the MOST IMPORTANT communication skill used in any job environment.

We spend about four hours each workday in listening activities.

The way you listen at work may be different from the way you listen in school or in your personal life. Outside of work hours, people often listen to “get the gist” or the general idea of what is being said. At work, you must listen for more details. Having a “general idea” of a job task is not good enough.

Learning Activity # 9 – Communication Skills

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

A2.1 Interpret very simple documents to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

1. Read the chart to find the missing information.

Skill	Listening	Speaking	Reading	Writing
Used	<i>Most (45%)</i>	<i>Next Most (30%)</i>	<i>Next Least (16%)</i>	<i>Least (9%)</i>
Taught	<i>Least</i>	<i>Next Least</i>	<i>Next Most</i>	<i>Most</i>

- Listening is the skill we use the _____.
- Writing is the skill we use the _____.
- We are taught how to write the _____ and how to _____ the least.
- We use our reading skills about _____% of the time.

2. Do you feel the data in the chart reflects what you were taught in school? Why or why not?

3. How would you teach someone listening skills?

Learning Activity #10 – Work versus Life

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.2 Write texts to explain and describe information and ideas

1. How is listening at work different from most of the listening you do outside of work?

Are You a Good Listener?

- Have you ever pretended to be listening when you are not?
- Do you know how to look interested when your mind wanders far away?
- Do you ever “tune out” people when their ideas are boring or difficult?
- Do you find it difficult to concentrate on ideas when a speaker’s appearance or mannerisms are strange?

Most people would answer “yes” to one or more of these questions because we have developed poor listening habits. Basically, we are not paying attention to the speaker. Poor listening habits are costly in business.

Barriers and Distractions

- **External Distractions:** It is difficult to listen well if you are distracted by background noises such as other people talking, noisy machinery, traffic, etc.
- **Internal Distractions:** How you feel determines how well you listen. If you’re tired, hungry, sick or worried about something, you may have problems focusing on what is being said.
- **Overload:** When people give too much information at one time or use words that are unfamiliar, you may feel overwhelmed and just stop listening.

Good Listening Habits

- **Focus your Attention:** Look at the speaker. Tune out external distractions. If possible, turn off noisy machinery or move to a quieter place. Don’t think about **how** they are saying something; focus on **what** they are saying and not on what you are thinking. Listen to listen. Don’t listen and plan what you are going to say next.

- **Show You're Listening:** Be responsive. Maintain eye contact with the speaker. Look interested in what she or she is saying. An occasional "yes" or "I see", or a head nod lets the speaker know you are listening.
- **Ask Questions:** Asking relevant questions is one of the best ways to show a speaker that you have been listening. In a work situation, many people are shy about asking questions; they think it makes them look bad to the employer. The only thing that will make you look bad in an employer's eyes is not doing the job correctly. Employers want you to ask questions.

Know How to Ask Questions

"I know what I want to ask...I just don't know how to ask it."

One of the most important things to think about when phrasing your question is . . . how to get to the point. Make your questions as direct as possible. You don't want the speaker to begin his answer to you with "I'm not really sure what you are asking." Be clear and concise; don't add details that don't matter to your question or the answer.

What to Say

Think about the question you want answered. Begin your sentence with phrases like:

- "Can you re-phrase . . .?"
- "I don't understand what you meant by . . .?"
- "I've never . . . before. Can you show me how to . . .?"
- "Can you repeat that?"
- "How do I . . .?"



Paraphrasing and Clarifying

This means mirroring the information back to the speaker in order to make sure you understand exactly what they want you to do. Clarifying means asking for more information to make something clearer. Some phrases you could use are:

- "So, what you're asking me is . . .?"
- "So, what you're saying is . . .?"
- "So, what I need to do is . . .?"

When you paraphrase the information in your own words, the employer will know that you understand what it is you are supposed to do. It will also help you to remember if you are an auditory learner.

Take Notes

When given verbal instructions, you may only get one or two chances to hear the information. You have to process, understand and remember all of it quickly. Carrying a small notebook with you is a good idea. Make short notes for yourself or draw simple sketches to help you remember the details. There is nothing wrong with making notes. It shows your boss that you want to do the job right.

Learning Activity # 11 – Listen Up

OALCF Competency Task Groups and Levels**A1.1 Read brief texts to locate specific details****B2.1 Write brief texts to convey simple ideas and factual information**

1. List five things that can make listening difficult.

a) _____

b) _____

c) _____

d) _____

e) _____

2. How can you tell when someone is listening to you?

3. What is paraphrasing?

4. Asking questions is a very important skill. What are some reasons that may prevent people from asking important questions?

5. Your boss asked you to pick up the order of perennials at the nursery before 1 p.m. and to double check the order before you accept it. Can you think of any relevant questions you might need to ask in order to complete this task? How would you phrase your questions?

Learning Activity # 12 – Paraphrasing

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.2 Write texts to explain and describe information and ideas

Paraphrase the following instructions.

Plant the bulbs in staggered rows and then back-fill the holes and fertilize. Only plant 200, even though there are more to go in. Use the landscape fabric because we've had trouble with weeds in this bed. Make sure to cut the X spots on the fabric in the right spots.

Finding Information

How do you go about finding information? You need to:

- Talk to the *right* person, not just the person standing next to you. If you don't know who the right person is, ask your supervisor.
- Read something.
- Look it up in a manual or catalogue.
- Look it up on a computer/cell phone/tablet.
- Use the telephone.



The ability to find information is important in our lives at work and at home. However, sometimes finding information is difficult.

Some hints to help find information:

To help find information in written material, try:

- **Skimming** – to quickly identify the main idea of the text. Skimming is done at a speed three to four times faster than normal reading. You can skim when you have lots of material to read in a limited amount of time.
- **Scanning** – to search for **specific** key words in the text. In most cases, you know what you are looking for, so you concentrate on finding that particular piece of information. Scanning involves words or phrases.
- **Using information design features** such as Tables of Contents, Indexes, Titles, Sub-titles, headers, paragraphing. Underlining and bold print can lead you to the right place to look.

Time Management

Time management is a common expression, but actually, you can't manage time. Time ticks on, no matter what we do, so we have to manage **ourselves** and our **use of time** instead. We have to pay attention to time.

Time management is an important part of Job Task Planning and Organizing. It is a valuable skill for an employee to have. However, like any skill, it takes time to learn and a lot of practice to develop. One good thing is that time management can be practised in our daily lives — at home, at school, and everywhere.

How can we manage ourselves?

- Check your present use of time
- Set goals
- Organize
- Develop good work habits
- Schedule
- Include leisure time in planning
- Don't slack off

What do you do with your time?

Have you ever counted minutes like a dieter counts calories? Sometimes it is quite an eye-opener on how we waste time, doing almost nothing, or doing unimportant things. All those minutes add up to hours and days that we could have been using to accomplish something we wanted to do, but never had time for. Now, unless you are at work, it is up to each one of us to decide what is important and what is unimportant to use our time up for. However, when you are at work, that won't be the case.



Learning Activity # 13 – Time Log

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

C2.1 Measure time and make simple comparisons and calculations

Create a “log” or record of everything you do over a two-day period. Mark down the number of minutes that you spent on each thing you did. Don’t try to remember at the end of the two days what you did, because you will forget all the little things. Instead, keep your log with you all the time and, at least once an hour, mark down your activities. Don’t forget to mark down chatting, cigarette/coffee breaks, TV time, etc. Don’t cheat! (You can use the sample form or create your own.)

After each item in your log, mark whether it was something that you had to do (like going to work or paying bills), or something that you wanted or liked to do.

After you complete your two-day log, look it over and calculate your time use. Add up how much time you spent on each type of activity. Add up how much time you spent on things you had to do, and on things you wanted or liked to do.

After doing all of the above and considering the results, would you want to try to change any of your time use? Why or why not?





**Landscape and Grounds Maintenance Worker
Curriculum
Unit 2: Working with Plants**

Unit 2: Working with Plants

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Unit 2: Working with Plants

OALCF Skill Competency Chart by Task

This OALCF Skill Competency Chart aligns each activity in the unit to the Ontario Adult Literacy Curriculum Framework. Each activity is listed and articulated by Task Group and skill level.

Activity #	Task Group #	Find and Use Information			Communicate Ideas and Information			Understand and Use Numbers				Use digital technology	Manage learning	Engage with others
		Read continuous text	Interpret documents	Extract info from films	Interact with others	Write continuous text	Complete and create documents	Manage money	Manage time	Use measures	Manage data			
Activity #	Task Group #	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D	E	F
1	Bubble Diagram		2			1	1							
2	Planting Plan Q and A	1	2			1								
3	Plan Directions	1	1			1								
4	Point X and Y		2			1								
5	Giving Directions				2	2								*
6	Zone Map		1			1					2			
7	True/False	1				1								
8	Fun Weather Facts	1				1								
9	Fill in the Blanks	1				1	1							
10	Plants	1				1								
11	My Zone	2	2			1								*
12	Seed Packets	1	1			1								
13	What Can Grow?	1	2			1								
14	Plant Names					2	1							
15	Latin Name Game											2		
16	Resemblance					1								
17	Scary Names	1												
18	Types of Plants	2												*
19	Learning Styles Scenario	2				2					2			
20	Lists of Belonging			1		1								*
21	Word Association	1				1								
22	Plant Match		1											
23	Silly Names	1				1								
24	Memory Tricks	1					1							

Landscaping Site Directions

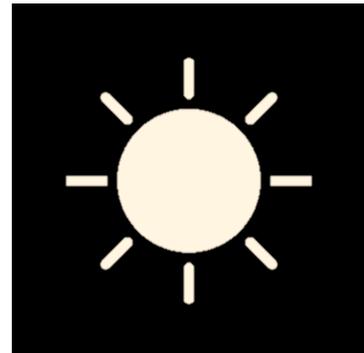
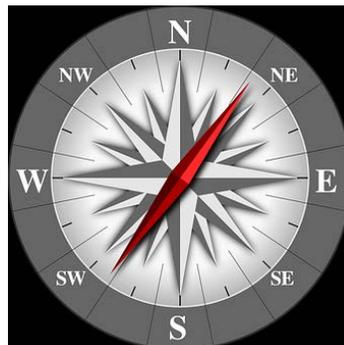
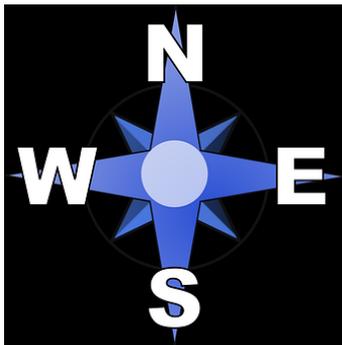
Each continent occupies a space on the planet. Each country occupies a space on its continent. Each city occupies a space within a country. We could continue talking about space in this very general manner without really knowing where any place, or one of us, is located. We need a common way to communicate exact location to pinpoint where we are in relation to space. We use directions for this purpose. There are two types of directions commonly used on a site: positional and cardinal.

Positional Directions

These directions relay location in relation to an object. We usually describe these directions in terms of left or right. If you are the object, then one arm is on the left, while the other is on the right. You may not always be the object. In landscaping, objects may be a hedge, fountain, garden, etc. As a result, you must know position in relation to yourself and other features on the site. Other words used to describe positional direction are: beside, behind, in front of, between, under or on top of. It is important to have a clear understanding of positional language to avoid mishaps on a work site.

Cardinal Directions

A compass is an instrument that indicates direction. It is often used by mariners, aviators, hunters and other travellers to enable them to get from one place to another. The compass points are north, south, east and west.



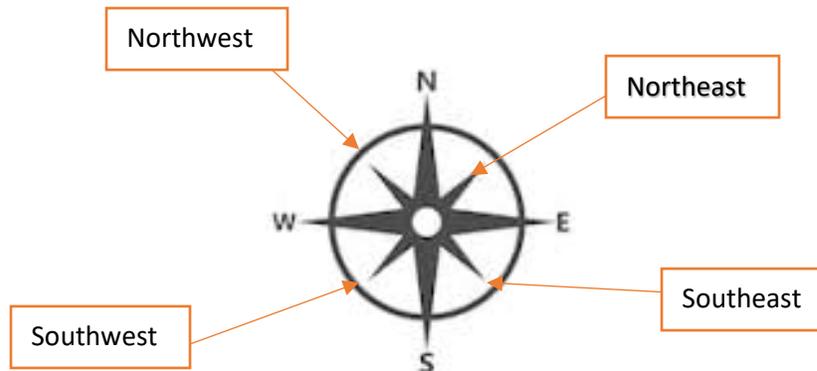
(It may also help to remember that the sun rises in the east and sets in the west.)

Moving materials around the work site, preparing planting beds, edging beds and planting a variety of different landscape plants are all daily tasks that you will be performing as a softscape labourer. Knowing your way around the work site is necessary for you to perform and complete these tasks efficiently.

Often directions on a work site are given in cardinal points. Cardinal points are the four directional points found on a compass:

North, South, East and West

If your compass points between North and East, then the direction is Northeast. Observe the following compass to see the in-between sections of the cardinal directions:



Cardinal points are used to direct workers to locations on a work site. For example, they tell workers where the planting beds are located. They are also used to describe locations in relation to features on the site.

Your supervisor may tell you to *dig up the bulbs at the south entrance to the arena, but leave the west entrance for another week*. If you don't know your cardinal points, you may dig up the wrong bed! Do you have any tricks to remember the cardinal directions? Do you know the directions in your town/city? Do you use landmarks?

Sketches and Plans

Site Sketches

Labourers who work on landscaping sites occasionally refer to site sketches. Sketches are usually rough drawings that organize information about site features and site layout. Sketches use pictures to convey information about the site.

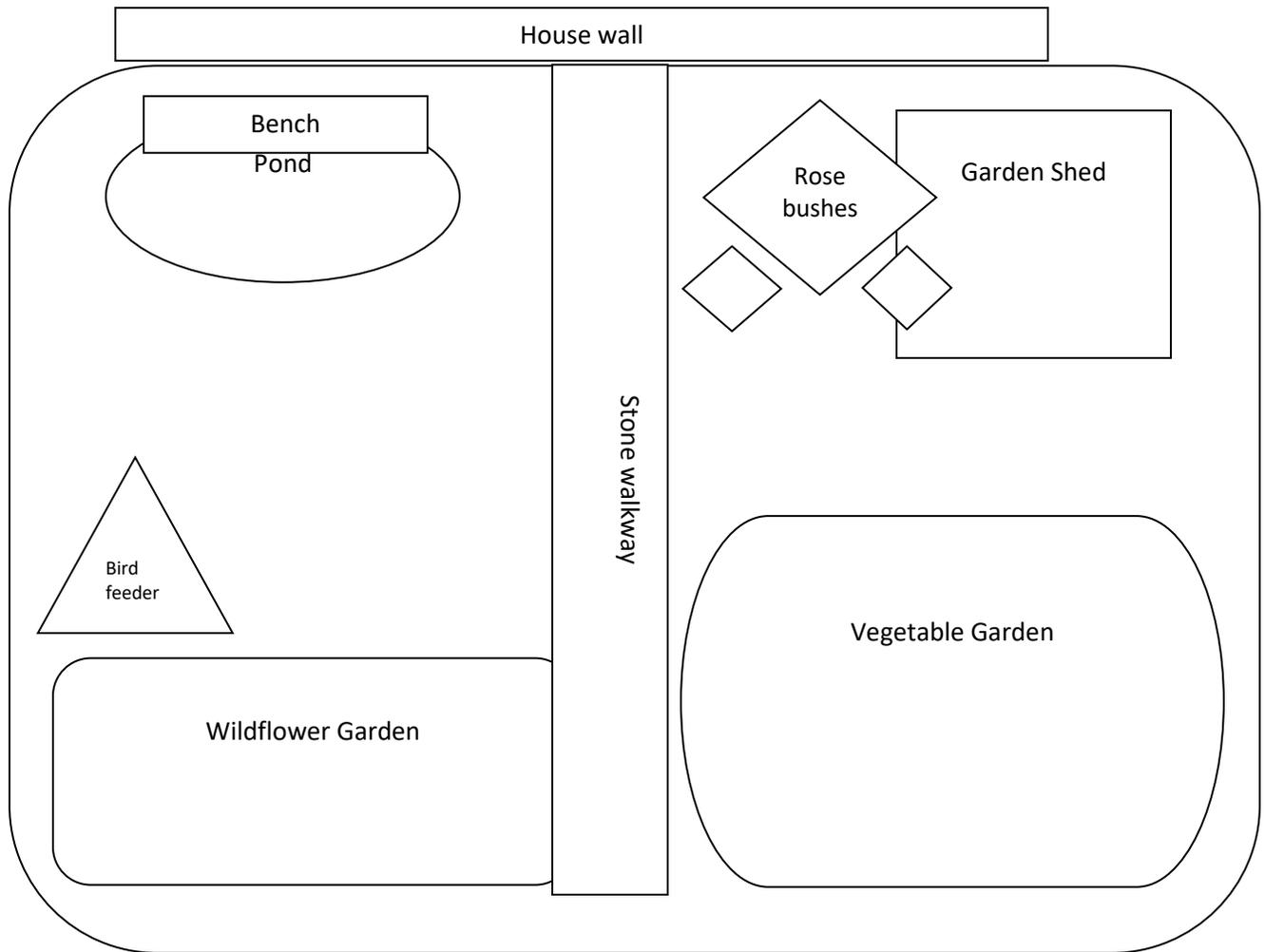
A site feature may be a structure such as a deck or a retaining wall. It may also be a natural grouping like trees or a water feature like a pond. The layout of a site tells you where the features are in relation to each other.



Bubble Diagrams

Bubble diagrams are another way to communicate information visually. Bubble shapes are used to define specific spaces within a landscape area. The specific spaces may represent groupings of similar items (group of trees) or a single item (house). Unlike site sketches, bubble diagrams use words within shapes to provide information.

Look at the example below. Notice how each bubble separates different parts of the landscape area.



Learning Activity # 1 – Bubble Diagram

OALCF Competency Task Groups and Levels

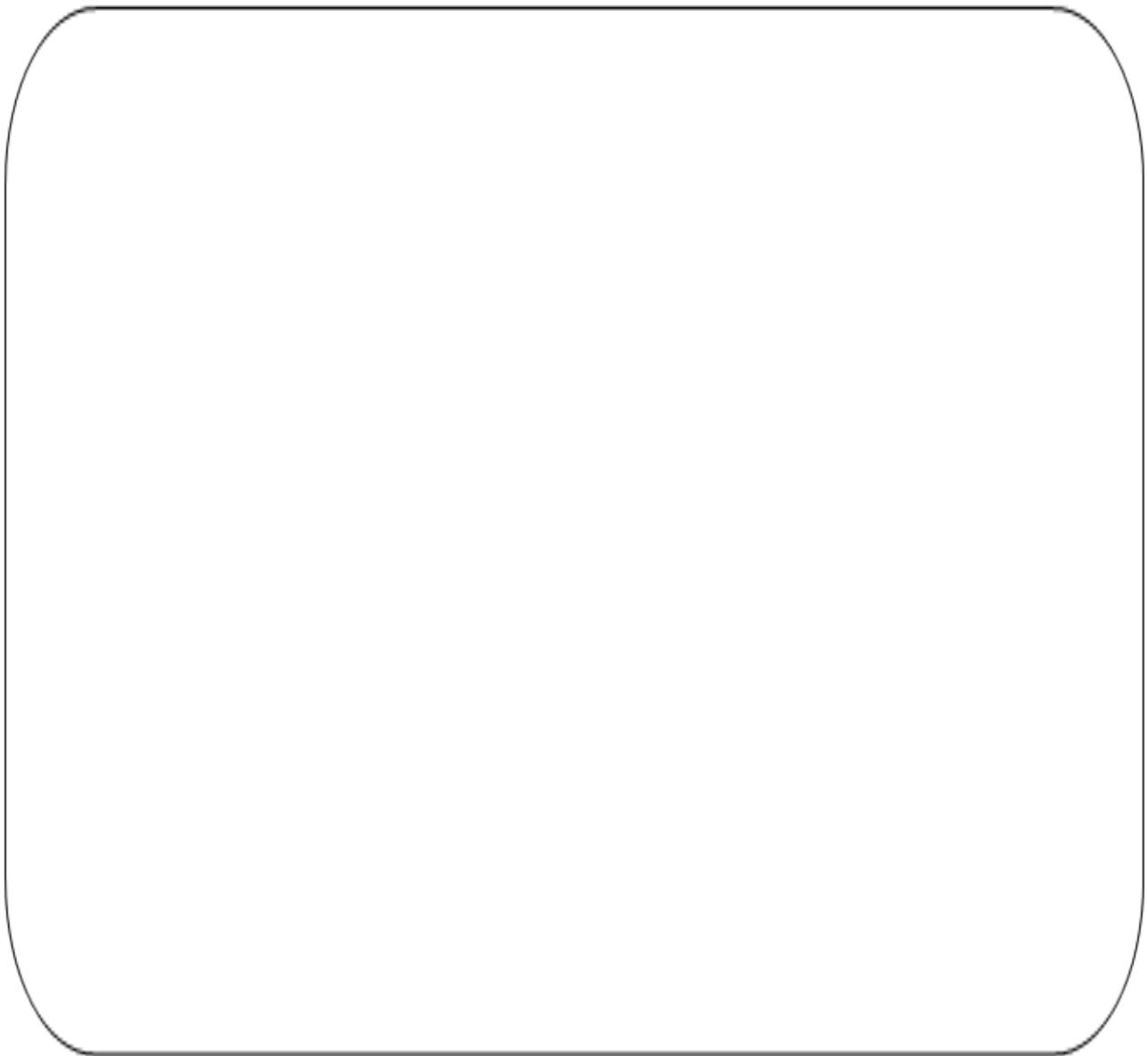
A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

B3.1 Create a very simple document to display and organize a limited amount of information

Choose a location for which you can create your own bubble diagram (your own yard, a community garden, the building you are in right now...).

My Bubble Diagram



How to Read a Planting Plan

Planting plans provide more detail about the landscape area. They tell us the types of plants and where they are located. Planting plans are a type of map. Like most maps, north is at the top and south is at the bottom, east is on the right and west is on the left. Sometimes planting plans have a **key**.

A key is a type of code that is used to decipher information. A key tells you what a specific colour, shape or symbol represents on the map. It provides more detailed information about the content of a map.

Some other elements that might be found on a key include:

- Water stations
- First aid
- Kiosks
- Benches
- Specific types of plants/flowers
- Trails
- Lookout points
- And more!



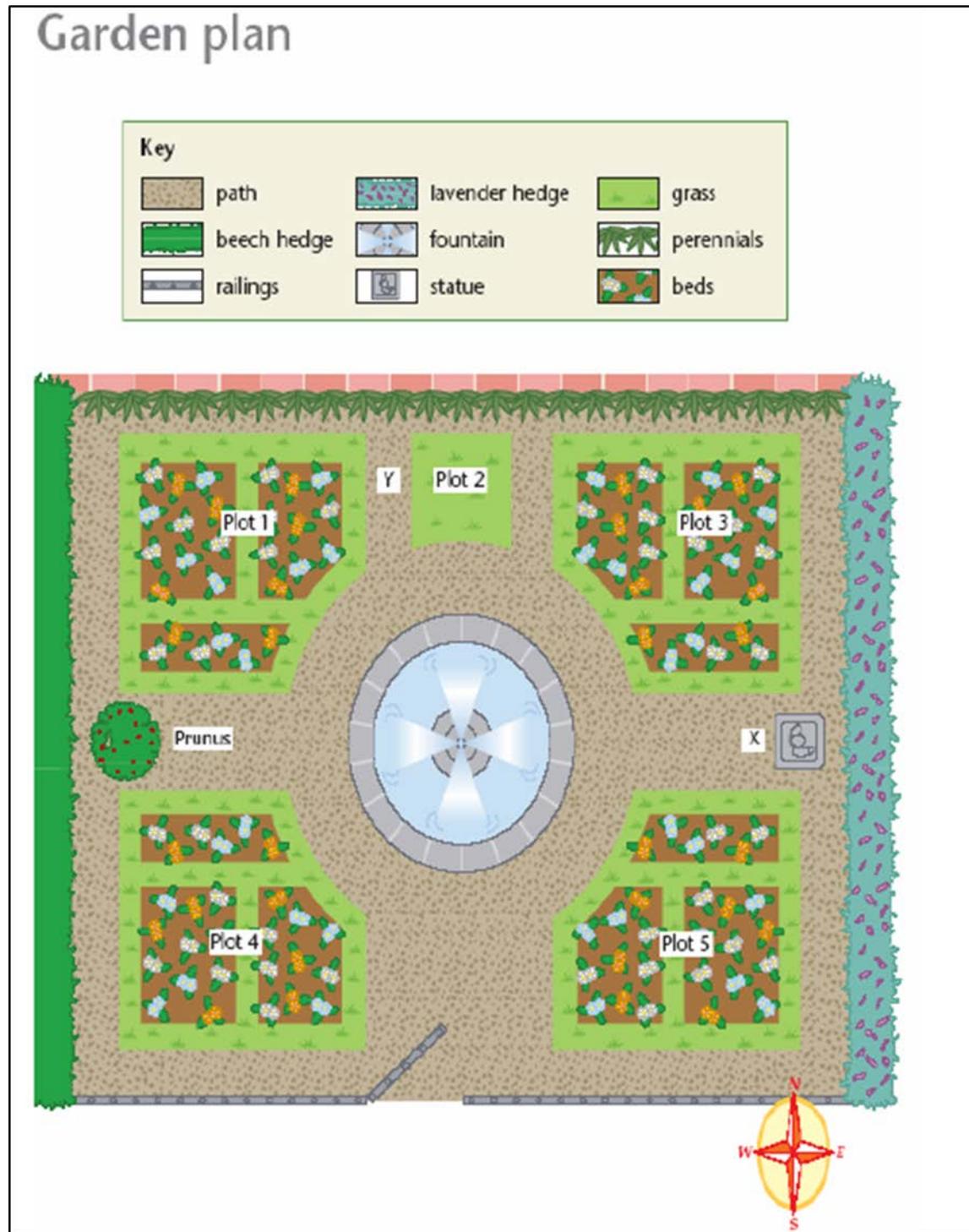
Tips on Reading Sketches and Plans

Look at the compass points – which direction are you facing?

Turn the plan around to match the direction you are facing.

Turn yourself to face the direction in which you would like to go.

The following activities are designed to make sure you have the skills you need to find your way around a site. Use this sample planting plan to complete the next three activities.



Learning Activity # 2 – Planting Plan Q and A

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

Look at the *Garden Plan diagram*. Match the colours and shapes on the key to get familiar with the site. Answer the following questions using positional directions.

1. Where is plot 5? It is on the _____ side of the gate.
2. Where is plot 1? It is _____
3. Where is plot 3? It is _____
4. Where is plot 4? It is on the _____ side of the gate.
5. Where is the lavender hedge? _____
6. Where is the fountain? _____
7. Where is the beech hedge? _____
8. Where is the statue? _____

Learning Activity # 3 – Plan Directions

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

A2.1 Interpret very simple documents to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

Use the *Garden Plan diagram* to answer the following questions using cardinal directions. What direction are you facing...

1. As you go in through the gate? _____
2. If you stand with your back to the brick wall? _____
3. If you stand by the fountain looking at the statue? _____
4. If you stand by the fountain looking at the beech hedge? _____

Learning Activity # 4 – Point X and Y

OALCF Competency Task Groups and Levels

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

While looking at the *Garden Plan diagram*, answer the following questions.

1. If you stand at point X, looking at the statue, which plot is:

a. On your right? _____

b. On your left? _____

2. What is behind you?

3. If you stand at point Y, looking south, which bed is:

a. On your right? _____

b. On your left? _____

4. If you stand at point Y, what is behind you?



Learning Activity # 5 – Giving Directions

OALCF Competency Task Groups and Levels

B1.2 Indicate and maintain interactions with one or more persons to discuss, explain or exchange information and opinions

B2.2 Write texts to explain and describe information and ideas

F Engage with others

1. Write a set of directions for someone telling them how to get from your home to your school. Use positional and cardinal reference points.

2. Now find a partner. Give your partner directions orally (nothing written down), giving them directions to the nearest bus stop or gas station.



Zones and Regions

Zones

A zone is a place where a specific activity takes place. It is a smaller section of a larger area, but it is different from the whole in some way. If you are a football fan, the term “end zone” will be familiar to you. This part of the playing field is different from the rest. The rules of the game tell us that the end zone is the only place on the football field where points can be scored. The activity that takes place in the end zone is what makes it different from the rest of the field.

In cities, towns and rural areas, the government also has rules which tell us how the land can be used. These rules are called zoning by-laws. Land is divided into industrial, commercial and residential zones. The zones are based on the way the land is used. Each zone shares similar characteristics. In an industrial zone, you would expect to find factories, manufacturing and processing plants.

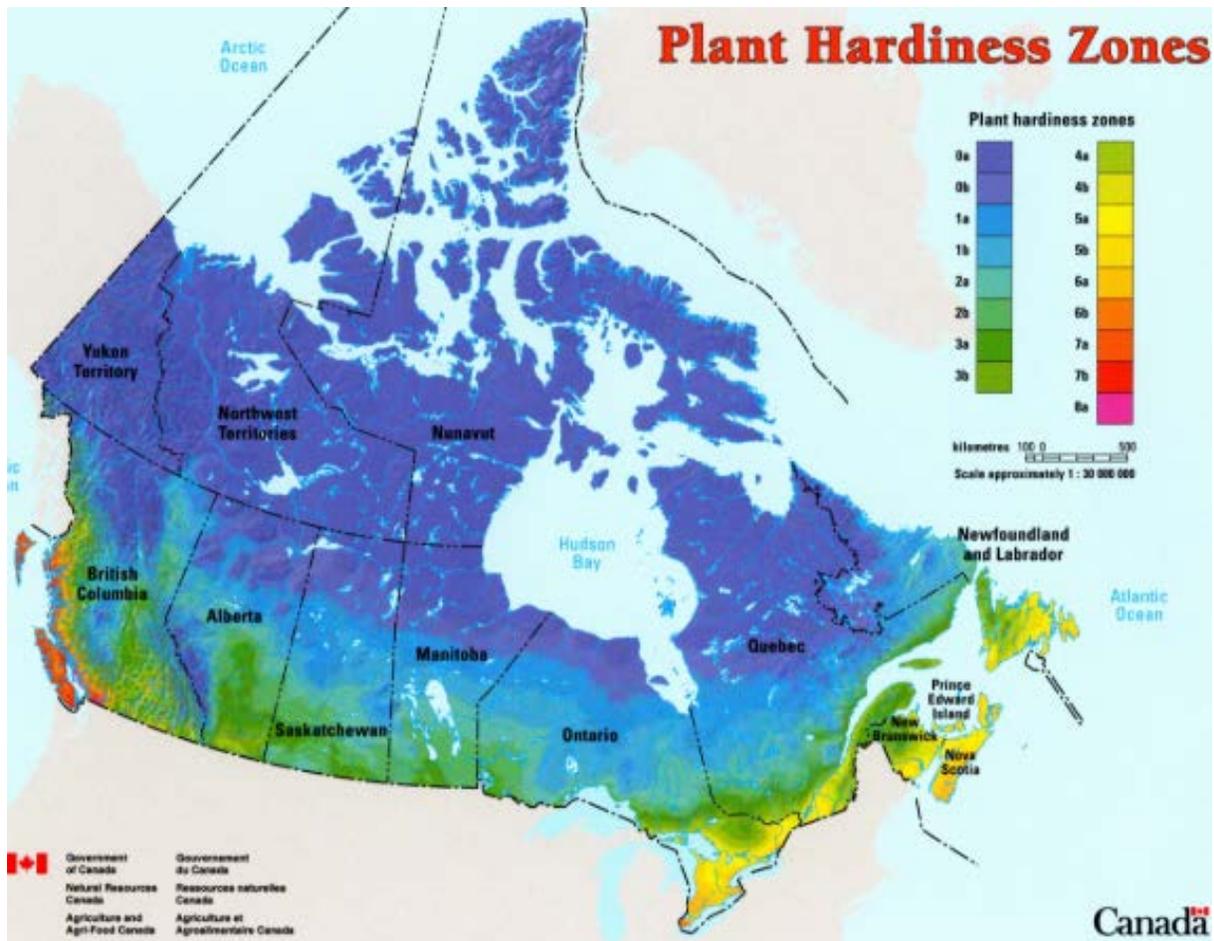
In a commercial zone, you would expect to find different types of stores, restaurants and businesses. And in a residential zone, you would expect to find parks, community centres and homes. The way something is zoned not only tells us what is allowed in a zone, but it also tells us what is not allowed. For example, you could not build a large factory or a processing plant in a residential zone.

Regions

A region, like a zone, is a section of land that is part of a larger area. Canada has seven different physical regions. Each region has its own geographical features and its own climate. Mountains, lakes and forests are examples of geographical features. These physical features can influence the type of weather a region experiences. For example, if you live near mountains you will get more rain than someone who lives in a prairie region, which is flat. The mountains influence the climate.

Climate describes the typical weather conditions for each physical region. Weather conditions such as rainfall, snowfall, temperature and wind speed are recorded and averaged over a number of years. In Canada, the average is calculated over a thirty-year span.

Plant Hardiness Zones Map



Learning Activity # 6 – Zone Map

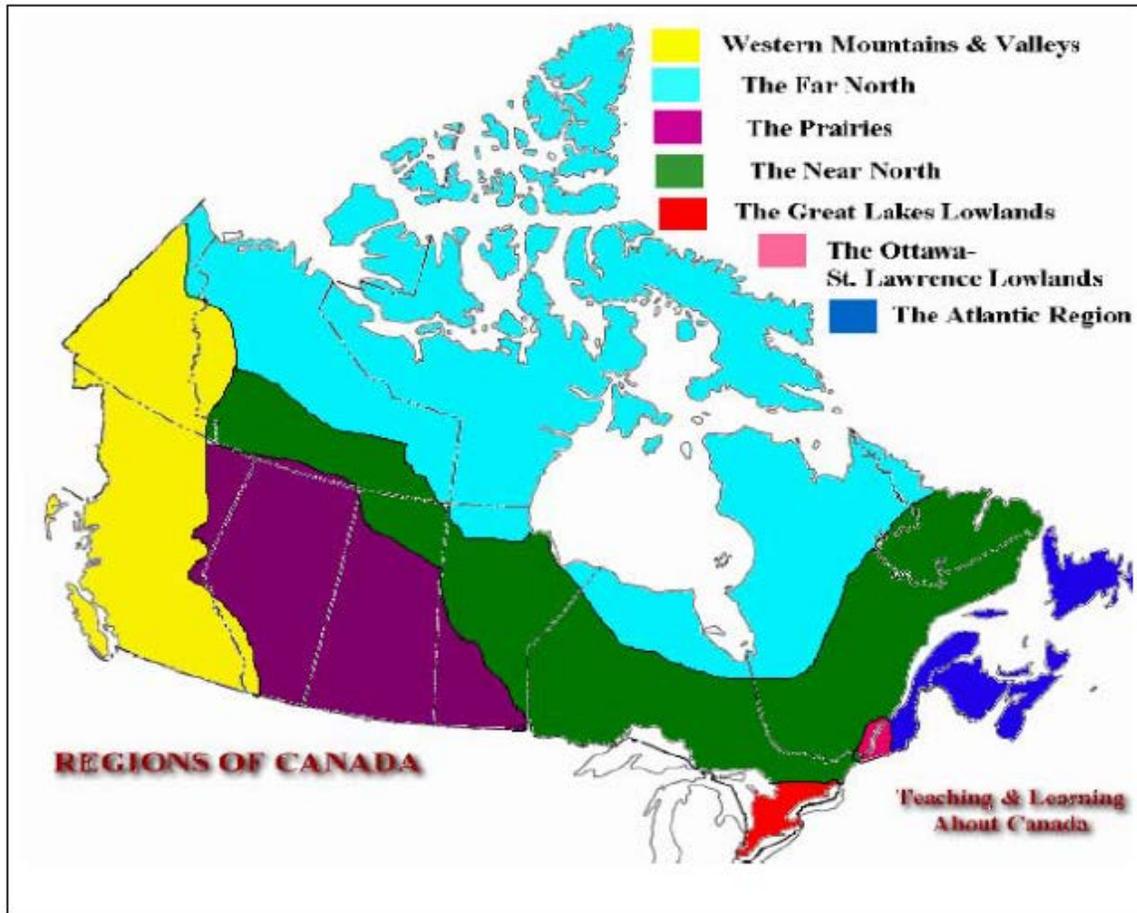
OALCF Competency Task Groups and Levels

A2.1 Interpret very simple documents to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

C4.2 Make low-level inferences to organize, make summary calculations and represent data

Look at the map below and find the region that you live in.



(courtesy of Agri-Canada)

1. List some of the physical features in your region. For example, are there mountains or is the land flat where you live?

2. Calculate the **averages** for the following questions. **Annual** means yearly.

To calculate an average, you add items you are working with together and divide this total by the number of items. For example, the average of the following numbers is (12, 10 16 and 14):

$$12+10+16+14 = 52$$

$$52 \text{ divided by } 4 = 13$$

The average is 13.

- a) Calculate the average winter snowfall for St. John's, Newfoundland, using the following information:

Winter months

November	=	26.3 centimetres of snow
December	=	61.3 centimetres of snow
January	=	79.9 centimetres of snow
February	=	66.5 centimetres of snow
March	=	52.3 centimetres of snow

The average winter snowfall for **St. John's** is _____

- b) Calculate the average winter snowfall for Whitehorse, Yukon Territory, using the following information:

Winter months

November	=	27.3 centimetres of snow
December	=	26.4 centimetres of snow
January	=	23.7 centimetres of snow
February	=	16.8 centimetres of snow
March	=	14.9 centimetres of snow

The average winter snowfall for **Whitehorse** is _____

- c) Calculate the average summer temperature for Edmonton, Alberta, using the following information:

Summer months

June	=	15.5 degrees Celsius
July	=	17.5 degrees Celsius
August	=	16.6 degrees Celsius

The average summer temperature for **Edmonton** is _____



- d) Calculate the average summer temperature for Iqaluit, Nunavut, using the following information:

Summer months

June	=	3.6 degrees Celsius
July	=	7.7 degrees Celsius
August	=	6.8 degrees Celsius

The average summer temperature for **Iqaluit** is _____

- e) Calculate the average monthly rainfall for Victoria, British Columbia, using the following:

Annual Rainfall

January	=	121.8 millimetres
February	=	98.8 millimetres
March	=	75.8 millimetres
April	=	44.5 millimetres
May	=	36.5 millimetres
June	=	32.0 millimetres
July	=	19.5 millimetres
August	=	23.9 millimetres
September	=	30.4 millimetres
October	=	75.6 millimetres
November	=	144.4 millimetres
December	=	138.3 millimetres

The average monthly rainfall for **Victoria** is _____

- f) Calculate the average monthly rainfall for Regina, Saskatchewan, using the following information:

Annual Rainfall

January	=	0.3 millimetres
February	=	0.7 millimetres
March	=	4.6 millimetres
April	=	16.7 millimetres
May	=	49.7 millimetres
June	=	75.5 millimetres
July	=	64.4 millimetres
August	=	43.2 millimetres
September	=	31.7 millimetres
October	=	15.3 millimetres
November	=	2.0 millimetres
December	=	0.07 millimetres



The average monthly rainfall for **Regina** is _____

Learning Activity # 7 – True/False

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

Look back at your answers to the questions in Learning Activity # 6 and answer the following True or False questions. **Circle** your answer.

