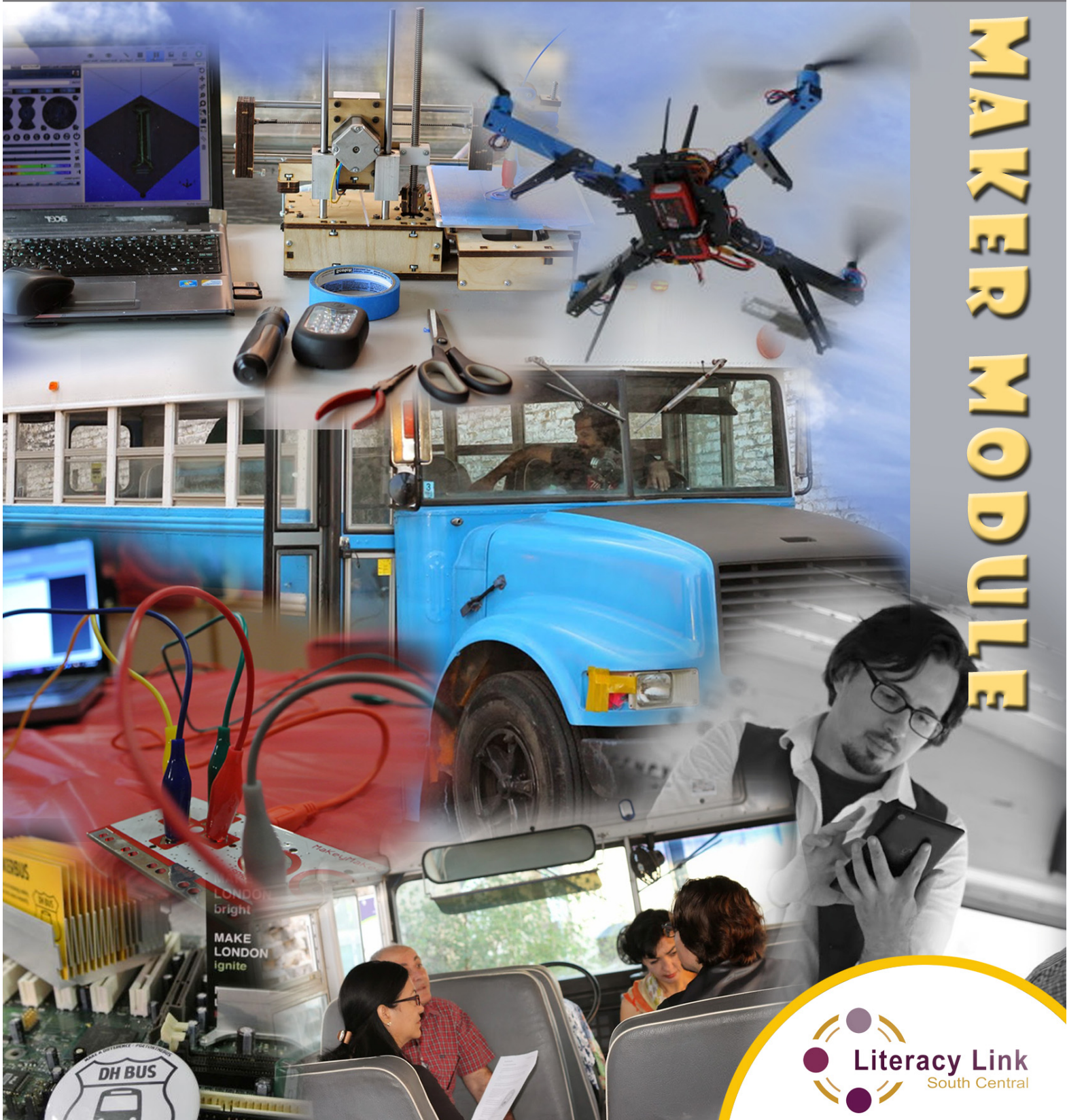




# MACROPHOTOGRAPHY

## MAKER MODULE



## Acknowledgements

These Maker Modules were prepared for the Literacy Link South Central project “Using Technology to Facilitate Connections between Literacy and the Broader Community” (2014). Maker Modules available in this series include:

