

RAPID PROTOTYPING ACTIVITY

Hummingbird Bit

Use this activity to help your students **plan** and **build** a successful project with the Hummingbird Robotics Kit!

PROTOTYPING ACTIVITY

1. Define the word “prototype” for your students

- **A prototype is a rough first draft. Prototyping takes many forms:**

- **Works-like:** Working models
- **Looks-like:** Non-working models
- This activity leads students to create a Looks-like Prototype to help them plan their projects.

2. Provide each team with one set of Prototyping Cards and craft materials (No robotics parts yet)

3. Time to Prototype

- Let students combine craft materials to create a looks-like prototype of their project.
- Ask students to attach prototyping cards where they think their robotics parts will go.

4. What's Next?

- Students develop a complete plan for constructing their robot.
- Pair 2 groups together. Groups should share their ideas with each other, explain their looks-like prototype, and troubleshoot potential issues.
- Teach students how to use robotics parts if you haven't already. (see www.birdbraintechnologies.com/hummingbirdbit/makecode/program)
- Give the students a Hummingbird Robotics Kit and a programming device (laptop, tablet, etc) and start programming!

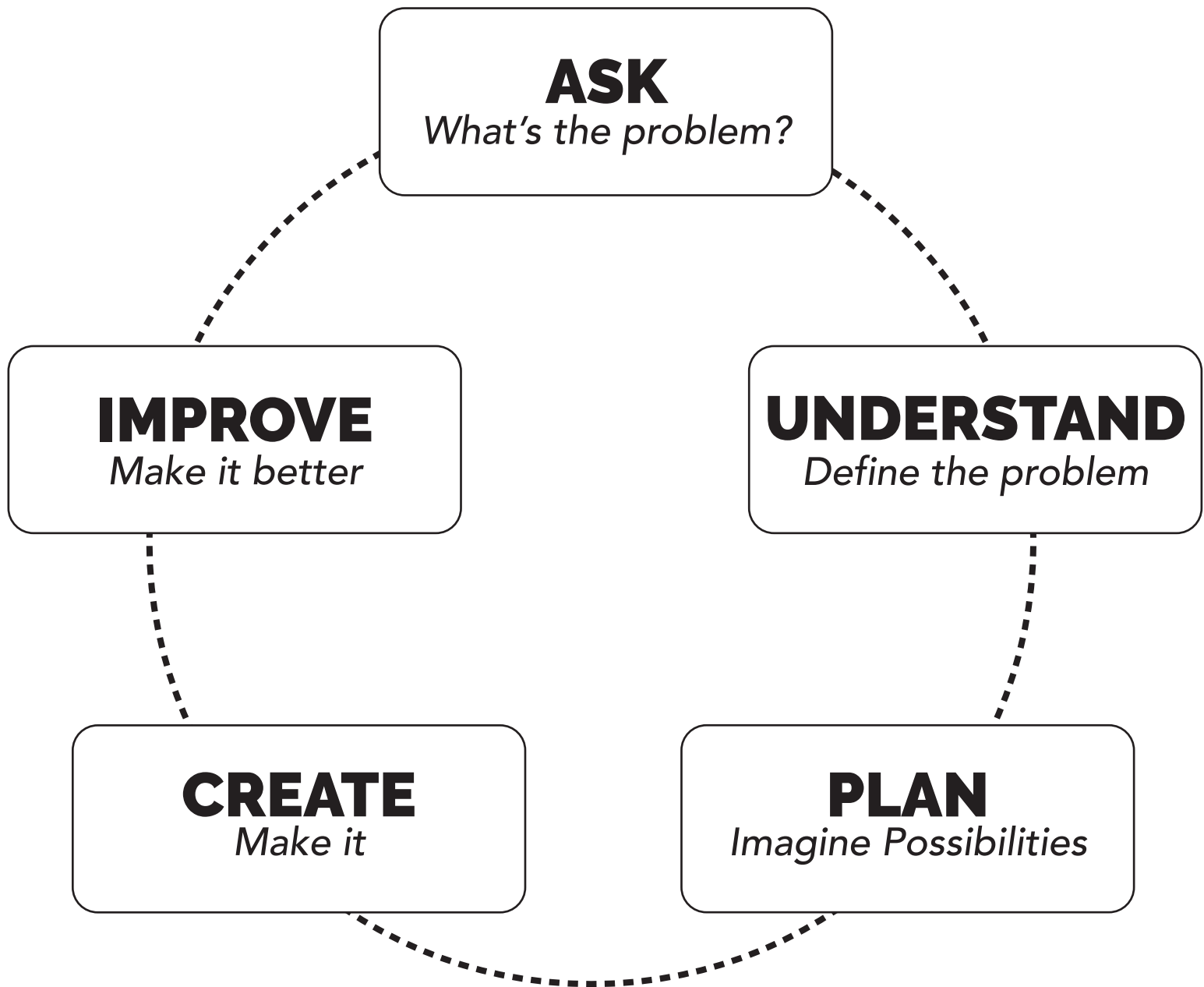


Want to inspire more creative robotics? Check out these resources:

Engineering Design Assessment Guide
Coding Cards
Video Tutorials

THE ENGINEERING DESIGN PROCESS

The Engineering Design Process is a way of thinking about and approaching a problem to be solved.



















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OUTPUTS

Cut out these squares. Attach the ones you plan to use to your prototype to plan **where** your robotics components will go, and **how** they will attach to your project.















<p>SINGLE LED Control the brightness of the light</p> 	<p>SINGLE LED Control the brightness of the light</p> 	<p>SINGLE LED Control the brightness of the light</p> 	<p>SINGLE LED Control the brightness of the light</p> 