1. Regina, Saskatchewan, has a greater average monthly rainfall than Victoria, British Columbia.

True

False

2. St. John's, Newfoundland, has more winter snowfall than Whitehorse, Yukon.

True

False

3. Iqaluit, Nunavut, is warmer than Edmonton during the summer months.

True

False

4. The average monthly rainfall in Regina is 34.3 millimetres.

True

False

Some Fun Canadian Weather Facts

(Source: *The Atlas of Canada*)



With our cold winters, hot summers and everything in-between, it is not surprising that the weather is a national preoccupation of Canadians.

- 🍁 **Victoria, British Columbia**, is the city with the lowest annual average snowfall: 47 centimetres.
- 🍁 **Winnipeg, Manitoba**, has the sunniest winters with the most hours of sunshine during December, January and February: 358 hours.
- 🍁 **Corner Brook, Newfoundland**, is the snowiest city, with an annual average snowfall of 422 centimetres.
- 🍁 **Yellowknife, North West Territories**, is the city with the coldest winters. The average nighttime temperature during December, January and February is -29.9 degrees Celsius.
- 🍁 **Medicine Hat, Saskatchewan**, is the driest city, with 271 days without rain or snowfall. It is known as the sunniest city in Canada.
- 🍁 **Windsor, Ontario**, is the most humid city in Canada.
- 🍁 **St. John's, Newfoundland**, is the windiest city.
- 🍁 **London, Ontario**, has the most days per year with thunderstorms: 36 days.

Learning Activity # 8 – Fun Weather Facts

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

Read “*Some Fun Canadian Weather Facts*” again, this time looking for the information you need to answer the following questions.

1. Which Canadian city has the sunniest winters? _____
2. What is Canada’s windiest city? _____
3. Which of the following cities is the driest? Yellowknife or Medicine Hat
4. Why do you think this is the driest city in Canada? _____
5. Do you know any other fun facts about Canadian weather to add to this list?

Plant Hardiness Zones

Location...Location...Location!

Plant hardiness zones are smaller planting areas located within larger regions. All plants need sunshine, water, food and suitable growing temperatures in order to survive. Plants that share the **same** growing requirements are placed in similar zones. Each zone has its own growing environment which is good for growing certain types of plants.

The amount of rainfall, snowfall, wind speed, soil type, temperature, and even how much sunshine a zone gets are all factors that affect plant growth. As a softscape labourer, you will be working with plants that match the growing conditions in your zone. Let’s look at some of the basic growing requirements that **all** plants need to survive.



Factors Affecting Plant Survival

Hardiness is a term that is used to describe how well a plant can tolerate the cold. The most important indicator we have of a plant’s survival rate is based on how well it survives the winter. Plants differ in their ability to survive **frost**. Some plants will die instantly, and others can live longer. Plants that can survive colder temperatures are stronger or hardier than plants that need warmer temperatures. The lowest winter temperature that a plant can survive is the best indicator of what zone it will thrive in.

Heat from the sun is important to plants. Some plants need lots of sun to live while other plants need less. Plants are divided into three groups based on how much heat and light they need to survive. Plants that need lots of sun are called **sun plants**. Plants that can't take too much sun are called **partial sun plants**. Plants that grow better in shady areas are called **shade plants**.

Daylight is an important factor when it comes to growing plants. All plants need sunlight to make their own food. The longer the day, the more food the plant can make.

Temperature Range tells us the highest and the lowest temperatures at which a plant can survive. Plants can grow within a wide range of temperatures. Some plants have a wide range of temperatures that they can survive in, while others have a smaller range. Plants must be placed in an area that is within their temperature range or they will not survive. You cannot grow a plant in a cold region if it is a plant that needs a warm temperature range. (A range has a starting point, a middle part and an end point. It can be an area, a space, or a period of time between two set points. For example, a mountain range is a line of mountains that spans an area stretching between the first mountain and the last mountain. It may start in one province and end in another province.)

Rainfall is another critical factor that affects a plant's survival. Different plants need different amounts of rainfall. If a plant needs a lot of water, planting it in a dry zone would be a mistake. It would die of thirst. Plants that don't need a lot of rain are known as "**drought resistant**."

Soil types vary from zone to zone. The plant's roots are the feeding system of the plant. The roots spread out in the soil searching for the food and oxygen that the plant needs to live. How well the roots do their job, depends on how acidic or non-acidic the soil is. If something is acidic, it means that it is sour and sharp to the taste. A lemon is a good example of something that is acidic. Our own bodies can also be acidic. Our saliva and the gastric juices that help us break down food are weak forms of acids. The acid in our body system affects how our **body** works. For example, too much acid in our digestive system may cause heartburn. It is important that our bodies maintain a balance of acid and alkalinity. Just as the amount of acid affects how our bodies work, it also affects the way plants absorb their food and water. Plants have a definite range of how much acid they can tolerate. This is called the pH level. If there is too much or not enough acid in the soil, a plant will die. All plant species need to be grown in soil that is compatible with their root system.

Other factors that are measured when determining where a plant will grow successfully are weather conditions such as wind speed and snowfall. The way plants are spaced when they are planted and how deep they are planted also predicts how well a plant will grow.



Learning Activity # 9 – Fill in the Blanks

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

B3.1 Create a very simple document to display and organize a limited amount of information

Take the Challenge

1. Fill in the blanks with the correct words. Since you have already read the information on the previous pages, you may now wish to scan the material again to find the missing words for the activity below.

A plant hardiness _____ is a planting area located within a region. Plants that share _____ growing requirements live in similar zones. A plant's survival rate is often connected to the type of _____ a zone experiences. Hardiness is a term that is used to describe how well a plant can tolerate the _____. Most plants can grow within a wide _____ of temperatures within their zones. However, you cannot grow a plant in a cold region if it is a plant that needs a warm _____ range. Plants are divided into _____ groups based on how much heat and light they need to survive. _____ plants need to be shaded while partial sun plants need some shade and some _____. Rainfall is another factor that affects a plant's _____. Plants that don't need a lot of rain are called drought _____. These plants can live in drier soils. Soils in _____ zones have different levels of acids. Other factors that are _____ when determining where to place a plant in a landscape are wind, _____ and snowfall. A plant will only _____ in a zone that matches its growing _____.

2. Which of the following essential skill(s) did you use to complete this exercise? **Circle** your answer.

Oral communication
Reading
Writing
Digital Technology

Continuous Learning
Numeracy
Document Use

3. Can you name the Essential Skills that are missing from the list in question 2?

Learning Activity # 10 – Plants

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

1. What does the term “plant hardiness” mean?

2. List six factors that affect plant survival.

- _____
- _____
- _____
- _____
- _____
- _____

3. Why is pH balance in soil important?

4. What does the term “drought resistant” mean?

Plant Hardiness Zone Maps

There are nine planting zones in Canada. The harshest zone is 0 and the mildest zone is 8. These zones are represented in a map format that was created by the Agriculture and Agri-Food section of the Canadian Federal Government. Each zone has its own growing conditions. The zones tell us what plants will grow there and what plants won't. The number tells us the maximum or upper limit of the planting zone. If a plant can survive in zone 4, then any zone higher than 4 will also be good. A zone 8 plant would not survive in zone 4.

Microclimate

Micro is a prefix that means small. You use a microscope to look at very small things. Microclimate is an area within a zone that has conditions that may be different from the larger zone. For example, you may live in zone 6 but part of your garden may not have any shelter from strong winds. Plants that normally would grow in zone 6 may have a difficult time growing in an unprotected area.

Larger regional climate factors may also affect the conditions in your hardiness zone. For instance, Ontario generally has harsher and longer winters than, say, British Columbia. However, not everyone who lives in Ontario experiences the same weather. Winter in Ottawa is much colder than winter in Toronto.

Planting zones have similar variations. On the Hardiness Zone Map, these variations are marked by the letters **a** and **b**. Information about the plant's zone will be printed on labels, on seed packets and in plant catalogues.



Learning Activity # 11 – My Zone

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

F Engage with others

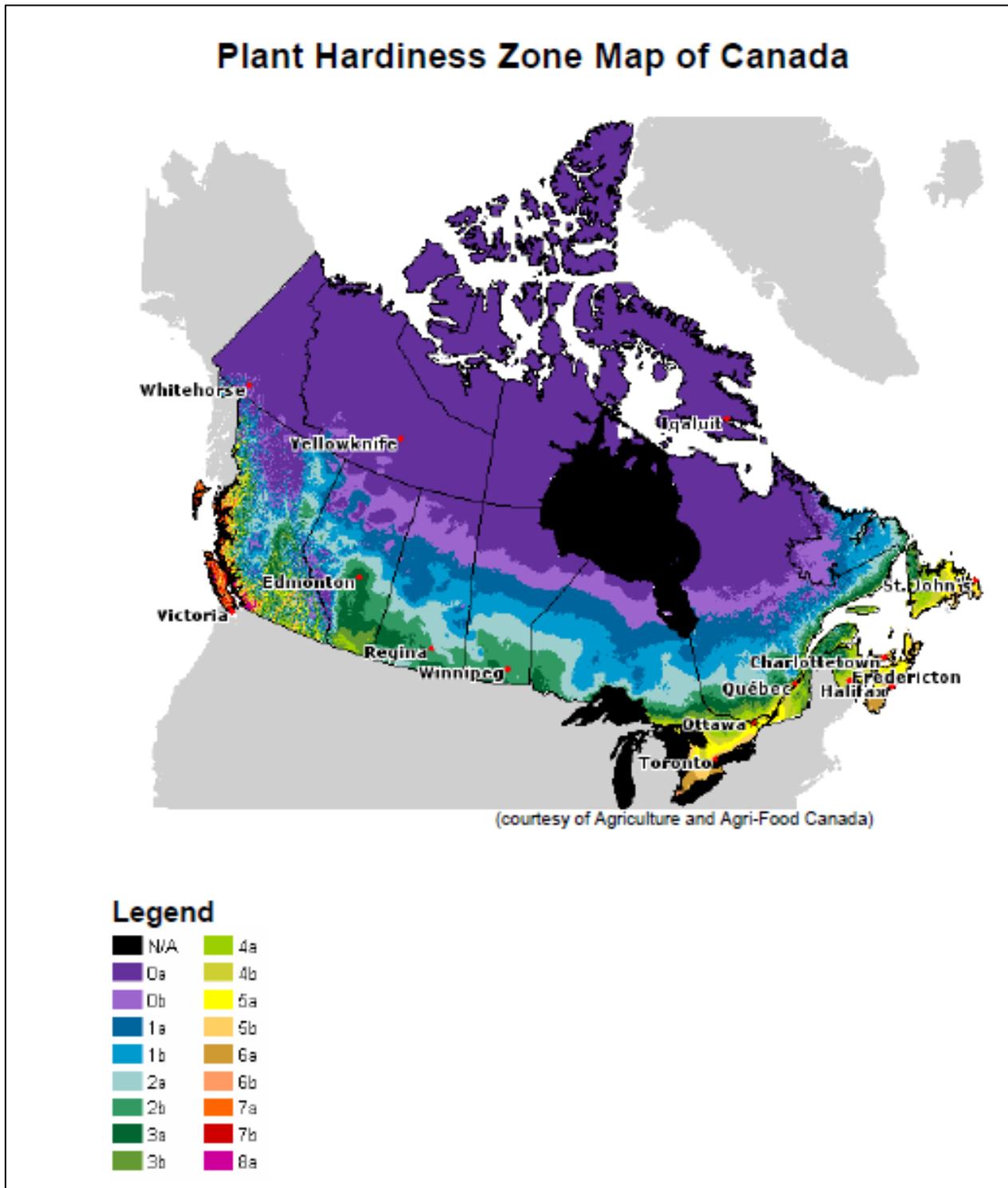
Look at the Plant Hardiness Zone Map and find the zone that you live in.

1. I live in zone # _____

2. To complete this activity, you will need help from your practitioner. Find a nursery in your area. You can look in the yellow pages or online for a listing. If possible, go on a field trip and visit the nursery. Make a list of ten plants that grow in your zone. If you can't go to a nursery, go to the library and look through some books on gardening to make your list. There are also lots of gardening sites online.

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

(Courtesy of Agriculture and Agri-Food Canada)



Learning Activity # 12 – Seed Packets**OALCF Competency Task Groups and Levels****A1.1 Read brief texts to locate specific details****A2.1 Interpret very simple documents to locate specific details****B2.1 Write brief texts to convey simple ideas and factual information**

Look at the sample seed packages on the next page and answer the following questions.

1. Which plants can grow in zone 5? _____
2. Can Baby's Breath grow in zone 8? _____
3. Can Sweet Alyssum grow in zone 2? _____
4. Which plants can grow in zone 1? _____



Sample Seed Packets

Common Name: Baby's Breath
Botanical Name: Gypsophila elegans
Colour: Mixed
Hardiness Zones: 3,4,5,6,7
Bloom Time: June/October
Height: 5 to 7 feet tall
Size: Seeds
Sun Requirements: Full Sun

Common Name: Sweet Alyssum
Botanical Name: Cruciferae
Colour: White
Hardiness Zones: 5,6,7
Bloom Time: 6 – 8 weeks
Height: 4 inches
Size: Seeds
Sun Requirements: Full Sun to Partial Sun

Common Name: Grandiflora Rose
Botanical Name: Rosa
Colour: Bronze
Foliage Colour: Green
Bloom Time: Summer
Bloom Size: 3 - 4 inches
Height: 4 - 6 feet
Width: 2 - 3 feet
Bulb Size: #1 Bareroot
Hardiness Zones: 4,5,6,7,8,9

Common Name: Hosta
Botanical Name: Hosta sieboldii
Colour: Lavender
Foliage Colour: Green
Bloom Time: June/August
Height: 20 inches tall
Width: 30 inches wide
Sun Requirements: Full to Partial Sun
Hardiness Zones: 3,4,5,6,7,8

Common Name: Peony
Botanical Name: Paeonia
Colour: Lavender
Foliage Colour: Green
Bloom Time: May/June
Height: 32 inches tall
Width: up to 30 inches wide
Requirements: Full Sun
Hardiness Zones: 3,4,5,6,7,8

Common Name: Black-eyed Susan
Botanical Name: Rudbeckia fulgida
Colour: Orange/Yellow
Foliage Colour: Green
Bloom Time: June/October
Height: 24 inches tall
Sun Requirements: Full Sun to Partial Sun
Hardiness Zones: 3,4,5,6,7,8

Learning Activity # 13 – What Can Grow?

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

Look at the Plant Hardiness Zone Map **and** the sample seed packs to answer the following questions.

1. Can Peonies grow in Iqaluit? _____

2. Which plants could grow in the Ottawa area?

3. Will Grandiflora Rose grow in Regina? _____

4. Which plants could grow in Victoria?

5. Can Black-eyed Susans grow in Whitehorse? _____

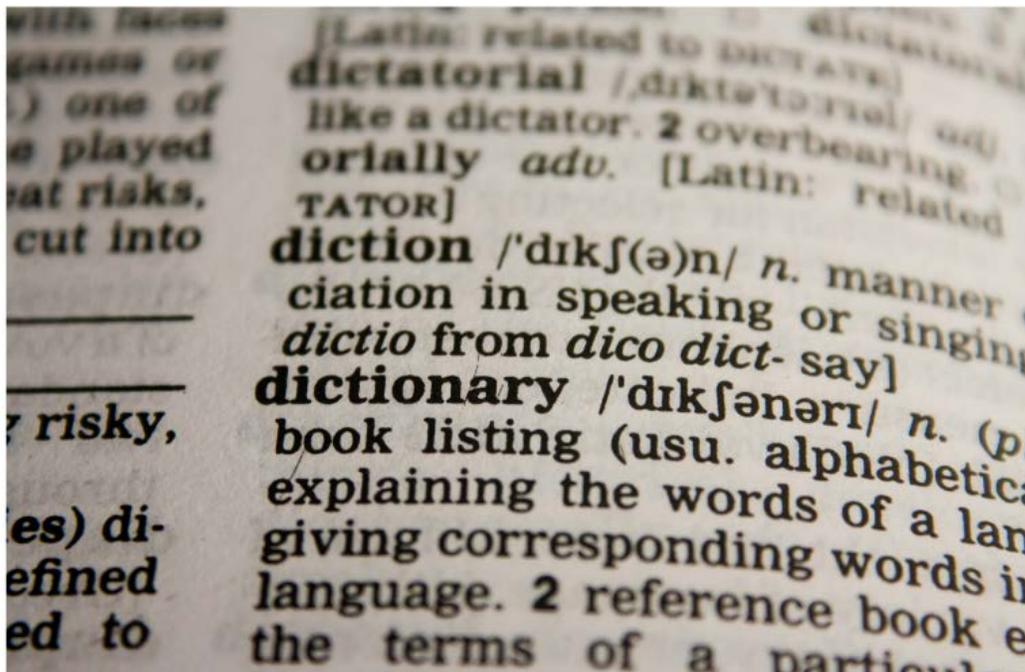
6. In a paragraph, explain what microclimate means?

Learning a New Language

It is impossible for anyone to learn all of the different plants and plant materials that exist. It would be like trying to learn every word in the world's biggest dictionary. When faced with a difficult problem, like learning a lot of new information, it is easier if you break the task down into smaller parts. One way of breaking a task down is to narrow your focus.

Let's say you meet a new group of people for the first time. You are introduced and you know there is an expectation for you to remember their names. This is a big task. You must break this task into smaller parts. Instead of trying to name individuals randomly, you may devise a system to group people. Perhaps there is the red group (each is wearing the colour red). This is what they have in common. Another grouping may have short hair; another grouping may all be tall people. Through grouping, you have eliminated all the unimportant factors about each person. It is easier to remember Joe, John and Mary because they have become the Reds. David, Sam and Anne are easier to remember because they are now the Talls.

We can also narrow our focus in reading. In other words, it is possible to improve your comprehension of reading passages by learning a common grouping of words. These are called sight words.



Did You Know?

In the English language, one hundred simple words make up half of all reading.

It may seem impossible, but it is true. These words are used so often, that you probably don't think about them when you are reading.

Box A – These 12 words = 1 / 4 of all reading.

Box A		
a	in	that
and	is	the
he	it	to
I	of	was

Box B has 20 words. Box A + Box B = 1 / 3 of all reading.

Box B		
all	be	have
on	they	are
but	him	one
as	for	we
his	said	with
at	had	not
	so	you

Box C has 68 words. Box A + B + C = 1 / 2 of reading (Total = 100 words)

Box C				
about	come	could	other	their
were	an	her	me	here
or	them	what	back	did
much	if	then	when	been
do	into	our	must	there
where	before	down	my	just
out	this	which	big	by
first	like	new	over	two
who	from	little	right	no
up	will	call	get	now
see	look	want	your	come
made	go	off	she	well
can	has	old	some	went
make	more			

As you can see, you do not have to know every English word in order to read most materials.

The good news is that the same is true with plant names!

Did You Know?

There are over 230, 000 known plants in the world.

Canada has over 5,000 different plants.

(Source: Redpath Biodiversity Project)

To do your job well as a landscape labourer, you do not need to know the names of all the plants in the world. You do not need to know the names of all the plants in your hardiness zone. But you do need to know the names of all the plants on your site.

When you are on a site, your supervisor and/or your co-workers will use plant names when they are giving you work instructions. You may be told to “move the Dahlias into the shed”. To do your job correctly, you must know which plants are the Dahlias.



Learning Plant Names

There are thousands and thousands of different plants in the world. Plant names can be difficult to read and difficult to remember. Many of their names will be unfamiliar to you, and some of them will be difficult for you to pronounce. It is almost like learning a new language.

When learning a new language, you usually start by learning **basic** vocabulary words first. You learn the words that name people, places and things. These words are called **nouns**. Examples of nouns include sister, house and dog. Next, you may learn the words that describe these nouns such as, big sister, new house and good dog. These words are the **adjectives**.

Learning Activity # 14 – Plant Names

OALCF Competency Task Groups and Levels

B2.2 Write texts to explain and describe information and ideas

B3.1 Create a very simple document to display and organize a limited amount of information

1. Take a minute to answer these questions about someone in your immediate family and someone in your distant family.

- What are their first names?

a. _____ b. _____

- What are their last names?

a. _____ b. _____

- What do they look like?

a. _____ b. _____

- Where do they live?

a. _____ b. _____

- Where were they born?

a. _____ b. _____

- How tall are they?

a. _____ b. _____

2. Write a paragraph describing the ways you could tell them apart.

Naming Plants

In the last exercise, we named and described people. Plants, like people, have family names, exact names and common names. **Common names** are nicknames that usually describe a feature of the plant. Most people will recognize a Bluebell by the way it looks. The plant is blue and is shaped like a bell.

Generally, common names for plants are used on a work site. However, it important to know that plant nicknames can be different in different places. To avoid confusion and to help people communicate information about plants worldwide, a **Binomial system** for naming plants is used. Binomial means having two names. The first name tells you the plant's family name. The second name usually describes a characteristic of the plant, for example, *Diets bicolour*. Often you'll see a name in quotation marks; this tells you it is a man-made variety, called a cultivar.

Person, Place or Thing

The person who discovers a new plant can give it a name. Sometimes the name is related to the person who found it, or it is named in honour of someone. For example, *Hypericum edisonianum* is named after Thomas Edison. The place where the plant is found can also be used, for example *Cornus florida*. The shape of the plant is sometimes found in its name. For example, the plant *Viburnum dentatum* (think of dentures) has toothed leaves. Sometimes the colour is used in naming. *Acer rubrum* is the Red maple (rubrum is Latin for red).

Learning Activity # 15 – Latin Name Game

OALCF Competency Task Groups and Levels

D.2 Perform well defined, multi-step digital tasks

Using a computer, tablet or cell phone, go online to:

http://www.bbc.co.uk/gardening/htbg/module2/plant_names1.shtml

Click on the interactive link for Latin Naming and play the Latin Name Game. Enjoy!

Reading Plant Labels

On plant labels, you will find the family name is written first. It always starts with a capital letter. *Buddleia* starts with a capital B. The descriptive or "exact" name is written second. It always starts with a small letter, for example, *dauidii*. Both names, *Buddleia dauidii*, are written in a language called Latin. Latin is the common language used for plant identification all over the world.

Many English words have Latin root words. A root word is a word or part of a word that is found in many other words. Sun is the root word of sunshine, sunlight, sunny, and Sunday. These root words often help us to find the meaning of words that may not be familiar to us. In plant names, some of the Latin descriptive words are similar to English words that you may already know.

Learning Activity # 16 - Resemblance

OALCF Competency Task Groups and Levels

B2.1 Write brief texts to convey simple ideas and factual information

Look at the following Latin descriptive words for plants. What English words do you think they resemble? Write your answers in the space provided.

1. fragrantissima _____
2. compacta _____
3. californica _____
4. montana _____
5. elephan _____
6. mega _____
7. grandi _____
8. aquatica _____

Example of Binomial Naming

<p>This is Rosemary White. White tells you what family she belongs to. Rosemary is her exact name. Everybody calls her Rosie. In the phone book she is listed with all the other Whites as White, R.</p>		<p>This is Buddleia davidii 'Royal Red'. Buddleia is the family or <i>generic</i> name. davidii is the <i>species</i> or kind of buddleia. 'Royal Red' is the particular kind of buddleia that has been made by humans, a <i>cultivar</i>. Everybody calls it a Buddleia.</p>	
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“Binomial nomenclature is a formal system of naming species of living things by giving each a name composed of two parts, both of which use Latin grammatical forms, although they can be based on words from other languages.” - Wikipedia

Learning Activity # 17 – Scary Names

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

1. Underline the family name of the following plants.
 - *Hermodactylus tuberosus*
 - *Muscari latifolium*
 - *Ferraria crispa*
 - *Calochortus albus*
2. Circle the describing name (species) of the following plants.
 - *Hyacinthoides hispanica*
 - *Zephyranthes grandiflora*
 - *Watsonia beatricis*
 - *Chirita lavandulacea*
3. Circle which of the following are cultivars.
 - *Tradescantia pallida* 'Purple Heart'
 - *Gerbera jamesonii*
 - *Antirrhinum majus* 'Trumpet Serenade'
 - *Bolax gumifera*

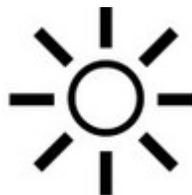
Symbols on Plant Labels

Symbols are images used to convey information to the reader. Symbols appear just about everywhere we look. Road signs, box labels and prescriptions all represent examples of labels we may find in our daily living. Symbols are a substitute for words.

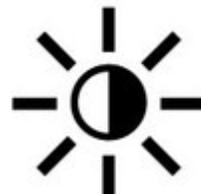
In the case of plant labels, symbols are used to describe what conditions the plant needs to survive.



shade



full sun



partial sun



drought resistant

Learning Activity # 18 – Types of Plants

OALCF Competency Task Groups and Levels
A1.2 Read texts to locate and connect ideas and information
D.2 Perform well-defined, multi-step digital tasks

Use the Internet or gardening books to research the following:

1. List five shade plants.

- _____
- _____
- _____
- _____
- _____



2. List five full sun plants.

- _____
- _____
- _____
- _____
- _____

3. List five drought resistant plants.

- _____
- _____
- _____
- _____
- _____

Common Sense

All the information we have about the world we live in comes directly to us from our senses. We have five senses: sight, sound, touch, smell and taste. Most of us have all five senses but we may use them differently when we are learning new material.

Some people learn best by looking at things, others learn best by listening, and still others learn best by using a hands-on approach. For example, when asked to build a do-it-yourself (DIY) bookshelf:



Visual learners may prefer to read the instructions or look at the pictures.



Auditory learners may prefer to discuss the process or vocalize the steps out loud.



Kinaesthetic learners may prefer to handle the parts and start putting things together using their hands.

Learning Activity # 19 – Learning Styles Scenario

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

B2.2 Write texts to explain and describe information and ideas

C4.2 Make low-level inferences to organize, make summary calculations and represent data

This activity can be done with a partner or individually. Select a learning style to look at in further detail. Using the Internet for research purposes, complete the following scenario.

Jane is having difficulty learning about plant names. She has just discovered she is a _____ (select a learning style) learner and wants to use her learning style to help her better understand the material. What could Jane do to make learning the material easier for her. Brainstorm some activities that would help Jane learn more efficiently.

Memory Use

Zoom

Hunters, scientists, astronomers and doctors all understand the importance of zooming in on an object. Hunters look through rifle **scopes**, focusing on their prey. Scientists peer down **microscopes**, studying objects that can't be seen by the naked eye. Astronomers use **telescopes**, getting a closer look at a star or planet. Doctors use **stethoscopes** for listening only to the heartbeat. Mechanical scopes help us focus our attention on a specific object. These various types of scopes all have one thing in common: they eliminate the unimportant details and allow us the opportunity to pay attention to what is truly important. For example, in the case of hunters, the scope allows them to focus on the deer and not the surrounding trees.

We can also narrow our focus without using mechanical scopes. Our brain acts like a scope every day. It recognizes and sorts information into meaningful patterns that allow us to live our daily lives. We eliminate unimportant information and focus on the information that we need. If we had to pay attention to everything around us all the time, we wouldn't be able to do anything. For example, if you're playing a game of darts and you're looking everywhere in the room but the board, you won't hit the bull's-eye. To hit the bull's-eye, you need to focus your attention and practise throwing your darts. Memory works the same way.

Focus

When learning new information, you have to pay attention and learn the information, or you won't remember it. Be an active listener. For example, when people introduce themselves and you're not paying attention, you won't remember their names because you didn't learn them. Sometimes people will say, "**I have a bad memory**" when what they mean is, "**I wasn't paying attention**".

Learning Activity # 20 – Lists of Belonging

OALCF Competency Task Groups and Levels

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

B3.1 Create a very simple document to display and organize a limited amount of information

One of these things is not like the others.

Your instructor will read you nine different lists of various words Listen to each list and write down the item that does **not belong**. Pay close attention.

**Note to practitioners: These lists can be found in the Answer Key at the end of this guide.*

- List 1 _____
- List 2 _____
- List 3 _____
- List 4 _____
- List 5 _____
- List 6 _____
- List 7 _____
- List 8 _____
- List 9 _____

Tips to help you remember:

- If someone tells you something, for example, the ideal weight of a package, repeat that weight out loud. Saying something out loud (numbers, names, colours) helps us to remember the information.
- Take notes in a notebook. Write the information down. If you cannot write it down immediately, write it down as soon as you get a break. Writing information helps you to remember it.
- If you have trouble writing the information, draw diagrams and pictures to help you remember. Don't worry about how "good" a drawing is, because it just needs to remind you.

- Visualize the information. Picture the information in your mind. See the number, the name, the colour, even the process of doing something in your mind. Rehearse it in your mind. Picture yourself doing the task or saying the information out loud. Visualization is a good tool.
- The more you understand something, the more likely it is that you will be able to remember it. If you don't understand, ask questions.
- To help you remember something that you are reading, try highlighting important information.

People use many different tricks to help them remember things. Memory tricks work best when you create them yourself. When something is familiar to you, chances are you will remember it better. Learning new material is easier if you connect it to something that is familiar to you. You can use colours, shapes, smells, sounds and even how something feels to help you create links with things you already know. For example, lamb's ear is a plant that has a soft velvety leaf.

Learning Activity # 21 – Word Associations

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

Write the first word you think of when you read each of the words in the following list. Do not use opposites.

- | | |
|-----------|----------|
| 1. Bell | 1. _____ |
| 2. Yellow | 2. _____ |
| 3. Soft | 3. _____ |
| 4. Hot | 4. _____ |
| 5. Snow | 5. _____ |
| 6. Green | 6. _____ |

Learning Activity # 22 – Plant Match

OALCF Competency Task Groups and Levels

A2.1 Interpret very simple documents to locate specific details

Look at the following plant pictures. Pay attention to the shape of the plant and match the pictures to the names listed. Write the correct letter in the space provided.



A



B



C



D



E



F



G

1. Bleeding Heart _____
2. Bird of Paradise _____
3. Sunflower _____
4. Pitcher Plant _____
5. Elephant Ears _____
6. Venus Fly Trap _____
7. Spider Plant _____

Tricks to Help You Remember

Sometimes, how something looks, smells, sounds or feels won't remind you of something you already know. Another way to help you remember new information is to create "silly links". The crazier the link, the more likely you are to remember it.

For example, if you want to remember the flower Hollyhock, you could say "my girlfriend Holly has a hawk". Here's another one: to remember the flower called peony (pee-o-knee), you could say, "*don't let your dog pee on my knee*". You don't have to be exact, but you do have to be silly. Let's try some more.

Learning Activity # 23 – Silly Names

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

Create a silly link for each of the plant names. If you don't know how the words sound, ask your practitioner.

1. Marigold _____
2. Yucca _____
3. Petunia _____
4. Pansy _____
5. Hosta _____

Learning Activity # 24 – Memory Tricks

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B3.1 Create a very simple document to display and organize a limited amount of information

Organizing information into groups is another trick that is helpful when you are learning new material. It is easier to remember things in groups, instead of as a list of single items.

1. Look at the following word list for **ten seconds** and try to remember as many words as you can, in the order they are written. Cover the list and complete the activity without looking at the list.

soccer
cake
baseball
pizza
basketball
cereal
skating
tennis
popcorn
hockey

2. List the words you remembered. (Don't peek at the list.)

- It is easier to remember words that have things in common. Remembering unrelated words is more difficult. Now, look at the list again for ten seconds and see how many sports words you can remember.

Sports

- Without looking at the list again, can you think of a second group that the remaining words would fit into?

Group # 2 _____

*Studies have shown that people remember things better when they try to remember a few things over a period of time, rather than trying to remember everything at once. When you work with plants, there are lots of things to remember. Set a **goal** for yourself: for example, to learn the name of one new plant every day and practice what you've learned on a daily basis. You could simply repeat the name out loud. You could also practice linking new names with things you already know. Research tells us that sometimes a name may need to be repeated up to 100 times before it is committed to memory. Practice using the name as often as you can. "Practice, practice and more practice."*



Landscape and Grounds Maintenance Worker Curriculum

Unit 3: Planting

Unit 3: Planting

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Unit 3: Planting

OALCF Skill Competency Chart by Task

This OALCF Skill Competency Chart aligns each activity in the unit to the Ontario Adult Literacy Curriculum Framework. Each activity is listed and articulated by Task Group and skill level.

OALCF CHART	Competency	Find and Use Information			Communicate Ideas and Information			Understand and Use Numbers				Use digital technology	Manage learning	Engage with others
	Task Group	Read continuous text	Interpret documents	Extract info from films etc.	Interact with others	Write continuous text	Complete and create documents	Manage money	Manage time	Use measures	Manage data			
Activity #	Task Group #	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D	E	F
1	Plant Basics	1				1	1							
2	Crossword		1				1							
3	A to Z					2	1					2		
4	Soil		1			1	1							
5	Fertilizer		1			1					2			
6	Sample Label		1			1								
7	Dictionary Work	1				2								
8	Sample Label 2	1	1											
9	Planting Materials					1								
10	Listening Script			2		1								
11	True/False						1							
12	Plantings					2	1							
13	Getting Ready	1				1								
14	Day's Instructions			2		1								
15	Listening Instructions			1		1						2		
16	Unclear Instructions	2				1								

What is a Plant?

A plant is anything that grows from the ground. A plant can be a flower, a bush, a vine, a tree, a weed, a vegetable or grass. Plants, like our own bodies, have many parts that have special uses. Each part does its bit in helping the plant to grow and flourish.

Roots

Roots soak up water, oxygen and nutrients from soil. They also help to support the plant. Plants can have two different types of root systems: taproot or fibrous. A **taproot** is a single large root. Taproots grow straight down and act as strong anchors for the plant. A carrot is an example of a taproot. A **fibrous** root system has many smaller roots which branch off the main root. These smaller, branching roots grow close to the surface of the ground. They spread out underground and surround the plant. These roots help to keep the surface soil from blowing or washing away. Grass is an example of a fibrous root system.

Leaves and Stems

In green plants, the leaves absorb light and convert this energy into food for the plant, which is carried through the plant by the stem. The food and water which is pulled from the soil by the roots also travels through the stem. The stem helps to hold the plant up, which helps it get more light from the sun. There are two kinds of stems: **herbaceous** and **woody**.

Herbaceous plants usually have flowers and soft green stems which bend easily. They die back to the ground when they have completed their growing season. Most annuals, perennials, vegetables and houseplants are herbaceous plants.



Cosmos



Larkspur



Hibiscus

Woody plants have stiff woody stems that stay in place when the plant has completed its growing season. Woody plants can have trunks or just branches. When in bloom, woody plants can have colourful flowers, leaves and berries. In the winter, when you see bare branches everywhere, you are looking at woody plants that are dormant over the winter. Trees and shrubs are examples of woody stemmed plants.



Lilac



Forsythia



Roses

Seeds, Fruits and Flowers

Seeds produce new plants. In flowering plants, the flower produces the seed. In plants that produce fruit, the seed is found in the fruit, as in an apple.

Plant Groups

As we've seen, when you put things into groups, the group name itself can help you remember things better. The group name tells you what the things have in common. Let's say you're at the grocery store and you forgot your shopping list at home. To help yourself remember what was on the list, you could think in terms of groups. For example, "What vegetables did I need?", or "What dairy products was I supposed to get?", etc. Plants are also divided into groups based on their growing seasons.

All plants originally come from seeds. Seeds grow into plants and the plants then produce their own seeds (in a flower or fruit). The seeds ripen and fall, and then the plant dies back to the ground. Plants complete this cycle during their growing season. Some plants die, never to grow back again; others will sleep underground (in a dormant state) until the next growing season arrives.

Annuals: complete their life cycle in **one year**

Biennials: complete their life cycle over **two years**

Perennials: repeat their life cycle over a **number of years**

Annuals

Annuals are quick-blooming flowering plants that have lots of bright colours. They bloom all summer and then they die down in the fall, when the first frost comes. In landscaping, you'll find them in hanging baskets, planting pots on patios and decks, and in flowerbeds. They are generally cheap to buy because they only last for one growing season.



Pansy



Morning Glory



Sweet Pea

Biennials

Biennials take two years to flower or produce fruit. The first year the plant grows only its leaves above ground. It sleeps through the winter, and then in the second year the plant will flower or produce fruit. Some vegetables such as carrots, cauliflower and onions are biennials. Some examples of biennial flowers are hollyhocks and verbena. In landscaping, most flowering biennials are more expensive than annuals, because they are generally bought when they are in their second season.

Perennials

Perennials will flower year after year. Once they're planted in a landscape, they will bloom at the same time each growing season. They have a limited bloom time of usually 2 - 3 weeks. For example, daffodils and tulips are perennials that bloom in the spring and then die back to the ground. They do not flower all summer. Other perennials will bloom in mid-summer, late summer or fall. Flowering perennials generally cost more than annuals and biennials because they are more permanent.



Daylily



Geranium



Peony

Learning Activity # 1 – Plant Basics

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

B3.1 Create a very simple document to display and organize a limited amount of information

1. Describe the function of each of the following plant parts:

a) Roots: _____

b) Leaves: _____

c) Stems: _____

d) Seeds, Fruits and Flowers: _____

2. Name the two types of root systems.

a) _____

b) _____

3. Name the two types of stems.

a) _____

b) _____

4. Fill in the blanks:

_____ complete their life cycle over a two-year period. Perennials complete their life cycle over _____ of years. _____ are generally the most inexpensive flowering plant because they live and die during one growing _____.

5. What does it mean when a plant is dormant? Use the dictionary definition.

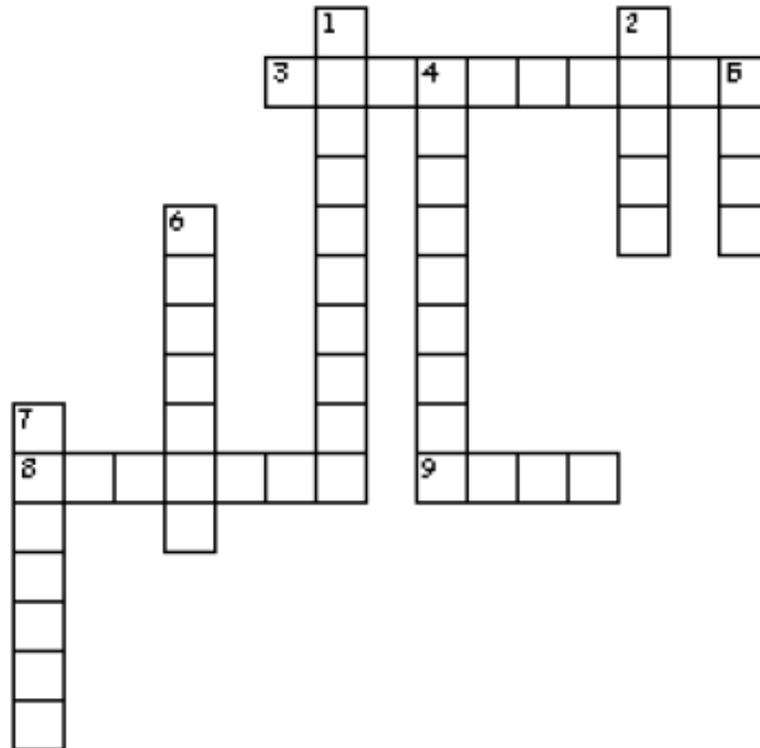
Learning Activity # 2 – Crossword

OALCF Competency Task Groups and Levels

A2.1 Interpret very simple documents to locate specific details

B3.1 Create a very simple document to display and organize a limited amount of information

Complete the Crossword.



