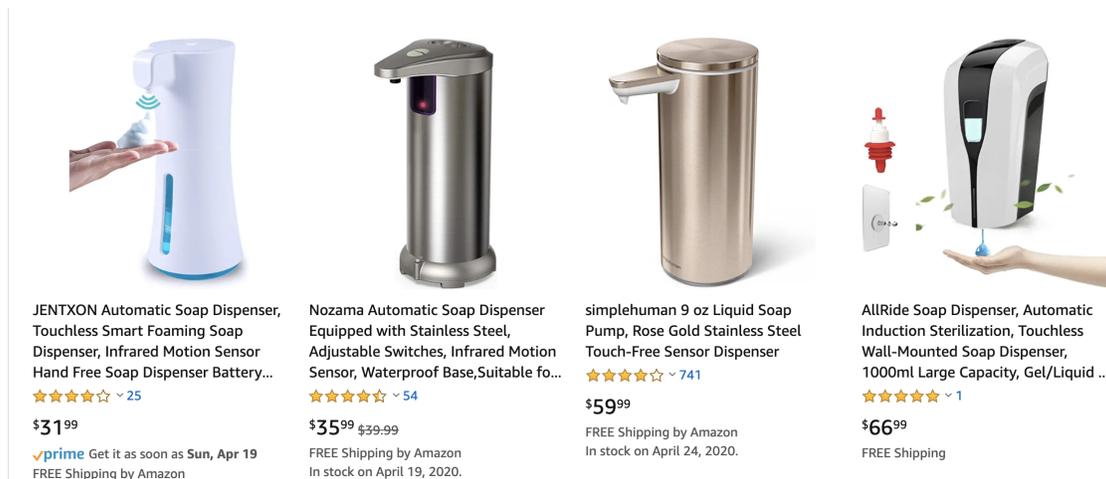


## Pacific MESA Coding Challenge (Week 4)

This week we will continue using Tinkercad to build a virtual Arduino circuit, but over the next couple of weeks will virtually build an automatic hand sanitizer for your own house. So before we get into building the circuit we'll do some brainstorming about building this machine.

Take a look at these models, the way these machine works is when it detects your hand, it will dispense the sanitizer. It sounds easy, doesn't it? So it will be great if we can build this machine for our family, so we can save around 30\$ to 50\$.



**Step 1:** Let's brainstorm how this machine can detect a human's hand?

Try to search for some sensors that are suitable to detect a human's hand. Then, you should narrow down the category to an Arduino-compatible sensor kit.

**Step 2:** Create a list of materials that you should have to create this machine.

**Step 3:** One of the basic steps to make the machine work is connecting the sensor to the motor, so each time the sensors receive signals the motor will run to disperse the liquid. So now we will get started by connecting our motor to the Arduino.

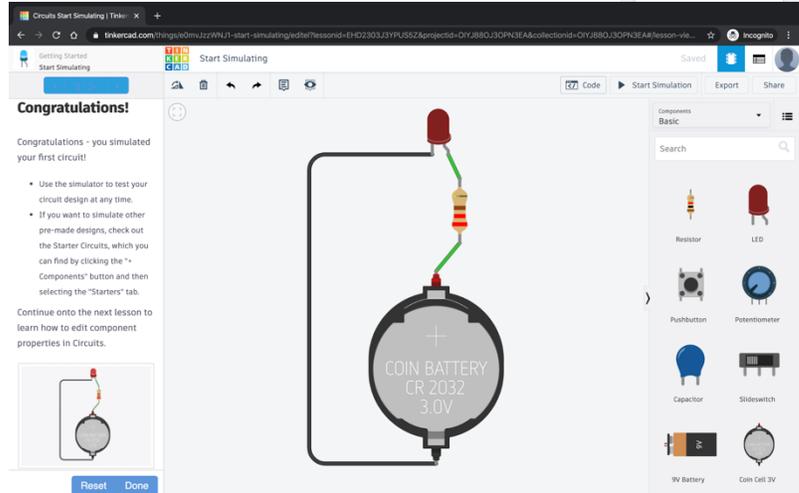
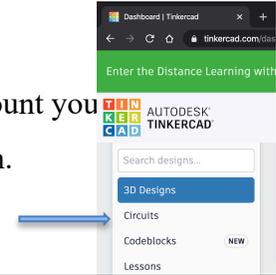
It's now time for coding!

**Step 4:** First, open your Tinkercad account. If you haven't yet created an account you can see instructions on how to do that [here](#), it's pretty self explanatory though.