<p>TRI-COLOR LED Control the color of the light</p> 	<p>TRI-COLOR LED Control the color of the light</p> 	<p>TRI-COLOR LED Control the color of the light</p> 	<p>TRI-COLOR LED Control the color of the light</p> 
<p>POSITION SERVO Control the angle of the motor from 0° to 180°</p> 	<p>POSITION SERVO Control the angle of the motor from 0° to 180°</p> 	<p>POSITION SERVO Control the angle of the motor from 0° to 180°</p> 	<p>POSITION SERVO Control the angle of the motor from 0° to 180°</p> 
<p>ROTATION SERVO Control the speed of rotation</p> 	<p>ROTATION SERVO Control the speed of rotation</p> 	<p>ROTATION SERVO Control the speed of rotation</p> 	<p>ROTATION SERVO Control the speed of rotation</p> 

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INPUTS

Cut out these squares. Attach the ones you plan to use to your prototype to plan **where** your robotics components will go, and **how** they will attach to your project.

<p>DISTANCE SENSOR Measure the distance to the closest object</p> 	<p>DISTANCE SENSOR Measure the distance to the closest object</p> 	<p>DISTANCE SENSOR Measure the distance to the closest object</p> 	<p>DISTANCE SENSOR Measure the distance to the closest object</p> 
<p>LIGHT SENSOR Measure the light around the robot</p> 	<p>LIGHT SENSOR Measure the light around the robot</p> 	<p>LIGHT SENSOR Measure the light around the robot</p> 	<p>LIGHT SENSOR Measure the light around the robot</p> 
<p>SOUND SENSOR Measure the sound around the robot</p> 	<p>SOUND SENSOR Measure the sound around the robot</p> 	<p>SOUND SENSOR Measure the sound around the robot</p> 	<p>SOUND SENSOR Measure the sound around the robot</p> 
<p>DIAL SENSOR Measure how much the knob is turned</p> 	<p>DIAL SENSOR Measure how much the knob is turned</p> 	<p>DIAL SENSOR Measure how much the knob is turned</p> 	<p>DIAL SENSOR Measure how much the knob is turned</p> 