Across

- 3. Soft green stem
- 8. Blooms all summer
- 9. Produces new plants

Down

- 1. daffodils and tulips
- 2. type of stem
- 4. grows over two seasons
- 5. helps support the plant
- 6. several main roots with branches
- 7. single large root

Learning Activity # 3 – A to Z

OALCF Competency Task Groups and Levels

B2.2 Write texts to explain and describe information and ideas

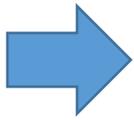
B3.1 Create a very simple document to display and organize a limited amount of information

D.2 Perform well-defined, multi-step digital tasks

1. Work with a partner, group or independently and list any plant names or plant products that start with each letter of the alphabet. The first one is done for you. Go online or use plant reference books if you need extra help.

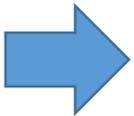
A. <u>Aster</u>	N. _____
B. _____	O. _____
C. _____	P. _____
D. _____	Q. _____
E. _____	R. _____
F. _____	S. _____
G. _____	T. _____
H. _____	U. _____
I. _____	V. _____
J. _____	W. _____
K. _____	X. _____
L. _____	Y. _____
M. _____	Z. _____

2. Now choose five plants from the A - Z list and find out more about them. Use the internet and/or garden books from the library to answer the following questions.



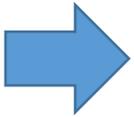
PLANT #1

- a) Plant name – Scientific name: _____
- b) Plant name – Common name: _____
- c) Hardiness Zones where it will grow: _____
- d) Is it a sun, partial sun or shade plant? _____
- e) Is it annual, biennial or perennial? _____
- f) Describe what it looks like: _____



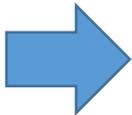
PLANT #2

- a) Plant name – Scientific name: _____
- b) Plant name – Common name: _____
- c) Hardiness Zones where it will grow: _____
- d) Is it a sun, partial sun or shade plant? _____
- e) Is it annual, biennial or perennial? _____
- f) Describe what it looks like: _____



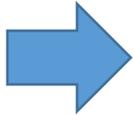
PLANT #3

- a) Plant name – Scientific name: _____
- b) Plant name – Common name: _____
- c) Hardiness Zones where it will grow: _____
- d) Is it a sun, partial sun or shade plant? _____
- e) Is it annual, biennial or perennial? _____
- f) Describe what it looks like: _____



PLANT #4

- a) Plant name – Scientific name: _____
- b) Plant name – Common name: _____
- c) Hardiness Zones where it will grow: _____
- d) Is it a sun, partial sun or shade plant? _____
- e) Is it annual, biennial or perennial? _____
- f) Describe what it looks like: _____



PLANT #5

- a) Plant name – Scientific name: _____
 - b) Plant name – Common name: _____
 - c) Hardiness Zones where it will grow: _____
 - d) Is it a sun, partial sun or shade plant? _____
 - e) Is it annual, biennial or perennial? _____
 - f) Describe what it looks like: _____
-

Soil

Soil is a mixture of air, water, living things (leaves and worms, etc.), organic and mineral materials. Organic materials are formed when living things like plants and animals decay. This organic material is called **humus**.

Mineral material is made up of small pieces of rock that have been worn down over time by water, wind and chemical processes. The water and air that plants need to survive are trapped in the soil in little air pockets or pores.



The size of these pores is determined by the type of soil. There are three basic soil types: sand, silt, and clay. Sandy soils have large pores, silty soils have smaller pores and clay soils have the smallest. If the pores are too big, like in sandy soils, water will drain too quickly. The plant's roots won't have enough time to absorb the water and nutrients it needs. In clay soils, the pores are small and can't drain water easily. They can fill up with water and the plant won't get enough oxygen. The best soil is a balanced mixture of sand, silt, clay and humus, called **loam**. Loam allows the plant to get the water, oxygen and food that it needs.

Soil Texture

Texture is something you can feel. Sandpaper has a rough texture. Velvet has a soft texture. You can tell the different kinds of soil apart when they are wet by their texture and colour. Sandy soils are light in colour and feel rough to the touch, like sugar. Silt and loamy soils are dark and feel spongy to the touch, like mushrooms. Clay soils can be reddish or grey and feel smooth to the touch, like plasticine.

Learning Activity # 4 – Soil

OALCF Competency Task Groups and Levels

A2.1 Interpret very simple documents to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

B3.1 Create a very simple document to display and organize a limited amount of information

Materials needed: handful of soil, water and ruler

Go outside and gather a handful of soil.

1. What words would you use to describe the colour and texture?

2. Slowly, wet the soil in your hand until it forms a ball. Next, squeeze the soil out between your thumb and forefinger to form a worm-like ribbon. Measure the length of the ribbon in centimetres (cm).

How long is the ribbon? _____

Colour	Texture	Length	Soil Type
Dark	Spongy	2.5 cm	Silt/Loam
Reddish grey	Smooth	5 cm or longer	Clay
Light	Grainy	Won't form a ribbon	Sand

3. Based on the above chart, what is your soil type? _____

4. Which chart heading did you use to find your answer? _____

5. Draw a line to connect the correct word with its meaning.

Organic	A. Food
Sandy soil	B. Weak in nutrients and water drains quickly through it
Nutrient	C. Balanced mixture of sand, silt, clay, humus
Drainage	D. Living things
Loam	E. Not organic
Minerals	F. How something feels
Clay	G. The removal of water
Humus	H. Rich in organic material
Texture	I. Has small pores

What is Fertilizer?

Fertilizer is a plant food that is used to help balance soil. Fertilizer has many nutrients. Three of the most important ones are: **Nitrogen (N)**, **Phosphorous (P)**, and **Potassium (K)**. All plants need these to live. Nitrogen helps plants to grow dark green, healthy leaves. Phosphorous helps build strong roots, protects against disease and helps the plant make seeds and flowers. Potassium also keeps roots strong and protects against disease. In addition, it helps green plants make food in their leaves.



Types of Fertilizers

Fertilizers can be **synthetic** (man-made) or **organic**. Synthetic fertilizers can be liquid, granular or powdered in form. On site, you may see bags of fertilizer that look like sacks of kitty litter; these are **granular** fertilizers. These fertilizers are spread on the ground or they can be mixed into the soil. Once in the soil, they dissolve in water and the nutrients are absorbed by the plant roots.

Powdered and **liquid** fertilizers are mixed with water before they are used. Once dissolved, they work very quickly when they are applied. There are also **slow release** fertilizers that work over a period of time. When you use synthetic fertilizers, you must follow the directions on the label exactly. If you use too much, you could burn the plant roots. Your supervisor will show you how to mix and apply them correctly.

Organic fertilizers are made from manure and other organic products. Some people make their own organic fertilizer from yard clippings and vegetable kitchen waste. This is known as **compost**. Organic fertilizers are not as harsh as synthetic fertilizers. You need to use more of them, but the risk of burning the plant and its roots is much less. Organic fertilizers can also improve drainage in soil and can help the soil get more air. For example, organic fertilizers help sandy soils hold more water. In clay soils, organic fertilizers can help break up the tight soil and allow the water to drain better.

Reading Fertilizer Labels

All fertilizer labels have three numbers printed on the front. The first number tells you the **percentage of nitrogen (N)**, the second is the percentage of **phosphorous (P)** and the third is the percentage of **potassium (K)**. There are other nutrients in fertilizers, but N, P and K are the most important.

Percentage is the relationship of the parts to the whole.

50 cents is 50% of a dollar

Learning Activity # 5 – Fertilizer

OALCF Competency Task Groups and Levels

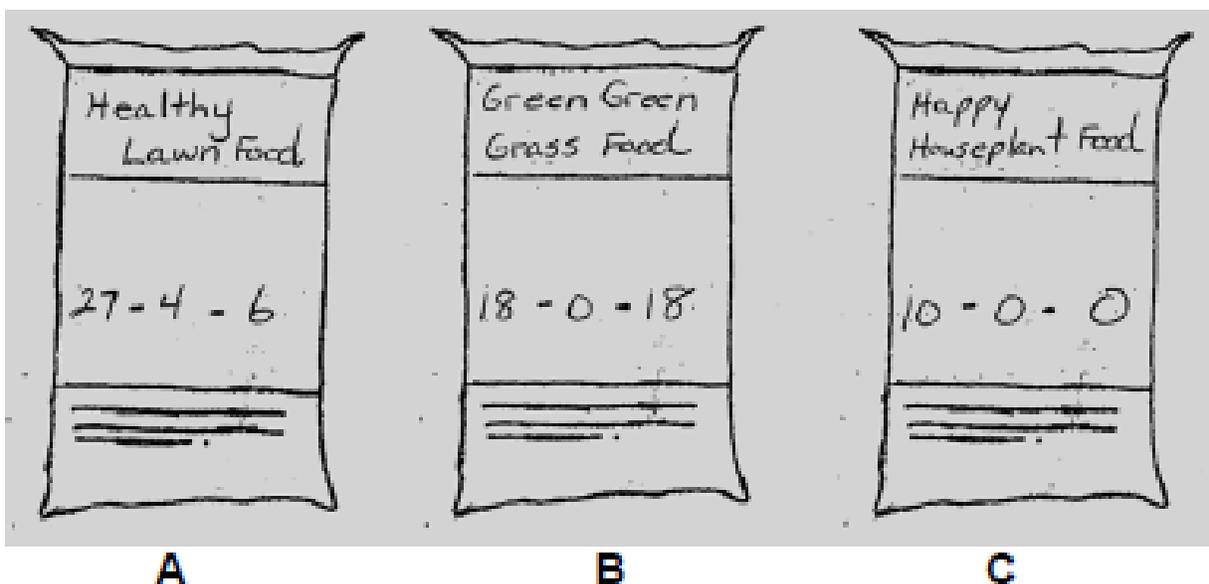
A2.1 Interpret very simple documents to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

C4.2 Make low-level inferences to organize, make summary calculations and represent data

Look at the sample fertilizer labels below and answer the following questions.

1. Which sample has the most Potassium? _____
2. Which sample has the least Nitrogen? _____
3. Which sample has the most Phosphorous? _____
4. What does the letter K mean? _____
5. What does the letter N mean? _____
6. What does the letter P mean? _____



Learning Activity # 6 – Sample Label #1

OALCF Competency Task Groups and Levels

A2.1 Interpret very simple documents to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

Look at sample label and answer the questions.

There is no need to read the whole label. Scan the label until you see the key word you are looking for. It is the same technique as scanning for the face of a friend in a crowd.

Use the *headings* to help find the section of the label you need.

They may be written:
Bigger
IN CAPITALS
BOLD
In different colours

Sections
The label is divided into coloured sections, including:

- product details – what it is
- where, when and how to use it.

Boost® All-Round Compost
Healthy growth from seed to full bloom. It has a rich natural base of the finest Moss Peat with a perfect balance of lime and plant food.*

INSTRUCTIONS FOR USE

POTTING

1. Fill the new pot with Boost® All-Round Compost and leave enough room for the plant and its existing compost.
2. Place plant in the centre of the pot.
3. Fill in around the plant with Boost® All-Round Compost and use finger tips to gently firm down.
4. Regular watering is recommended.
5. A liquid feed should be added with each watering after four weeks. This will enhance colour and vigour.

HANGING BASKETS
Boost® All-Round Compost is the ideal compost for hanging baskets with its special blend of nutrients and retting agent.

SEEDLINGS
Healthy growth and colour of developing plants is ensured by the use of Boost® All-Round Compost. Transplant seedlings to pots when they are large enough to handle and remember to water them regularly. Never lift seedlings by the stems as these are easily damaged. Lift them by the leaves.

*** ENVIRONMENTAL INFORMATION.**
THE PEAT IN THIS PRODUCT HAS NOT BEEN HARVESTED FROM AREAS OF SCIENTIFIC INTEREST.
Boost® is a registered trademark.

Peat*
A symbol (*) can send you to another part of the label for extra information.

When you find the section you need you can read it more carefully to find the answer to the question.

Extra information

1. Does the product have “peat” in it? _____
2. Is it good for transplanting seedlings? _____
3. Can you use it for hanging baskets? _____
4. When do you add a liquid feed? _____

Learning Activity # 7 – Dictionary Work

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.2 Write texts to explain and describe information and ideas

Find the dictionary meaning for the following words.

1. Recommended

2. Suitable

3. Enriched

4. Peat

Learning Activity # 8 – Sample Label #2

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

A2.1 Interpret very simple documents to locate specific details

B1.1 Participate in brief interactions to share information with one other person

Read sample label #2 out loud to your practitioner.

Make a list of the words that are new to you and check their meanings in the dictionary. Use an extra sheet of paper if you need more space.

<i>Ericaceous Plant Food</i>	Concentrated	1 Litre
<p>Ericaceous* plant food is a concentrated liquid plant food, specially formulated with extra iron for feeding all acid-loving plants. It is recommended for plants such as rhododendrons, azaleas and heathers.</p> <p>Provides a fast acting, balanced nutrient supply to promote long lasting, colourful and fragrant blooms and rich green foliage.</p> <p><u>When and where to use</u> For all ericaceous plant species whether they are growing in containers or in the soil. Feed weekly from March to October. Feed monthly from November to February.</p> <p><u>How to use</u> Shake the bottle before use. Use the top cap of the container as a measure. For containerised and pot</p>	<p>plants, dilute one cap in 3 litres of water and water the plant as normal. For a 5-litre watering can, one and two-thirds caps are required. For plants grown outdoors in the soil, the mixing rate should be doubled.</p> <p><u>Storage</u> Replace the cap after use. Avoid storing under very cold or very hot conditions, either under 6°C or above 40°C.</p> <p><u>Caution</u> Keep the bottle away from children and animals. Do not pour the liquid into open water or down drains.</p> <p>*plants of the heather family and other lime-hating plants</p>	

1. In which section of the label would you look for the following information?
 - a) Whether you could store it in the shed _____
 - b) How often to use it _____
 - c) Whether it needs to be diluted _____
 - d) What kind of product it is _____

2. Read the label carefully to find the following information:
 - a) Can you use the product to feed plants in winter? _____
 - b) What does this product contain that makes it so good for heathers? _____
 - c) Can you flush unused product down the drains? _____
 - d) Does the product need to be stored in a cold place all the time? _____

Planting Materials

Mulch

Mulch is a loose material that is spread on top of soil. Mulch helps to protect the soil around plantings. Wind and water can wear soil away if it is not protected. Mulch also helps to hold water and heat in the soil and helps to prevent weed growth. Usually it is a rough organic material like leaves, grass clippings, bark or wood chips.

Landscape Fabric

Landscape fabrics are usually large sheets of inexpensive, lightweight materials that are placed under mulches. They can be made of plastic, burlap and other synthetic materials. These fabrics allow water and air to reach the soil but, prevent weeds from growing.



Learning Activity # 9 – Planting Materials

OALCF Competency Task Groups and Levels

B2.1 Write brief texts to convey simple ideas and factual information

Use a **complete sentence** for each question.

1. What is mulch?

2. Why is landscape fabric used?

Planting Tools

Tools are used to help us reduce the strain on our bodies. They allow us to work easier and faster if we use them correctly. Before using any tool, you should ask yourself three questions:

- Is the tool in good working condition?
- Is it the right tool for the job at hand?
- Do I know how to use the tool correctly?

In landscaping and grounds maintenance, you will use many different kinds of tools when you are working on site. Some of these tools will be used to **install** plant materials, others will be used to **build** site features and others will be used to **maintain** both softscape and hardscape features.

Since we're "working with plants" in this unit, let's take a look at some of the planting tools you will be using on site.

Learning Activity # 10 – Listening Script

OALCF Competency Task Groups and Levels

A3 Extract info from films, broadcasts and presentations

B2.1 Write brief texts to convey simple ideas and factual information

Choose the tool. Your instructor will read a script as you look at the diagrams of the planting tools. Listen to the work orders and write the name of the tool that you would use to complete the job.

***Note to practitioners: This script can be found in the Answer Key at the end of this document.**

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____





1. Long-handled shovel for digging heavy soil.



2. Blunt-nosed spade for edging beds, planting shrubs and dividing large perennials.



3. Garden forks for mixing, aerating and turning soil.



4. Stiff rake for spreading soil and organic materials and grading beds and lawns.



5. Soft rake for gathering leaves.



6. Wide-blade trowels for planting small perennials and annuals.



7. Narrow-blade trowel for planting bulbs and removing weeds.



8. Folding pruning saw for removing heavy rose canes and thick shrub branches.



9. Bypass pruners (also called secateurs) for trimming shrubs and roses.

Types of Plantings

Handle with Care

As a softscape labourer, a large part of your job will involve handling and planting a wide range of plants. Many of the plant products you will be handling are fragile, heavy and sometimes expensive. It is your responsibility to work safely and minimize the risk of damage to yourself and the materials that are in your care.

All plants have the same basic needs but each group of plants has special care requirements. Your supervisor will give you on-the-job training on how to care for them and how to plant them. Each group of plants needs to be planted a certain way, or they will not survive. Wastage in any business is not acceptable.

We've already seen that some plants like lots of sun, some like a little bit of sun and others like shade. Knowing which group the plant belongs to will help you care for them properly. For example, if you are unloading a shipment of shade plants on a site, you wouldn't leave them in a hot sunny place.

Handling Tips

When you are moving and inserting plants in a landscape area, greenhouse or nursery, you have to be careful not to damage the roots. Roots can be damaged by rough handling and improper storage. On hot summer days, it is important to keep the roots of the plants you are working with as cool as possible. If the roots are badly damaged, the plantings will not be able to get enough food and water to survive. Stems can be very fragile. You should always lift large plants from the bottom and hold the stem in the middle to keep the plant balanced. Cracks in the stem can allow bugs and diseases to enter the plant.

Transporting Tips

You may be asked to pick up some planting stock at the local nursery. It's important that you secure your load. Keep potted plants packed together. The pots will support each other and keep them from tipping over. If you're transporting plants in an open vehicle, cover them with a tarp or plastic sheeting. You must protect the plants from windburn and sunscald. High speed winds can break stems, and dry out buds and leaves very quickly.

Types of Plantings

There are many different ways that plants are grown in commercial nurseries. Some plants are grown in containers, and others are grown in the field. Container grown plants may range from small individual plastic "cell-packs" to large lightweight plastic pots. Plants dug up in the field may come with their roots wrapped in burlap or with their roots exposed. All plants that are going to be planted are called **plantings**.

Soil Ball

Most plantings will have a clump of soil attached to their roots. It is called the soil ball. The soil ball should be planted with the planting. You should always check the roots in the soil ball to make sure they are not packed too tightly. When a plant doesn't have enough room to grow, its roots become **rootbound**. Before planting a rootbound plant, you must loosen the roots on the outside of the soil ball. Gently shake the soil ball and loosen the roots with your fingers. If you can't free the roots with your fingers, use a knife and make four or five vertical cuts (up and down) around the ball to release them. Let's look at some of the different types of plantings you will be working with on site.



Examples of Rootbound Plantings

Container Plantings

Cell-packs

Cell-packs are plastic trays with separate compartments for each planting. They are similar to ice-cube trays. To remove the plantings, gently squeeze the bottom of each cell. Usually there's a long, coiled, bottom root that you will have to cut off. Gently shake the plant to loosen the soil and then insert it into the ground. It is important that you work with one planting at a time. The roots can dry out quickly if they are not covered.



Flats

Sometimes you'll see large trays of plantings that are not in cell-packs. These are called flats. Often plants are packed into Styrofoam containers which need to be removed. Once freed from the Styrofoam, these plants need to be separated by hand. Sometimes a knife is used to cut them apart.

Peat Pots

Peat pots are similar to cell-packs except they are made of natural materials such as peat. Peat is an organic material that comes from wet areas like bogs or marshes. It is formed into pots that are used for growing plantings. Because peat is organic, you can plant the pot directly into the soil. The roots will grow through the pot.



Plantings Without Containers

Balled and Burlapped

These plantings are grown in the field. Usually they are larger plantings like shrubs and trees. The soil ball will be wrapped in burlap and tied with string. Untie the plant before planting or it will suffocate when it grows.

Bare Root

Bare root plantings do not come with a soil ball to protect them. They are cheaper to buy than balled and burlapped, but you must be very careful to keep the roots moist, cool and protected.

Trees

When planting medium-size trees (6 feet to 12 feet), special supports may be needed. Two or three long wooden stakes are hammered into the ground around the outside of the planting hole. Covered wire is attached between the stakes. This is called **staking**.

Larger trees, over 12 feet in height, may need more support. Cables are attached to the trunk of the tree. These cables are then connected to stakes placed around the planting hole. This process is called **guying**.

Learning Activity # 11 – True/False

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

True or false? Circle the correct answer.

1. Excessive heat can damage a plant's root system.

True

False

2. Cracks in a plant's stem can allow bugs and diseases to enter the plant.

True

False

3. When transporting plants in an open truck, covering them with a tarp will help protect them from windburn and sunscald.

True

False

4. Never lift a large plant by its stem.

True

False

Learning Activity # 12 – Plantings

OALCF Competency Task Groups and Levels

B2.2 Write brief texts to convey simple ideas and factual information

B3.1 Create a very simple document to display and organize a limited amount of information

D.2 Perform well-defined, multi-step digital tasks

Complete the Word Search puzzle. Then answer the following questions.

PLANTINGS

D	M	Z	G	G	R	N	W	K	L	Y	H	L	M	N
M	L	Z	U	V	O	J	Z	X	X	Z	X	B	U	L
T	F	E	Y	C	O	T	M	D	U	G	U	R	L	A
Z	K	X	I	C	T	A	S	M	A	R	S	H	E	S
S	Q	D	N	F	B	E	T	W	L	E	D	F	F	V
L	G	A	G	X	O	P	L	A	R	S	T	A	L	F
O	X	N	A	B	U	Y	P	I	G	P	N	T	J	G
K	R	C	I	S	N	R	E	N	I	A	T	N	O	C
C	U	G	G	T	D	S	I	C	L	L	K	U	F	Y
A	Q	O	A	F	N	K	V	K	I	X	U	B	I	K
P	B	Z	O	N	A	A	U	J	J	R	U	N	R	W
L	I	Y	J	T	I	E	L	L	S	Z	Q	M	U	P
L	M	V	S	Y	Q	C	D	P	X	E	W	U	B	J
E	Q	Z	F	W	L	V	I	X	P	U	I	P	L	O
C	I	U	K	K	Z	S	P	M	A	A	P	Q	G	K

BOGS

MARSHES

STAKING

NURSERIES

PEAT

GUYING

ORGANIC

BURLAP

ROOTBOUND

CELLPACK

FIELD

FLATS

CONTAINER

PLANTINGS

- How do you free a rootbound plant?

2. List three types of container plantings.

- a) _____
- b) _____
- c) _____

3. Give two reasons why you would stake or guy a tree.

- a) _____
- b) _____

4. What is tree girdling? Use the Internet to help you with this one!

5. What happens when you guy a tree with unwrapped wire?

6. List two types of wire covers used for guying trees.

- a) _____
- b) _____

Planting Tasks

Different plants will have different planting requirements, but there are several work tasks that are common to all plantings. In this unit, we will look at some of the jobs you will be doing and some of the types of plants you will be working with.

Site Preparation

Preparing a site for planting involves a lot of work with the soil. The soil must be:

- Cleared of weeds and debris
- Loosened up
- Levelled and rolled
- Fed the right nutrients

Four Steps for Planting Preparation

Step 1

Clear the planting ground. Weeds, rocks, stones, twigs and any other debris have to be picked up.

Step 2

Break up the ground. The soil needs to be loosened up. This is called **tilling**. Tilling the ground helps to get air into the soil. Adding air to the soil is known as **aeration**. Tilling is done by using tilling tools. These can be small hand-held tools, gas-powered machines or tractor attachments. Tillers **claw** the ground to loosen the soil. Hand-held tillers have forks that dig into the ground and break up clumps of soil. You may have heard of a tool called the “Garden Claw”. This is an example of a tilling tool. The size of the tiller you use will depend on the size of the job. For example, if you’re working on a large piece of ground, like a park flowerbed, you may use a gas-powered tiller called a **rototiller**.

Claw



Rototiller



Step 3

Level the ground. If the planting site is on a slope, levelling the ground makes planting faster. Spacing plants and planting them at the right depth are easier if the ground is level. Uneven ground can stress plants and make them more vulnerable to disease and pests. Water can pool in hollows (dips in the ground) and cause drainage problems.

Levelling the ground is done by hand-raking and, on large sites, by raking and rolling.

The tools used most often for levelling are: hard rakes, landscape rakes, fan rakes and hand rollers. A hand roller looks like a large drum with a handle. Water or sand is put in the drum to give it some weight. The roller is rolled over the raked soil to level it out.



Levelling rake

Step 4

Fertilize. Your supervisor will show you which fertilizer to use. Fertilizer can be applied by hand or by using a rolling cart called a spreader. Granular fertilizer is loaded into the spreader and then rolled through the area that needs to be fertilized. There are two kinds of spreaders: drop spreaders and rotary spreaders.

A drop spreader drops the fertilizer straight down. It spreads the fertilizer evenly. The second kind of spreader is the rotary type. A rotary spreader has a small fan that throws the fertilizer granules in front of the cart. A rotary spreader can cover a large area faster than a drop spreader but the spreading is not as controlled. The blade can fling the fertilizer in a wide arc, up to 6 to 8 feet in front of the cart.

Drop spreader



Rotary spreader



Learning Activity # 13 – Getting Ready

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

1. List the four steps in soil preparation.

a) _____

b) _____

c) _____

d) _____

2. Write a complete sentence to answer the following questions.

a) What is tilling?

b) Why is aeration important?

3. True or False. Circle the correct answer.

a) Tilling soil is best done when the soil is wet.

True

False



b) A spreader is a type of rake.

True

False



c) Three kinds of fertilizer are: granular, liquid and powdered.

True

False

d) Spacing plants is easier on level ground.

True

False

e) Do not walk on soil that has been tilled.

True

False

f) A rototiller is used in small spaces.

True

False

g) Levelling the ground is done by raking and rolling the soil.

True

False

4. How is a drop spreader different from a rotary spreader?

Planting Instructions

Listening to Learn

On the site, the details you need to do your job will be given to you as work orders. These orders can be written but often you'll be **told** what to do. A work order is a set of instructions.

Work Orders

Instructions tell us:

- **What** to do and **what not** to do
- **How** to do things
- **When** to do them
- **Where** to do them
- **Why** we need to do them

Key Words

Listening for certain key words can help you understand and remember instructions better.

- Listen for words that tell you what **must** be done:
should, make sure, always and do
- Listen for words that tell you what **not to do**, such as:
do not, don't and never
- Listen for words that are **action words**. Action words tell you what to do:
dig, rake, move and unload
- Listen for words that tell you **where** to do things:
near, in front of, west side, next to, etc.
- Listen for words that tell you **when** to do things:
daily, weekly, once, twice, every and each
- Listen for words that tell you **more than one** job needs to be done:
and, also and then
- Listen for words that tell you a job **only needs doing** if something else happens:
only, if, unless, if necessary and sometimes
- Listen for words that tell you the **order of steps** to do things:
first, second, third, before, after, now and next

Self-questioning

When listening to instructions, it is helpful to ask **yourself** questions about what is being said:

- “What do I have to do first?”*
- “What should I do next?”*
- “Is there anything that I need to ask about?”*
- “Is there anything I shouldn’t do?”*
- “What else was I supposed to do?”*
- “When does it have to be finished?”*



Learning Activity # 14 – Day’s Instructions

OALCF Competency Task Groups and Levels
A3 Extract info from films, broadcasts and presentations
B2.1 Write brief texts to convey simple ideas and factual information

1. Listen to the day’s instructions (From the Practitioner’s Answer Key that is found at the end of this document). Make a note of the jobs that must be done.

2. Listen to the instructions again. This time make a note of the things that must **not** be done.

3. Write a set of step-by-step instructions about something you know how to do. It could be a hobby you have or a skill.

Learning Activity # 15 – Listening Instructions

OALCF Competency Task Groups and Levels

A3 Extract info from films, broadcasts and presentations

B2.1 Write brief texts to convey simple ideas and factual information

D2 Perform well-defined, multi-step, digital tasks

Read the box marked “Listening Instructions” **and** complete the following tasks.

Listening Instructions

1. Fill in the missing jobs

a) Daily jobs:

- Unlock the gates
- Collect litter
- _____

b) Weekly jobs:

- Collect clippings
- Rake beds
- _____

c) Twice weekly jobs:

- Inspect signs for graffiti
- _____

d) If-necessary jobs:

- Empty the bins
- Re-tie the hollyhocks
- _____

Listening Instructions

This week, we'll all be keeping it looking good! There's the usual daily unlocking of gates and collecting litter. The bins will only need emptying twice this week, unless they're overflowing. Each patch of grass will need mowing once this week and the clippings will need to be collected.

All the beds will need raking and rolling. Go around dead-heading daily and replace those plants that have magically walked away in the night. While you're at it, check the hollyhock ties and re-tie them if you need to. The forecast is for rain but, if necessary, we'll water. The annuals will need watering every day.

Remember: put your tools away daily. On Monday and Friday, check the signs for graffiti and, if you have time, clean them up; if not, it can wait till next week.

2. Do you know what “dead-

heading” is? If not, write a question asking your boss what it means.

Unclear Instructions

Some people have a hard time giving clear instructions. They sometimes add unimportant details or confuse things by giving too many details. Instructions should be given in order: step by step.

Unfortunately, this is not always the case.

Learning Activity # 16 – Unclear Instructions

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

B2.1 Write brief texts to convey simple ideas and factual information

Read the work order and answer the following questions.

WORK ORDER

O.K., we've got a lot of work to do to get ready for the spring beddings. Did anyone see the game on Saturday? I can't believe Williams missed that shot. All right, I need Peter to head over to the McNabbs' place and finish digging up the bulbs. I've got the annuals coming in later today and I want Susan and Steve to pick them up at the nursery. They should be ready sometime around 2 p.m. Peter, when you're at the McNabbs', make sure you check the beds for weeds. Call me when you're done. Peter, how's Allison? Did she finish her program yet? Susan, I want you and Steve to finish up the north beds at City Hall before you pick up the plantings at the nursery.

1. Use a highlighter pen and mark any information that is not directly related to the work orders.
2. List the jobs that Peter must do.
 - a) _____
 - b) _____
 - c) _____
3. List the jobs that Susan and Steve must do.
 - a) _____
 - b) _____
4. What might go wrong if you don't understand or follow work instructions?



Landscaping and Grounds Maintenance Worker Curriculum

Unit 4: Grounds Maintenance

Unit 4: Grounds Maintenance

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Unit 4: Grounds Maintenance

OALCF Skill Competency Chart by Task

This OALCF Skill Competency Chart aligns each activity in the unit to the Ontario Adult Literacy Curriculum Framework. Each activity is listed and articulated by Task Group and skill level.

	Competency	Find and Use Information			Communicate Ideas and Information			Understand and Use Numbers				Use digital technology	Manage learning	Engage with others
	Task Group	Read continuous text	Interpret documents	Extract info from films etc.	Interact with others	Write continuous text	Complete and create documents	Manage money	Manage time	Use measures	Manage data			
Activity #	Task Group #	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D	E	F
1	Weeds	1				1								
2	Canadian Weeds	2	2			2						2		
3	What's the Problem?	1				1	1					1		
4	Evidence				2	2								
5	Dutch Elm	2				1						2		
6	Bacteria and Viruses	2				2						2		
7	Plant Problems	2				1						2		
8	Equipment Manuals	1	2			1	1							
9	Lawn Mower	1	2			1								
10	Troubleshooting	2	2			2								
11	Turf	2				1								
12	Nurse Grass	2				2						2		
13	Turf Problems	1				2	1					2		
14	Mowing	1	2			1	2							
15	Sod	1				1								

Weeds

What is a Weed?

A weed is a plant that is growing in an area where it doesn't belong. Generally, most weeds are very good at surviving and can multiply more quickly than most plants. In a garden or on a lawn, weeds can rob other plants and grasses of nutrients and water from the soil, and light from the sun. Weeds must always be controlled. Weeds, like flowers, can be perennials or annuals. As a grounds maintenance worker, it is important that you recognize some of the more common types of weeds and learn some of the basic techniques of weed control.

Annuals

Annual weeds complete their life cycle in one growing season. They have a fibrous root system that spreads out just beneath the surface of the soil. Annual weeds seem to pop up suddenly in little clusters around the parent weed. Some examples of annual weeds are thistles, crabgrass and chickweed.

Maintenance

The best defense against annual weeds is to "nip them in the bud". It is important that you remove the weeds while they are still small and before they flower and spread their seeds. Annuals generally can be pulled by hand because their root system is close to the surface of the soil. You can also use a steel rake, hoe or cultivator to gently uproot them. You don't have to dig into the soil too deeply, just on the surface. Some annual seeds can lie dormant for up to seven years. The warm, wet, spring weather can encourage the seeds to sprout. It is a good practice to check for weeds every other day. If the weeds **have not flowered** you can pull them and leave them in the sun, and when they are dry, you can work them back into the soil. Remember, the weeds suck up a lot of nutrients, so recycle them and give the soil a boost.

Perennials

Perennial weeds live for many years. They have a taproot system that can grow deep into the soil. Perennial weeds are tough and well anchored, unlike the surface root system of annual weeds. The underground root system can stretch up to 20 feet away from the parent plant's location. If the taproot is cut, new plants will grow from the site. Some perennial weeds also have hard, woody stems which are very difficult to pull.



Maintenance

Perennial weeds must be carefully dug up. Cut back all stems above the ground and dig up the underground root. You must dispose of the seed heads and the roots carefully. Do not recycle or compost. It is important to dig up perennial weeds before you cultivate or rototill your soil. It is also important to keep the root intact to prevent new plants from sprouting. Pulling up perennial weeds is a strenuous job. The best time to attack these hardy weeds is after the first freeze and thaw in the late fall. Remember, soil contains pockets of air that collect water; when these pockets freeze and then thaw out they **heave** the soil. When the soil heaves, it loosens and breaks apart, making it easier to pull up these tough weeds.

Weed Control

The first step in weed control is recognizing problem plants. If you know what belongs, it will be easier to know what shouldn't be there. It is important that you take the time to learn what some of the most common weeds look like. The second step in weed control is action. If you see a weed, pull or dig it out. If you are not sure if it is a weed, ask your supervisor. Weed control is a task that all members of a landscaping crew share.

Prevention

Herbicides can also be used to control weeds and prevent them from growing. Other ways to keep weeds from sprouting include the use of landscape fabrics and mulches.



Learning Activity # 1 – Weeds

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

1. Why is it important to control weeds?

2. Discuss the differences in the root systems of annual weeds and perennial weeds.

3. What are two things you can do to help control on-site weeds?

4. Why is it easier to dig up perennial weeds after the first freeze and thaw?

Learning Activity # 2 – Canadian Weeds

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

A2.2 Interpret simple documents to locate and connect information

B2.2 Write texts to explain and describe information and ideas

D.2 Perform well-defined, multi-step, digital tasks

1. Go online using a computer or a tablet, or visit your local library to find the answers to the following questions about the common Canadian weeds listed below. Use a separate piece of paper for each answer.

- a) Chickweed
- c) Dandelion
- e) Canada Thistle
- g) Creeping Charlie
- i) Ragweed

- b) Queen Anne's Lace
- d) Goldenrod
- f) Quack Grass
- h) Crabgrass

2. Print a picture of the weed.

3. Write a brief description of what the weed **looks** like.

4. Is it an annual or perennial weed?

5. What type of soil does it like?

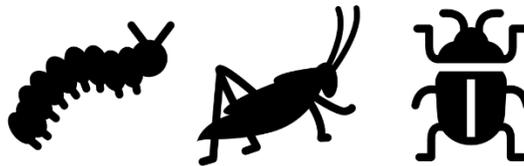
6. Without using chemicals, what is the best way to control it?

Plant Pests

Plant pests include small animals that dig up plant materials and insects that can kill large numbers of plants if they are not controlled. Recognizing and controlling bugs that hurt plant materials is an important part of grounds maintenance work. Not all bugs found on plants are harmful; for example, ladybugs eat aphids. Aphids are a serious threat to plants, specifically roses. In this unit, we will look at some common insects that can damage plant materials, and some of the ways we can control them without using insecticides.

Mouthparts

Insects that attack plants can be grouped into three categories, according to the damage they do to plant materials.



- **Chewing and biting insects**

This includes insects like caterpillars, grasshoppers and beetles, bite or chew holes in leaves, bark and stems of plants. Signs of damage by chewing and biting insects may include holes in leaves, brown and brittle leaves, and yellow or white spots.

- **Sucking and piercing insects**

This includes insects like aphids, leafhoppers and mealy bugs, have needle-like mouths that they use to pierce and suck out plant juices. Signs of damage by sucking and piercing insects may include yellowing flecks, wilting leaves, curling leaves and/or a shiny, sticky coating.

- **Borers and miners**

Borers and miners are the insect larvae. Larvae are worm-like creatures that hatch from the eggs of some insects. Maggots are the larvae form of flies. These larvae can be buried in the bark, leaves and stems of plants. They carve tunnels in the plant as they eat the plant's nutrients. Flies, beetles and moths are common sources of borers and miners.

Signs of damage include sudden wilting and discoloration, and circular or oval exit holes. Borers like to attack weakened trees and plants. In trees, you will often see signs of borers near the top (also known as the crown) of the tree.

Maintenance (Control)

The best way to help control these pests is to pick them off the plant and destroy them. Borers and miners can be further avoided by maintaining strong, healthy plants. If a plant is infected with borers, you may have to cut off and destroy the infected part by burning or chipping it.

Other Plant Pests

Snails and Slugs

Snails and slugs are not considered insects. They are molluscs, similar to clams and oysters. They eat odd-shaped holes in the lower leaves of plants. Snails and slugs also leave a slimy trail wherever they go. They like dark, damp conditions and usually feed at night. Slugs don't have a shell and are vulnerable to dehydration, whereas snails have a shell that protects them from drying out. If you see snails or slugs on plants, pick them off and destroy them.

Small Animals

Small animals can cause a lot of damage to plant materials. Skunks will dig up lawns as they look for grubs to eat. Squirrels will dig up flower bulbs looking for food. Rabbits and mice can kill some trees and plants by eating their bark. Moles can cause damage by burrowing in lawns and gardens. Animal urine can also cause burn problems in trees, plants and lawns. Recognizing the signs of animal and insect damage is important when you are working as a grounds maintenance worker. You will not always be expected to know what caused the damage, but you will be expected to report the damage to your supervisor. The more pests you can recognize, the better you will be able to do your job.



Learning Activity #3 – What's the Problem?