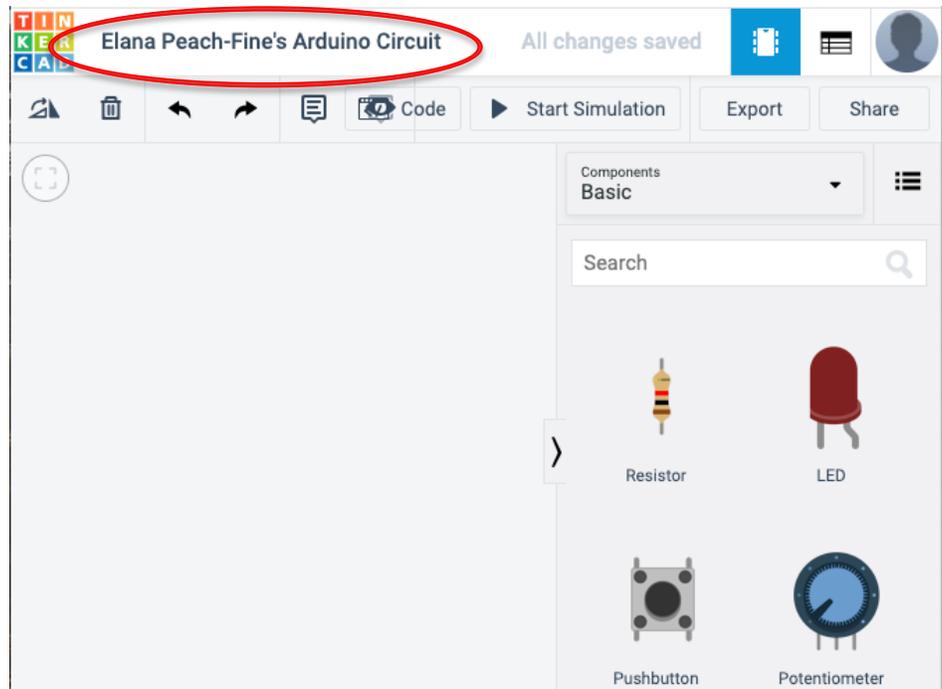
From the dashboard select circuits. Select "try circuits" to first learn how to build up a circuit and run

simulation before you get started creating your own Arduino circuits.

You can see codes for each activity by clicking on the button "code" in the top right corner.



**Step 5:** To get ready for this week's challenge first go back to the dashboard (where you started) by pressing the Tinkercad icon in the top left corner. Select "Circuits" and select the green button "Create new Circuit". You will have opened up a blank screen. Before proceeding label your



challenge next to the Tinkercad icon, by clicking on the default name and changing it to your name and Arduino Circuit i.e. "Elana Peach-Fine's Arduino Circuit"

**Step 6:** You are now ready to start the challenge! The challenge for this week is to create an Arduino Circuit to run a servo motor using a: 1) Arduino Uno R3 2) Breadboard Small 3) MicroServo (motor). You will need to wire your Arduino and code it to run the motor.

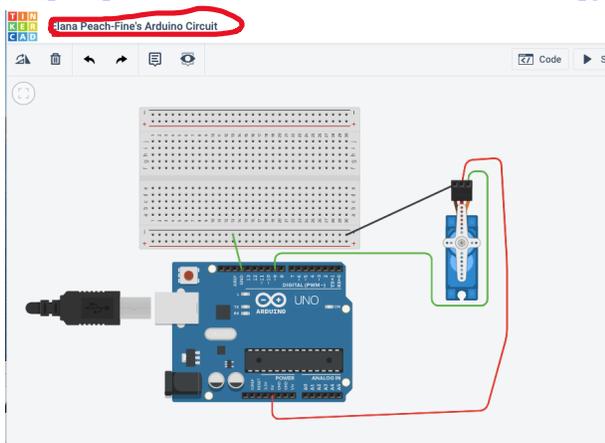
**Experienced User Challenge:** Try to do this challenge on your own and code in “Text”.

**Beginner User Challenge:** Follow this tutorial

<https://www.youtube.com/watch?v=7Zs6fsMg9K8> and code your motor with blocks to learn the basics of using Arduinos.

**Step 7:** After completing this challenge you are now ready to submit it to

[https://pacificmesaonline.wufoo.com/forms/pjrkplq1l13vtk/!](https://pacificmesaonline.wufoo.com/forms/pjrkplq1l13vtk/)



You’ll want to make sure you have copied your Arduino code of your circuit from Tinkercad. If you coded in “blocks” make sure to scroll down to Text to be able to copy the code. You’ll also need to make sure you’ve included your name in the screenshot.

#### Additional Arduino Tutorials

*To learn more about how the Tinkercad virtual Arduino relates to programming your real Arduino you can check out some of the following videos:*

1) On setting up the cables and motor (from mertarduino.com):

<https://www.youtube.com/watch?v=LHvXPeT2gws>

2) On how to control the angular turns of the servo by changing degrees:

<https://www.allaboutcircuits.com/projects/servo-motor-control-with-an-arduino/>

3) Some of you will need more than one servo (why not?), you should watch this video

<https://www.youtube.com/watch?v=TkA2LJctU1c>