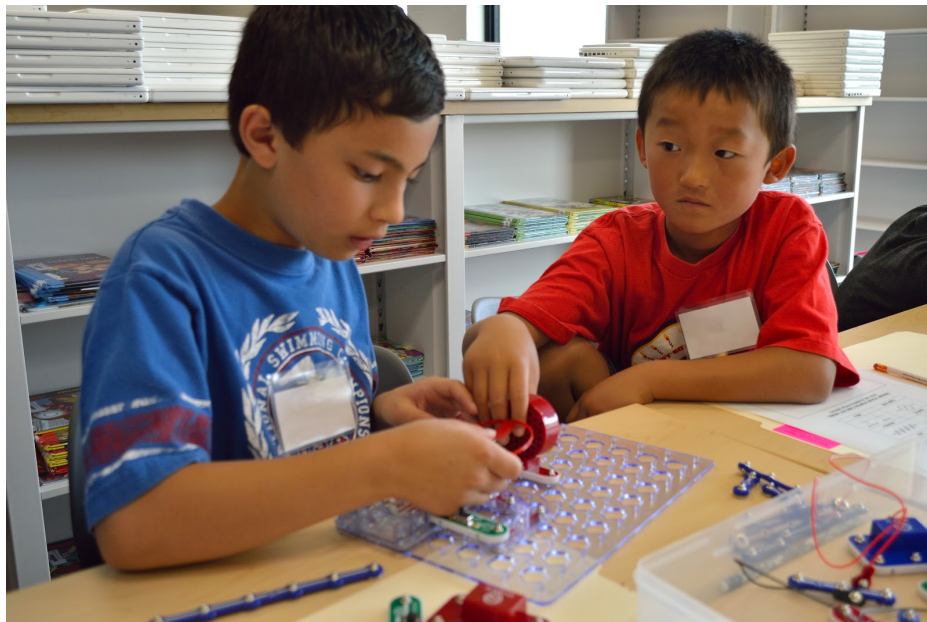


Maker Tech Camp 2015

Learning Journal



Session 2

Student Name: _____

Maker Tech Camp Survey

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

Before Camp

After Camp

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

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!

(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.

Questions

1. What did you do to your Brush Bot to make it go straight? in a curve?
2. What else could you use to make a Brush Bot besides toothbrushes?
3. What are some games and contests you can have with your Brush Bots? Create one and test it out with your friends.
4. 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?

MOSS Robotics

Our first task today is to create the beginnings of something that drives. We need to start with a **power source** (the green face). Then we need a **sensor** and an **actuator** (something that has an action).

Important things to remember:

- Green to Green passes power (think of green as your electrical wire that keeps the power flowing)
- Red is data INPUT.
- Brown is data OUTPUT

This means that data comes in to the cube with the red face, and then the red face communicates it out to the brown face.

What is needed for this to be more than just a toy car, but instead a ROBOT vehicle?

It needs _____, and then it needs to _____, _____, and _____.

What could we do to create more functional, or better designed vehicles? (consider seating, steering, stability, a robust design?) Explore making different shapes of vehicles. Remember that building with 2 sensors and 2 actions allows us to build a robot where each of the sensors gives data to each of the actions so it can react and drive.

Snap Circuits

Before Discussion

Finish this sentence:

A Circuit is _____

After Discussion

Draw a simple circuit:

Series Circuit	Parallel Circuit

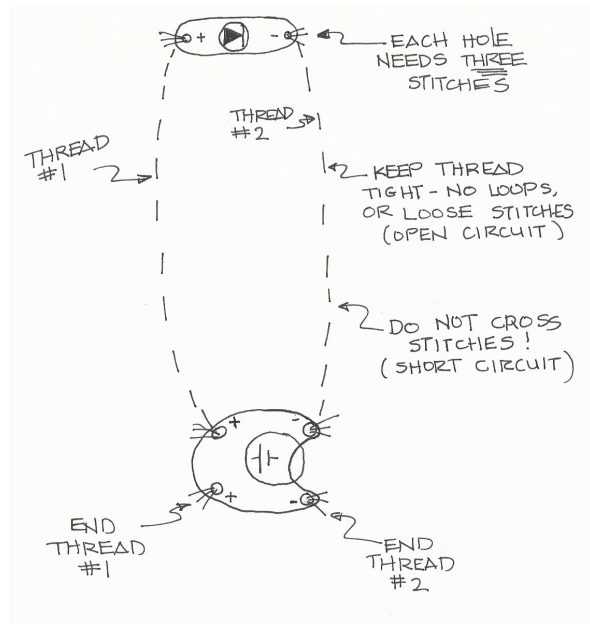
Now you get to build your own circuits! Use the Snap Circuit kits to build one with a green tab on it. Then go on to one with a blue tab. Show a volunteer what you made and how it works.

e-Textiles

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 sew an LED light and a switch onto a bookmark! Follow the project steps below and ask a volunteer for help when you need it.

Project Steps

1. Tie the thread to one side of the LED.
2. Using a pencil, draw a path on the back of your bookmark to sew over. See the diagram for help.
3. With your needle, poke holes $\frac{1}{4}$ " apart along the path from the battery holder.
4. Using your first piece of thread, sew one side of the LED to the matching side of the battery holder.
5. A volunteer will help you tie off your string.
6. Repeat steps 1-5 for the other side.



Questions

1. When is this circuit closed? open?
2. Draw a schematic diagram for a bookmark just like it is, and then with four LEDs (you won't actually sew this; it's just for practice). You can either make it a series or parallel circuit.

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!!