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

B3.1 Make straightforward entries to complete very simple documents

D.1 Perform simple digital tasks according to a set procedure

1. Read the following scenarios and make a guess as to what caused the problem.

- a) John was sent to deadhead the flowerbeds at the Queen Plaza site on Monday. When he arrived, he noticed many of the lower leaves of the plants had irregular holes in them. When he looked closer, he noticed a slimy trail on some of the leaves. What should he report to his supervisor?

- b) Anna was pruning the rose bushes at the Bell estate when she noticed some of the leaves were covered in yellow flecks and were starting to curl. What should she report to her supervisor?

- c) Sahid was pruning some shrubs along the city bike path when he noticed that the tops of the shrubs were beginning to discolour. When he looked closer, he saw signs of circular exit holes. What should he report to his supervisor?

- d) Ipeelee was asked to cut the grass in the southeast section of the memorial gardens at the Rest-A-While cemetery. When he arrived, the lawn was full of holes. Tufts of grass were ripped up everywhere. What should he report to his supervisor?

2. Match the following plant pests to the description of plant damage. Draw a line to the correct match. Some may have more than one answer.

- | | |
|-------------------------------------|--------------|
| a) tunnels in plant leaves | beetles |
| b) curling leaves | mice |
| c) missing tree bark | slugs |
| d) odd-shaped holes on lower leaves | aphids |
| e) chewed leaves and yellow spots | caterpillars |
| f) burn areas on plants | rabbits |

3. Go to the website listed below and play the Pest Paparazzi game. On a separate sheet, list the ten pests that you found.

<http://www.bbc.co.uk/gardening/htbg/module6>

Learning Activity # 4 – Evidence

OALCF Competency Task Groups and Levels

B1.2 Indicate and maintain interactions with one or more persons to discuss, explain or exchange information and opinions

B2.2 Write texts to explain and describe information and ideas

Go outside and collect some evidence of pest activity on plants in your area. Present what you find to your group or your practitioner.

Remember to examine leaves, stems, roots, grass and tree bark for pest activity. Write two paragraphs discussing your findings. Take some photos with a camera or cell phone to add to your findings.

Plant Diseases

Plants, like humans, can get sick from many types of diseases. Like humans, plants also show symptoms of diseases. Plant diseases can be caused by living organisms and non-living environmental stresses. Let's look at some of the diseases caused by living organisms first.

Fungi

Fungi are the most common of all the plant diseases. They are primitive organisms that act like parasites. Unlike most plants, fungi can't make their own food so they must invade other plants to survive. You can usually see fungi on plants. Most fungi grow in the dark. Mushrooms are an example of fungi.

Fungi spread quickly by sending out flying spores. These spores are transported to other healthy plants by wind, rain, insects, animals, and human activities. Fungi infections are difficult to control.



Learning Activity # 5 – Dutch Elm Disease

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

B2.1 Write brief texts to convey simple ideas and factual information

D.2 Perform well-defined, multi-step, digital tasks

Go online or to your local library and find the answers to the following questions about Dutch elm disease.

1. What is Dutch elm disease?

2. How is the disease spread from one tree to the next?

3. What are the symptoms of Dutch elm disease?

4. What can be done to stop the spread of Dutch elm disease?

Bacteria

Bacteria are single-celled organisms that can only be seen under a microscope. Some of the plant diseases caused by bacteria are blights, galls, and rots. Bacteria enter plants the same way they do in humans, through cuts or openings. Bacteria spread very quickly in plant materials. An infected part will ooze milky pus which contains thousands of bacteria.

Viruses

Viruses are tiny particles of infective agents that cannot even be seen by regular microscopes. They can cause serious damage to plant materials and need a living organism to reproduce. They are spread by sucking insects and by human activities such as pruning. Some symptoms of plants that are infected with viruses include yellowing, ring spots, deformities and stunted growth in plants. Some viruses only attack a certain type of plant. Viruses are controlled by the use of chemicals.

Learning Activity # 6 – Bacteria and Viruses

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

B2.2 Write texts to explain and describe information and ideas

D.2 Perform well-defined, multi-step, digital tasks

Go online or to your local library and find the following definitions.

1. Plant blight: _____
2. Plant gall: _____
3. Plant rot: _____
4. Now research **one plant virus** and answer the following questions:
 - a) What is the name of the virus? _____
 - b) What type of plants does it infect? _____
 - c) What are the symptoms of the infected plant? _____
 - d) How is the virus transmitted? _____
 - e) How is the virus controlled? _____

Symptoms of Plant Diseases

Anyone who works with plant materials should always be on the lookout for signs of plant injury. When a plant is weakened, it is more likely to be attacked by harmful, dangerous diseases. Some of the things to look for are:

- Discolouration – yellowing or browning
- Odd shaped holes
- Parts of the plant (new shoots) dying
- Dead spots on leaves
- Stems or branches with sunken areas
- Abnormal swelling or growths
- Blisters
- Bad odour
- Mildew (soft fuzz that grows on the plant) or a powdery coating
- Mushy decay
- Powdery orange-red spores
- Wilt

Learning Activity # 7 – Plant Problems

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

B2.1 Write brief texts to convey simple ideas and factual information

D.2 Perform well-defined, multi-step, digital tasks

Go online or to your local library and find the definitions and a picture for each of the following plant problems.

- Canker
- Blotch
- Damping-off
- Leaf scorch
- Needlecast
- Blackleg
- Leaf spot
- Wilt

Equipment Maintenance

Routine Maintenance

Wherever machinery is used, it is important that it is well maintained and in safe working order. When a machine fails to work properly, time is lost, and time is money. Equipment manuals have a section on routine maintenance, which generally include the following:

- A set order of steps to complete the job
- Diagrams that show how to do the job and/or where the parts are located
- Important details or technical information that must be read carefully

These instructions answer **What** is to be done, **How** it is to be done, and **When** it is to be done.

Sometimes you have to make decisions. Look for words like **or** and **if**. These may mean that you have to choose.

Numbered instructions should be followed in order. For example, you must take out the oil filler dipstick **before** you can empty the oil from a machine. Doing jobs in the right order prevents damage to the machine and personal injuries, and makes the job easier.

Learning Activity # 8 – Equipment Manuals

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

B3.1 Make straightforward entries to complete very simple documents

1. List the three common layout features that most equipment manuals use to give instructions on machine maintenance.

- a) _____
- b) _____
- c) _____

Look at the diagram for “Maintenance for the L99 Lawnmower” and answer the following:

2. Number the following steps.

- a) _____ Check the condition of the guards and safety devices and the cutter blade.
- b) _____ Check the oil level.
- c) _____ Remove grass from around the engine, exhaust and airways in the top cowl and on underside of the deck housing.
- d) _____ Remove grass debris from the grass bag and check for signs of damage.

3. When should you change the oil? _____

Maintenance Schedule for the L99 Lawnmower	
First 5 hours	After the first 5 hours change the engine oil
Daily	<ul style="list-style-type: none"> • Check the oil level. • Remove grass debris from around the engine, exhaust and airways in top cowl and underside of the deck housing. • Remove grass debris from the grassbag and check for signs of damage. • Check the condition of the guards and safety devices and the cutterblade.
25 hours or every season (whichever is soonest)	<ul style="list-style-type: none"> • Change the engine oil if continuously operating under heavy load or high ambient temperature. • Service the air cleaner. • Lubricate wheels, pivot points and linkages and grease inner control cables at point of entry and exit from their outer casing. • Check the clutch cable adjustment. • Sharpen the cutterblade.
50 hours or every season	<ul style="list-style-type: none"> • Change the engine oil.

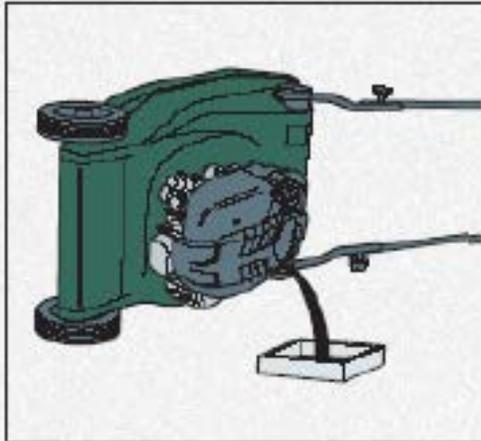
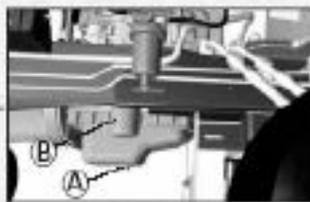
Look at the diagram for “Oil Service” and answer the following:

4. List the seven steps involved in changing the oil in a lawnmower.

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____
- f) _____
- g) _____

OIL SERVICE

1. Drain fuel by running the engine until the fuel tank is empty.
2. Remove the spark plug lead.
3. Allow the engine to cool.
4. Drain the oil while the engine is warm (not hot).
5. Tip the mower over onto its left-hand side, thus ensuring that the air cleaner is kept uppermost to prevent engine damage.
6. Remove the oil filler dipstick and drain the oil into a suitable container.
7. Refill with new oil of the recommended SAE viscosity grade.

3. Place a container at oil drain location under machine.
4. Remove oil drain plug (A).
5. Wipe dirt from around oil filter

Learning Activity # 9 – Lawn Mower

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

Look at the “Air cleaner service” diagram below about power lawn mower air cleaner service. Answer the following questions.

1. What is the first thing you need to do? _____
2. How many screws are there? _____
3. What do you use to clean the air cleaner? _____
4. Is it correct to use petroleum solvents to clean it? _____
5. What should you do if the air cleaner is really dirty? _____
6. When do you re-install the pre-cleaner and cartridge? _____
7. What is part number 5 in the diagram? _____

Air cleaner service

See Fig. 2

To service the air cleaner

1. Loosen the screws (1) and remove cover (2).
2. Carefully remove pre-cleaner (3) and cartridge (4).
3. Wash in a solution of liquid detergent and water. Allow to dry thoroughly before fitting.

If very dirty, replace.

- Do not use petroleum solvents.
- Do not use compressed air.
- Do not oil the cartridge.

4. After servicing, install the pre-cleaner and cartridge in the assembly base (5).
5. Replace the cover and securely tighten the screw.

Tip
Use these numbers to identify different parts of the air cleaner.

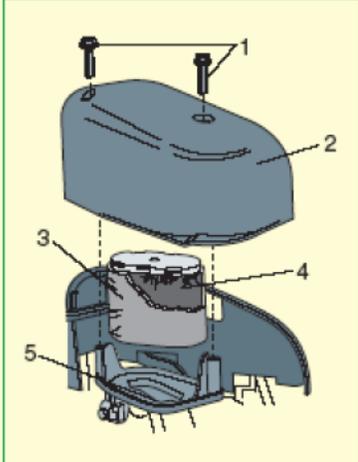


Fig. 2

Troubleshooting

Sometimes you will have to deal with minor problems with machinery or equipment. The operator manual should be the first place you look if you are working alone. In most manuals, **common problems** are presented in a table form for easy reference. This section is usually called “troubleshooting”. Often there is more than one thing wrong and you will have to decide which one of the choices is the most likely. Reducing your possible options by **the process of elimination** is a good approach to troubleshooting.

Learning Activity # 10 – Troubleshooting

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

A2.2 Interpret simple documents to locate and connect information

B2.2 Write texts to explain and describe information and ideas

Use the “Troubleshooting Chart” at the end of this activity to answer the following questions.

1. What is the definition of remedy?

2. You’re cutting the lawn beside the local high school with a power mower when you notice the engine begins to smoke.

- a) What do you think could be the problem?

- b) Where would you look to find information on ‘troubleshooting’ for this mower?

- c) Refer to the troubleshooting chart. What could you do to solve the problem?

3. You’re cutting the grass using a riding mower at the Teed-Off Golf Course and you notice the engine is really vibrating. Where would you look for information on troubleshooting for this mower?

4. Solve the problem. Write the remedy to the description of the problem.

a) The airflow through the grass bag is restricted.

Solution: _____

b) The mounting bolts are loose.

Solution: _____

c) The engine is cold.

Solution: _____

d) The cutter blade is worn.

Solution: _____

e) The fuel cap vent is blocked.

Solution: _____

f) The grass bag is full.

Solution: _____

g) The cut height is too low.

Solution: _____

h) A spark plug is faulty.

Solution: _____

i) The grass is wet.

Solution: _____

j) The crankshaft is bent.

Solution: _____

Troubleshooting Chart

Problem	Possible fault	Remedy
Engine will not turn over	Engine stop lever released Incorrect oil level Obstruction under deck	Operate engine stop lever Check oil level Remove obstruction
Engine smokes	Excess oil level Air cleaner cartridge oil soaked or blocked	Check oil level Service air cleaner
Engine runs then stops	Fuel starvation Fuel cap vent blocked	Fill fuel tank Clean fuel cap vent
Engine will not start	Engine under load Fuel starvation Engine cold Incorrect/contaminated fuel Spark plug lead disconnected Throttle setting incorrect Engine brake not released Faulty spark plug Wiring fault	Raise height of cut Fill fuel tank Set throttle to 'choke' position Drain fuel tank and fill with correct fuel Connect spark plug lead Set throttle to 'fast' position Operate engine brake lever Clean and adjust gap or replace Check wiring
Engine vibrates excessively	Mounting bolts loose Cutterblade bolt loose Cutterblade out of balance Bent crankshaft	Tighten bolts Tighten bolt Balance cutterblade Consult your dealer
Uneven cut	Undulating ground conditions Cutterblade worn Cutterblade out of balance Wheels/roller damaged	Change direction of travel Sharpen the cutterblade Balance the cutterblade Inspect and replace as necessary
Discharge chute blocks	Grass is wet Cut height too low Grassbag full Airflow through the grassbag is restricted Engine speed too low	Mow dry grass Increase cut height Empty grassbag Clean the grassbag Set throttle to 'fast' position
Mower is hard to push	Cut height too low Wheels/roller damaged	Increase cut height Inspect and replace as necessary
Mower will not self-propel	Clutch out of adjustment Drive belt damaged	Adjust clutch cable Replace drive belt
Poor grass collection	Airflow through the grassbag is restricted Discharge chute blocked Grass is wet Grassbag full Engine speed too low	Clean the grassbag Remove blockage Mow dry grass Empty grassbag Set throttle to 'fast' position

Problem Solving

Good problem-solving skills are an asset to you and your employer. Problems arise on the job site all the time. Sometimes it is your job to help solve those problems.

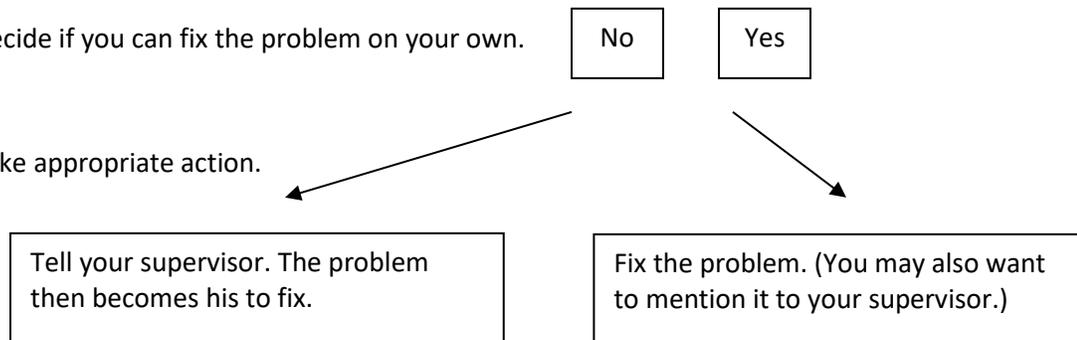
Problems? What problems?

For most entry level jobs in landscaping and grounds maintenance, you are not going to have a lot of responsibility for problem solving, but there are always things that come up that you may need to handle.

Working in a busy, noisy work environment can cause problems in communication and teamwork. It's important that workers find ways to make sure they understand exactly what is said to them and that they are heard clearly themselves.

As an entry-level worker, what should you do with a problem?

- Define the problem.
- Decide if you can fix the problem on your own.
- Take appropriate action.



How do you know if you can, or should, fix the problem on your own?

That's a hard question to answer because there are so many things to consider. Some employers like initiative and others just want you to do your job. If you notice something that is health and safety related, you must tell your supervisor.

Watch other employees. What kinds of problems do they fix on their own and what kinds do they get help to fix? If you come across a problem and ask your supervisor for help, note her reactions towards helping you. Does she tell you that you should have gone ahead and fixed it yourself? Is she happy to help? If you're not sure, ask, "Should I fix it myself or do you prefer that I call you?"

A big part of problem solving is knowing when to problem solve and when to ask for help! When in doubt, ask. Don't rush into things just because you *think* you are capable.

Turf Grasses

Turf is a combination of **two or more types** of grasses and the surface layer of soil that holds their roots. The grasses are matted together, almost like a carpet. Turf grasses are used for recreational and decorative purposes, such as athletic fields, golf courses, airfields, cemeteries and lawns. Grasses are mixed together to form sods. Turf grasses are designed to grow in specific places.

Combinations

Different grasses are **combined** to enhance their suitability to the environment where they are used.

- Some grasses are quick-growing; others are slow-growing.
- Some grasses grow better in full sun; others grow better in shade.
- Some grasses need moist soil; others need dry soil.
- Some grasses grow well in compacted soil; others need sandy soil.
- Some grasses need a lot of maintenance; others need less.
- Some grasses are thick; others are thin and delicate.
- Some grasses are disease and insect resistant; others are vulnerable to disease and specific insect infestations.

Some of the factors that must be considered when choosing turf are:

- Climate
- Use
- Appearance

Climate

The combination of grass types that are used in turf can be divided into two groups, based on temperature range: **warm season** and **cool season grasses**.

Warm Season Grasses

Warm season grasses grow best when the temperature range is between 27°C and 35°C (80°F and 95°F). Warm season grasses grow best in the summer months. They have a poor winter tolerance and don't do well in shady areas. Some examples of warm season grasses are Bermuda grass and zoysia. Warm season grasses are used widely throughout the warmer, southern areas of North America.

Cool Season Grasses

Cool season grasses grow best when the temperature range is between 15°C and 24°C (60°F and 75°F). Cool season grasses are the most commonly used turf grasses in Canada. Cool season grasses grow during the spring and fall seasons.

During the summer and winter seasons, cool season grasses are semi-dormant. They have a good winter tolerance and can survive partial shade. Some examples of cool season grasses are Kentucky bluegrass, creeping bent grass, fine/red fescue and perennial ryegrass.

Use

How the turf is to be used is another factor which affects turf choice. Turf grass that is suitable for a high traffic area, such as a goal zone on a soccer field, will not be suitable for a putting green at a golf course. The level of maintenance is also a factor in choosing a suitable turf grass.

Appearance

Turf grasses are used to enhance the appearance of a property. Homeowners use turf grasses that are suitable to the macro-climate and the micro-climate of their properties. City parks, institutional grounds, airfields, roadsides and cemeteries are some examples of properties where healthy, attractive-looking lawns are important to maintain.

Common Turf Grasses in Canada

Kentucky Bluegrass

Kentucky bluegrass is the most commonly used turf grass in Canada. It is a quick-growing grass that is strongly knit. It is used on athletic fields because it can quickly grow over cleat marks and divots. It holds up to high traffic areas fairly well and it is able to recover quickly when damaged. It's also commonly used for sod because of its tight weave. Its attractive dark green to blue-green colour makes it a popular choice for lawns.



Perennial Ryegrass

Perennial ryegrass is another quick-growing grass. Perennial ryegrass has the best wear tolerance of any of the cool-season grasses. Because it grows quickly, it helps to curb weed growth and resists turf diseases. It also tolerates compacted soils. Perennial ryegrass holds its colour, which is a yellow-green shade, throughout the summer. It is often used for home lawns and around schools, parks and athletic areas.

Red Fescue

Red fescue is one of the slower growing grasses. Because it takes time to recover from damage, it is not suitable for high traffic areas and athletic fields. Red fescue grows well in drier soils, which makes it a good choice for areas that have problems retaining moisture. It will also grow well in shaded locations. It is used in areas where soil erosion is a problem, such as along highways and airfields. It is a medium to dark green colour with a reddish colour at the base of the blade.

Learning Activity # 11 – Turf

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

B2.1 Write brief texts to convey simple ideas and factual information

1. What is turf?

2. List eight ways in which turf grasses can differ.

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____
- f) _____
- g) _____
- h) _____

3. What are the two groups that turf grasses are divided into?

- a) _____
- b) _____

4. Write a brief description of the following turf grasses.

Kentucky bluegrass

Perennial ryegrass

Red fescue

Learning Activity # 12 – Nurse Grass

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

B2.2 Write texts to explain and describe information and ideas

D.2 Perform well-defined, multi-step, digital tasks

Go online or to your local library and research another common type of Canadian turf grass known as nurse grass. Answer the following questions. Write your answer in paragraph form. Limit your answer to two paragraphs.

1. What does nurse grass look like?
2. Does it grow fast or slow?
3. Where is it used and why?
4. Why do you think it is called nurse grass?

Turf Problems

Grass Weeds

The best defense against grass weeds is to maintain healthy grasses. Recognizing some of the common grass weeds will also help prevent further spread. When you see grass weeds on site, always report them to your supervisor. Let's look at some problem Canadian grass weeds.

Creeping bent grass

Creeping bent grass is a good example of the definition of a weed. Remember, we said, "A weed is a plant that is growing in the wrong place." Creeping bent grass is known for its plush, rich, carpet-like texture. It grows very evenly and is very dense, so it is ideal for use on golf-course putting greens. The problem with creeping bent grass is that it requires a lot of maintenance. On a golf course, there are maintenance people who work full time maintaining the greens. In a backyard environment, unwanted creeping bent grass can cause serious problems.

At first, the invading creeping bent grass will appear as beautiful green circular patches in the lawn. However, after a few years, the patches will increase and leave the lawn looking blotchy. The patches become thick and tangled. Creeping bent grass patches are perfect growing environments for something called "snow mould fungus". The mould is whitish grey in colour and appears in the late winter; it kills the creeping bent grass. The result is an unattractive, unhealthy lawn.

Quack grass

Quack grass is another invasive grass. It has a coarse texture and leafy shoots. The broad leaf blades do not knit together to form a smooth turf; instead they create a tufted, ragged look. Quack grass grows faster than the turf grasses it invades.

Clover

Clovers tend to grow in patches in turf. They make the turf look patchy. Many clovers have flowers which attract unwanted bees. Clover patches are also very slippery when wet, so they can be dangerous in areas where people need traction, for example, sports fields.



Insect Invaders

Insects can cause severe damage to turf grasses. Two of the most common types of insects that invade turf are **chinch bugs** and **grubs**.

Chinch bugs

Chinch bugs kill the turf by sucking the juices from grass blades causing them to wither and die. Yellowish-brown areas in the turf are often a sign of chinch bug activity. The adult chinch bug is about one quarter of an inch long. The body is usually black or brown with an odd-shaped white band on each wing. During the winter, the adults live in protected areas in long grasses. Most of the damage they cause is during the hot summer season, usually late July, August and, in some areas, September. If you suspect chinch bugs are in the turf, cut the ends off a tin can and push it into the ground. Fill it with water and the chinch bugs should float to the top.

Grubs

Grubs feed on the root system of the turf. When the root system is attacked, the turf turns a gray-green colour and wilts quickly in the sun. The grub is the larvae form of various beetles. They are C shaped and milky white in colour. When they attack the root system, the turf becomes loose and can easily be rolled back like a carpet. Turf infected with grubs feels spongy when you walk on it. Another problem with grub infestation is that animals, like skunks and raccoons, will tear up the turf to eat the grubs.

Thatch

Thatch is a thick, matted layer of grass roots, dead leaves and organic material that builds up between the soil surface and the base of plant materials. Normally, micro-organisms and earthworms will break down this debris. However, when the soil is not getting enough air, the micro-organisms and worms cannot survive, and the debris builds up even more. Other factors which contribute to thatch formation are poor drainage, over watering, low pH, high levels of nitrogen and compacted soils.

When the thatch becomes too thick, the grass has trouble growing. It will strain to grow above the thatch, which weakens its root system and makes it vulnerable to insect and disease infestations. A thick thatch can also prevent water from reaching the soil underneath.

Thatch Removal

1. Physical removal

Thatch can be removed physically with a rake or with mechanical devices such as de-thatchers and vertical mowers. Mechanical de-thatchers have a series of spinning vertical blades or teeth. The blades/teeth dig into the thatch and pull it up, separating it from the turf.

2. Topdressing

Topdressing involves covering the surface of the turf with a thin layer of soil. The added soil must be similar to the underlying soil. The soil is raked or dragged through the thatch. This method brings the micro-organisms in the soil into contact with the thatch. These micro-organisms can then begin to break the thatch down.

3. Core Aerification

Core aerification is a process which helps to get air back into the soil and the thatch layer. Aerification also helps to loosen up compacted soils. It is used most commonly in areas that have heavy traffic and in sports fields. Holes are punched into the ground (usually 3 – 4 inches deep) using hollow, tube-like forks which remove plugs of soil. The openings in the soil allow air, water, and fertilizer to penetrate the turf grass more easily.

By increasing the oxygen in the soil, microorganisms and worms that help break down the thatch, can multiply and reduce thatch build-up. The soil cores, which also contain micro-organisms and worms, are left on the surface of the turf to help speed up this decomposition process. The soil cores should be left to dry and then crumbled and spread with a hand rake or broom.

When is the best time to de-thatch?

De-thatching should always be done when the turf is actively growing. Cool season grasses such as Kentucky bluegrass, creeping red fescue, and creeping bent grass should be de-thatched in late summer/early fall or in early spring. Late summer/early fall is the best time to de-thatch because the growth of weeds can be a problem following an early spring de-thatching.



Learning Activity # 13 – Turf Problems

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.2 Write texts to explain and describe information and ideas

B3.1 Make straightforward entries to complete very simple documents

D.2 Perform well-defined, multi-step, digital tasks

1. What is the best way to reduce weed problems in turf?

2. List three common Canadian turf grass weeds.

a) _____

b) _____

c) _____

3. Go online and print off a picture of the above three grass weeds.

4. Match the following descriptions with the insect invader. Mark G for grub and C for chinch bug.

a) C-shaped, milky white insects _____

b) Skunks love to eat them _____

c) They feed on the root system of turf grasses _____

d) They cause the most damage during hot summer months _____

e) They cause yellowish-brown areas in turfs _____

f) They are examples of piercing and sucking insects _____

g) Turf feels spongy when you walk on it _____

5. What is thatch?

6. List some problems that thatch build-up can cause.

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____
- f) _____

7. Why is it important to aerate turf grasses?

Turf Mowing

Mowing turf grasses regularly and evenly is one of the most important ways to keep them healthy. Healthy turf grasses have fewer weeds, stronger resistance to diseases, and they can survive heat stress and drought conditions better than poorly mowed turf grasses. Mowing is one of the most expensive and time-consuming tasks of turf maintenance.

Mowing Height

How short you should cut turf grasses depends on the type of grass. All turf grasses have a range of mowing heights. The mowing height is the lower and upper height range at which the grass should be maintained in order to keep the grass healthy. Lawn mowers have adjustable blades or wheels that can be raised or lowered to cut different grasses at different heights. Look at the chart below to see the correct mowing heights for some common turf grasses grown in Canada.

Turf grass species	Spring and Fall	Summer Stress Periods
Kentucky bluegrass	2 – 2.5 inches	2.5 – 3 inches
Perennial ryegrass	2 – 2.5 inches	2.5 – 3 inches
Fine fescues	2 – 2.5 inches	2.5 – 3 inches
Tall fescues	2 – 3 inches	2.5 – 3 inches

Generally, most plants do not like to be cut, but turf grasses grow stronger the more they are mowed. One reason may be that they are grazing grasses. Animals like cows and goats regularly “mow” these grasses by eating the top portions. Turf grasses, over the years, have adapted to this ‘mowing’ process whereas other plants, such as weeds, have not. Mowing the grass within the set limits for each type will keep the turf healthy and evenly cut.

In most professionally maintained turf areas, 30% to 50% of the annual budget is spent, either directly or indirectly, on mowing.

The 1/3 Rule

All grasses should be cut when they grow 1/3 beyond their set mowing height range. For example, if perennial ryegrass should be 2 inches high after it has been mowed, it should be cut when it grows to 3 inches. When you cut more than 1/3 of the grass blade it causes stress to the turf. The energy that the plant needs to maintain a healthy root system is redirected to the “damaged” tip. Turf grasses, like most plants, depend on the energy from the sun to make food in their leaves (blades). If you cut the grass too short (known as scalping), the turf will not have enough leaf area to produce the food it needs. Cutting the turf too short also exposes the soil to the heat of the sun. The sun can dry out soils quickly and make it difficult for the turfs root system to grow deep, healthy roots.

How to Mow

Check the Blades

You should always adjust the mower blades on a flat, hard surface. The blades should be kept sharp. A dull mower blade will tear the turf and cause the grass blades to fray, allowing diseases to enter the plant more easily. Torn grass blades will also discolour and give the turf a brown overall appearance. Operating a mower with dull blades also takes more power and fuel.

Mowing Frequency

How often you mow depends on how fast the grass grows. Some grasses grow quickly during the spring and fall seasons and need to be cut twice a week. During the summer months, most turf grasses grow at a slower rate and may only need cutting every other week. Always follow the 1/3 rule and you will know when it is time to mow.

Mowing Direction

The direction of mowing should be changed every time you mow. If you mow in the same direction every time, wheel tracks from the mower may form in the turf. By changing directions, you also encourage the turf to grow in different directions, which creates a more even appearance.



Learning Activity # 14 – Mowing

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

B3.2 Use layout to determine where to make entries in simple documents

1. Fill in the blanks.

- a) Mowing turf grasses _____ and _____ is one of the most important ways to keep grass _____.
- b) Healthy turf grasses have fewer _____, stronger resistance to _____ and can better survive heat _____.
- c) Mowing is one of the most _____ and _____ areas in turf maintenance.

2. What is mowing height?

3. Should you mow the following grasses?

Turf Grass	Grass height (range)	Grass height	Mow Yes or No?
Bermuda – common	1-2 inches	3 inches	
Buffalo	2-4 inches	1 inch	
Centipede	1.5-2 inches	4 inches	
Fescue – creeping red	2-3 inches	3 inches	
St. Augustine – common	3-4 inches	3 inches	
Zoysia	1-2 inches	5 inches	

4. What are two problems that can happen if you cut the grass too short?

a) _____

b) _____

5. True or False.

a) Always adjust the mower blades on a flat surface.

True

False

b) Operating a mower with dull blades, saves on fuel cost.

True

False

c) During the summer months, most turf grasses grow quickly.

True

False

d) Changing the direction that you mow may help prevent tire grooves in the turf.

True

False

e) Damaged grass blades allow diseases to enter the plant more easily.

True

False

Laying Sod

As a landscape labourer, part of your job may include installing turf grasses that are already grown. These turf grasses are known as sods. Sods are rolled up strips of grass that look like small carpet rolls. Sods are used to save time and often they are used to replace areas that have been dug up during construction projects. They are also used to make lawns in new sub-divisions.

Steps for Sod Installation

1. Soil Preparation

- The soil needs to be cleared of rocks, branches and other debris.
- Rototill or cultivate the soil using a spade to a depth of 4 – 6 inches.
- Rake in fertilizer.
- Rake, smooth and level the soil.
- Roll the area with a lawn roller one-third full of water.
- Water the area to settle the soil and to prepare the area for the sod.

2. Installation

- Install the sod as soon as it arrives on site.
- Store the stacks of sod in a shady area until they are ready to be used.
- To begin, choose the longest straight line in the area, for example a driveway or a sidewalk.
- Join the ends of the sod strips tightly against each other as you lay them down.
- Do not stretch the sod.
- Do not overlap.
- Stagger the joints in each row, the same way you would if you were laying bricks.
- Trim corners with a large sharp knife.
- Do not use smaller strips at the outer edges – they are not able to retain enough moisture.
- Do not walk or kneel on the turf unless absolutely necessary; this can cause air pockets and indentations.

3. **Roll** the area to remove air pockets and to increase contact with the soil and the turf.

4. **Water** the area **thoroughly** within half an hour of installation.



To review, watch the following video about laying sod:
<https://www.youtube.com/watch?v=kIFTgv4T4A8>

Learning Activity # 15 – Sod

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

1. List the steps involved in preparing the soil for sod installation.

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____
- f) _____

2. What are four things you should **not do** when you are installing sod?

- a) _____
- b) _____
- c) _____
- d) _____



**Landscape and Grounds Maintenance Worker
Curriculum
Unit 5: Landscaping Math**

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Unit 5: Landscaping Math

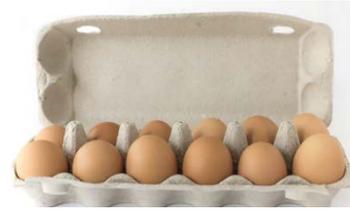
OALCF Skill Competency Chart by Task

This OALCF Skill Competency Chart aligns each activity in the unit to the Ontario Adult Literacy Curriculum Framework. Each activity is listed and articulated by Task Group and skill level.

	Competency	Find and Use Information			Communicate Ideas and Information			Understand and Use Numbers				Use digital technology	Manage learning	Engage with others
	Task Group	Read continuous text	Interpret documents	Extract info from films etc.	Interact with others	Write continuous text	Complete and create documents	Manage money	Manage time	Use measures	Manage data			
Activity #	Task Group #	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D	E	F
1	Batches					2				1				
2	Planting Table		2				1			1				
3	Fractions		2							2				
4	Tape Measure									1				
5	Measuring Items									1				
6	Converting Measures									2				
7	Funbrain Online									1		2		
8	Measurement Fun									1				
9	Area									2				
10	Perimeter							1		2	2			
11	Cubic Measures									2				
12	Work Schedules		2							1				
13	Timesheets		2				2			1				
14	Payroll Slips									3				

Batches

A batch is a number of things grouped together and counted as a whole. Counting in batches is something we do every day. For example, a carton of eggs is a batch. Eggs are usually sold in batches of 12 or a “dozen”.



When you know the number in a batch, you can add the batches together or you can multiply them.

Your supervisor asks you to get 18 marigolds. The marigold trays contain ten flowers each. How many trays will you need? (You will have some marigolds left over.)



= 2

Larger Numbers

When you are working with larger batches, it helps to figure out how many items are in each batch. Look

batches, it helps to figure out at the example below.



Both batches, or trays, have the same number of holes for plants. How many plants can be in tray 1 and 2? There are several ways to calculate the answer for this question. You could count each hole in each tray. You could count each hole in one tray and double your answer for the total. Both ways would be correct but these methods would take a little time.

When working with larger numbers, it is faster if you:

- Count the number of items (holes) in one row
- Count the number of rows
- Multiply these numbers together

Solution:

- There are 10 holes in each row
- There are 5 rows in each tray
- There are 2 trays

10 holes \times 5 rows \times 2 trays = 100 plants

or

10 holes \times 5 rows = 50 holes in one batch + 50 holes in the second batch = 100 holes

Rounding Up

It is important to know the maximum number of items in each batch.

For example, each tray of petunias has 6 plants (a plant may have more than one flower). Your supervisor has asked you to plant 20 petunias in the small circular bed. How many trays will you need? Since each tray contains 6 plants, you will need to bring 4 trays. If you round the number of plants up to the maximum in each tray, you will have enough plants to plant with 4 to spare.



Always make sure you have enough plants. A second trip to the storage shed will cost your employer time and money. Four trays of 6 plants will allow for damage and poor-quality plants. Always round up your number to the maximum number of plants in a tray.

Estimating

You may also need to estimate the number of items you will need to complete a task. When you estimate, you make a rough or approximate calculation. Learning how to quickly estimate the number of plants you will need to complete a planting task is a good skill to develop. Some plant trays may only have six sections while others may have hundreds of sections.

As a new hire, you will not be asked to do a lot of estimating. Estimating comes from experience. When you perform a job task several times, you will begin to get a “feel” for how long something will take to do and how much material you will need to do it. Your supervisor may ask you to bring 250 petunias to a planting site. You will have to work out how many trays you should bring.

When you know the total number of plants equals 250, and the number of plants in each tray equals 24, divide the numbers to find your answer.

Example: $250 \div 24 = 10$ trays and 10 extra plants

Another important reason for estimating is when measuring. For example, place a ruler on the table. Make a fist and put your knuckles on the table along the ruler. Stretch out your thumb and pinky finger along the ruler. What is the distance? Mine is about 8”. The information card for the Begonia says to space 12” between each plant. Rather than using the tape measure, I would use my outstretched fist 1 and ½ times to space the Begonias.

Learning Activity # 1 – Batches

OALCF Competency Task Groups and Levels

B2.2 Write texts to describe and explain information

C3.1 Measure and make simple comparisons and calculations

1. How many plants/holes are there in the following trays?



= _____



(one tray)
= _____



(both trays)
= _____

2. Explain how you reached your answers in question 1. For example, did you add the items one at a time?

Plant Trays

As you have seen, plant trays come in a wide range of sizes from 6 to 600 cells/spaces per tray. When the numbers are **smaller**, you can count the plants in batches. For example, if there are 10 plants in a tray and you need 35 plants:

- Count the plants as batches of 10s. 10, 20, 30 and 5 more makes 35. So, you will need four trays.

For **larger** numbers, you can group the batches in order to make calculations easier. For example, if there are 25 plants in a tray:

- Count out four trays - 25, 50, 75, 100. Double it and you get 200.

That's 4 trays of 25 for 100.

That's 8 trays of 25 for 200.



Learning Activity # 2 – Planting Table

OALCF Competency Task Groups and Levels

A2.2 Interpret simple documents to locate and connect information

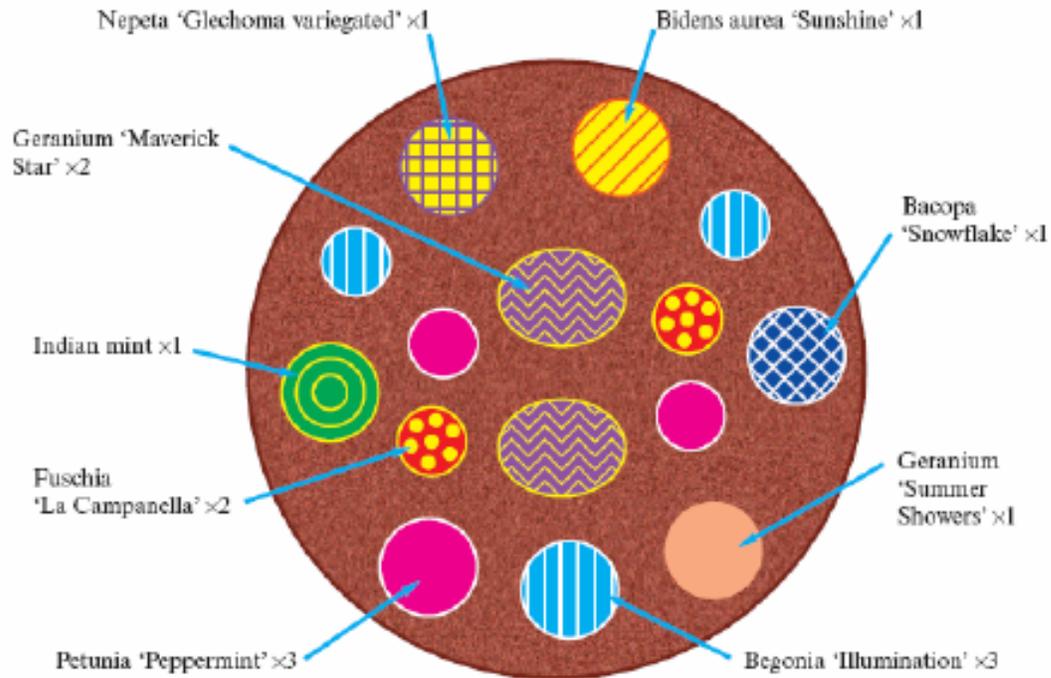
B3.1 Make straight forward entries to complete very simple documents

C3.1 Measure and make simple comparisons and calculations

Fill in the following **Planting Table** by looking at the *Hanging Basket Planting Plan*. Your job is to plant 30 hanging baskets. Remember, you may have plants left over.

