

Maker Tech Camp 2015

Learning Journal



Session 1

Student Name: _____

Maker Tech Camp Survey

You will take this survey before and after the class. Please answer each question to the best of your ability. Thanks!

Before Class

After Class

<p>1. What is 3D modelling?</p> <p>2. What can you use 3D printing for?</p> <p>3. What is a robot?</p> <p>4. How does a circuit work?</p> <p>5. Have you ever programmed LEGOs before?</p> <p>6. How much do you like STEM (science, technology, engineering, and math)?</p> <p>1 2 3 4 5=a lot!</p>	<p>1. What is 3D modelling?</p> <p>2. What can you use 3D printing for?</p> <p>3. What is a robot?</p> <p>4. How does a circuit work?</p> <p>5. Have you ever programmed LEGOs before?</p> <p>6. How much do you like STEM (science, technology, engineering, and math)?</p> <p>1 2 3 4 5=a lot!</p>
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3D Printing

By making models in 3D, you will get to use your creative and spatial thinking skills! During the presentation, answer the questions below.

1. What is 3D printing?
2. What could *you* use 3D printing to print?
3. How do you think the printer moves the printhead?
4. What are some other applications for 3D printing?

We'll be using Tinkercad to create 3D models. Sketch the front, top, and right side views of your model.

Top	
Front	Right Side

Brush Bots

Building and playing with Brush Bots will exercise your problem-solving and engineering skills! Answer the questions below.

(During the video) Why do you think that you can't have the two wires from the battery touch?

Project steps:

1. Check the contents of your kit.
2. Cut the toothbrush.
3. Cut the tape.
4. Trim the battery wires.
5. Test-fit the battery.
6. Attach the battery.
7. Attach the vibrating motor.
8. Twist the wires and go!
9. Use the pipe cleaners, etc. to modify.

What did you do to your Brush Bot to make it go straight? in a curve?

What else could you use to make a Brush Bot?

What are some games and contests you can have with your Brush Bots? Create one and test it out with your friends.

How did your Brush Bot do in the competitions? What could you do to it to make it do better?

Introduction to Robotics

Before Discussion

Finish this sentence:

A Robot is _____

Draw a picture of what you think a robot looks like.

After Discussion

By definition a robot is something that:

needs _____ and then

1. _____,

2. _____, and

3. _____.

Cubelets

You will be given three blocks. Draw pictures of six different ways you put the blocks together and describe how they behave differently each time you change them around.

Write:		
Draw:		

Using just the **battery**, **distance**, and **drive** blocks, make a robot that goes straight. Now change something to make it go in a circle. What did you change?

Now add a **passive** block. How does this change your robot?

See what you can make with six blocks. Draw a picture of your robot below and describe what it does, how it moves, and how the blocks communicate with each other.

CHALLENGE:

Build something that will serve a purpose or solve one of the challenge problems. Circle the one you picked.

1. Someone keeps stealing your toys! How can you make a motion activated light that will alert you when someone gets close to your toys?
2. Your power has gone out and your freezer won't stay cold forever. Can you make an alarm that will let you know when things are warming up so your ice cream won't melt?
3. You're having a party with 4 different kinds of cupcakes! How can you make a robot that will turn without stopping, while holding a paper plate on it?
4. You are in a dark basement. and don't know where the lights are. You don't have a flashlight or candle, but you do have Cubelets! How can you make a robot flashlight that will stay lit while it's dark but go out and conserve power when you get into the light?

Describe the problem for the challenge you chose in your own words.

Draw or write out your solution below.

How will you know if it is successful?

Snap Circuits

Before Discussion

Finish this sentence:

A Circuit is _____

After Discussion

Draw a simple circuit:

Series Circuit	Parallel Circuit

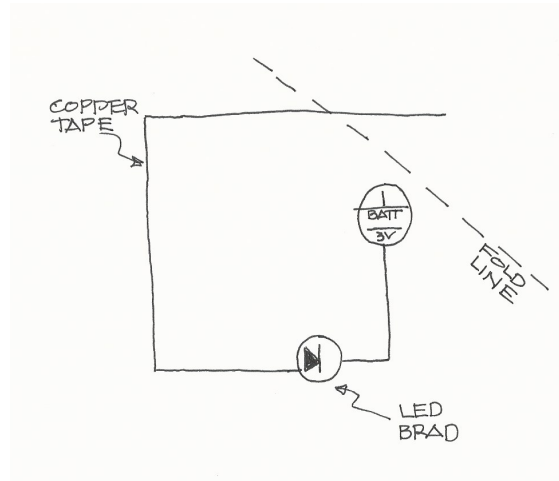
Now you get to build your own circuits! Use the Snap Circuit kits to build one with a green tab on it. Then go on to one with a blue tab. Show a volunteer what you made and how it works.

Paper Circuits

Now that you know a little bit about circuits and had the chance to build some using the Snap Circuits kits, you're going to get to make a circuit out of paper and copper tape! Follow the steps below and ask a volunteer for help when you need it.

Project Steps

1. You have a black card in front of you with a light bulb drawn in the middle.
2. Using your metallic marker, add a message like "You light up my life," or "You add light to my life."
3. Poke a very small hole in the middle of the light bulb drawing.
4. We have folded over a corner and circled where your batteries are going to connect. A volunteer will help you draw a simple circuit on the other side of your card that looks like the drawing.
5. Put copper tape over the lines, and make sure to **leave a gap for the LED**.
6. A volunteer will give you an LED light bulb that is going to go through your card hole. Open up the two wires and gently spread them apart so that they connect to your copper wire.
7. Using the copper tape, secure the LED wires to the circuit.
8. Attach a battery holder and place your battery inside. Close the corner tab and put a paperclip on it to hold it. If your light does not light, flip your battery the other way.



Write down some other ideas of how you can make simple paper circuit cards or pictures below.

LEGO Education

Getting Started

1. Open LEGO WeDo Kit and follow the instructions given to you to build the alligator.
2. Open the LEGO WeDo software on the computer. The icon looks like a green play button in a yellow square. Experiment with the program for a while and then try the challenges below in order.

Challenges

1. Program the alligator to open and then close its mouth.
2. Try using a **touch sensor** to sense when your finger is in the mouth. Make the alligator close its mouth when your finger is in the mouth and open when you take it out.
3. Use a **loop** to make the alligator chomp whenever a new finger enters the mouth.

Questions

1. How does the WeDo know what to do?
2. What does the play button tell your WeDo to do when you click it?
3. What problems did you encounter and how did you solve them?

5. List three cool things you learned at camp.

6. Circle the snacks you liked and cross out the ones you didn't like.
 - a. pop tarts
 - b. chocolate chip cookies
 - c. oreos
 - d. cheese sticks
 - e. animal crackers
 - f. popsicles
 - g. bananas

7. What is one thing you think the teachers/volunteers could do better?

8. Would you recommend this camp to a friend?

9. Should we have another Maker Tech Camp next year?

Thanks for a great time, everyone!!