Augmented Reality  
Bluetooth  
Dropbox  
Evernote

Leap Motion  
Macrophotography  
MaKey MaKey  
Portable Podcasting

QR Codes  
Tiny Scan  
Word Lens  
The World of 3D

**Literacy Link South Central (LLSC)** wishes to acknowledge the valuable contributions made by the following consultants, project staff and partners:

Beth Compton, MakerBus  
Danielle Carr, Literacy-Technology Liaison  
Herta Taylor, Literacy-Technology Liaison  
James Graham, MakerBus  
Kim Martin, MakerBus  
Ryan Hunt, MakerBus  
Summer Burton, LLSC  
Titus Ferguson, UnLondon Digital Media Association  
Tony Mejia, Literacy-Technology Liaison

The staff and learners of Nokee Kwe Native Education Centre, Collège Boréal London, Literacy London, ATN Access Inc., WIL Employment Connections and Youth Opportunities Unlimited for testing the Maker Modules and providing their feedback.



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This *Employment Ontario* project is funded in part by the Government of Canada.

**EMPLOYMENT  
ONTARIO**

## Introduction

To successfully complete this MakerBus Module, you will need:

1. **Notes to the Literacy Practitioners**
2. **Macrophotography Pre Visit Activity**
  - estimated time is 10 minutes
3. **Macrophotography MakerBus Module**
  - estimated time is 15 minutes
4. **Macrophotography Post Visit Activity**
  - estimated time is 30 minutes
5. **Evaluation Forms (optional)**
  - learners' feedback is submitted immediately following the visit
  - practitioners' feedback to be submitted following the completion of any Post Visit Activities
6. **Equipment List:**
  - smartphones with Canon Easy-PhotoPrint application (app) installed
  - tablets with Canon Easy-PhotoPrint application (app) installed
  - the MakerBus Wifi hotspot and its password
  - laser pointers (or other lenses), bobby pins, needle nose pliers, and tape for each learner
  - Canon Selphy CP800 Black Photo Printer complete with sufficient ink and photo paper. Paper is loaded shiny side up, with only a few sheets at a time.



**Notes to the MakerBus Facilitator:** Remind learners to check the Tip and Tricks in using the Macro Lens. For this Module, learners will be asked to download an app on their own smartphones or tablets. Some learners may be hesitant to do this, so please provide additional devices.

All instructional materials are available on the Literacy Link South Central (LLSC) website, should you need additional copies. Please visit: <http://www.llsc.on.ca/>.

## Notes to Literacy Practitioners

### Learning Objectives:

1. Turn a laser pointer into a macro lens
2. Connect to a hotspot so you can access a wireless printer
3. Print a photo taken with the macro lens

### Notes to Practitioners:

The optional Pre Visit Activity is not essential to the success of this lesson, but will allow learners to understand a bit about macrophotography before actually going on the Bus. It is estimated to take about 10 minutes.

If they have not already done so, it may be wise to have learners complete the Downloading an application (app) Generic Pre Visit activity. This is also estimated to take 10 minutes.

This is a very hands-on activity that will allow the learners to create a macro lens using some basic and inexpensive components. Learners will take close-up photos using the lens, and print them wirelessly. Competencies for the Pre Visit Activity include: A1.2/3; B1.2/3 and D2/3.

Competencies for the MakerBus Module include: A1.2; A3 and D2/3.

The optional Post Visit Activity allows learners to demonstrate their learning by writing out the steps to create a macro lens. It can be done in the class or on their own time. It is intended to reinforce the skills used, and is estimated to take about 15 minutes.

Competencies for the Post Visit Activity include: B1.2; B2.1.



## Macrophotography Pre Visit Activity Learner Handout

1. As a class, discuss the word “macrophotography”. What does “macro” mean?

Predict what you think it is. What kinds of pictures do you think you could take? Do most of you agree?

2. Use the internet to look at some macrophotography images. Is this the type of image you expected? If not, how did it differ?

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3. Are there any types of images that you particularly like? Which ones? Share this with the class.

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4. Think about how easy or difficult photos like these might be to take. For instance, taking a close up photo of a fly depends on the fly staying in one place long enough for you to take the photo. What types of images would be easiest to take?

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5. Is there something you would like to take a close-up picture of while on the Bus? If so, write it below and perhaps you could bring it along!