1. Find out how many of each plant you will need for each basket. Fill in the **Number per basket** column in the Planting Table.
2. Work out how many plants you will need to fill 30 baskets. Fill in the **Number per 30 baskets** column in the Planting Table.
3. Each type of plant comes in a different size tray. Look at the table below the hanging basket plan to work out how many whole trays of each plant you will have to pick up. Fill in the **Number of trays** column in the Planting Table.

Hanging Basket Planting Plan



Code	Plant name	Number of plants per basket	Number of plants per tray
	Nepeta 'Glechoma' variegated	1	35 (7 × 5)
	Geranium 'Maverick Star'	2	8 (2 × 4)
	Indian mint	1	42 (6 × 7)
	Fuschia 'La Campanella'	2	6 (2 × 3)
	Petunia 'Peppermint'	3	40 (8 × 5)
	Begonia 'Illumination'	3	63 (7 × 9)
	Bidens aurea 'Sunshine'	1	24 (6 × 4)
	Bacopa 'Snowflake'	1	9 (3 × 3)
	Geranium 'Summer Showers'	1	4 (2 × 2)

Planting Table

Plant name	Number per basket	Number per 30 baskets	Number of trays
Bidens aura 'Sunshine'			
Nepeta 'Glechoma variegated'			
Geranium 'Maverick Star'			
Indian mint			
Fuschia 'La Campanella'			
Petunia 'Peppermint'			
Begonia 'Illumination'			
Bacopa 'Snowflake'			
Geranium 'Summer Showers'			

Imperial or Metric?

There are two different systems of weights and measures: imperial (inches) and metric (centimetres).



Americans use **the imperial system**. They measure in inches and feet.



Canadians use **the metric system**. We measure in centimetres and metres. Canada used to use the imperial system. We changed to the metric system in the 1970s.

For whatever reason, a lot of construction and landscape work in Canada is still done using the imperial system. Wood is sold by the foot. Screws are measured in inches. Soil is sold by the yard. Area is calculated by the square foot. Bricks, pavers, gravel and stone are still sold by the load, measured by weight, most often in tons or pounds. Imperial measurement is still widely used. For this reason, this unit will focus on imperial measurements.

Inches and Feet

The imperial system is based on inches, feet, yards, and miles. The two symbols used in imperial measurement are the ' (apostrophe) and the " (quotation mark).

5' ¾" means five feet and three quarter inches. 5 ¾" means 5 and ¾ inches.

Sometimes measurements are only written in inches. 5' ¾" can be written as:

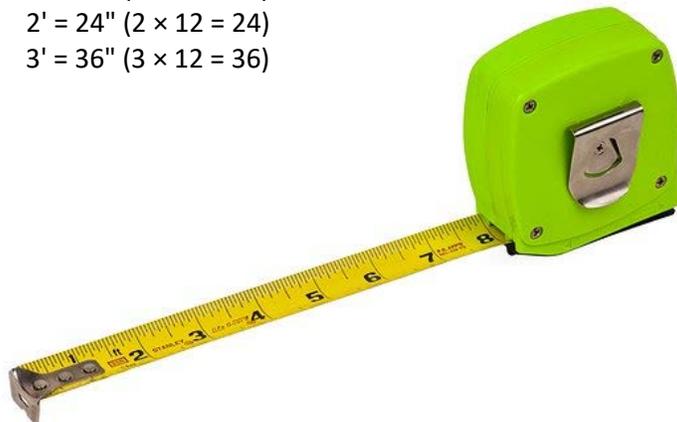
60 ¾" or **60 and three quarter inches**.

To find the total number of inches, we multiply the number of feet by 12, because there are 12 inches in a foot.

$$1' = 12'' (1 \times 12 = 12)$$

$$2' = 24'' (2 \times 12 = 24)$$

$$3' = 36'' (3 \times 12 = 36)$$



Fractions and Decimals

Landscape Construction

Fractions are used quite a bit in landscape construction. Often the measurements are not whole numbers (2 inches, 3 inches, etc.). A landscaper might measure a piece of wood that is $3 \frac{3}{8}$ " long. He needs to know how to work with this number.

Example:

You have two pieces of wood.

One measures $4 \frac{3}{4}$ " long and the other is $3 \frac{3}{8}$ " long.



If the landscaper wants you to find the total measurement of the two pieces of wood, he needs to be able to add them together. Some tape measures come with fractions written on the tape but knowing how to add and subtract fractions is a useful skill on any construction project.

Adding Fractions

Look at the fraction below:

$$\frac{1}{2}$$

The top number (1) is called the **numerator**. The bottom number (2) is called the **denominator**. This is true whether the fraction is written with a horizontal line ($\frac{1}{2}$) or with a slanted line ($\frac{1}{2}$).

It is fairly easy to add two fractions that have the **same denominator**. For example,

What is $\frac{1}{4} + \frac{2}{4}$?

If you got $\frac{3}{4}$, you are correct. To add two fractions with the same denominator, just add the two

numerators together (1+2). So, $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$

In our first example (measuring two pieces of wood), the boards measured $4 \frac{3}{4}$ " and $3 \frac{3}{8}$ ".

Notice that the two denominators are **not** the same. If your boss asked you to add the two measurements together, you would have to do the following:

1. First, let's put the whole numbers aside for the moment (4 and 3) and just consider the fractions.

$$\frac{3}{4} + \frac{3}{8} =$$

We can't simply add the two numerators together (3+3), because this time the denominators are different. The two divided lines below will help us to visualize this problem.

A)



B)



Line A represents $\frac{3}{4}$. Line B represents $\frac{3}{8}$. Do you notice anything?

From the above, you can see that $\frac{3}{4}$ is the same length as $\frac{6}{8}$. We can add $\frac{6}{8} + \frac{3}{8}$ because they both have the same denominator. How do we get this by looking at the numbers alone? What do the numbers 4 and 8 have in common?

Answer: $4 \times 2 = 8$. Since you can get 8 by multiplying 4 by 2, you can add these fractions by converting them from fourths to eighths.

2. To do this, we multiply the numerator and denominator by 2. This will allow the two fractions to be added because they have the **same** denominator. (Since $\frac{2}{2} = 1$, we are not changing the value of $\frac{3}{4}$).

$$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$$

3. Therefore, the first board measures $4\frac{6}{8}$ " and the other board measures $3\frac{3}{8}$ ".

4. To add the measurements of the two boards, add the whole numbers first.

$$4\frac{6}{8} + 3\frac{3}{8}$$

$4 + 3 = 7$

5. Next, add the numerators. (**Do not add the denominators**)

$$\frac{6}{8} + \frac{3}{8} = \frac{9}{8}$$

6. The two boards measure $7\frac{9}{8}$ " in total.
7. How many 8ths are in a whole inch? If you look at the divided line B), you can see that if the whole line were shaded in, you would have $\frac{8}{8}$ ". Whenever the numerator is larger than the denominator, you need to reduce the fraction to a whole number plus a fraction (or a **mixed number**). In order to do this, divide the numerator by the denominator.

In this case, if you divide 9 by 8, you get 1 and some left over. The leftover, in this case, is 1. This leftover is the new **numerator** and is put over the denominator.

$$\frac{9}{8} = 1\frac{1}{8}$$

Answer: The two boards measure $(7" + 1") + \frac{1}{8}" = 8\frac{1}{8}"$

Subtracting Fractions

Subtracting fractions follows the same rules as adding fractions. Let's look at our two boards again. One

board measures $4\frac{3}{4}$ " and the other is $3\frac{3}{8}$ "

Your boss wants both boards to be cut to a length of $3\frac{3}{8}$ "

How much must you cut from the longer board? Follow the same steps that you used to add the fractions together, but now subtract the fractions.

$$\frac{3}{4} - \frac{3}{8} =$$

1. Once again, the fractions must have the same **denominator**. Look at the two denominators (4 and 8). Do they have something in common?

In this case, $4 \times 2 = 8$.

2. Multiply the numerator and denominator in the fraction $\frac{3}{4}$ by 2. This will allow the two fractions to be subtracted because they will then have the **same** denominator.

$$\frac{3}{4} \times \frac{2}{2} =$$

3. The one board measures $4\frac{6}{8}$ and the other board measures $3\frac{3}{8}$.

4. Subtract the measurements of the two boards. Subtract the whole numbers **first**.

$$4 \frac{6}{8} - 3 \frac{3}{8}$$

$$4 - 3 = \underline{\quad} \mathbf{1} \underline{\quad}$$

5. Next, **subtract** the numerators. (**Do not subtract the denominators. The denominators will stay the same**)

$$4 \frac{6}{8} - 3 \frac{3}{8}$$

$$6 - 3 = \underline{\quad} \mathbf{3} \underline{\quad}$$

So $\frac{6}{8} - \frac{3}{8} = \frac{3}{8}$

Answer: You would have to cut $\underline{\quad} 1 \frac{3}{8} \underline{\quad}$ off the longer board.

Converting Fractions and Decimals

Sometimes you will have to convert (or change) decimals to fractions or fractions to decimals. Some common conversions that are used in construction are found in the following table. These measures are used often and should be memorized.

Common Conversion Table	
Fraction	Decimal
$\frac{1}{16}$.0625
$\frac{1}{8}$.125
$\frac{1}{4}$.25
$\frac{1}{2}$.5

--	--

Suppose you were asked to convert $\frac{3}{8}$ " to a decimal. You know $\frac{1}{8}$ is the same as 0.125.

To convert $\frac{3}{8}$, you multiply .125 by 3.

$$.125 \times 3 = .375$$

$\frac{3}{8}$ " is the same as .375"

Learning Activity # 3 – Fractions

OALCF Competency Task Groups and Levels

A2.2 Interpret simple documents to locate and connect information

C3.2 Use measures to make one-step calculations

1. Add the following measurements.

a) $3\frac{1}{2} + 6\frac{1}{2} =$

b) $2\frac{3}{4} + 7\frac{1}{8} =$

c) $4\frac{3}{8} + 1\frac{5}{16} =$

d) $2\frac{3}{4} + 5\frac{9}{16} =$

2. Subtract the following measurements.

a) $4\frac{2}{3} - 2\frac{1}{3} =$

b) $7\frac{2}{4} - 5\frac{3}{8} =$

c) $9\frac{1}{4} - 7\frac{2}{16} =$

d) $4\frac{3}{12} - 2\frac{2}{8} =$

3. Using the conversion table from earlier in this unit, convert the following.

a) $\frac{11}{16}$ to a decimal

b) $\frac{7}{8}$ to a decimal

c) $\frac{3}{8}$ to a decimal

4. Suppose you had two boards measuring $7\frac{5}{8}$ " and 3.25". What is the total measurement of the two boards?

a) As a fraction _____

b) As a decimal _____

How to Read a Measuring Tape

Reading between the lines

The Inch

Inches are clearly marked on a measuring tape. They are shown as whole numbers (1, 2, 3, 4, etc.). They are marked on a tape as the longest lines.

Half an Inch – $\frac{1}{2}$ "

The second longest line is the $\frac{1}{2}$ (one-half) inch mark. It is one half of the way between two whole numbers. One-half of the way between 1 inch and 2 inches is 1 and $\frac{1}{2}$ inches (one and one-half inches or 1 $\frac{1}{2}$ ").

Fourths of an Inch – $\frac{1}{4}$ "

Within an inch, there are two lines that are fourths, or quarters. There are only two of these: $\frac{1}{4}$ and $\frac{3}{4}$. The $\frac{1}{4}$ falls between the whole number and the $\frac{1}{2}$ -inch mark. The $\frac{3}{4}$ falls between the $\frac{1}{2}$ and the whole number.

Eighths of an Inch – $\frac{1}{8}$ "

Look at the tape measure again. The lines that are a little shorter than $\frac{1}{4}$ are called 8ths. There are four of these: $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, and $\frac{7}{8}$.

Sixteenths of an Inch – $\frac{1}{16}$ "

The shortest lines are called 16ths. They are shorter than the $\frac{1}{8}$ of an inch measure. There are eight of these: $\frac{1}{16}$, $\frac{3}{16}$, $\frac{5}{16}$, $\frac{7}{16}$, $\frac{9}{16}$, $\frac{11}{16}$, $\frac{13}{16}$ and $\frac{15}{16}$.

Note on 32nds of an Inch

Some tape measures have 32nds of an inch. If present, these lines would then be the very smallest.



Learning Activity # 4 – Tape Measure

OALCF Competency Task Groups and Levels
C3.1 Measure and make simple comparisons and calculations

1. Use your tape measure to measure the lines below. Mark your answer on each line.

What Else is on a Tape Measure?

Every foot and every 16" increment is marked on a tape measure. The kind of marking varies from tape measure to tape measure. It may be a coloured box, triangle, or coloured number. Why? The markings are there because construction workers use these marks when they are spacing studs in a wall or when they are putting in floor or roof joists. For walls that are loadbearing, studs and joists are placed every 16 inches. For walls that are not load-bearing, they are placed every 24". Having every 16" and 24" clearly marked on a tape measure helps builders to measure correctly and faster.

Still Having Problems Reading a Tape Measure?

If you find that you are having problems reading a tape measure, look for one that clearly marks the fractions of an inch. They aren't as common, but they are available. Learning the names of these markings comes with time and practice. Use your tape measure every day. Carry it with you. Measure random items for practice.

Learning Activity # 5 – Measuring Items

OALCF Competency Task Groups and Levels**C3.1 Measure and make simple comparisons and calculations**

1. With your tape measure, measure five items or spaces that you would find inside a room. Write the items and the measurements in the spaces below.

a) _____

b) _____

c) _____

d) _____

e) _____

2. Go outside and measure five items or spaces with your tape measure. Write the items and the measurements in the spaces below.

a) _____

b) _____

c) _____

d) _____

e) _____

Fractions of an Inch

One (whole) inch (1"): On most tape measures, each inch is divided into 16 parts. One whole inch, written as a fraction, is $16/16$. The divided line below represents one inch (1") divided into 16ths.



One half inch ($1/2$): One half of an inch is $8/16$ ". When we talk about fractions, we talk in **lowest terms**. So, $8/16$ " can be reduced to $1/2$ ". When you look at the diagram below, you can see that $8/16$ is one half of the line, or one half inch. In lowest terms, $8/16$ " is the same as $1/2$ ".



One quarter inch ($1/4$): One quarter inch ($1/4$ "), or one fourth inch, is represented by the shaded squares below. You can see that one fourth is the same as $4/16$. When you reduce $4/16$ to lowest terms, it is $1/4$.



One eighth inch ($1/8$): One eighth of an inch is also two sixteenths of an inch, or $2/16$ ", as you can see by the shaded squares below. When you reduce $2/16$ to lowest terms, it is $1/8$.



One sixteenth inch ($1/16$): Look at the line below. One out of a possible 16 squares is shaded. $1/16$ " is the smallest fraction of an inch on most tape measures.



Learning Activity # 6 – Converting Measures

OALCF Competency Task Groups and Levels

C3.2 Use measures to make one-step calculations

Get out your tape measure or multiply by 12. Use a calculator if you would like. Convert the following measurements to inches.

1. $5' \frac{3}{4}" = \underline{60 \frac{3}{4}"}$
2. $10' \frac{3}{4}" = \underline{\hspace{2cm}}$
3. $3' \frac{5}{8}" = \underline{\hspace{2cm}}$
4. $5' \frac{7}{8}" = \underline{\hspace{2cm}}$
5. $8' 2 \frac{1}{4}" = \underline{\hspace{2cm}}$
6. $1' 5 \frac{1}{8}" = \underline{\hspace{2cm}}$
7. $4' \frac{5}{8}" = \underline{\hspace{2cm}}$
8. $2' \frac{1}{16}" = \underline{\hspace{2cm}}$
9. $6' \frac{9}{16}" = \underline{\hspace{2cm}}$
10. $4' 4 \frac{1}{8}" = \underline{\hspace{2cm}}$
11. $7' \frac{1}{2}" = \underline{\hspace{2cm}}$
12. $6' \frac{7}{16}" = \underline{\hspace{2cm}}$
13. $8' 6 \frac{5}{16}" = \underline{\hspace{2cm}}$
14. $8' \frac{7}{8}" = \underline{\hspace{2cm}}$
15. $7' \frac{7}{8}" = \underline{\hspace{2cm}}$
16. $2' \frac{3}{4}" = \underline{\hspace{2cm}}$

Learning Activity # 7 – Funbrain Online

OALCF Competency Task Groups and Levels

C3.1 Measure and make simple comparisons and calculations

D.2 Perform well-defined, multi-step digital tasks

A great website: Measure It! @ FunBrain www.funbrain.com/measure/

Start with Easy Inches. When you feel comfortable, move on to Medium, and finally Hard. This site also allows you to practice metric measurements.

More on Measurement

Visual Aids

Comparisons

Most of the math you will need to work as a landscape labourer will be “done in your head” or told to you by your supervisor. Because of the seasonal nature of the business, work must be completed as quickly as possible. Your supervisor will generally mark off sections of ground that is to be worked with spray paint or use chalk lines to guide you in hardscape construction projects.

To save time and money, most employers in this field will give you measurement directions by using visual aids. There often is no time or need for precise calculations. For example, an employer wants you to dig a trench for a retaining wall. A retaining wall needs a deep foundation. He wants the trench to be 6 inches (15 cm) deep. To measure 6 inches, as you’re digging, would take a lot of time. Instead, using a visual comparison, such as half a spade head or a full spade head, will speed things up. Measurements are often given in this way by experienced landscapers.

Visual aids are usually used for most planting tasks. Let’s say you’re planting bamboo. Your supervisor may say, “Dig a hole as large as the container and twice as wide.”

Spacing plants is often done by hand references such as the distance between your thumb and your baby finger or the width of three fingers together, etc. Planting depths can be given by finger references, for example, “plant up to your second knuckle”. These references are used to save time.

Three Common Measures

Square

It is helpful to have a visual reference for some of the common measures that are frequently used in landscaping.

A common measurement used in landscaping is the square foot. A square foot is about the size of most floor tiles.



$$1 \text{ square foot} = 1 \text{ foot} \times 1 \text{ foot}$$

Area can be defined as the amount of surface of something flat. The formula for area is:

$$\text{Area} = \text{Length} \times \text{Width, or} \\ A = L \times W$$

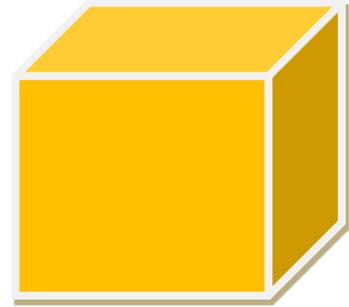
Area is often measured in square feet.

Cubic Measures

Unlike area, which is a **two**-dimensional surface measure ($A = L \times W$), cubic measures tell us the amount in **three**-dimensional spaces. Cubic measures are made up of Length, Width and Height. These distances are multiplied together to give you the volume.

You know you are working with volume when you see the measurement unit has the following notation: 5 yards³ or 5 cubic yards.

What does a cubic yard look like? 27 cubic feet equals 1 cubic yard. A cubic yard of soil weighs 2700 pounds. Does that help you visualize it?



*You must use the same units for all measurements.
For example, inches cannot be multiplied by feet.*

Learning Activity # 8 – Measurement Fun

OALCF Competency Task Groups and Levels C3.1 Measure and make simple comparisons and calculations

- Using a tape measure, measure the following items.
 - Your thumb. _____
 - Your middle finger. _____
 - The length of your hand from your wrist to the end of your middle finger. _____
 - The width of your three middle fingers together. _____
 - The length of your foot. _____
- At home, measure the following items.
 - A floor tile. _____
 - The inside rectangular part of your refrigerator. _____
 - A die (one cube from a pair of dice). _____

Area

Area is the amount of surface of something flat. For example, you calculate area of a property to find the amount of sod needed to cover it.

To calculate area, use the formula $\text{Area} = \text{Length} \times \text{Width}$.

This can be written as:

$$A = LW \quad \text{or} \quad A = L \times W$$

The formula tells you to multiply the length by the width. When there are two letters right beside each other, like LW , you also multiply them.

Area is always measured in **square units** like square feet (ft^2) or square metres (m^2).

When you have to calculate an area, the first step is to write down the formula. After that, you write it again, filling in the blanks with your measurements. See the following example.

You're asked to find the area of a yard that is 9 feet long and 5 feet wide.

$$A = LW$$

$$A = 9 \times 5$$

$$A = 45 \text{ feet}^2$$

So what did we just do?

We replaced L (length) with 9 and W (width) with 5. Using those numbers, we found out the size (or area) of the whole space, 45 square feet.

Now, picture a rectangle with a length of 3 feet and a width of 4 feet. How big is the area? Draw your own picture to help.

$$A = LW$$

$$A = \underline{\quad} \times \underline{\quad}$$

$$A = \underline{\quad}$$

Here is another example: A backyard measures 15 feet long by 20 feet wide. What is the area of the yard?

$$A = LW$$

$$A = \underline{\quad} \times \underline{\quad}$$

$$A = \underline{\quad}$$

Length usually means the longer side, but you can switch them around and still get the same answer.

Here is a scenario:

Joe wants to stain a deck. The deck is 7 feet long and 3 feet wide. He must calculate the area of the deck before he buys the stain. Calculate the area of the deck.

$$A = LW$$

$$A = 7 \times 3$$

$$A = 21 \text{ feet}^2$$

Now we know how big an area he has to stain. Let's say Joe buys a gallon of stain. One gallon of stain will cover 378 square feet. What area would Joe be able to stain with the stain that is left over?

378 square feet

– 21 square feet

Answer: 357 square feet

If Joe bought a half-gallon, what area could he stain with what is left?

$$378 \div 2 = 189 \text{ sq. ft.}$$

$$189 \text{ sq. ft.} - 21 \text{ sq. ft.} = 168 \text{ square feet}$$

The area of a rectangle is the length times the width. If the width is 6 inches and the length is 4 feet, what is the correct calculation for area?

- a) 6 times 4 or b) $1/2$ foot \times 4 feet

B is **CORRECT**. 6 inches is the same as $1/2$ foot. Area is $1/2$ foot times 4 feet = 2 square feet (or 2 sq. ft., or 2 ft²).

Often landscape materials such as pavers, bricks and fencing are measured in square inches and square feet.

It will help to memorize the following unit as a base reference:

$$1 \text{ square foot} = 144 \text{ square inches}$$

Learning Activity # 9 – Area

OALCF Competency Task Groups and Levels

C1.1 Compare costs and make simple calculations

C3.2 Use measures to make one-step calculations

C3.3 Use measures to make multi-step calculations; use specialized measuring tools

1. Calculate the area for the following measurements. Draw a rectangle showing the measurements.

a) Length 13 feet \times Width 10 feet = Area _____

b) Length 42 feet \times Width 4 feet = Area _____

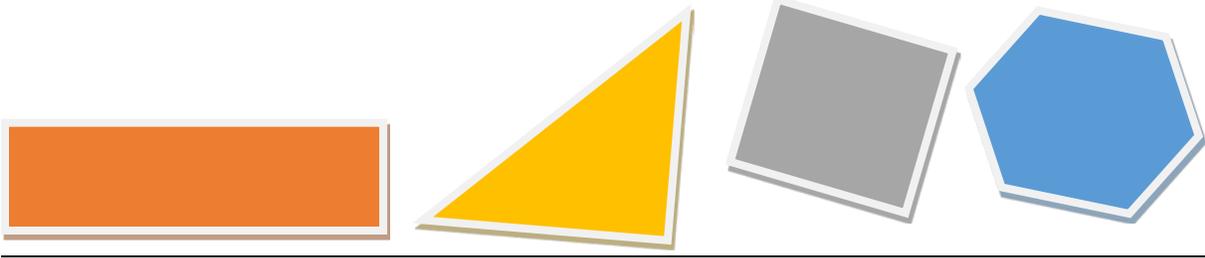
c) Width 2 inches \times Length 4 inches = Area _____

2. Sam has been asked to apply fertilizer to a lawn that is a rectangle shape measuring 20 feet wide and 30 feet long. He must find the area of the lawn before he can mix the fertilizer. Calculate the area of the lawn.

3. Jane works at a public garden. Her boss has asked her to use the drop spreader to apply some new grass seed in the southeast section of the gardens. The space is an *almost* square shape measuring 5 feet wide and 4 feet long. Calculate the area of the section.

4. Roscoe is laying sod. The ground he must cover is 42 feet long by 89 feet wide. The sod costs \$ 0.39 a square yard. How much will it cost Roscoe to do this job?

5. Amy is laying patio blocks for a private residence. The most common size for patio blocks is 8" by 16". The finished patio will total 15 sq. ft. How many patio blocks will Amy need to complete the job? Show your work.



Shapes

In landscaping, the shapes of the material you work with, and the shape of the space that you work in, determine the way you do your job. For example, if you are mixing fertilizer for a lawn, the shape of the lawn determines the way you would calculate the amount of fertilizer you would mix. If the lawn was circular, you would use a specific calculation; if the lawn was square, you would use a different calculation.

As a labourer, the amount of calculating that will be expected of you is minimal; however, you should have an understanding of the basic shapes that you will be working with and an understanding of how those shapes influence how you do your job. Some of the most common shapes you will be working with are called polygons.

Polygons

A polygon is a many-sided shape made up of line segments. All polygons have straight sides.

A **regular** polygon has **equal** line segments. When we look at polygons for this course, we should look at the following properties:

- The number of sides
- The length of the line segments

Regular Polygons

Square

- All four sides are of equal length.



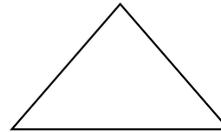
Rectangle

- Opposite sides are of equal length.



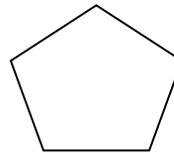
Triangle

- A three-sided enclosed shape. The prefix **tri** means 3.



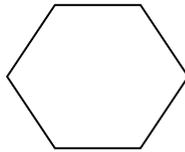
Pentagon

- A 5-sided polygon. The prefix **pent** means 5.



Hexagon

- A 6-sided polygon.



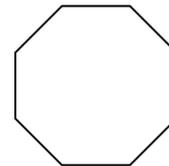
Heptagon

- A 7-sided polygon.



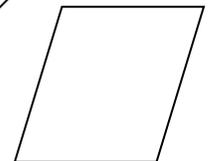
Octagon

- An 8-sided polygon. What traffic sign does the octagon remind you of?



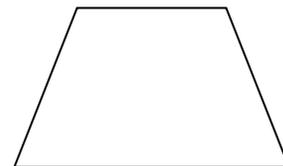
Parallelogram

- Opposite sides are parallel and are equal lengths. Opposite lines never cross.



Trapezoid

- One set of the lines are parallel; the other set is not. One set could cross if you extend the lines far enough.



Remember: To find the perimeter of regular polygon shapes, add the lengths of the sides together.

Perimeter

Perimeter is the distance around an area. To calculate the perimeter of an area you **add** all the **sides** together. Let's say you are building a fence in someone's backyard. You would have to calculate the perimeter of the property to know how much fencing material you would need.

Areas can be different shapes: squares, rectangles, triangles, octagons, etc. If their sides are straight lines, they are called **regular polygons**. To calculate perimeter for regular polygons, use the formula:

$$P = A+B+C+D\dots$$

The formula tells you to add the lengths of all the sides. The calculation used to determine perimeter for irregular shapes and circles is different. If you want to learn how to calculate perimeter for these shapes, ask your instructor. For the purposes of this course, a general understanding of basic perimeter calculations is sufficient.

Learning Activity # 10 – Perimeter

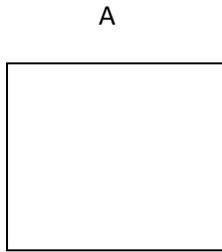
OALCF Competency Task Groups and Levels

C1.1 Compare costs and make simple calculations

C3.2 Use measures to make one-step calculations

C4.2 Make low-level inferences to organize, make summary calculations, and represent data

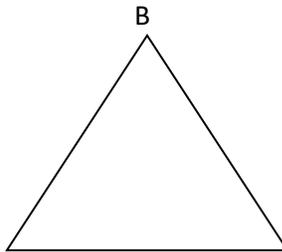
1. Calculate the perimeters of the following shapes.



A = one side is 4 inches

B = one side is 5 feet

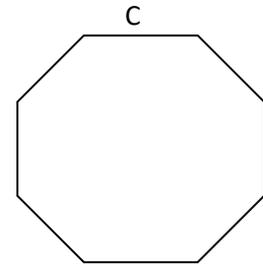
C = one side is 3 cm



The perimeter of A = _____

The perimeter of B = _____

The perimeter of C = _____



2. Four Greens Landscaping is building a fence in a customer’s backyard.

- a) The distance to be fenced in is called the **run**. Most types of fencing are sold in **8 foot sections**. The property to be fenced in is a **rectangular** shape. The length is 128 feet long and the width is 64 feet. What is the perimeter of the run?

- b) Calculate the cost of the fence for each of the following fencing options. (Remember always round up. It is better to have some extra than to not have enough.)

<u>Type of Fence</u>	<u>Cost per Section</u>	<u>Section Length</u>	<u>Cost</u>
Basket Weave	\$ 8.75	6 ft. by 8 ft.	\$ _____
PVC	\$16.51	6 ft. by 8 ft.	\$ _____
Iron	\$17.41	6 ft. by 8 ft.	\$ _____
Privacy Wood	\$ 7.99	6 ft. by 8 ft.	\$ _____
Chain Link	\$ 4.90	6 ft. by 8 ft.	\$ _____
Basket Red Cedar	\$ 9.30	6 ft. by 5 ft.	\$ _____

c) What is the cheapest option for completing the fence?

d) What is the most expensive option for completing the fence?

e) The customer has looked at the pricing chart above and has expressed an interest in the Basket Red Cedar fence. You know the customer has a budget of \$500 for the fence. Is the Basket Red Cedar fence a good option? If not, explain your answer as you would do with a real-life customer.

3. Four Greens Landscaping has been hired to edge the perimeter of an octagonal shaped flower bed in an amusement park. One side measures 40 ft. Calculate the perimeter of the bed.

4. a) How much would the materials cost to install a PVC fence around an irregular shaped pool deck? Use the fencing chart in question 2b. The deck has four irregular sized sides. The measurements are as follows:

Side 1 = 9 ft.

Side 2 = 12 ft.

Side 3 = 13 ft.

Side 4 = 20 ft.

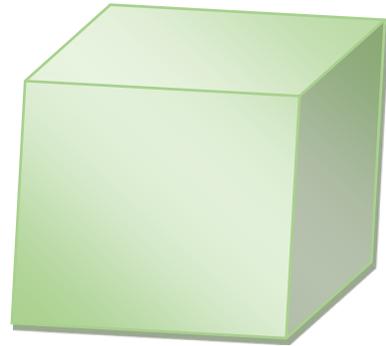
Answer:

b) How many sections would you have to order?

Cubic Units

Landscapers and grounds maintenance workers often use cubic measures. Any materials that are used on site, such as gravel, soil, and mulches, are spread to a specific level. For example, a garden is 50 feet long and 20 feet wide, you need to cover the area with four inches of mulch.

There are three dimensions to think about when you are calculating the amount of mulch needed to complete this task. As a labourer you will not be expected to do the calculation, but it is good to have a general idea of how cubic measures are used. Just as with area, measurements must be converted into the same units (feet, inches) before cubic measures can be calculated.



To find the cubic measure (volume) of squares or rectangles, start with the area ($L \times W$) and multiply by the height (H). This gives you the cubic measure or volume (V). The formula is expressed as $V = L \times W \times H$. Other shapes such as triangles, cones and circles have different formulas.

Volume is the amount of space occupied by a three-dimensional object. For example, the amount of water in a swimming pool is measured by volume. Cubic measures are used to measure the capacity of objects or spaces. The following formula is used for finding the volume of **rectangular** objects and **cubes**:

$$V = L \times W \times H$$

In landscaping, many of the conversions to cubic units involve changing square feet or yards (area) into cubic feet or yards (volume). For example, the amount of soil needed to fill a raised bed is determined first by the size of the bed. Let's say you have to estimate how much soil you will need to fill the bed. The bed is 5 feet long and 4 feet wide. The soil needs to be 18 inches deep. How would you determine the amount of soil you will need? Soil is sold by the cubic yard. The formula is $V = L \times W \times H$.

- $L = 5$ feet
- $W = 4$ feet
- $H = 18$ inches

First we must change the units into the same form. 18 inches = 1.5 feet.

Therefore, $5 \times 4 \times 1.5 = 30$ cubic feet of soil.

Soil, like gravel and mulches, is sold by the cubic yard.

Cubic Measures and Approximate Weights

A cubic foot of sand or gravel weighs approx. 100 lb. (45 kg)

A cubic foot of 5/8" crushed gravel weighs approx. 95 lb. (43 kg)

A cubic foot of concrete weighs approx. 150 lb. (68 kg)

A cubic yard of sand or gravel weighs approx. 2700 lb. (1215 kg)

A cubic yard of 5/8" crushed gravel weighs approx. 2600 lb. (1170 kg)

A cubic yard of concrete weighs approx. 4050 lb. (1823 kg)

A cubic yard has a volume of 27 cubic feet. (.76 cubic metres)

Learning Activity # 11 – Cubic Measures

OALCF Competency Task Groups and Levels

C3.2 Use measures to make one-step calculations

1. In the example of the raised bed in the previous section, how many cubic yards of soil must be ordered to complete the task?

2. List some of the materials that are used in landscaping that are sold by the cubic yard.

3. What is the formula for calculating volume?

It will help to remember: ***9 square feet = 1 square yard***
27 cubic feet = 1 cubic yard

4. How many cubic yards would you have to order to cover the following areas? Fill in the chart:

Cubic Feet	Cubic Yards
27	
54	
81	
60	

5. True or False. Circle your answer.

- a) A cubic yard of concrete weighs approx. 2700 lb. (1215 kg).

True *False*

- b) A cubic foot of concrete weighs approx. 150 lb. (68 kg).

True *False*

- c) A cubic yard of sand or gravel weighs approx. 2700 lb. (1215 kg).

True *False*

- d) A cubic foot of sand or gravel weighs approx. 100 lb. (45 kg).

True *False*

- e) A cubic foot of 5/8" crushed gravel weighs approx. 95 lb. (43 kg).

True *False*

- f) A cubic yard of 5/8" crushed gravel weighs approx. 2500 kg.

True *False*

Schedules and Timesheets

Many positions available in landscaping and grounds maintenance are seasonal. During the busy seasons, it is not unusual for workers in this industry to work extended workdays and sometimes extended workweeks. Workers may have to work weekend days as part of their weekly shift.



Your supervisor will make a schedule for the staff. The schedule could be a weekly or monthly schedule. Many smaller companies do not pay for lunch breaks, so you may have to subtract the lunch period from your total hours. It is a good idea to copy the schedule so that you can refer to it when you are organizing your week.

Four Greens Landscaping Schedule						
Week of July 3-9						
Employee	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Sahid	9:00am-3:00pm	Off	8:00am-8:00pm	8:00am-8:00pm	9:00am-3:00pm	9:00am-4:00pm
Betty	10:00am-6:00pm	9:00am-3:00pm	3:00pm-9:00pm	Off	10:00am-6:00pm	9:00am-4:00pm
Latisha	9:00am-3:00pm	10:00am-6:00pm	Off	8:00am-4:00pm	9:00am-5:00pm	9:00am-4:00pm
John	1:00pm-9:00pm	Off	10:00am-8:00pm	10:00am-8:00pm	1:00pm-9:00pm	9:00am-4:00pm
Rosco	9:00am-3:00pm	3:00pm-9:00pm	Off	8:00am-4:00pm	9:00am-3:00pm	9:00am-4:00pm
Anne	10:00am-6:00pm	Off	10:00am-8:00pm	10:00am-8:00pm	10:00am-6:00pm	9:00am-4:00pm
Munzar	1:00pm-9:00pm	9:00am-3:00pm	1:00pm-9:00pm	Off	8:00am-4:00pm	9:00am-4:00pm
Ipeelee	1:00pm-9:00pm	10:00am-6:00pm	10:00am-6:00pm	9:00am-3:00pm	8:00am-4:00pm	Off

Learning Activity # 12 – Work Schedules

OALCF Competency Task Groups and Levels**A2.2 Interpret simple documents to locate and connect information****C3.1 Measure time and make simple comparisons and calculations**

Use the Four Greens Landscaping schedule to answer the following questions.

1. Which employees have the most shifts for this week? _____
2. Calculate the number of hours that each employee works for the week. At Four Greens Landscaping, employees are not paid for their half-hour lunch.

Sahid _____

Betty _____

Latisha _____

John _____

Rosco _____

Anne _____

Munzar _____

Ipeelee _____

3. On what day(s) does Rosco work evenings? _____
4. Which employees are scheduled the earliest on Tuesday? _____
5. How many more hours of work does Ipeelee have than Latisha? _____
6. What are the shortest shifts? _____
7. Is everyone scheduled to work on Saturday? _____

Weather

In smaller landscaping companies, schedules are often varied. Some weeks you may work a set schedule, while other weeks may vary, depending on the job and the weather. Flexibility is something most employers look for in a new hire. In larger companies and municipal offices, schedules are generally more fixed because they are not as dependent on good weather conditions as many of the smaller companies.

Rain Days

Landscapers and grounds maintenance workers generally work in all types of weather conditions. Rainy days are an exception. Some of the work you will be doing cannot be done when it is raining. Larger companies and municipal offices generally pay for rain days, but many smaller, privately-owned businesses do not. Company policies about rain days vary. Some employers will expect you to phone in while others will expect you to show up to work and wait. It is up to you to ask your boss what the company policy is for rain days.



Timesheets

Timesheets are a record of what hours you have worked in a pay period. A pay period may be one week, two weeks or in some cases one month. It is your responsibility to keep track of the hours you have worked. As a landscape labourer, you will likely work at several different sites during your pay period. For example, on Monday you may be helping to build a fence at a private residence, and on Tuesday you may be planting bulbs at the local mall. It is important that you mark down the site location on your time sheet. Your employer includes his labour costs for each job he estimates.

Learning Activity # 13 – Timesheets

OALCF Competency Task Groups and Levels

A2.2 Interpret simple documents to locate and connect information

B3.2 Use layout to determine where to make entries in simple documents

C3.2 Use measures to make one-step calculations

Read the following scenario and fill in the **sample timesheet** on the following page with the correct information.

1. Sahid works for Cornwall Interlocking. For the purposes of this exercise, assume that Cornwall Interlocking does not pay for lunch breaks (which are 30 minutes long) or rain days.

On **Monday** Sahid worked at the Bells' house helping to install a fence. He worked a full day, starting at 9 a.m. and finishing at 5 p.m. **Tuesday**, Sahid was booked off. **Wednesday** he worked a long day helping with the installation of a patio at the Scotts' residence. He was scheduled to work 9 a.m. to 9 p.m. **Thursday** he was back at the Scotts' finishing the job. The crew started at 12 p.m. Sahid was scheduled to work until 9 p.m., but the job was finished at 7 p.m. and everyone was sent home early with full pay. **Friday**, he started grading the yard at the Kazar estate. He started work at 8 a.m. The crew stopped at noon for lunch. At 1:30 it started to rain. The supervisor kept the crew until 2 p.m. before he sent them home for the day. **Saturday**, Sahid worked a full shift at the Kazar estate, starting at 9 a.m. and finishing at 5 p.m.

2. Sahid has bought a house and is moving next week. Where should he include his new address?

Sample Timesheet

Retail Essential Skills Curriculum
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(Time sheet courtesy of Cornwall Interlocking and Landscaping Depot)



**CORNWALL
INTERLOCKING
& LANDSCAPING
DEPOT**

TIME SHEET

EMPLOYEE'S NAME _____
 FOR THE WEEK OF _____

DATE WORKED	START	FINISH	LUNCH	TOTAL	JOBSITE
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
SATURDAY					
TOTAL					

COMMENTS OR QUESTIONS FOR THE PAYROLL DEPARTMENT

Payroll Slips

Time and Earnings

For most landscaping and grounds maintenance jobs, you will be paid by the hour. Your earnings depend on both the number of hours you work and the rate of pay you are receiving. To figure gross earnings you multiply your hourly rate of pay by the number of hours you have worked.

$$\text{Hourly rate of pay} \times \text{Hours worked} = \text{Gross Earnings}$$

Regular pay plus any other pay make up the gross earnings. This is the total pay before payroll deductions are taken out.

- **Example:** Jacqueline earns \$14.15 an hour. She worked 30 hours this week. What are her gross earnings?
- **Solution:** $14.15 \times 30 = 424.50$
- **Answer:** Jacqueline's gross earnings for the week are \$424.50.

Learning Activity # 14 – Payroll slips

OALCF Competency Task Groups and Levels**B2.1 Write brief texts to convey simple ideas and factual information****C1.1 Compare costs and make simple calculations**

1. Find the gross earnings in each example below. You may use a calculator.

a) Hourly rate \$21.56. Hours worked 5.25. Answer _____

b) Hourly rate \$14.56. Hours worked 30.5. Answer _____

c) Hourly rate \$16.15. Hours worked 5. Answer _____

d) Hourly rate \$18.00. Hours worked 20. Answer _____

2. Find the gross earnings of each individual below. Remember to show all your work, and answer in full sentences. You may use a calculator.

a) Angela is cutting grass at a golf course. She earns \$15.15 an hour. Last week she worked a total of 23 hours. What are her gross earnings for that week?

b) John is being paid \$15.32 an hour as a grounds maintenance worker for the local parks department. He worked 32 hours one week and the following week he worked a total of 28 hours. What are his gross earnings for the two weeks?



**Landscape and Grounds Maintenance Worker
Curriculum
Unit 6: Safety at Work**

Unit 6: Safety at Work

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Unit 6: Safety at Work

OALCF Skill Competency Chart by Task

This OALCF Skill Competency Chart aligns each activity in the unit to the Ontario Adult Literacy Curriculum Framework. Each activity is listed and articulated by Task Group and skill level.

	Competency	Find and Use Information			Communicate Ideas and Information			Understand and Use Numbers				Use digital technology	Manage learning	Engage with others
	Task Group	Read continuous text	Interpret documents	Extract info from films etc.	Interact with others	Write continuous text	Complete & create documents	Manage money	Manage time	Use measures	Manage data			
Activity #	Task Group #	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D	E	F
1	Accident Reporting	1				1								
2	Electrical and Chemical Safety	2			2	1								
3	Injury and Illness	1			1	1								
4	Lifting	1			1									
5	Shovelling		2			1								
6	Pesticides					1								
7	WHMIS	2	2											
8	More on WHMIS	2	2											
9	Personal Protective Equipment					2								
10	Cold Environments					1								
11	Heat					3								
12	UV Exposure					2								
13	Natural Toxins	1				1						2		
14	Hantavirus					2								
15	Bites and Stings					1						2		
16	Operating Manuals	1				1								
17	Riding Lawn Mowers	1				1								
18	Power Mowers					1								
19	Power Equipment					1								

Safety at Work

Health and safety laws are meant to protect you. By law, your employer must provide you with a safe and healthy workplace. It is your supervisor's responsibility to make sure that you understand the safest way of doing your work.

Working safely is your responsibility. You **must** use personal protective equipment required by your employer, follow safety procedures and report any dangerous conditions you notice. If you think a task is too dangerous, you have the right to refuse to do that job until it can be done safely. You **must** report to your supervisor your intention to refuse dangerous work.



The following is a link to a short video about Health and Safety/WHMIS:
<https://www.youtube.com/watch?v=sO3I5bY330o>

Accident Reporting

Purpose: The purpose of accident investigation is to find the reasons for the accident and NOT to blame people for the accident. Accidents, as well as 'close calls', should be reported and investigated.

Investigation Team: The accident investigation team generally consists of:

- Manager/supervisor
- An expert (sometimes)
- Health and safety committee member



Roles and Responsibilities: You must report any occurrence of an accident or "close call" to your supervisor/boss immediately. Your supervisor/boss is responsible for conducting the accident investigation and notifying the health and safety committee.

The accident investigation report is generally submitted as a formal document which includes:

- Name and occupation of the employee
- Location and time of accident and injury
- Name(s) of witness(es)
- Description of the task, including the equipment and working conditions
- Description of what happened to cause the accident
- Name of the person(s) completing the report
- Recommendations for corrective action

Learning Activity # 1 – Accident Reporting

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

1. Circle the correct answer.

a) The health and safety laws are meant to protect the employer.

True

False

b) Working safely is your responsibility.

True

False

c) You don't have to wear personal protective equipment. It is your choice.

True

False

d) You have the right to refuse work if you think it is too dangerous.

True

False

e) The purpose of an accident investigation is to find out who is to blame.

True

False

f) You don't have to report "close calls" to your supervisor.

True

False

2. Place a check mark beside the information that is included in a formal accident report.

—What the employee was wearing

—Description of what happened to cause the accident

—Name(s) of witness(es)

—Recommendations for corrective action

—Location and time of accident and injury

—How long the employee has been employed

—Name and occupation of the employee

—Whether the employee has had other accidents in the past

—Description of what happened to cause the accident

—Description of the task, including the equipment and working conditions

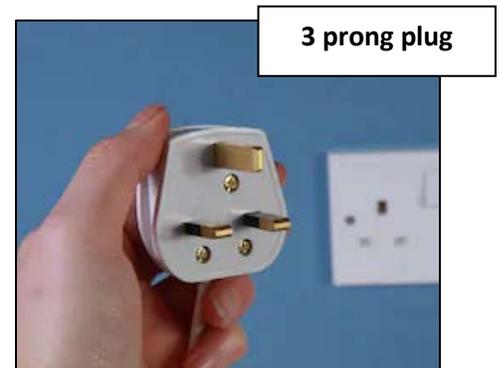
General Precautions

Basic Electrical Safety

- **Inspect** tools, power cords, and electrical fittings for damage before each use. Report any damage to your supervisor/boss so the item can be repaired or replaced.
- **Do not wear** gloves, loose clothing or jewellery while using rotating power tools.

Tools

- **Switch off** tools before connecting them to a power supply.
- **Disconnect** power supply before making adjustments.
- **Ensure** tools are properly grounded or double-insulated. The grounded tool must have an approved 3-wire cord with a 3-prong plug. This plug should be plugged into a properly grounded 3-prong outlet.
- **Unplug** electrical tools after you turn them off.
- **Do not use** electrical tools in wet conditions or damp locations, unless the tool is connected to a “ground fault circuit interrupter” (GFCI).
- **Do not clean** tools with flammable or toxic solvents.
- **Do not operate** tools in an area containing explosive vapours or gasses.



Power Cords

- **Keep** power cords clear of tools during use.
- **Do not carry** electrical tools by the power cord.
- **Do not tie** power cords in knots. Knots can cause short circuits and shocks. Loop the cords or use a twist lock plug.
- **Do not disconnect** a power cord by pulling or jerking it from the outlet. This will cause wear and may cause a shock.
- **Keep** power cords away from heat, water and oil. These can damage the insulation and cause a shock.
- **Do not allow** vehicles to pass over unprotected power cords. Cords should be put in **conduits** or protected by planks alongside them.

Electric Power Lines

Two major sources of electrical injuries and fatalities are:

- Running into power poles and electrical equipment with machinery
- Coming in contact with buried cables while trenching and digging fence post holes.

Chemical Safety

The following are general guidelines for the safe use of chemicals:

- All chemicals should be handled by trained employees only.
- Read the label for hazard information.
- Check the MSDS (Material Safety Data Sheets) for information on toxicity and methods of safe use.
- Use the required personal protective clothing and equipment.
- Do not smoke, eat or drink while using chemicals.
- Report all accidents and spills to your supervisor.
- Wash contaminated clothing separately from other laundry.

Fire Safety

Some common starters of fire are sparks, friction, open flames, smoking and spilled fuels. In the case of fire, you must follow the fire safety procedures established by your employer.

Refuelling Equipment

- **Do not smoke** or have an open flame while refuelling. Gas fumes are heavier than air and will drift downward from the container. The vapour, not the liquid, burns.
- **Do not spill** any fuel on equipment. If you do, wipe it up and allow any residue to dry before starting the engine.
- **Do not run** if your clothing catches fire. **Stop, drop and roll**. Quickly remove the burning clothes, or drop to the ground and roll slowly, or wrap yourself in a blanket.



Noise

Noise is too loud when:

- You have difficulty talking to someone
- You feel a ringing sound in your ears after a long exposure
- Your hearing is numbed at the end of the work shift and comes back the next morning

The loudness of noise is expressed in decibels = dB(A) levels.

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The loudness of noise is expressed in decibels = dB(A) levels.

Wood Chipper	100-110 dB(A)
Lawn mower	95-110
Power mower, snowmobile	95-105
Chain saw	95-105
Sidewalk snowplough	90-100
Salt and sand truck	90-100
EXPOSURE LIMITS	85-90
Vacuum cleaner	80-85
Normal conversation	60-65
Whisper	30-40

Waste Management

- **Do not burn** green vegetation.
- **Do not burn** plastics, rubber, tires or any other materials known to produce toxic fumes.
- **Do not add** any more materials that burn slowly if a fire produces dark smoke.
- **Do not throw** away excess chemicals which could contaminate streams, irrigation or drinking water.

Infectious Waste

Infectious wastes include human waste, animal waste and objects and materials contaminated with blood and body fluids. Occasionally, you may encounter discarded hypodermic needles, syringes, condoms, and other objects/materials contaminated with blood or body fluids. You must be very careful in handling such materials. Often these biological wastes are contaminated with germs which can make you ill. Major concerns are the spread of hepatitis B and AIDS.

Do not reach into any waste container or receptacle which may contain infectious waste.

Learning Activity # 2 – Electrical and Chemical Safety

OALCF Competency Task Groups and Levels**A1.2 Read texts to locate and connect ideas and information****B1.2 Indicate and maintain interactions with one or more persons to discuss, explain or exchange information and opinions****B2.1 Write brief texts to convey simple ideas and factual information**

1. Complete the following sentences about electrical safety. Write your answers in the space provided.

- a) _____ tools before connecting them to a power supply.
- b) _____ tools, power cords, and electrical fittings for damage before each use.
- c) _____ electrical tools after you turn them off.
- d) _____ power supply before making adjustments.
- e) _____ gloves, loose clothing or jewellery while using rotating power tools.

2. At the end of his shift, Sahid was asked to bring the electric saw he had been using back to the shop. Sahid pulled on the cord to disconnect the plug from the socket. He then tied the cord with a twist lock plug and carried the saw to the truck by holding the cord. What did Sahid do wrong?

3. Two major sources of electrical injuries and fatalities are:

4. List the chemical guidelines for the safe use of chemicals.

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____
- f) _____
- g) _____

5. What are the three precautions you should take when refuelling equipment?

- a) _____
- b) _____
- c) _____

6. Which of the following statements are true?

- a) A power mower is as loud as a snowmobile. _____
- b) You should always burn green vegetation. _____
- c) You can add slow-burning materials to a fire that is already producing black smoke.

- d) Human waste, animal waste, and objects and materials contaminated with blood or body fluids are known as infectious waste. _____
- e) Discarded hypodermic needles and syringes are potentially very dangerous to your health.

Safety Tips

Landscaping and grounds maintenance involve a wide range of tasks. Many of these tasks can cause bodily injuries or illnesses. You can prevent such injuries and illnesses by following safe work practices and by using proper protective equipment.

Examples of some injuries and illnesses are:

- Cuts or amputations (limb loss) from the use of chain saws, tillers and gardening tools.
- Bruises and abrasions from plants and trees.
- Burns from hot engines or motors of powered equipment and vehicles.
- Electric shock or electrocution from contact with live electrical parts or electric power lines.
- Slips and falls from working in wet and/or cluttered areas.
- Soreness and pain in hands, wrists, shoulders or back as a result of doing repetitive work; applying too much force over and over again; operating vibrating equipment or lifting heavy loads the wrong way.
- Itching, swelling or redness of the skin as a result of exposure to very hot or very cold weather; contact with chemicals such as cleaning solutions, fertilizers or pesticides; or contact with plants and animals.
- Illness as a result of prolonged exposure to chemicals and pesticides; or contact with objects contaminated with infectious materials such as needles and biological waste, dead animals and animal droppings.
- Allergies as a result of inhalation of dust, contact with plants and animals, insect bites or stings.



Be Aware

- **The right way is the safe way** of doing your job. Follow instructions. If you don't know or don't understand something, ask.
- **Know potential hazards** in your work, and ways of working safely to prevent such hazards.
- **Use personal protective equipment** as required by your employer. Such equipment includes, but is not limited to, safety glasses, hearing protection, respirators, safety boots, hard hats, gloves and face shields.
- **Wear proper clothing.** Do not wear loose sleeves, cuffs, rings, bracelets, or anything else that may get caught in moving machinery and cause injury.
- **Know emergency equipment** and understand how to use emergency equipment such as fire extinguishers, eyewash and safety showers.
- **Follow emergency procedures** in case of fires, medical emergencies and if a rescue squad is needed.
- **Report all injuries,** including minor scratches, cuts, burns, slips and falls. Your employer needs this information to take timely, corrective action to prevent future injuries. Follow your company's procedures of reporting injuries.
- **Follow electrical safety** rules when using electrical equipment, grounding portable electrical tools and working near overhead *and/or underground* power lines.
- **No horseplay.** Horseplay is dangerous and prohibited. Off-the-job safety is equally important. Safety does not **stop** when you leave your workplace.



Learning Activity # 3 – Injury and Illness

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B1.2 Indicate and maintain interactions with one or more persons to discuss, explain or exchange information and opinions

B2.1 Write brief texts to convey simple ideas and factual information

1. Give four examples of injuries that can occur while working as a landscape labourer.

- a) _____
- b) _____
- c) _____
- d) _____

2. Give four examples of illnesses that you may develop working as a landscape labourer.

- a) _____
- b) _____
- c) _____
- d) _____

Manual Materials Handling

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Manual Materials Handling

Guidelines for Lifting

Store bags at waist height.

Do not bend over and try to lift the bag all at once.



To Lift from the Ground

1. Raise bag upright.
2. Put one knee against bag.
3. Pull bag up the leg.
4. Rest bag on edge of knee of the other leg.
5. Stand upright.
6. Carry the load with your back in upright position.



Guidelines for Transferring Weight

REDUCE the load on your back by transferring weight.

- Shift body weight from one leg to the other.
- Avoid twisting your back.

To Move Materials

Use the following order of motions for moving heavy or bulky materials such as patio stones, sidewalk slabs, cement blocks, balled trees, rolled sod, etc.

1. Pull material towards you.
2. Transfer your weight to the lift side.
3. Lift only to level needed.
4. Shift weight to your other leg.
5. Push material into position.

Transferring Weight



Learning Activity # 4 – Lifting

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

1. Put the following steps in order. Write your answer in the space provided. Use complete sentences.

Push material into position.

Lift only to level needed.

Pull material towards you.

Transfer your weight to the lift side.

Shift weight to your other leg.

a) _____

b) _____

c) _____

d) _____

e) _____

2. Which of the following do the above directions describe? Circle your answer.

Transferring weight

Lifting

The Macarena

Shovelling and Digging

The Right Tool

A **shovel** is used for shovelling. A **spade** is used for digging.

- A garden shovel should be between elbow and chest height.
- A snow shovel handle should come up to chest height.
- A light shovel (about 1.5 kg or 3 lbs) is good for shovelling snow.
- A heavier shovel (about 3 kg or 6.5 lbs) is good for shovelling soil.

How to Shovel

- Keep feet wide apart. Place front foot close to shovel.
- Put weight on front foot. Use leg to push shovel.
- Shift weight to rear foot. Keep load close to body.
- Turn feet in direction of throw.

How to Dig

- Push spade down using leg muscles.
- Slide load close to body.
- Make sure load is loose from ground before lifting.

Total weight (shovel and load) should be

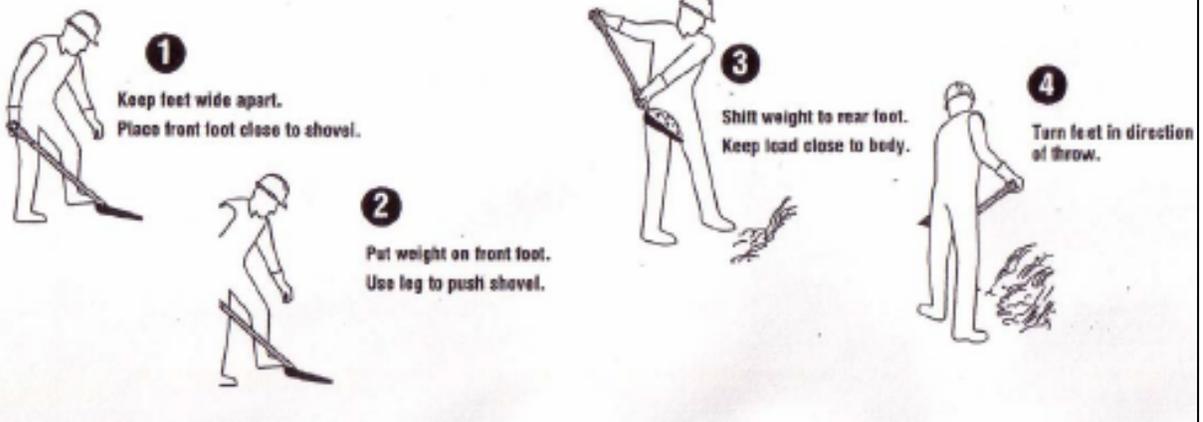
5-7 kg (11-15 lbs).

The best shovelling rate is 15-20 scoops per minute.

This rate should not last longer than 15 minutes.

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Shovelling



Digging



Learning Activity # 5 - Shovelling

OALCF Competency Task Groups and Levels

A2.2 Interpret simple documents to locate and connect information

B2.1 Write brief texts to convey simple ideas and factual information

1. Which would you use, a spade or a shovel, to perform the following tasks? Write your answer on the line:
 - Shovel soil _____
 - Move mulch _____
 - Dig up a plant _____
 - Shovel snow _____

2. Fill in the blanks
 - a) A garden shovel should be between _____ and _____ height.
 - b) A snow shovel handle should come up to _____ height.
 - c) A _____ is good for digging.
 - d) The total weight (shovel and load) should be _____.
 - e) The best shovelling rate is _____ per minute.

3. Which of the following directions is correct? Circle the correct answers.
 - a) **Shovelling:** Keep feet close together. Place front foot close to shovel. Put weight on front foot. Use arms to push shovel. Shift weight to rear foot. Keep load away from your body. Turn feet in direction of throw.

 - b) **Digging:** Push spade down using leg muscles. Slide load close to body. Make sure load is loose from ground before lifting.

Pesticides

Pesticides are chemicals that are used to kill weeds and insects that are harmful to plants. There are two kinds of pesticides: insecticides and herbicides. Insecticides are used to kill insects. Herbicides are used to kill plant diseases like fungus and moulds. They are also used to kill weeds. All chemical pesticides are hazardous substances.

In a commercial workplace environment, only licensed workers are legally allowed to handle them. Workers must complete a training course and apply for a provincial license before they can work with pesticides. Courses are available throughout Canada. Check out the Pest Management Regulatory Agency's website to find out more about training and licensing:

www.hc-sc.gc.ca/pmra-arla/english/edutran/edutran-e.html

Working near Pesticides

You may not be applying pesticides, but you will be working in areas where pesticides are being used or have been applied. Be careful when you are working in areas that have been recently sprayed with pesticides. Wash your hands well before eating, drinking, smoking or using the toilet. Never touch pesticides with your bare hands. If you feel sick, tell your supervisor right away. Pesticide poisoning must be treated immediately.

When pesticides are being mixed and/or applied, keep a safe distance and stay upwind of any spray.



Learning Activity # 6 – Pesticides

OALCF Competency Task Groups and Levels

B2.1 Write brief texts to convey simple ideas and factual information

1. True or False. Circle your answer.

a) Pesticides are chemicals used to kill plant diseases.

True

False

b) Herbicides are used to kill moulds and fungus that can grow on plants.

True

False

c) All chemical pesticides are hazardous substances.

True

False

d) On site, anyone can mix and apply pesticides.

True

False

e) In a work environment, you need a provincial license to work with pesticides.

True

False

f) Always stay upwind of any pesticide spraying.

True

False

g) If you feel sick, it is best to leave the spray area for a few minutes.

True

False

WHMIS

Introduction

WHMIS (pronounced whim-iss) stands for the **Workplace Hazardous Material Information System**.

WHMIS is a Canada-wide system designed to protect the health and safety of working Canadians by providing information about hazardous materials on the job. WHMIS addresses the worker's "right to know" certain information about potential dangers.

There are three main areas to WHMIS:

- Labels
- Material Safety Data Sheets (MSDSs)
- Worker education and training

WHMIS deals with the preservation of life and health against hazardous substances encountered at work. The industry, labour, and government representatives who worked together to create WHMIS were working to protect Canadians from injury or illness on the job.

WHMIS is the Law!

In 1988, people from the federal (Canada), provincial (Ontario, British Columbia, Newfoundland, etc.), and territorial (Yukon, etc.) governments, as well as representatives from organized labour, got together and created WHMIS. The WHMIS regulations are laws in every province and territory in Canada. Federal and provincial legislation make WHMIS a Canada-wide program.



Hazardous Material

The Hazardous Products Act says that any product, material, or substance which falls into any of the six hazard classes described below is a **controlled product**.

CLASS	SYMBOL	EXAMPLE
CLASS A: Compressed Gas A substance that at room temperature (20°C) is in a gaseous state and kept under pressure.		oxygen
CLASS B: Flammable and Combustible Material A solid, liquid, or gas that will ignite and continue to burn if exposed to a flame.		acetone
Class C: Oxidizing Material A substance that will cause another substance to burn.		chromic acid
CLASS D: Poisonous and Infectious Material 1) Materials causing immediate and serious toxic effects 2) Materials causing other toxic effects (Cancer-causing materials are included here.) 3) Biohazardous Infectious Material		ammonia
		asbestos
		contaminated blood products
Class E: Corrosive Material A substance that will erode steel or aluminum, or destroy animal tissue.		hydrochloric acid sodium hydroxide
Class F: Dangerously Reactive Material A material which will react with water to produce a poisonous gas or which will undergo a reaction if the container is heated, pressurized, or agitated.		acetylene

KNOW THESE SYMBOLS ... THEY COULD SAVE YOUR LIFE!

You can find hazardous substances in the workplace in the following forms:

SOLID	LIQUID	GAS
<ul style="list-style-type: none"> dusts fumes smoke 	<ul style="list-style-type: none"> mists vapours 	gasses

SOLID: Dusts, fumes, smoke

Dusts are made by grinding, crushing, or handling. Fine particles of dust can remain suspended in the air. **Fumes** are formed when a volatized solid, such as metal, condenses in cool air. This occurs in welding operations. **Smoke** is formed when a material containing carbon is burned.



LIQUID: Mists, vapours

Mists are suspended liquid droplets that are formed when gasses move into a liquid state, or when a liquid is broken by splashing or foaming. Examples: paint mist from spraying. **Vapours** are gaseous forms of substances which are normally a solid or liquid. You may find vapours in cleaning agents and paint thinners.

GAS

Gasses are substances that do not exist as a solid or liquid at room temperature and pressure. Gasses tend to spread out and occupy the entire space you are in. Examples: carbon monoxide, methane, and oxygen.



All of these different forms of substances can contaminate the workplace air.

Chemicals can enter your body through:

- **Your lungs** if you breathe fumes, mist, or dust
- **Your skin** if liquid or dust touches, spills or splashes on you
- **Your mouth** if you eat after handling chemicals or if you accidentally swallow chemicals
- **Your eyes** if chemicals splash on you or are in the air

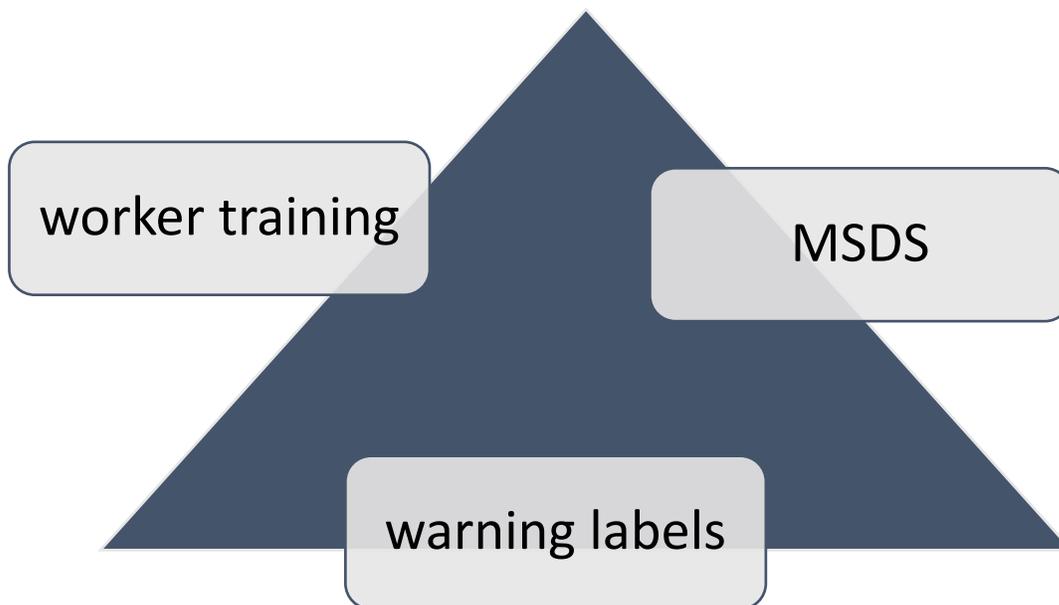
Getting Information Out

All workers have a right to know about hazardous materials in their workplace. WHMIS gives people the means to find out that information. It does this through a three-pronged approach:

1. **Warning labels** on containers of hazardous materials
2. **Material Safety Data Sheets** (MSDSs) providing further, detailed information
3. **Worker training** on how to use the information contained on the labels and MSDSs

All three of these requirements are of equal importance for the success of WHMIS!

Labelling containers and providing Material Safety Data Sheets would accomplish little if workers were not trained about the significance of the information contained on the labels and data sheets. Similarly, training would be of little use if containers and MSDSs were not available to provide detailed information about the products.



Labels

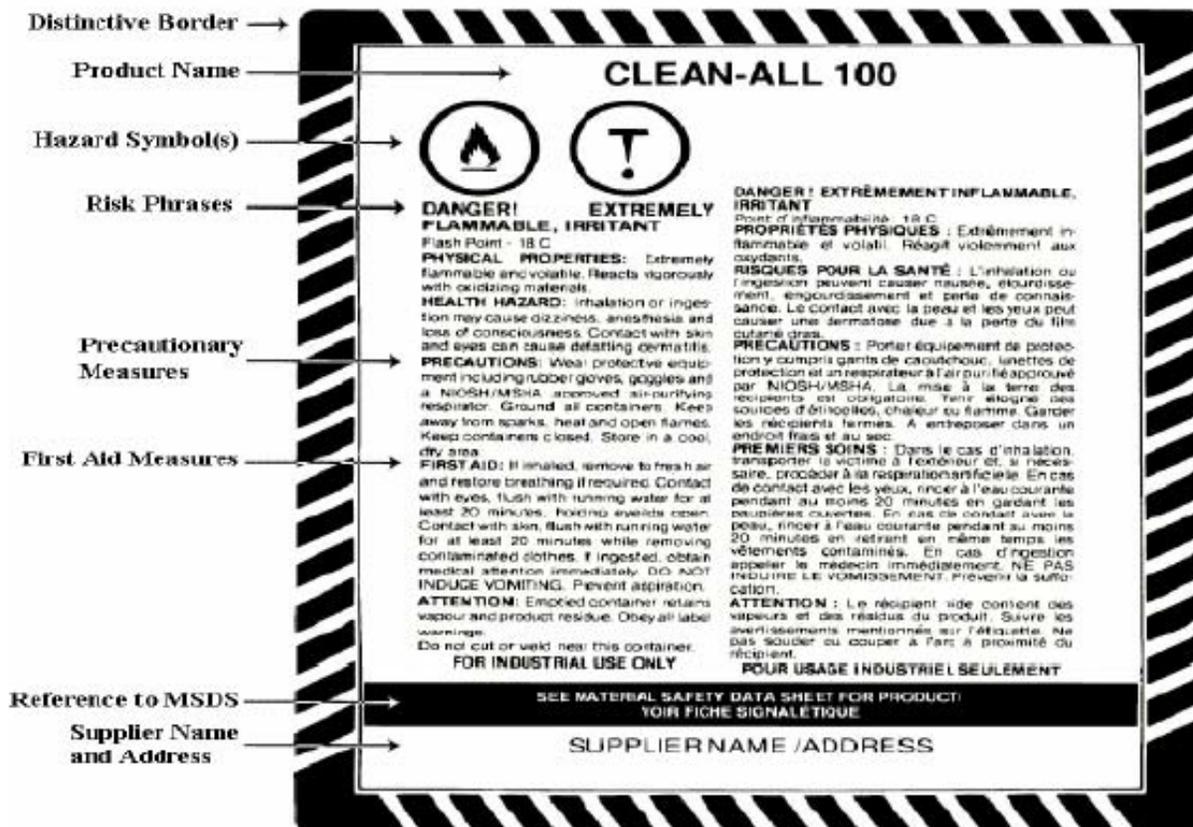
The label is the first and most basic form of WHMIS hazard warning to employers and workers. It is easily recognized, appears on the container of a controlled product, and provides basic information about the risks associated with the use of the material inside the container.

WHMIS requires two kinds of labels: supplier and workplace labels.

Supplier Labels

Suppliers are importers, manufacturers, or sellers of hazardous materials destined for use in Canadian workplaces. Below is an example of a supplier label.

Note: Information must be in French and English



Workplace Labels



Workplace Identifiers

This is a substitute for the workplace label. It is used when a workplace label might not be practical. Look at the picture below. The two identifiers (tags) are used because there really is nowhere to put the labels. In this case, it makes more sense to use tags. That way there is no confusion as to which label goes with which pipe.





Labelling of Chemicals

If chemicals are placed in another container, this new container must have a label on it. All containers must have labels. If two or more chemicals are mixed together, it could cause a serious reaction.

Material Safety Data Sheets (MSDSs)

The MSDS is the second level of the WHMIS information-delivery system. While the label provides vital warning information to users on the spot, the MSDSs contain additional details that are important for handling emergencies or clean-ups. Much of the information provided on the MSDS is of a technical nature. It is addressed primarily to engineers, occupational hygienists, firefighters, emergency coordinators, and other professionals. Nevertheless, it is useful for everyone in the workplace to understand **how** the information on the MSDS can be used to protect health and safety. For each controlled product likely to be encountered on the job, Ontario employers must have an MSDS available at their site for workers.

Information Required on a Material Safety Data Sheet

- **Product Identification and Use:** Identification of the product by generic name, trade name, brand name, common name, chemical name, code name, or code number. There should also be a description of the product use.
- **Hazardous Ingredients:** Names, concentrations, and other details of known hazardous ingredients, and of other ingredients which the employer or supplier suspects may be hazardous or whose dangers to the body are unknown.

- **Physical Data:** Physical properties of the material, such as physical state (gas, solid or liquid), odour and appearance.
- **Fire or Explosion Hazard:** Information such as flashpoint of the material, and upper and lower flammable limits.
- **Reactivity Data:** Details of stability/reaction to conditions such as light, heat, moisture and vibration.
- **Toxicological Properties:** Adverse health effects from exposure.
- **Preventive Measures:** Instructions for safe use, handling and storage.
- **First Aid Measures:** Instructions for initial treatment of anyone who has been improperly exposed to the material.
- **Preparation Information:** Name, address, and telephone number of the person, group or department which prepared the MSDS and the date of preparation.

Worker Training and Education

The third part of the WHMIS information delivery system is the worker education program. Its purpose is to teach workers how to use the information on labels and MSDSs so that they can protect themselves. In fact, increasing workers' knowledge of the hazards of the materials they work with is the main aim of WHMIS.

A worker who works with a "controlled product" is any person who stores, handles, uses or disposes of a controlled product, or a person who supervises another worker performing these activities.

Workers need to:

- Have access to hazard information
- Be able to understand it
- Follow required procedures and precautions
- Not be shy when it comes to asking a question or pointing something out

The employer has the general duty under the *Occupational Health & Safety Act* to provide workers with the information, instruction, and supervision necessary to protect their health and safety.

Worker Responsibilities Regarding Training

The worker:

- Must take and learn the information on controlled products, which the employer must give you;
- Must tell the employer when information about a controlled product is not good enough to keep the workers healthy and safe;
- Should work with the employer through the health and safety representatives to make the training program as good as possible;
- Should understand something completely and, if not, should ask for it to be explained until it is understood.

Learning Activity # 7 – WHMIS**OALCF Competency Task Groups and Levels****A1.2 Read texts to locate and connect ideas and information****A2.2 Interpret simple documents to locate and connect information**

Read the given Ontario **WHMIS Information Bulletin**. Answer the following questions.

1. What does WHMIS stand for?

2. In what year did WHMIS legislation come into effect? _____

3. WHMIS is designed to

4. What are MSDSs?

Workplace Safety Labels and Material Safety Data Sheets

Skilled Trades Helpers and Labourers Curriculum

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INFORMATION BULLETIN



CONSTRUCTION SAFETY ASSOCIATION OF ONTARIO

IB010

Page 1 of 2

Workplace Hazardous Materials Information System

In 1988, WHMIS (Workplace Hazardous Materials Information System) legislation came into effect across Canada. It is designed to protect the health and safety of workers through the provision of information about hazardous materials on the job.

Right to Know

WHMIS gives everyone the right to know about the hazards of materials they work with and provides the means to find out that information. It does this through labels, material safety data sheets (MSDSs), and worker training and education.

Hazardous Materials

Materials covered under WHMIS include six classes. Each class has its own symbol, which must appear on the supplier label so that the hazard is easily identified.

Class A Compressed gas (e.g., acetylene, nitrogen, oxygen).

Class B Flammable and combustible material (e.g., solvents).

Class C Oxidizing material (e.g., epoxy hardeners).

Class D Poisonous and infectious material.

Division 1: Immediate and serious toxic effects (e.g., ammonia, carbon monoxide gas, carbon tetrachloride, some pesticides).

Division 2: Other toxic effects (e.g., asbestos, silica).

Division 3: Biohazardous infectious material (not normally encountered in construction).

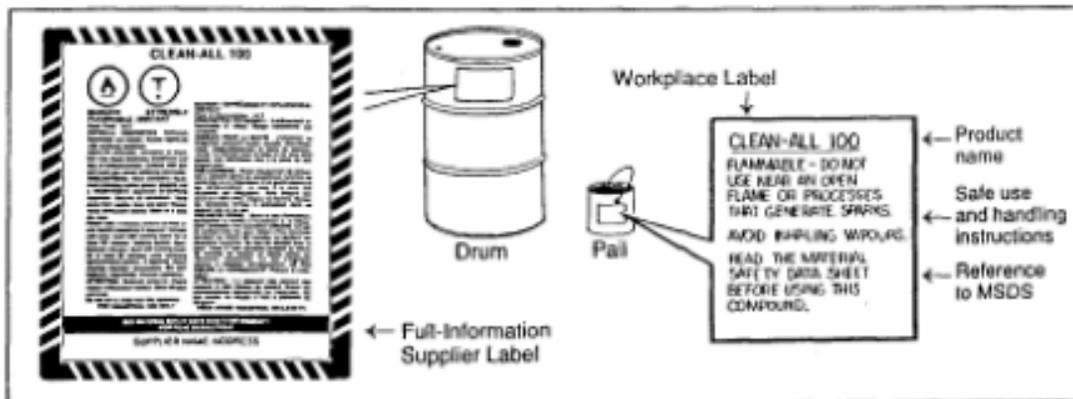
Class E Corrosive material (e.g., acids and alkalis).

Class F Dangerously reactive material (e.g., acetylene).



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Labels

WHMIS labels help workers recognize that a product may be hazardous to their health. Hazardous products used in the workplace should have WHMIS supplier labels. These are readily identified by their cross-hatched border and must contain information on health hazards and safe handling, as well as other data. If material is transferred from the original container to another container, workplace labels must generally be used. These contain only three pertinent pieces of information, as shown above.

Material Safety Data Sheets (MSDSs)

MSDSs provide detailed information about the product, including the following.

- **Product Information**
- **Hazardous Ingredients**
- **Physical Data**
- **Fire and Explosion Data**
- **Reactivity Data**
- **Toxicological Properties**
- **Preventive Measures**
- **First Aid Measures**
- **Preparation Information:** name and phone number of party preparing the MSDS and date of preparation.

Worker Training and Education

WHMIS education should equip all workers to recognize hazardous products and use proper controls. Only then can everyone work safely with, or near, hazardous materials in the workplace.

To fulfill this requirement, the employer must

- develop and provide a program of worker instruction
- develop the program with the health and safety representative or committee
- ensure that the program educates workers to apply the information
- provide all hazardous information received from supplier and other sources
- review the program at least annually.

Instruction must include

- information on content, purpose, and significance of labels and MSDSs
- procedures for safe storage, handling, use, and disposal of controlled products
- procedures to follow in emergencies.

What You Should Do

- Demand MSDSs for all controlled products purchased.
- Ensure that controlled products have WHMIS labels and accompanying MSDSs.
- Make yourself and those reporting to you familiar with the hazards and recommended procedures for working with any hazardous materials that are used.
- Develop a worker training and education program as outlined above.