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## Macrophotography MakerBus Module

This activity gives you an opportunity to be a macrophotographer who makes a \$70 macro lens out of a smartphone and a dollar store laser pointer. Once you have your new macro lens, wirelessly print out a photo to show off your work!



### You will learn how to:

1. turn a laser pointer lens into a macro lens
2. connect to a wireless hotspot so you can access a wireless printer
3. print a photo that you have taken

### Part 1: Turn a laser pointer into a macro lens

A macro lens lets you take extremely close up photos to show fine detail, often not visible by the naked eye. All it takes is a laser pointer and some creativity to make a macro lens for a mobile phone or tablet camera.

Here are the tools you need:

- Laser pointer
- Bobby pins
- Needle nose pliers
- Tape
- A smartphone or tablet with a built-in camera



### **Macro Lens Instructions:**

1. Take the laser pointer and unscrew the top
2. Use the pliers to unscrew the black ring (be careful, the ring holds the lens)
3. Once the black ring is off, tap pointer on the table and the lens will pop out
4. Slide the lens in between the arms of the bobby pin. The bobby pin will help you hold it in place, almost like tweezers.
5. Take your lens and bobby pin combo and align it to your camera lens
6. Use tape to secure the macro lens to your smartphone or tablet

You have now created a powerful macro lens that can increase your camera's focal point by 135 times. Try it out!



### **Tip and Tricks for using the Macro Lens:**

- Remove any phone covers before putting the lens in place
- Turn off flash and/or auto-zoom features
- Be sure to put the convex side of the lens facing out
- Get as close as possible to the object without touching it

## **Part 2: Connect to the hotspot and access a wireless printer**

The Canon Selphy CP800 Black is a wireless printer that allows you to print without physically connecting to the printer with cords or cables. Canon provides a free application (app) so that you can easily print your photos from your phone. First, you will need to use a Wi-Fi hotspot to connect to the printer. Both the phone and printer must be using the same Wi-Fi network to print.

Follow the instructions to enable Wi-Fi on your Android or Apple device:

	
<ol style="list-style-type: none"><li>1. Choose Systems Settings and then Wireless &amp; Networks</li><li>2. Tap available Wi-Fi (MakerBus)</li><li>3. Enter the password provided by the MakerBus facilitator</li></ol>	<ol style="list-style-type: none"><li>1. Choose Settings and then tap on Wi-Fi</li><li>2. Tap available Wi-Fi (MakerBus)</li><li>3. Enter the password provided by the MakerBus facilitator</li></ol>

**Note:** these steps may differ from phone to phone.

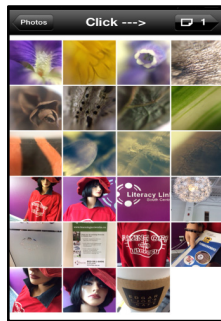




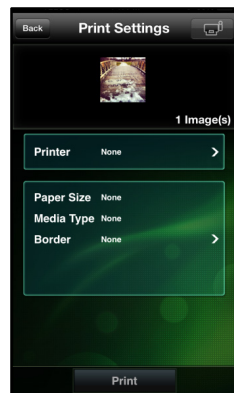
### Part 3: Print the photo you took

**Download:** a mobile or tablet application (app) is needed for this task. MakerBus devices have apps ready for use. If you are interested in learning how to download using your own device, please ask for the Downloading and Deleting module.

Access the Canon Easy-PhotoPrint app on your phone and follow these steps:



1. Tap on Photo Album
2. Choose a photo you would like to print and click on Select
3. Click on the Print Setting box



4. Tap "Print" and it will take about a minute to complete the printing process

Now you are able to make your own macro lens, connect to an internet hotspot and print your own pictures wirelessly!

## Macrophotography Post Visit Activity

### Learner Handout

1. Will you ever use a macrolens again? Think about how it might be useful. For example, you could take a photo of a leaf of a diseased plant in your garden then show the photo to someone at the garden centre to find out what they recommend. Make a list as a class.

We could use a macrolens to...

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2. A friend asks you how you made the macro lens. Write down the steps you followed, from memory. Check your answer by reviewing the handout.

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3. What other things have lenses that you could use in a similar way?

For example:

- Disposable cameras are useless after the film has been removed. You could try the lens from one of these
- You could try the lens from a DVD player that no longer works. How would this differ from the laser pointer lens?

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