For more information, including the data sheet **WHMIS in Construction (DS028)** and WHMIS posters, contact CSAO.

Learning Activity # 8 – More on WHMIS

OALCF Competency Task Groups and Levels

A1.2 Read texts to locate and connect ideas and information

A2.2 Interpret simple documents to locate and connect information

1. WHMIS believes that workers have a _____ !
2. What are the three main areas of WHMIS?
 - a) _____
 - b) _____
 - c) _____
3. What is a controlled product? Circle your answer.
 - An item you can't have
 - A product, material, or substance that falls into one of the six hazard classes
 - A product that is safe for anyone to handle, regardless of training
4. Why is it important to know these symbols?

5. The skull and crossbones symbol tells me that the material is poisonous or infectious, and causes immediate and serious effects.
 - a) The letter R symbol tells me that the material

 - b) The flame symbol tells me that the material

c) The flame and circle symbol tells me that the material

d) The symbol that looks like a cross between a T and an exclamation mark (!) tells me that the material

e) The symbol that has a bottle or container on it tells me that the material

6. When you use spray paint, you are creating _____

7. You may find vapours in _____

8. Three examples of gasses are:

a) _____

b) _____

c) _____

9. What are four ways that chemicals can enter your body?

a) _____

b) _____

c) _____

d) _____

10. What should you do if you come across a chemical that is not labelled?

11. What three things is a worker responsible for in regard to training?

- a) _____
- b) _____
- c) _____

12. Draw a line from the hazard to its definition.

highly toxic	similar to highly toxic, but takes longer exposure
target organ effects	damages a specific organ
carcinogen	can kill you quickly
toxic	may cause cancer
irritant	causes an allergic reaction
corrosive	harms your skin
sensitizer	destroys or changes your tissues

Personal Protective Equipment

Safety Glasses

Safety glasses are stronger than regular glasses. They are made to protect your eyes from “flying” debris.

Use eye protection when power tilling, breaking up rocks or concrete, using strong cleaning agents, spraying or dusting. Wear proper sunglasses when in direct sunlight for long periods of time.

Correct Fit of Safety Glasses

- **Make sure** your safety glasses fit properly. Eye size, bridge size and temple length all vary, so safety glasses need to be individually assigned and fitted.
- **Wear** safety glasses so that the temples fit comfortably over the ears. The frame should be as close to the face as possible and correctly supported by the bridge of the nose.

Proper Care of Safety Glasses

- **Clean** your safety glasses daily. Follow the manufacturer’s instructions. Avoid rough handling which can scratch the lenses. Scratches impair vision and can weaken glass lenses.
- **Store** your safety glasses in a clean, dry place where they cannot fall or be stepped on. Keep them in a case when they are not being worn.
- **Replace** scratched, pitted, broken, bent or ill-fitting glasses. Damaged glasses interfere with vision and do not provide adequate protection.

Gloves

- Use vibration-absorbing gloves while operating vibrating equipment. Wear rubber or plastic gloves when handling fertilizers and pesticides.

Safety equipment needs regular maintenance.



Safety Footwear

Safety footwear is designed to protect feet against a wide variety of injuries. Impact, compression and puncture are the most common types of foot injury.

<ul style="list-style-type: none"> • Select CSA certified footwear. For landscaping, high-cut safety footwear with toe caps and reinforced soles are recommended. • Walk in new footwear to make sure it is comfortable. • Lace up boots fully. High cut boots provide support against ankle injury. 	<ul style="list-style-type: none"> • Lace up boots fully. High cut boots provide support against ankle injury. • Apply a protective coating to make footwear water resistant. • Inspect footwear regularly for damage. • Repair or replace worn or damaged footwear.
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Hard Hats

Headwear consists of a shell and suspension. These work together as a system and both need regular inspection and maintenance.

The shell is hard and light, and is shaped to deflect falling objects.

- **Replace** headwear when hairline cracks start to appear. These cracks will spread and widen.
- **Replace** headwear that has been struck, even if no damage is visible.
- **Do not drill** holes into the shell, or alter or modify the shell. Alterations may reduce the protection provided by the headwear.
- **Adjust** headband size so that headwear will stay on when wearer is bending over, but not so tight that it leaves a mark on the forehead.

Hearing Protection

Hearing protectors reduce the amount of sound reaching the ears. Improper fit and irregular use greatly reduce the effectiveness of hearing protection.

- **Earplugs** are inserted to block the ear canal. They may be preformed or mouldable, such as foam plastic or waxed cotton. Always throw away single use earplugs after use.
- **Canal caps** are made of two earplugs held over the ends of the ear canal by a stiff headband.
- **Earmuffs** have soft ear cushions which fit around the ear and have hard outer cups. They are held together by a headband.

Learning Activity # 9 – Personal Protective Equipment

OALCF Competency Task Groups and Levels

B2.2 Write texts to explain and describe information and ideas

1. In which of the following job tasks would you wear safety glasses?

- a) Breaking up rocks or concrete
- b) Laying sod
- c) Unloading bags of gravel
- d) Power tilling
- e) Tree planting
- f) Moving pesticide containers
- g) Using strong cleaners
- h) Raking leaves

2. Write a short paragraph about the proper care of safety glasses.

3. Fill in the blanks.

For landscaping, _____ safety footwear with _____ and reinforced soles are recommended.

4. Which of the following statements are true? Circle your answer.

- a) Replace headwear when hairline cracks start to appear.
- b) Only replace hard hats if there is visible damage.
- c) You can alter the shell of a hard hat, as long as you don't drill any holes in it.
- d) If your hard hat falls off when you bend over, you must re-adjust the headband.
- e) Radio headsets protect your hearing when you are working in loud environments.
- f) Never touch pesticides unless you're wearing gloves.

Working in Cold Environments

Working in cold weather can be dangerous to the unprepared and to people without adequate protective clothing. Two types of cold hazards are common: hypothermia and frostbite.

Hypothermia can be fatal. It results from the cooling of the deep inner body or core to a temperature below 34.5°C (94.1°F) due to long exposure to cold. Persons exhausted during physical work are more prone to hypothermia. The victim can become weak and confused and make little or no effort to keep warm. The victim should be immediately warmed. The victim should be wrapped in a blanket and moved to a warm room. Body heat (from cuddling) is the most effective way to warm a hypothermia victim. In bad cases of hypothermia, immediate medical care is necessary.

Frostbite is freezing of the body tissues as a result of very cold temperatures or contact with very cold metallic objects like a car or a fence. When performing work at temperatures below the freezing point, metal handles and bars should be covered by thermal insulating material. Workers should be able to operate machines without removing their mittens.

At any temperature, it usually feels colder when it is windy. The combined effect of cold and wind speed is called the **equivalent chill temperature (ECT)**. Skin should not be exposed for long when ECT is -32°C (-25°F) or lower.

Protective Clothing

Multiple layers of lightweight loose-fitting clothing provide better protection against the cold than a single thick layer of clothing.

Clothing should be kept clean. Dirt destroys its insulating ability. Clothing must be dry. For work in wet conditions, the outer layer of clothing should be waterproof. Gloves should be used in mild to moderate cold weather. For work below -17°C, mittens should be used. Felt-lined, rubber-bottomed, leather-topped boots with removable felt insoles are best suited for heavy work in cold weather. Almost 50 percent of body heat is lost through the head when the rest of the body is covered. A wool-knit cap or a liner under a hard hat reduces excessive heat loss.

Consumption of alcohol does not increase tolerance to cold. Instead, it increases the risk of hypothermia.

Learning Activity # 10 – Cold Environments

OALCF Competency Task Groups and Levels

B2.1 Write brief texts to convey simple ideas and factual information

1. What are the two types of cold hazards?

a) _____

b) _____

2. In your own words, what is hypothermia?

3. Which of the following is **not** a symptom of hypothermia?

a) Weakness

b) confusion

c) excessive sweating

4. What is equivalent chill temperature?

5. True or False. Circle your answer.

- | | | |
|--|------|-------|
| a) In cold weather, workers should always remove their gloves when operating machines. | True | False |
| b) Skin should not be exposed for long when ECT is -32°C . | True | False |
| c) A hard hat protects your body against hypothermia. | True | False |
| d) Multiple layers of clothing provide good cold weather protection. | True | False |
| e) Fifty percent of body heat is lost through the head. | True | False |
| f) Gloves should be used below 4°C for light work. | True | False |
| g) Mittens should be used for work below 17°C . | True | False |

Working in Hot Environments

On a hot summer day, working outdoors can be uncomfortable and may also cause adverse health effects. How hot we feel depends on the temperature, humidity (how much water is in the air), wind speed and type of work.

Humidex

In the weather forecast, the degree of environmental heat is often given in terms of the humidex. This is determined by taking into account the temperature (in degrees Celsius) and the humidity in the air.



Heat Exposure Limits

Heat Exposure Limit is given in units of WBGT (Wet Bulb Globe Temperature), a scale which takes into account the effect of temperature, humidity and air movement.

Potential Health Problems

The most serious heat illness is heat stroke, caused by prolonged work in an extremely hot environment. Signs of heat stroke include dry, hot skin due to failure of sweating, and complete or partial loss of consciousness. Heat stroke can be fatal and requires fast first aid and medical attention. People are generally unable to notice their own heat stress symptoms. Their survival depends on their co-workers' ability to recognize symptoms and seek medical help.

Less Severe Health Problems

Other symptoms of heat illness can be:

- **Heat edema** – swelling of the ankles
- **Heat rashes** – tiny red spots on the skin that cause a prickling sensation during heat exposure
- **Heat cramps** – sharp muscle pains resulting from the failure to replace salt lost with sweat
- **Heat exhaustion** – weakness, dizziness, visual disturbances, intense thirst, nausea, headache, vomiting, diarrhea, muscle cramps, breathlessness, palpitations, and tingling and numbness of the hands and feet
- **Heat syncope** – fainting caused by the loss of body fluids through sweating, and by lowered blood pressure due to pooling of blood in the legs while working in a standing position

If you notice that a co-worker has any of these symptoms, take them to a cool place.

Preventing Heat-Related Illness

The following practices help prevent heat-related illness:

- **Acclimatization** – People who work regularly in hot environments develop a certain degree of tolerance (acclimatization) for heat. Most of the acclimatization occurs in the first three or four days. Complete acclimatization may require a week or more.
- **Clothing** – Loose cotton clothing provides protection in hot and humid environments.
- **Work/rest schedule** – A schedule of work/rest periods is generally recommended for working in hot conditions. Ask your supervisor about your company’s policy about this.
- **Drinking water** – Drink lots of cool (10-15°C) water or fruit drink every 15 to 20 minutes even though you may not feel thirsty. Thirst is an inadequate indicator of the body’s need for water.

Learning Activity # 11 – Heat**OALCF Competency Task Groups and Levels****B2.3 Write longer texts to present information, ideas and opinions**

1. Answer the following questions using complete sentences.

a) What causes heat stroke?

b) What are the signs of heat stroke?

c) When working in hot weather, why is it important to watch out for your coworkers?

Ultraviolet Radiation

Ultraviolet (UV) exposure may cause damage to the skin and eyes. UV rays are an invisible part of sunlight. UV exposure is of concern mainly in the summer months; however, in winter harmful effects may occur as a result of direct exposure to sunlight and reflections from snow, sand and concrete.

Effects on the Skin

UV rays cause darkening of the skin, sunburns and erythema (reddening of the skin). Prolonged exposure increases the risk of skin cancer. Some prescription drugs can increase the risk of UV damage to the skin. Ask your doctor about any potential problems.

Effects on the Eyes

The eyes are particularly sensitive to UV rays. A short exposure can result in temporary conditions such as watering, blurred vision and pain. The onset of these conditions may be noticed following a delay after exposure. Prolonged exposure increases the risk of cataracts.

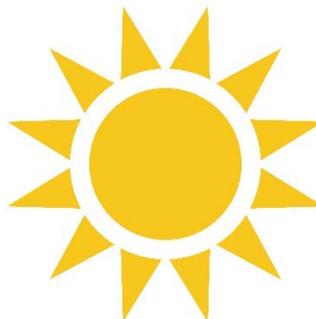
Protect Yourself

The following practices are recommended to minimize UV exposure during outdoor work:

- Avoid midday sun (11 a.m. to 4 p.m. in summer months).
- Wear clothing that is tightly woven to block sunlight.
- Wear a broad-brimmed hat that will shade your face, neck and ears.
- Apply to exposed skin a waterproof sunscreen with a sun protection factor (SPF) of 15 or higher, and with both UVA and UVB protection.
- Wear UV-filtering sunglasses. Plastic safety glasses and plastic sunglasses are good UV filters.
- Avoid unnecessary exposure. Seek shade when you don't have to be in the sun.

Sun Protection Factor (SPF)

The SPF measures the ability of sunscreen to protect the skin from UV rays in the sunlight. The greater the SPF number, the greater the protection that is provided; i.e., SPF30 gives more protection than SPF15.



Learning Activity # 12 – UV Exposure

OALCF Competency Task Groups and Levels
B2.2 Write texts to explain and describe information and ideas

1. List some of the harmful effects of UV rays on the skin.

- a) _____
- b) _____
- c) _____
- d) _____

2. List some of the effects of UV rays on the eyes.

- a) _____
- b) _____
- c) _____
- d) _____

3. List six ways you can minimize your exposure during outdoor work.

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____
- f) _____

4. What does SPF mean? _____

Natural Toxins

Substances from Trees and Plants

Skin contact with certain weeds and plants may cause irritation and skin problems. Make sure you know what kind of plants you are working with and which plants you are allergic to.

Prevention

- Barrier creams **do not** provide protection from contact with poisonous plants.
- **Use** gloves and proper clothing to prevent contact.
- **Destroy** poisonous plants when you notice them.
- **Wash** and **scrub** any area of the body that comes in contact with the poisonous plant.
- **Wash** clothes thoroughly after contact with a poisonous plant.
- **Do not inhale** the smoke if you burn poisonous plants.



Types of Poisonous Plants

Poison ivy is a term that generally refers to three types of plants:

- Poison oak
- Poison sumac
- Poison ivy



Recognizing poison ivy is the best way to avoid contact. The oil in the plants causes an extremely itchy rash which is followed by bumps and blisters. The rash can last up to a month. The oil is easily transferred from the plant by touch. The oil can remain active for up to a year. Clothing and shoes can also transfer the oil. You may infect others in your family if you do not take the proper precautions.

Like many plants, poison ivy can look different at different times of the year. In the summer, when the plant is in full bloom, its leaves are green and shiny. In the fall, the leaves turn into autumn colours: red, yellow, orange, and brown. In the winter, the plant loses its leaves. In the spring, its leaves are shiny and red.

Learning Activity # 13 – Natural Toxins

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

D2 Perform well-defined, multi-step, digital tasks

1. Go online and do a search for poison ivy. Print off three pictures of poison ivy: one for the spring, one for the summer and one for the fall. Next, print off three pictures of poison oak: one for the spring, one for the summer and one for the fall.

2. List some of the recommended treatments for poison ivy. Go online or use reference books at the library to complete your answer.

- _____
- _____
- _____
- _____
- _____

Hantavirus

Hantavirus infection is caused by a virus that is found in some rodents, especially deer mice in Canada and the United States. Examples of rodent locations are rubbish piles, wood piles, garbage, weeds and long grass, as well as infrequently used equipment and storage sheds. People can get the disease when they breathe the virus that is found in the urine, saliva, or droppings of infected rodents.

The disease caused by hantavirus infection is commonly known as hantavirus pulmonary syndrome (HPS). Early symptoms of the disease are flu-like (fever, chills and muscle aches). The disease worsens rapidly and can be fatal.



Prevention

- **Clean up** infected area in a way that minimizes production of airborne dust.
- **Use** personal protective equipment such as rubber gloves, rubber boots and a respiratory protection with high-efficiency particulate air (HEPA) filter.
- **Dispose** of used gloves and other equipment in the same way as you dispose of infectious waste.
- **Soak** dead mice, nests, and droppings thoroughly with diluted household bleach (1-part bleach in 10 parts water) before clean-up.
- **Scoop up** the material instead of vacuuming or sweeping.
- **Dispose of** contaminated material in sealed plastic bags.
- **Wash** hands thoroughly with soap and water after removing gloves.
- **Cover** broken skin that may be exposed to rodent contamination.

Learning Activity # 14 – Hantavirus

OALCF Competency Task Groups and Levels
B2.2 Write texts to explain and describe information and ideas

1. What causes hantavirus?

2. In which of the following on-site locations are you likely to find rodents? Circle your answer(s).

- a) Infrequently used storage sheds
- b) Long grass
- c) Planting beds
- d) Wood piles
- e) Garbage areas
- f) Sod piles
- g) Rubbish piles

3. List the steps you can take in order to prevent hantavirus infection.

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____
- f) _____
- g) _____
- h) _____

Bites and Stings

In most situations, biting and stinging insects are just a nuisance. In extreme circumstances, however, they can cause serious health problems.

Biting Insects

Mosquitos and black flies are the most common biting insects in Canada, but the list also includes deer flies, horse flies, stable flies and many others. Insects bite people to suck blood for food. In the process, they usually inject small amounts of chemicals that can cause irritation and allergic reactions. The type of insect and the time when it appears varies from place to place.

Ticks

Ticks transmit disease to people by bites. People who are in contact with nature are likely to come in contact with ticks. A tick bite isn't always felt. It is generally noticed by the presence of a tick on the skin. To remove a tick, never crush it. Make sure to remove the tick's head from your skin. If the tick is not completely removed, it feeds on blood for days and can cause a disease known as tick paralysis.

To reduce exposure to biting insects:

- Know what kind of biting insects to expect in a region before starting work.
- Use insect repellent.
- Wear appropriate protective clothing.

Stinging Insects

Stinging insects, such as bees and wasps, are equipped with stingers which inject small amounts of venom or poison that cause pain, irritation and, in rare cases, severe allergic reactions.

To reduce exposure to stinging insects:

- Know what kind of stinging insects to expect in a region before starting to work there.
- Look out for the nests of stinging insects and avoid disturbing them.
- If a bees' nest or wasps' nest must be removed from a work area, always check with a qualified pest removal expert.
- Carry a bee sting kit.



Learning Activity # 15 – Bites and Stings

OALCF Competency Task Groups and Levels

B2.1 Write brief texts to convey simple ideas and factual information

D2 Perform well-defined, multi-step, digital tasks

1. What are some ways you can protect yourself from bites and stings when you are working?

2. Go online to answer the following questions. Do a search of bees or wasps. What do their nests look like and where do they usually build their nests?

3. True or False. Circle your answer.

a) Ticks can transmit dangerous diseases.

True

False

b) You can feel a tick bite.

True

False

c) You can see a tick on your skin.

True

False

d) To remove a tick, crush it and brush it off your skin.

True

False

e) Make sure to remove the tick's head from your skin.

True

False

Operating Manuals

What is an operating manual?

One of the Essential Skills used by a landscape labourer is Document Use. An operating manual is a document/book that contains information on a specific mechanical product. A product can be anything from a DVD player to a space shuttle. A manual tells us how to install, operate and maintain the product.

The way the information is organized is called the **format**. The format of a manual helps a reader find the needed information fast.

Format

Most manuals have the following parts:

- Contents
- Graphics
- Headings
- Instructions
- Safety information
- Lists
- Tables

The contents page is found at the beginning of a manual. This page lists the items and the page numbers. The contents page helps you quickly find the section of the manual you need. Look at the example below.

Sample Table of Contents for an Operating Manual

Scan down the contents list to find the section and page number that you need. Use this example to answer the questions in Learning **Activity # 16 – Operating Manuals**.

Contents

Safety.....	3
Controls and features.....	8
Operations	10
Maintenance schedule	14
Service adjustments	19
Troubleshooting	22
Service parts	25
Accessories	27
Specifications	28
Dealers	29

Learning Activity # 16 – Operating Manuals

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

1. In the example on the previous page, in what section would you find information about:

- a) What to do if the engine won't start _____
- b) When to change the oil _____
- c) Replacing a broken part _____
- d) Operating in wet conditions _____
- e) What attachments come with the machine _____

2. Write a list of any manuals you have used in the past.

3. What format features have helped you find information in the manuals in the past? Look back at the format section to answer this question.

Common Formatting Features for Operating Manuals

Instructions

Instructions are often written in numbered steps. See the example below.

Stopping the engine

1. Stop unit.
2. Disengage PTO.
3. Set throttle lever to “slow”.
4. Turn ignition to “off” position and remove key.
5. Set parking brake.

Tips for Reading Manuals

- First check that you have the right manual. Model codes are often very similar.
- Look through the manual first to get a feel for the way it is laid out.
- You don't need to read every word to find the information. Use the contents page, headings, graphics and layout to help you.
- A parts list is a list of codes.
- Safety information may be indicated with symbols and written in **bold text**.
- Checks and fault finding information is often shown in tables.
- **Bold text** and CAPITAL LETTERS are used in section headings.



Lawn Mowers

Riding Lawn Mowers

Start-Up

- **Read** and follow the manufacturer's operating manual.
- **Inspect** the mower before starting it. Make sure the blade is sharp and secure.
- **Keep** safety devices in place.
- **Maintain** mower and attachments in good operating condition.
- **Clear** the work area of debris that might be thrown by the blades.
- **Set** the mower at the highest cutting point when operating on rough ground.
- **Disengage** all attachment clutches and shift mower into neutral before attempting to start the engine.
- **Look** behind the mower when backing up. Back up only minimal distances.
- **Watch** for rocks, holes and other hazards.
- **Mow** only in daylight.

Mowing on slopes

- **Mow** up and down slopes rather than sideways for greater stability, unless mower is counter balanced.
- **Reduce** speed on slopes and when making sharp turns to prevent tipping or loss of control.
- **Do not stop** or start suddenly when going uphill or downhill.
- **Do not leave** mower on slope.

Pulling Loads

PULL loads as follows:

- Use approved hitch points.
- Limit load weight and size.
- Do not turn sharply.
- Use counterweights as recommended by manufacturer.



Maintenance

- **Disengage** power to attachments and stop the motor before leaving operator's position or making any repairs or adjustments by:
 - *setting the brakes*
 - *putting the transmission in park, if possible*
 - *removing the ignition key*
- **Check** the blade mounting bolts frequently for tightness.
- **Check** grass catcher bags for wear. Replace worn bags.
- **Stop** and inspect the blades and shaft if the mower runs into a rock or stump. Damaged blades can cause vibration. Vibration can loosen the blades.
- **Do not remove** grass catcher or unclog chute with motor running.
- **Do not touch** hot motor parts.
- **Do not run** motor indoors.
- **Do not leave** vehicle unattended.
- **Do not carry** passengers.
- **Do not mount** or dismount while the mower is running. There is sufficient space for your toes to pass under the mower housing and be struck by the blade.
- **Keep** children away from lawn mowers. Children are attracted to the mowing activity.

TURN OFF the power if children enter the mowing area.

Learning Activity # 17 – Riding Lawn Mowers

OALCF Competency Task Groups and Levels

A1.1 Read brief texts to locate specific details

B2.1 Write brief texts to convey simple ideas and factual information

1. Fill in the blanks.

_____ the mower before starting it. Keep _____ devices in place.

Maintain mower and attachments in good _____ condition. Clear the

work area of debris that might be _____ by the blades. Set mower at

the _____ cutting point when operating on _____ ground.

Disengage all attachment clutches and shift mower into _____

before attempting to start the engine. Look _____ mower when

_____ up. Back up only _____ distances. Watch for _____,

_____ and other hazards. Mow only in _____.

2. Your supervisor has asked you to explain how to mow on slopes to a new employee. What would you say?

3. List four things you should do when pulling loads.

a) _____

b) _____

c) _____

d) _____

4. Before leaving the operator’s position or making any repairs or adjustments to a riding lawn mower, you should _____ power to attachments and _____ the motor by completing the following three steps.

- a) _____
- b) _____
- c) _____

5. What should you do if your machine hits something hard like a rock?

6. Why is vibration a problem?

7. Circle the best answer.

a) When operating a riding lawn mower, you shouldn’t...

- i. Touch hot motor parts
- ii. Run motor indoors
- iii. Carry passengers
- iv. All of the above

b) When operating a riding lawn mower, it is okay to...

- i. Leave the vehicle unattended
- ii. Dismount while the mower is running
- iii. Replace worn bags while the motor is on
- iv. None of the above
- v. All of the above

Power Lawn Mowers

Start-Up

- **Read** and follow manufacturer's operating manual.
- **Inspect** the mower before starting. Make certain that the blade is sharp and secure.
- **Ensure** that shields and other guards, such as rear drag shield and discharge deflector, are in place and working properly.
- **Know** the controls and how to stop the machine quickly.
- **Ensure** blade stopping controls are effective. Adjust as necessary.
- **Keep** hands away from the blades.
- **Wear** non-slip footwear with safety toe, and hearing protection.

Maintenance

- **Do not reach** under the machine. Disconnect the spark plug wire before sharpening, replacing and cleaning.
- **Expose** the underside of a mower for maintenance, after shutting it off, by tipping it by the handle.
- **Do not touch** hot motor parts.
- **Replace** thin or worn blades.
- **Do not spray** cold water on a hot engine.

*DO NOT REFUEL the
mower while the
engine is running.*

When The Motor Is Running...

- **Do not leave** a running mower unattended.
- **Do not make** wheel height adjustments while the motor is running.
- **Do not remove** grass catcher or unclog chute with motor running.

On Site

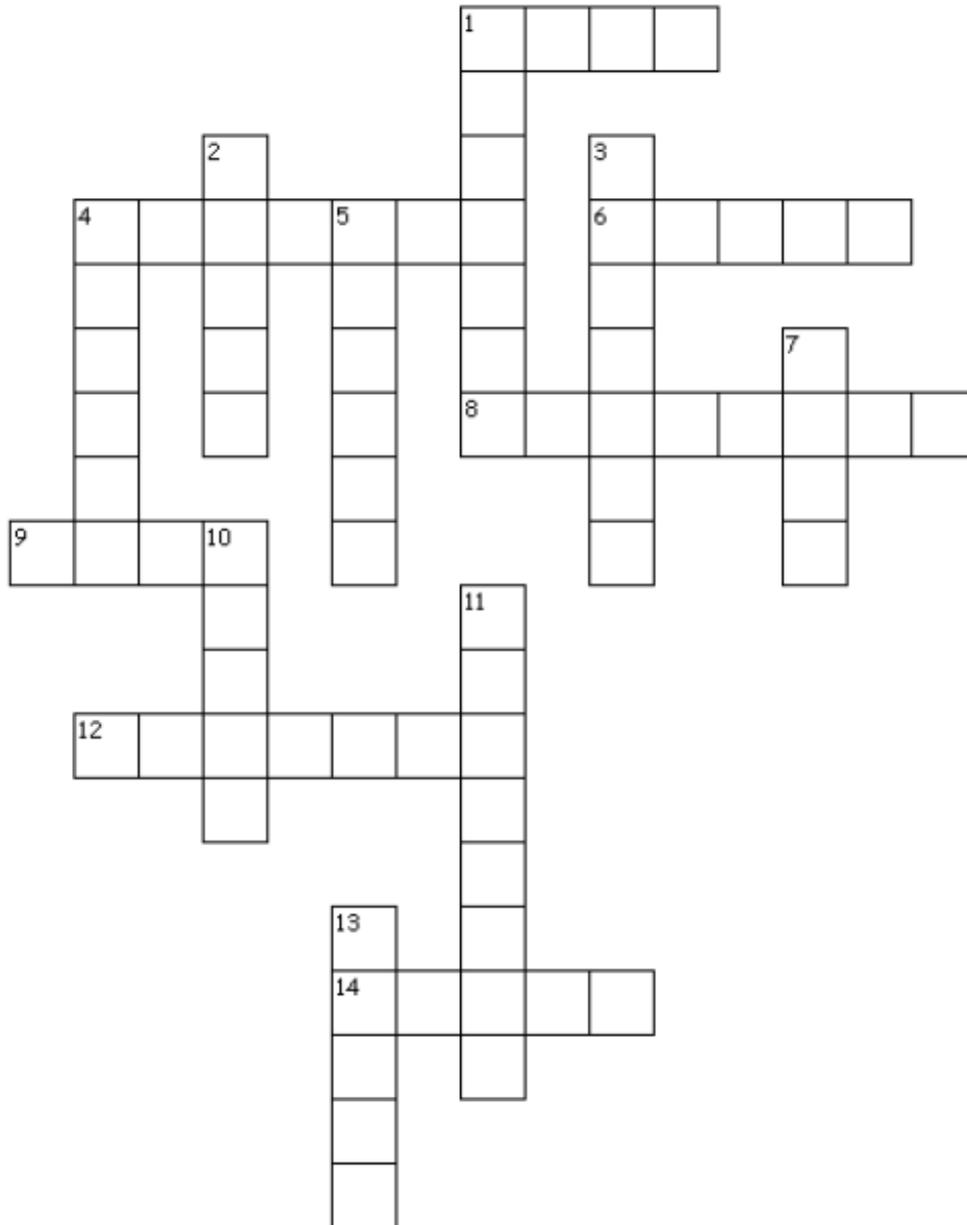
- **Clear** the work area of rocks, bottles and debris that might be thrown by the blades.
- **Keep** people away from the work area. The mower can throw objects in any direction.
- **Operate** mower standing up, not bent over.
- **Proceed** slowly into tall, heavy grass to avoid choking the mower or stalling the motor.
- **Watch** for hidden hazards such as holes, roots, drainpipes and insect nests.
- **Use** caution around low-hanging branches and shrubs.
- **Do not leave** blades rotating when crossing gravelled areas
- **Do not mow** when surfaces are too slippery for you or the mower.
- **Mow** across slopes. Your feet are less likely to slide under the mower. Also, the mower cannot roll back.

Learning Activity # 18 – Power Mowers

OALCF Competency Task Groups and Levels

B2.1 Write brief texts to convey simple ideas and factual information

Complete the questions on the next page. Refer to the reading to find the answers. Transfer your answers to the crossword grid below.



Across

1. Know how to _____ the machine quickly.
4. _____ thin or worn blades.
6. Do not reach _____ the machine.
8. Do not mow on _____ surfaces.
9. Disconnect the spark _____ before working on the machine.
12. _____ the mower prior to starting.
14. Keep _____ away from the blades.

Down

1. Ensure that _____ and other guards are in place and working properly.
2. Do not _____ cold water on a hot engine.
3. Do not leave a _____ mower unattended.
4. Do not _____ the mower while the engine is running.
5. Mow _____ slopes.
7. Operate mower standing up, not _____ over.
10. Proceed slowly into tall, heavy _____ to avoid choking or stalling the mower's engine.
11. Do not leave blades _____ when crossing gravelled areas.
13. Do not make _____ height adjustments while the motor is running.

Other Power Equipment

Garden Tractors

Start-Up

Garden tractors have features and operating practices, such as hydraulics and power take-off (PTO), similar to full-size tractors.

- **Read** and follow manufacturer's operating manual.
- **Check** oil and fuel levels before starting.
- **Ensure** that shields and other safety devices are in place and working properly.
- **Wear** close-fitting clothing, sturdy non-slip footwear and head protection.

During Use

- **Use caution** when working in the vicinity of schools or parks where children may be at play.
- **Do not ride** on the tractor hood or draw bar. Allow only one person on tractor.
- **Do not drive** with the PTO running, if it is not being used.
- **Drive** tractor up and down slopes rather than sideways for greater stability.
- **Let** the engine idle a few minutes before shutting down.
- **Do not leave** a tractor unattended, unless the power is off and the ignition key is removed.
- **Do not park** tractors where they can endanger the public.

Maintenance

- **Turn off** the machine and disconnect the spark plug wire before adjusting the machine.
- **Replace** or tighten all loose or broken parts. Keep the tractor in good working condition.
- **Have** a qualified mechanic regularly service the tractor.

Front-End Loaders

- **Operate** controls from the driver's seat, not standing beside the tractor.
- **Lower** the bucket when not using the loader.
- **Travel** with bucket low to ground.
- **Mark** out turning areas when loading vehicles.
- **Back** slowly down slopes. Look out for holes or obstructions which may cause a roll-over or loss of control.
- **Do not overload.** You can lose stability and steering control.
- **Do not use** the loader as a lift for people or as a fence post puller.

Rotary Tillers

Do not allow anyone to be in front of or to the side of the rotary tiller while it is operating.

- **Turn off** power to the tiller and shut off the motor before trying to clear any obstruction.
- **Keep** safety shields in place.
- **Check** the area for objects such as wires, cables and solid materials near ground level. They can quickly entangle rotating tines and cause a lot of damage.
- **Do not operate** close to ditches, fences or patios. The tines can catch and throw particles, or throw operator off balance.
- **Operate** tiller at a moderate speed so that you can stop quickly.
- **Lower** the blade when the machine is parked.

Grass Trimmers and Brush Cutters

Make sure you are trained in the proper use of this equipment. Rotating cutting tools can throw objects or cut the operator. READ and follow the manufacturer's operating manual.

To operate this equipment be to sure to wear:

- Sturdy and snug-fitting overalls, jeans or long pants
- Heavy-duty, non-slip gloves
- Safety boots with non-slip soles
- Safety goggles, or face screen and safety glasses
- Hearing protection (muffs or plugs)



Basic instructions for use:

- **Select** equipment with anti-vibration components.
- **Inspect** the trimmer before each use for damaged parts and fuel leaks.
- **Ensure** that the cutter is tight.
- **Replace** bent, warped, damaged or dull cutter.
- **Check** that the throttle springs back to idle position.
- **Keep** people away from starting and operating areas.
- **Check** the area for stones, glass, metal and debris.
- **Start** the unit on firm ground or other solid surfaces in an open area.
- **Maintain** good balance and secure footing when operating.
- **Secure** the cutter to prevent fuel spillage and damage during transport.
- **Keep** the cutter tool covered with the carrying guard when not in use.
- **Stop** the engine before putting the cutter down.
- **Use** the unit at ground level only.
- **Shut off** the engine before cleaning out a clogged or stuck cutter.
- **Make sure** the muffler is in good condition. In dry weather, use a firesafe muffler.
- **Do not leave** a running tool unattended.
- **Do not use** rigid blades in stony areas.
- **Do not overreach.** Keep proper footing and balance at all times.

Learning Activity # 19 – Power Equipment

OALCF Competency Task Groups and Levels

B2.1 Write brief texts to convey simple ideas and factual information

1. What does PTO stand for? _____

2. True or False

- | | | |
|---|------|-------|
| a) Allow only two people on the tractor at any given time. | True | False |
| b) You can leave a tractor unattended if the ignition key is removed. | True | False |
| c) Do not park tractors where they can endanger the public. | True | False |
| d) Always drive with the PTO running. | True | False |
| e) Drive the tractor up and down slopes. | True | False |
| f) Let the engine idle a few minutes before shutting down. | True | False |
| g) Replace or tighten all loose or broken parts. | True | False |
| h) You can service the tractor yourself, every couple of months. | True | False |

3. Fill in the blanks in this activity about front-end loaders.

Operate controls from the driver's _____, not standing beside the tractor.
_____ the bucket when not using the loader. Travel with the bucket
low to the _____. Mark out _____ areas when loading
vehicles. Back slowly down _____. Look out for holes or obstructions
which may cause a _____ or loss of control. Do not
_____. You can lose stability and steering control. Do not use the
loader as a _____ for people or as a fence _____ puller.

4. What safety instructions would you give a new person on your job site about using rotary tillers?

5. When operating grass trimmers and brush cutters, you should wear which of the following Personal Protective Clothing? Circle your answer(s).

- Hearing protection
- Safety goggles
- Loose-fitting clothing
- Safety boots with non-slip soles
- Light gloves

6. A cutter is a great tool to use. Identify whether the following statements are true or false. Circle your answer.

- | | | |
|---|------|-------|
| a) Shut off the engine after cleaning out a clogged or stuck cutter. | True | False |
| b) Check the area for stones, glass, metal and debris. | True | False |
| c) To prevent fuel spillage during transport, it is best to empty the unit. | True | False |
| d) Use the unit at ground level only. | True | False |
| e) Keep people away from operating areas. | True | False |
| f) Cover the cutter tool with the carrying guard when the unit is not in use. | True | False |
| g) Maintain good balance and secure footing when operating. | True | False |
| h) Use a fire-safe muffler in dry weather. | True | False |
| i) Stop the engine before putting the cutter down. | True | False |

7. What are five things you should **not** do when working with rotating cutting tools?

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____





**Landscape and Grounds Maintenance Worker
Curriculum
Practitioner Answer Key**

Practitioner Answer Key

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Unit 1: Introduction to Landscaping and Grounds Maintenance

Activity #1 – Definitions

1. Answers will vary. Definition should include the following words: outside, works, plants, spreads, digs, moves, trims, helps, hands, installs.
2. Answers will vary. Definition should include the following words: outside, hands, builds, patios, helps, works, decks.
3. Answers will vary. Definition should include the following words: cares for, hands, repairs, outside, sweeps, trims, worker.
4. Answers will vary but might include:
 - a. Digging
 - b. Raking
 - c. Levelling
 - d. Measuring
 - e. Cutting
 - f. Hauling, moving spreading materials
 - g. Tools use and maintenance
 - h. Site clean up
5. Private landscaping companies, government institutions, educational facilities, private institutions, public works departments, golf courses, cemeteries, self employment.
6. Answers will vary.
7. Answers will vary.

Activity #2 – NOC Codes

1. Answers will vary but may include:
 - a. Read handwritten notes from supervisor, coworkers
 - b. Read emails from clients
 - c. Read instruction manuals

2. Answers will vary but may include:
 - a. Talk to clients
 - b. Speak with supplier to order
 - c. Ask questions of supervisor

3. Answers will vary.

Activity #3 – Venn Diagram

1. Answers will vary.
2. Answers will vary

Activity #4 – Goal Setting

1. Answers will vary.
2. Answers will vary.
3. Answers will vary.
4. Answers will vary.
5. Answers will vary.

Activity #5 – Soft Skills

1. Answers will vary.
2. Answers will vary.
3. It sends the message that you are not punctual, don't care about the job, don't take the job seriously, etc.
4. Answers will vary.
5. Answers will vary.

Activity #6 – Speaking Well

1. Member of the public.
2. Co-worker
3. Manager
4. Team leader
5. Trainee

Activity #7 – Role Play

- Answers will vary.

Activity #8 – Answering Questions

The following answers are not acceptable:

- *What do you want*
- *Meh, I don't know*
- *Do ya know where to go*

Activity #9 – Communication Skills

1. Most / least / most / listen / 16
2. Answers will vary.
3. Answers will vary.

Activity #10 – Work versus Life

1. Answers will vary.

Activity #11 – Listen Up

1. Five things that can make listening difficult, will vary but might include:
 - People talking
 - Machinery
 - Traffic noise
 - Being hungry
 - Being sick
 - Too much information
 - Being tired
2. They maintain eye contact, nod, or say “yes”.
3. Paraphrasing is mirroring the information back to the speaker to confirm your understanding.
4. Answers will vary but could include that people may not ask questions because they don't want to look bad.
5. Answers will vary.

Activity #12 – Paraphrasing

- Answers will vary.

Activity #13 – Time Log

- Answers will vary.

Unit 2: Working with Plants

Activity #1 – Bubble Diagram

- Bubble Diagrams will vary but each shape must be clearly labeled.

Activity #2 – Planting Plan Q&A

1. East
2. Northwest of the gate
3. Northeast of the gate
4. West
5. East side
6. Center of the garden
7. West side
8. North of plot 5

Activity #3 – Plan Directions

1. North
2. South
3. East
4. West

Activity #4 – Point X and Y

1. A. Plot 5
B. Plot 3
2. Fountain
3. A. Plot 1
B. Plot 3
4. Perennials

Activity #5 – Giving Directions

1. Answers will vary.
2. Answers will vary.

Activity #6 – Zone Map

1. Answers will vary.
2.
 - a) Average winter snowfall for St. John's is 57.2 centimeters.
 - b) Average winter snowfall for Whitehorse is 21.82 centimetres.
 - c) Average summer temperature for Edmonton is 16.5 degrees Celsius.
 - d) Average summer temperature for Iqaluit is 6.0 degrees Celsius.
 - e) Average monthly rainfall for Victoria is 70.1 millimeters.
 - f) Average monthly rainfall for Regina is 25.35 millimeters.

Activity #7 – True / False

1. False
2. True
3. False
4. False

Activity #8 – Fun Weather Facts

1. Winnipeg
2. St. John's
3. Medicine Hat
4. Answer should include: Sunniest city in Canada, windy, flat.
5. Answers will vary

Activity #9 – Fill in the Blanks

1. A plant hardiness **zone** is a planting area located within a region. Plants that share **similar** growing requirements live in similar zones. A plant's survival rate is often connected to the type of **weather** a zone experience. Hardiness is a term that is used to describe how well a plant can tolerate the **cold**. Most plants can grow within a wide **range** of temperatures within their zones. However, you cannot grow a plant in a cold region if it is a plant that needs a warm **temperature** range. Plants are divided into three groups based on how much heat and light they need to survive. Shade plants need to be shaded while partial sun plants need some shade and some **sun**. Rainfall is another factor that affects a plant's **survival**. Plants that don't need a lot of rain are called drought **resistant**. These plants can live in drier soils. Soils in **different** zones have different levels of acids. Other factors that are **important** when determining where to place a plant in a landscape are wind **speed** and snowfall. A plant will only **survive** in a zone that matches its growing **conditions**.
2. Circled responses should include: Continuous learning, Document use, Reading, Writing.
3. Working with Others and Manage Learning.

Activity #10 – Plants

1. Plant hardiness is a term that is used to describe how well a plant can tolerate the cold.
2. Rainfall, snowfall, wind speed, soil type, temperature and sunshine.
3. PH balance is important because if there is not enough acid in the soil the plant will die.
4. Drought resistant means plants that don't need a lot of rain.

Activity #11 – My Zone

1. Answers will vary.
2. Answers will vary.

Activity #12 – Seed Packets

1. All of the ones on the seed packets.
2. No.
3. No
4. None of the plants can grow in zone 1.

Activity #13 – What Can Grow?

1. No
2. All
3. No
4. All
5. No
6. Micro-climate is an area within a zone that has conditions that may be different from the larger zone.

Activity #14 – Plant Names

1. Answers will vary.
2. Answers will vary.

Activity #15 – Latin Name Game

Online learning activity.

Activity #16 – Resemblance

1. Fragrant
2. Compact
3. California
4. Mountain
5. Elephant
6. Big
7. Grand
8. Aquatic

Activity #17 – Scary Names

1. Hermodactylus
Muscaria
Ferraria
Calachortus

2. hispanica
grandiflora
beatricis
lavandulacea
3. Purple Heart' and 'Trumpet Serenade'

Activity #18 – Type of Plants

1. Answers will vary.
2. Answers will vary.
3. Answers will vary.

Activity #19 – Learning Styles Scenario

- Answers will vary.

Activity #20 – Lists of Belonging

<u>1.</u>	<u>2.</u>	<u>3.</u>
1. carrot	1. rose	1. blue
2. pea	2. Tulip	2. map
3. turnip	3. daffodil	3. brown
4. apple	4. lily	4. grey
5. broccoli	5. carnation	5. red
6. asparagus	6. soil	6. silver
7. cauliflower	7. daisy	7. Yellow
<u>4.</u>	<u>5.</u>	<u>6.</u>
1. Emily	1. August	1. snowy
2. Anne	2. May	2. sunny
3. Joyce	3. Summer	3. rainy
4. Mark	4. June	4. grass
5. Susan	5. September	5. windy
6. Sally	6. April	6. hot
7. Cindi	7. March	7. Cool

<u>7.</u>	<u>8.</u>	<u>9.</u>
1. pencil	1. pear	1. Ford
2. staple	2. two	2. road
3. marker	3. peach	3. Toyota
4. pen	4. plum	4. Chrysler
5. crayon	5. pineapple	5. Saturn
6. chalk	6. orange	6. Honda
7. pencil crayon	7. melon	7. Hyundai

Activity #21 – Word Associations

- Answers will vary.

Activity #22 – Plant Match

1. A
2. F
3. G
4. B
5. E
6. C
7. D

Activity #23 – Silly Names

- Answers will vary.

Activity #24 – Memory Tricks

- Answers will vary.

Unit 3: Planting

Activity #1 – Plants Basics

1. Plant Part Functions

a) Roots

Answer should include:

- Soak up water, oxygen and nutrients from soil
- Help anchor the plant
- Help keep soil in place

b) Leaves

Answer should include:

- Absorb light and convert this energy into food

c) Stems

Answer should include:

- Transport food and water through the plant
- Support the plant
- Help the plant reach the sun

d) Seeds, Fruits and Flowers

Answer should include:

- Produce new plants

2. Types of Root Systems

- a) Taproot b) Fibrous

3. Two Types of Stems

- a) Woody b) Herbaceous

4. Fill in the Blanks

- Biennials
- a number
- annuals
- growing season

5. Answers will vary depending on dictionary used.

Activity #2 - Crossword

- **Across:** 3. herbaceous 8. annuals 9. seed
- **Down:** 1. perennials 2. woody 4. biennials 5. stem 6. fibrous 7. taproot

Activity #3 – A to Z

1. Answers will vary.
2. Answers will vary.

Activity #4 – Soil

1. Answers will vary.
2. Answers will vary.
3. Answers will vary.
4. Answers will vary.
5. Organic D
Sandy soil B
Nutrient A
Drainage G
Loam C
Minerals E
Clay I
Humus H
Texture F

Activity #5 – Fertilizer

1. Sample B has the most potassium.
2. Sample C has the least nitrogen.
3. Sample A has the most phosphorus.
4. The letter K means Potassium.
5. The letter N means Nitrogen.
6. The letter P means Phosphorus.

Activity #6 – Sample Label #1

1. Yes, it has peat.
2. Yes.
3. Yes.
4. After each watering after 4 weeks.

Activity #7 – Dictionary Work

1. Answers will vary based on dictionary used.
2. Answers will vary based on dictionary used.
3. Answers will vary based on dictionary used.
4. Answers will vary based on dictionary used.

Activity #8 – Sample Label #2

- | | |
|--------------------------|--------------------------------------|
| 1. | 2. |
| a) Storage | a) Yes |
| b) When and where to use | b) Extra iron for acid-loving plants |
| c) How to use | c) No |
| d) Ericaceous Plant Food | d) No |

Activity #9 – Planting Material

1. What is mulch?

Answer should include:

- Loose material that is spread on top of soil
- Protects the soil from being washed or blown away
- Helps the soil retain heat and moisture
- Made of rough organic materials, such as: bark, grass clippings, wood chips

2. Why is landscape fabric used?

Answer should include:

- Prevents weeds from growing
- Allows water and air to permeate

Activity #10 – Listening Script

Script for Practitioner to read:

1. John, I want you to go round to the north side of the Howland Street site and dig up the west bed. Be careful, the soil is really compacted so it's heavy, so watch your back.
2. Alice, you head over to the small beds at the city hall and finish the prep. The soil needs a good turning.
3. Babul, you can start planting the annuals and the smaller perennials at the Dovers' place.
4. Susan, I want you to finish trimming the roses at the Cassidy estate.
5. Alphonse, can you get over to Lemar Park and finish raking up the last of the leaves.
6. Rick, I want you to start edging the beds by the south entrance at the Zellers site.
7. Sookee, we need to start planting the bulbs at the Wilsons' place today.
8. Norm, I need you to check the grading at the stadium before we start doing the diamond markings. Make sure the bases are levelled.
9. Stan, we need to trim those overgrown shrubs that are blocking the Perry St. entrance to the bike trail.

Answers:

- | | | |
|------------------------|----------------|------------------------|
| 1. Long-handled shovel | 2. Garden fork | 3. Wide-blade trowel |
| 4. Bypass pruners | 5. Soft rake | 6. Blunt-nosed spade |
| 7. Narrow-blade trowel | 8. Stiff rake | 9. Folding pruning saw |

Activity #11 – True or False?

1. True
2. True
3. True
4. True

Activity #12 – Plantings

1. Answer should include:
 - Gently shake the soil ball and loosen the roots with your fingers.
 - Make four or five vertical cuts with a knife.
2. Three types of container plantings:
 - a) Cell-packs
 - b) Flats
 - c) Peat pots
3. Two reasons why you would stake or guy a tree.
 - a) It helps stabilize the root system of a new tree
 - b) It provides support for new planting
4. Girdling occurs when something (roots, wire or rope) is wrapped tightly around the trunk, choking the flow of water and nutrients.
5. Wires will cut into the tree, eventually killing it.
6. Two types of wire covers used for guying trees:
 - a) Flat webbing
 - b) Rubber hosing

Activity #13 – Getting Ready

1. The four steps in soil preparation:
 - a) Clear the planting ground
 - b) Break up the ground by tilling
 - c) Level the ground (if not planting on a slope)
 - d) Fertilize
2. Writing complete sentences
 - a) What is tilling? Answers should include:
 - Used to break up soil
 - Helps to aerate the soil
 - Use of hand-held tiller or gas-powered tiller

c) Why is aeration important?

- Aeration is important because it helps the plant's roots to get oxygen and it helps the soil drain more efficiently.

3. True or False?

- a) False
- b) False
- c) True
- d) True
- e) True
- f) False
- g) True

4. How is a drop spreader different from a rotary spreader? Answer should include:

- Drop spreader drops the fertilizer straight down / rotary throws fertilizer in an arc
- Drop spreader spreads fertilizer more evenly / rotary spread is not as controlled as a drop spreader

Activity #14 – Day's Instructions

Day's Instructions for Practitioner to read:

Right. It's that time of year again! Today we're going to start getting ready for the summer bedding. We're going to start in the park beds. We'll need to dig out all the spring bulbs, collect them and take them back to the shed. I'll put you in charge of that, Mike. Try not to get soil on the paths; it's really difficult to clear up. John, you can be in charge of the broom – keeping mud away from the public. We'll need to take planks to walk on because the soil is still wet. By tomorrow we should have dug all the bulbs out. Then I'll need Mike to collect weeds for the composter and to get some bedding from the shed

1. Jobs that must be done:

- Dig up the bulbs
- Collect weeds for the composter
- Get some bedding from the shed

2. Things that must **not** be done:
 - Don't get soil on the path
 - Keep mud away from the public
 - Don't walk on wet soil
3. Step-by-step instructions
 - Answers will vary.

Activity #15 – Listening Instructions

1. Jobs that need to be done:
 - Daily: Unlock the gates, collect litter, dead-head
 - Weekly: Mow grass, collect clippings, and rake beds
 - Twice weekly: Inspect signs for graffiti, empty bins
 - If necessary: water the beds, empty the bins, and re-tie the hollyhocks
2. What is dead-heading?
 - Dead-heading is the term used for the removal of flowers from plants when the flowers are fading or dead. It is done to enhance the plants performance and to encourage re-flowering. The faded flower is pinched off with your fingers.

Activity #16 – Unclear Instructions

1. Information not directly related to the work orders:
 - a) Did anyone see the game on Saturday?
 - b) I can't believe Williams missed that shot.
 - c) Peter, how's Allison? Did she finish her program yet?
2. Jobs Peter must do:
 - a) Check beds for weeds
 - b) Call boss when done
 - c) Dig bulbs
3. Jobs Susan and Steve must do:
 - a) Finish up north beds at City Hall
 - b) Pick up plantings at the nursery
4. What might go wrong if you don't understand or follow work instructions?
 - Answers will vary.

Unit 4: Grounds Maintenance

Activity #1 – Weeds

1. Weeds grow faster than other plants. They rob other plants and grasses of nutrients and water from the soil and light from the sun.
2. **Annual weeds:** roots have a fibrous system that spreads out just beneath the surface of the soil. Annual weeds seem to pop up suddenly in little clusters around the parent weed. They are surface roots so they are easy to remove.

Perennial weeds: roots have a taproot system that can grow deep into the soil. They are tough and well anchored and can stretch up to 20 feet away from the parent plant. If the taproot is cut, new plants will grow from the site. Some perennial weeds have woody stems and are very difficult to remove.

3. What are two things you can do to help control on-site weeds?
 - a) Recognize weeds
 - b) Take action – pull or dig weeds out
4. Soil contains pockets of air that collect water, when these pockets freeze and then thaw out, they heave the soil. When the soil heaves, it loosens and breaks apart, making it easier to pull up the tough perennial weeds.

Activity #2 – Canadian Weeds

- Answers will vary.

Activity #3 – What’s the Problem?

1. What caused the problem? Students should be expected to write in simple, clear sentences. Answers should include a statement of the problem and a suggested possible cause.
 - a) Snails/slugs
 - b) Aphids
 - c) Fly larvae/beetle or moth activity
 - d) Grubs

2. Matching plant pests to the description of plant damage
 - a) Beetles
 - b) Aphids
 - c) Mice and rabbits
 - d) Slugs
 - e) Beetles and caterpillars
 - f) Rabbits

3. Answers will vary.

Activity #4 - Evidence

Answers will vary.

Activity #5 – Dutch Elm Disease

Answers will vary but should include the following facts:

1. Fungal disease of elm trees
2. Spread by a bark beetle
3. Upper branches begin to wither and turn yellow in the summer months – spreads down the entire tree, the tree loses its leaves and thereby starves the roots.
4. There has not been much success in treating Dutch elm. Once a tree is infected, it likely will die.

Activity #6 – Bacteria and Viruses

Answers will vary but should include the following facts:

1. Blight
 - Complete dieback of shoots, branches or entire plants
 - Can be caused by bacteria or fungi
 - Contaminated tissues remain attached to healthy plants

2. Gall
 - Abnormal swelling of plant tissue
 - Can be caused by bacteria, fungi and insects

4. Rot
 - Any of several plant diseases, especially a disease of peach, plum,
 - apricot, cherry, and related plants, characterized by wilting and browning
 - of the flowers and leaves and rotting of the fruits

5. Researching one plant virus

Answers will vary.

Activity #7 – Plant Problems

Answers will vary.

Activity #8 – Equipment Manuals

1. List three common layout features
 - a) A set order of steps to complete the job
 - b) Diagrams which show how to do the job and/or where the parts are located
 - c) Important details or technical information that must be read carefully

2. Number the following steps
 - a) D
 - b) A
 - c) B
 - d) C

3. Change the oil every 25 hours if using continuously under a heavy load or change every 50 hours under regular use.

4. List the seven steps involved in changing the oil in a lawnmower.
 - a) Drain fuel by running the engine until the fuel tank is empty.
 - b) Remove the spark plug lead.
 - c) Allow the engine to cool.
 - d) Drain the oil while the engine is warm (not hot).
 - e) Tip the mower over onto its left-hand side, thus making sure that the air cleaner is kept uppermost to prevent engine damage.
 - f) Remove the oil filler dipstick and drain the oil into a suitable container.
 - g) Refill with new oil of the recommended grade.

Activity #9 – Lawn Mower

Answers to the questions about power lawn mower air cleaner service.

1. Loosen the screws and remove the cover
2. 2
3. Liquid detergent and water
4. No
5. Replace it
6. After servicing
7. The assembly base

Activity #10 – Trouble Shooting

1. Answers may vary.
2. What is the remedy?
 - a) Excess oil level / air cleaner cartridge soaked or blocked
 - b) In the manual
 - c) Check oil level/service air cleaner
3. Where would you find the information?
 - a) In the manual
4. What is the remedy?
 - a) clean the grassbag
 - b) tighten bolts
 - c) set throttle to choke position
 - d) sharpen the cutterblade
 - e) clean fuel cap vent
 - f) empty grassbag
 - g) increase cut height
 - h) clean and adjust gap or replace
 - i) mow dry grass
 - j) consult your dealer

Activity #11 – Turf

1. Turf is a combination of two or more types of grasses and the surface layer of soil that holds their roots.
2. Eight ways in which turf grasses can differ.
 - a) Rate of growth
 - b) How much sun they can tolerate
 - c) Amount of moisture they need
 - d) Density of the soil – compacted or sandy
 - e) Amount of maintenance
 - f) Structure – thick or thin
 - g) Disease resistance
 - h) Insect resistance
3. What are the two groups that turf grasses are divided into?
 - a) Warm season grasses
 - b) Cool season grasses
4. Write a brief description of the following turf grasses.

Answers will vary but should include the following points:

Kentucky bluegrass

- Quick growing
- Strongly knit
- Very hardy – can stand up to heavy traffic
- Attractive dark green to blue-green colour
- Most popular and most commonly used turf grass in Canada

Red fescue

- Slower growing grass
- Not suitable for high traffic areas
- Grows well in drier soils
- Grows well in shaded areas
- Combats soil erosion
- Reddish colour at the base of the blade

Perennial ryegrass

- Quick growing
- Best wear-tolerance
- Curbs weed growth
- Disease resistant
- Tolerates compacted soils
- Holds its colour throughout the summer

Activity #12 – Nurse Grass

Answer will vary but should include the following points.

1. They should include a picture or description.
2. It's very quick growing.
3. Nurse grass is used on areas such as slopes where erosion is a problem and on drier sites where irrigation is a problem.
4. It is called nurse grass because it is used to protect other more desirable grasses. It protects seedlings from wind and provides shade from the sun. It also helps the soil retain moisture. In short, it looks after the other grasses.

Activity #13 – Turf Problems

1. The best defence against grass weeds is to maintain healthy grasses.
2. Three common Canadian turf grass weeds:
 - a) Creeping bent grass
 - b) Quack grass
 - c) Clover
3. Students should have three pictures from the Internet of the above grasses.
4. Match the descriptions with the insect invader. Mark G for grub and C for chinch bug.
 - a) G
 - b) G
 - c) G
 - d) C
 - e) C
 - f) C
 - g) G
5. Thatch is a thick matted layer of grass roots, dead leaves and organic material that builds up between the soil surface and the base of plant materials.
6. List some problems that thatch build-up can cause.
 - a) Weakens the root system of the grass
 - b) Poor drainage
 - c) Low pH levels in the soil

- d) High levels of nitrogen
 - e) Compacted soils
 - f) Prevents water and fertilizer from reaching soil
7. It's important to aerate turf grasses because the openings in the soil allow air, water and fertilizer to penetrate the turf grass more easily. By increasing the oxygen in the soil, micro-organisms and worms which help break thatch down can multiply and reduce thatch build-up. Also by leaving the soil plugs on top of the soil, you are basically transporting existing micro-organisms and worms that are in the deeper soil to the surface.

Activity #14 - Mowing

1. Fill in the blanks.
 - a) regularly, evenly, healthy
 - b) weeds, diseases, stress
 - c) expensive, time-consuming
2. Mowing height is the lower and upper height range that the grass should be maintained in order to keep the grass healthy.
3. Should you mow the following grasses?

Bermuda – common	Yes
Buffalo	No
Centipede	Yes
Fescue – creeping red	No
St. Augustine – common	No
Zoysia	Yes

4. What are two problems that can happen if you cut the grass too short?

Answers should include:

- a) The turf will not have enough leaf area to produce the food it needs.
- b) Cutting the turf too short exposes the soil to the heat of the sun. The sun can dry out soils quickly and make it difficult for the turf's root system to grow deep, healthy roots.

5. True or False?

- a) True
- b) False
- c) False
- d) True
- e) True

Activity #15 - Sod

1. List the steps involved in preparing the soil for sod installation.

- a) Clear the area of debris
- b) Rototill to a depth of 4 – 6 inches
- c) Rake in fertilizer
- d) Rake, smooth and level the soil
- e) Roll the area with a lawn roller
- f) Water

2. What are four things you should **not do** when you are installing sod?

- a) Do not stretch the sod
- b) Do not overlap
- c) Minimize walking or kneeling on turf
- d) Do not use smaller strips at the outer edges

Unit 5: Landscaping Math

Activity #1 - Batches

1. 28, 38, 76
2. Answers will vary

Activity #2 – Planting Table

Plant name	Number per basket	Number per 30 baskets	Number of trays
Bidens aura 'Sunshine'	1	30	2
Nepeta 'Glechoma variegated'	1	30	1
Geranium 'Maverick Star'	2	60	8
Indian mint	1	30	1
Fuschia 'La Campanella'	2	60	10
Petunia 'Peppermint'	3	90	3
Begonia 'Illumination'	3	90	2
Bacopa 'Snowflake'	1	30	4
Geranium 'Summer Showers'	1	30	8

Activity #3 – Fractions

1. Addition
 - a) 10
 - b) $9\frac{7}{8}$
 - c) $5\frac{11}{16}$
 - d) $8\frac{5}{16}$

2. Subtraction
 - a) $2\frac{1}{3}$
 - b) $2\frac{1}{8}$
 - c) $2\frac{1}{8}$
 - d) 2

3. Conversion

- a) 0.6875
- b) 0.875
- c) 0.375

5. Measurement

- a) $10 \frac{7}{8}$
- b) 10.875

Activity #4 – Tape Measure

1. Measure the lines

- a) $2 \frac{13}{16}$ "
- b) $3 \frac{11}{16}$ "
- c) $5 \frac{5}{8}$ "
- d) $2 \frac{3}{8}$ "
- e) $1 \frac{1}{4}$ "

Activity #5 – Measuring Items

Answers will vary

Activity #6 – Converting Measures

1. $5' \frac{3}{4}" = 60\frac{3}{4}"$
2. $3' \frac{5}{8}" = 36\frac{5}{8}"$
3. $8' 2\frac{1}{4}" = 98\frac{1}{4}"$
4. $10' \frac{3}{4}" = 120\frac{3}{4}"$
5. $5' \frac{7}{8}" = 60\frac{7}{8}"$
6. $1' 5\frac{1}{8}" = 17\frac{1}{8}"$
7. $4' \frac{5}{8}" = 48\frac{5}{8}"$
8. $6' \frac{9}{16}" = 72\frac{9}{16}"$
9. $7' \frac{1}{2}" = 84\frac{1}{2}"$
10. $8' 6\frac{5}{16}" = 102\frac{5}{16}"$
11. $7' \frac{7}{8}" = 84\frac{7}{8}"$
12. $2' \frac{1}{16}" = 24\frac{1}{16}"$
13. $4' \frac{1}{8}" = 52\frac{1}{8}"$
14. $6' \frac{7}{16}" = 72\frac{7}{16}"$
15. $8' \frac{7}{8}" = 96\frac{7}{8}"$
16. $2' 8\frac{3}{4}" = 32\frac{3}{4}"$

Activity #7 – Fun Brain Online

Online activity

Activity #8 – Measurement Fun

Answers will vary

Activity #9 – Area

1.
 - a) 130 feet
 - b) 168 feet
 - c) 8 inches
2. 600 feet
3. 20 feet
4. Area = 3738 sq. ft. The student must convert the square feet to square yards. 1 square yard has 9 square feet. $3738 \div 9 = 415.33$ sq. yds. The sod costs .39 a square yard. Answer: Roscoe must pay \$161.98 for the sod.

5.

Solution: First you must find the area of the brick:
 $L \times W = 8" \times 16" = 128 \text{ sq. in.}$
Convert the square feet to square inches: $1 \text{ sq. ft.} = 144 \text{ sq. in.}$
 $15 \text{ sq. ft.} \times 144 \text{ sq. in.} = 2160 \text{ sq. in.}$
Each brick is 128 sq. in. The area to be covered is 2160 sq. in.
Divide the brick size into the area. You will need 17 bricks to complete the job. ($2160 \div 128 = 16.875$).

Activity #10 – Perimeter

1. Perimeter of the shapes
 - a) 16 inches
 - b) 15 feet
 - c) 21 cm

2. Building a fence

- a) Perimeter of the run

Remind students that opposite sides of a rectangle are the same.

$$128 + 128 + 64 + 64 = 384 \text{ ft. or } (128 \times 2) + (64 \times 2).$$

- b) Cost of the fence by various options
 - Basket Weave \$420.00
 - PVC \$792.48
 - Iron \$835.68
 - Privacy Wood \$383.52
 - Chain Link \$235.20
 - Basket – Cedar \$716.10 (*The Basket Cedar is sold in 5 ft. sections. You have to round up.*)

- c) Chain Link

- d) Iron

- e) The Basket Red Cedar is sold in 5 ft. sections. The total cost would exceed their budget for the fencing materials. The Privacy Wood may be a better option.

3. Perimeter of the bed

- 320 ft.

Remind the students that all sides in an octagon are the same size. The octagon has 8 sides.

4. Installing a fence

a) \$891.54

b) 7 sections

Activity #11 – Cubic Measures

1. 2 cubic yards. Remind the students that many suppliers only sell by the cubic yard (some will offer $\frac{1}{2}$ cubic units), so often you will end up with more than you need. You must round up.
2. Gravel, soil, mulches
3. Volume = $L \times W \times H$
4. How many cubic yards?
 - 27 cubic feet – 1 cubic yard
 - 54 cubic feet – 2 cubic yards
 - 81 cubic feet – 3 cubic yards
 - 60 cubic feet – 3 cubic yards
5. True or False?
 - a) False
 - b) True
 - c) True
 - d) True
 - e) True
 - f) False

Activity #12 – Work Schedules

1. All of the employees have the same number of shifts.
2. Hours worked per week
 - Sahid – 40.5 hours
 - Betty – 32.5 hours
 - Latisha – 34.5 hours

- John – 40.5 hours
- Rosco – 30.5 hours
- Anne – 40.5 hours
- Munzar – 34.5 hours
- Ipeelee – 35.5 hours

3. Tuesday
4. Betty and Munzar
5. 1 hour
6. 9-3, 3-9
7. No, Ipeelee is off

Activity #13 – Timesheets

Monday	9	5	.5	7.5	Bell
Tuesday					OFF
Wednesday	9	9	.5	11.5	Scott
Thursday	12	9	.5	8.5	Scott
Friday	8	2	.5	5.5	Kazar
Saturday	9	5	.5	7.5	Kazar
Total	-	-	2.5	40.5	

He should include his new address in the “Comments” section.

Activity #14 – Payroll slips

1. Find the gross earnings
 - a) \$113.19
 - b) \$444.08
 - c) \$80.75
 - d) \$360.00

2. Find the gross earnings
 - a) Angela’s total earnings for the week are \$348.45.
 - b) John’s gross earnings will be \$919.20.

Unit 6: Safety at Work

Activity #1 – Accident Reporting

1. Circle the correct answer.

- False
- True
- False
- True
- False
- False

2. Place a check mark beside the information that is included in a formal accident report.

- ✓ Name and occupation of the employee
- ✓ Location and time of accident and injury
- ✓ Name(s) of witness(es)
- ✓ Description of the task, including the equipment and working conditions
- ✓ Description of what happened to cause the accident
- ✓ Name of the person(s) completing the report
- ✓ Recommendations for corrective action

Activity #2 – Electrical and Chemical Safety

1. Complete the following sentences about electrical safety.

- a) Switch off
- b) Inspect
- c) Unplug
- d) Disconnect
- e) Do not wear

2. He pulled the cord instead of the plug. He carried the tool by the cord.

3. Running into power poles and electrical equipment with machinery, and hitting buried cables while trenching and digging.

4. Chemical Guidelines:
 - a) All chemicals should be handled by trained employees only.
 - b) Read the label for hazard information.
 - c) Check MSDS (Material Safety Data Sheets) for information on toxicity and methods of safe use.
 - d) Use required personal protective clothing and equipment.
 - e) Do not smoke, eat or drink while using chemicals.
 - f) Report all accidents and spills to your supervisor.
 - g) Wash contaminated clothing separately from other laundry.

5. What are the three precautions you should take when refuelling equipment?
 - a) Don't smoke.
 - b) Don't spill.
 - c) Don't run if your clothing catches fire.

6. Which of the following statements are true?
 - True Answers: a, d and e.

Activity #3 – Injury and Illness

1. Give four examples of injuries that can occur while working as a landscape labourer.
 - a) Cuts and amputations
 - b) Burns
 - c) Electric shocks
 - d) Injuries from slips and falls

2. Give four examples of illnesses that you may develop working as a landscape labourer.
 - a) Muscle strain
 - b) Skin problems
 - c) Allergies
 - d) Diseases from infectious wastes

Activity #4 – Lifting

1. Put the following steps in order.
 - a) Pull material towards you.
 - b) Transfer your weight to the lift side.
 - c) Lift only to the level needed.
 - d) Shift weight to your other leg.
 - e) Push material into position.

2. Description

- Transferring weight

Activity #5 – Shovelling

1. Which would you use, a spade or a shovel, to perform the following tasks?

- Shovel
- Shovel
- Spade
- Shovel

2. Fill in the blanks

- a) elbow, chest,
- b) chest
- c) spade
- d) 5-7 kg (10-15 lbs.)
- e) 15-20 scoops

3. Circle the correct answer.

- a) Shovelling: Keep feet close together. Use arms to push shovel. Keep load away from body.
- b) Digging: all are correct.

Activity #6 – Pesticides

1. True or False.

- a) False
- b) True
- c) True
- d) False
- e) True
- f) True
- g) False

Activity #7 - WHMIS

1. Workplace Hazardous Materials Information System
2. 1988
3. Protect the health and safety of workers by providing information about hazardous materials on the job.
4. Material Safety Data Sheets

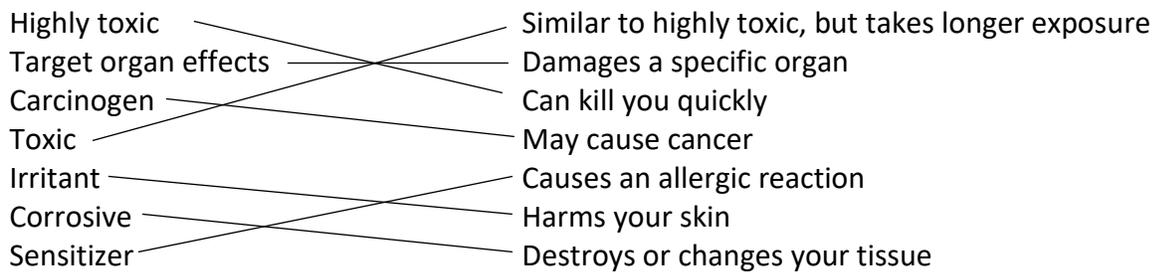
Activity #8 – More on WHMIS

1. Right to know
2. The three main areas of WHMIS
 - a) Labels
 - b) Material safety data sheets (MSDSs)
 - c) Worker education & training
3. What is a controlled product?
 - A product, material, or substance that falls into one of the 6 hazard classes
4. Why is it important to know these symbols?

So you can confidently identify what is in the container, how to use it safely, and how to handle a first aid situation.

5. What are these symbols telling me?
 - a) The material will react with water to produce a poisonous gas, or will undergo a reaction if the container is heated, pressurized, or agitated
 - b) The material will ignite and continue to burn
 - c) The material will cause another substance to burn
 - d) The material causes other toxic effects (including cancer)
 - e) The material is in a gaseous state at room temperature

6. Fumes
7. Cleaning agents and paint thinners
8. Three examples of gasses are:
 - Carbon monoxide, methane, oxygen
9. Four ways chemical can enter your body:
 - a) Lungs
 - b) Skin
 - c) Mouth
 - d) Eyes
10. Stop. Do not use the chemical and tell a supervisor.
11. Three things a worker is responsible for in regard to training:
 - a) Take and learn the information on controlled products
 - b) Tell the employer when info about a controlled product is not good enough to keep workers safe
 - c) Understand something completely and, if not, ask for it to be explained
12. Draw a line from the hazard to its definition:



Activity #9 – Personal Protective Equipment

1. In which of the following job tasks would you wear safety glasses?
 - Breaking up rocks or concrete
 - Power tilling
 - Moving pesticide containers
 - Using strong cleaners
2. Answer to “Proper care of safety glasses” should include:
 - Clean daily, avoid rough handling (scratches)
 - Store in a clean, dry place
 - Replace when scratched, pitted, broken or ill-fitting
3. Fill in the blanks:
 - High-cut, toe caps
4. The true statements are a), d) and f).

Activity #10 – Cold Environments

1. What are the two types of cold hazards?
 - a) Hypothermia
 - b) Frostbite
2. In your own words, what is hypothermia?
 - Answer should include: Hypothermia is the cooling of the deep inner body or core temperature below 34.5°C due to long exposure to cold. People who become exhausted during physical work are more prone to hypothermia.
3. Which is **not** a symptom of hypothermia?

The answer is C – Excessive sweating

4. What is equivalent chill temperature?
 - The combined effect of cold and wind speed. Any temperature feels colder when it is windy.

5. True or False

- a) False
- b) True
- c) False
- d) True
- e) True
- f) True
- g) True

Activity #11 - Heat

1. Questions and Answers

- a) Heat stroke is caused by prolonged work in extremely hot environments.
- b) The signs of heat stroke are: dry, hot skin due to failure of sweating and complete or partial loss of consciousness.
- c) People are generally unable to notice their own heat stress symptoms.

2. Definitions

Answers should include the following information used properly in complete sentences:

- a) Heat edema – swelling of the ankles
- b) Heat rashes – tiny red spots on the skin that cause a prickling sensation during heat exposure
- c) Heat cramps – sharp muscle pains resulting from the failure to replace salt lost with sweat
- d) Heat exhaustion – weakness, dizziness, visual disturbances, intense thirst, nausea, headache, vomiting, diarrhea, muscle cramps, breathlessness, palpitations, and tingling and numbness of the hands and feet

3. Answers will vary.

Activity #12 – UV Exposure

- a. List some of the harmful effects of UV rays on the skin.
 - a) Darkening
 - b) Skin burns
 - c) Erythema
 - d) Skin cancer

- b. List some of the effects of UV rays on the eyes.
 - a) Watering
 - b) Blurred vision
 - c) Pain
 - d) Cataracts

- c. List six ways you can minimize your exposure during outdoor work.
 - a) Avoid midday sun
 - b) Wear clothing that is tightly woven to block sunlight
 - c) Wear a broad-brimmed hat that will shade your face, neck and ears
 - d) Use sunscreen with an SPF of 15 or higher
 - e) Wear UV filtering sunglasses
 - f) Avoid unnecessary exposure

- d. What does SPF mean?

Sun protection factor (or SPF) measures the ability of sunscreen to protect the skin from UV rays. The greater the SPF, the greater the protection.

Activity #13 – Natural Toxins

1. Answers will vary

2. Answers will vary

Activity #14 - Hantavirus

1. What causes Hantavirus?

Hantavirus is an infection caused by a virus that is found in some rodents. People can get the disease when they breathe the virus, which is found in the urine, saliva or droppings of infected rodents.

2. In which of the following on-site locations are you likely to find rodents?

- a), b), d), e), and g)

3. List the steps you can take in order to prevent Hantavirus infection.

- a) Clean up infected area to reduce the production of airborne dust.
- b) Use personal protective equipment.
- c) Soak dead mice, nests and droppings thoroughly with bleach and water before clean-up.
- d) Scoop up the material instead of vacuuming or sweeping.
- e) Dispose of contaminated material in sealed plastic bags.
- f) Wash hands thoroughly with soap and water after removing gloves.
- g) Cover broken skin that may be exposed to rodent contamination.
- h) Dispose of used gloves and other equipment in the same way as you dispose of infectious waste.

Activity #15 – Bites and Stings

1. What are some ways you can protect yourself from bites and stings when you are working?

- Know what biting or stinging insects are in the area.
- Use insect repellent.
- Wear appropriate clothing.
- Don't disturb stinging insects' nests.
- If you have allergies, carry a bee sting kit.

2. What do wasp nests look like and where do they usually build their nests?

- Answers will vary.

3. True or False.

- a) True
- b) False
- c) True
- d) False
- e) True

Activity #16 – Operating Manuals

1. In the example given, in what section would you find information about:

- a) Trouble shooting
- b) Maintenance schedule
- c) Service parts
- d) Safety
- e) Accessories

2. Answers will vary.

3. Answers will vary.

Activity #17 – Riding Lawn Mowers

1. Fill in the blanks.
 - Inspect
 - safety
 - operating
 - thrown
 - highest
 - rough
 - neutral
 - behind
 - backing
 - minimal
 - rocks
 - holes
 - daylight

2. Answer should include:
 - **Mow** up and down slopes rather than sideways for greater stability, unless the mower is counterbalanced.
 - **Reduce** speed on slopes and when making sharp turns to prevent tipping or loss of control.
 - **Do not stop** or start suddenly when going uphill or downhill.
 - **Do not leave** the mower on the slope

3. List four things you should do when pulling loads.
 - a) Use approved hitch points
 - b) Limit load weight and size
 - c) Do not turn sharply
 - d) Use counterweights as recommended by manufacturer

4. Before leaving the operator's position or making any repairs or adjustments to a riding lawn mower, you should **disengage** power to attachments and **stop** the motor by completing the following three steps.
 - a) Set the brakes
 - b) Put the transmission in park, if possible
 - c) Remove the ignition key

5. What should you do if your machine hits something hard like a rock?
 - Disengage power to attachments
 - Stop the motor
 - Set the brakes
 - Put the transmission in park, if possible
 - Remove the ignition key
 - Inspect the blades and shaft

6. Why is vibration a problem?
 - Vibration can loosen the blades.

7. Circle the best answer.
 - a) iv – All of the above
 - b) iv – None of the above

Activity #18 – Crossword Answers

Across

1. stop
4. replace
6. under
8. slippery
9. plug
12. inspect
14. hands

Down

1. shields
2. spray
3. running
4. refuel
5. across
7. bent
10. grass
11. rotating
13. wheel

Activity #19 – Power Equipment

1. What does PTO stand for?

- Power take-off

2. True or False?

- a) False
- b) True
- c) True
- d) False
- e) True
- f) True
- g) True
- h) False

3. Front-end loaders: fill in the blanks

Seat, lower, the ground, turning, slopes, roll-over, overload, lift, post.

4. Answers will vary.

5. Personal Protective Clothing: Circle your answer

Hearing protection, safety goggles, safety boots with non-slip soles, light gloves.

6. Cutters: True or False?

- a) False
- b) True
- c) False
- d) False
- e) True
- f) True
- g) True
- h) True
- i) True

7. What are five things you should **not** do when working with rotating cutting tools?
- a) Do not leave a running tool unattended.
 - b) Do not wear short pants or sleeves.
 - c) Do not use rigid blades in stony areas.
 - d) Do not overreach. Keep proper footing and balance at all times.
 - e) Do not repair damaged attachments. Throw them out.