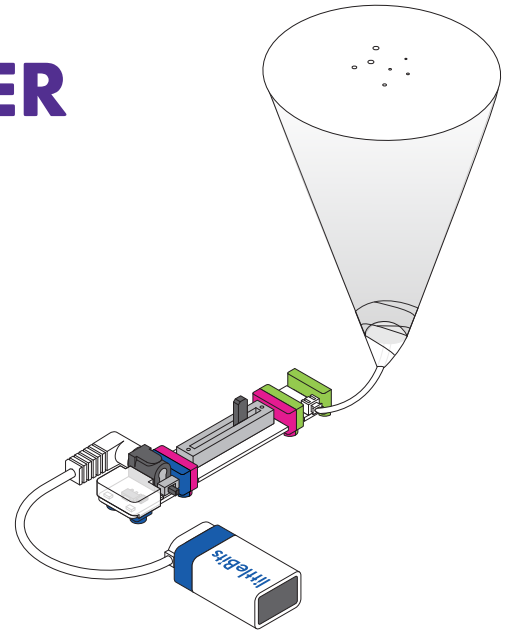


CONSTELLATION VIEWER



GUIDED

DESIGN CHALLENGE

Design a constellation viewer that allows us to see stars up close.



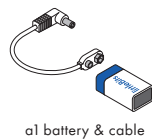
EXPLORE

- Complete Writing Box #1 in your guided handout.
- Write the name of your group's constellation in Writing Box #2.



CREATE

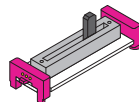
1. Gather your invention tools.



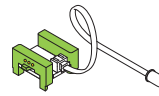
a1 battery & cable



p4 power



i5 slide dimmer

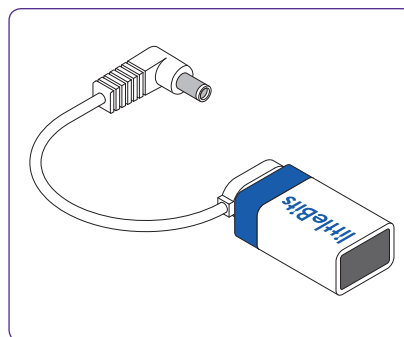
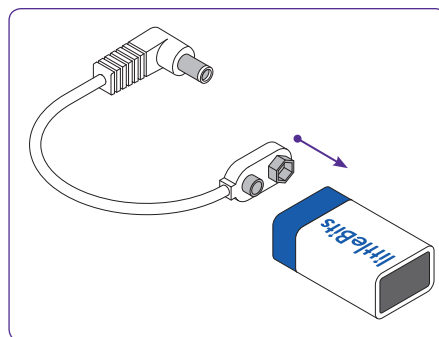


o2 long LED

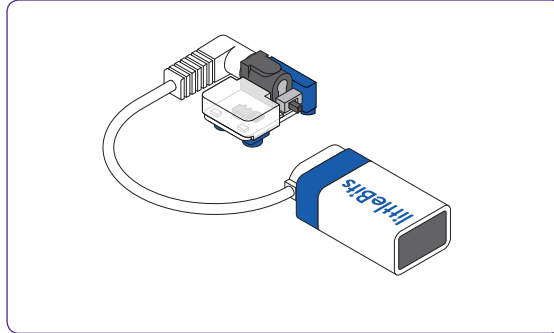
Other materials:

- Constellation viewer template
- Constellation stencil*
- Tape
- Glue stick
- Sharp objects in various sizes: thumbtacks, pencils, pens
- Scissors
- 1 piece of corrugated cardboard, cut into a 5" square

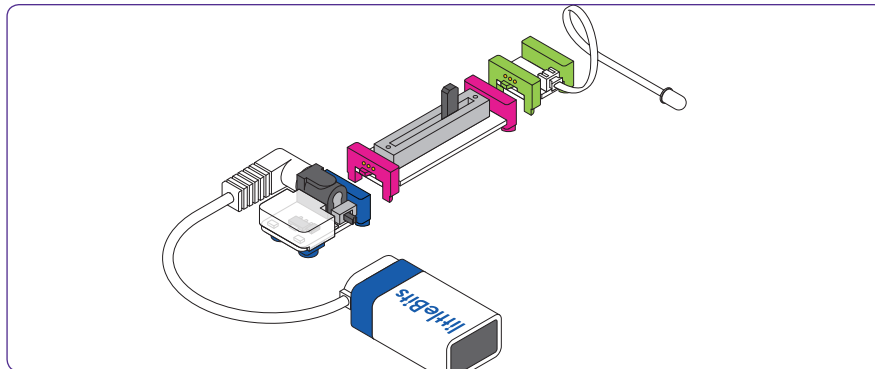
2. Attach the battery cable to the battery.



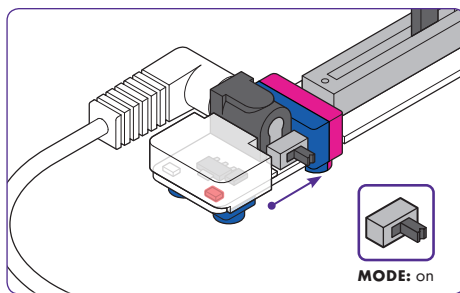
3. Attach the power Bit to the battery cable assembly.



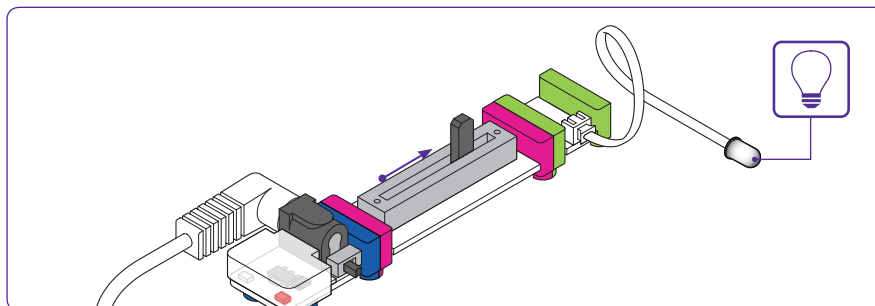
4. Snap this circuit together.



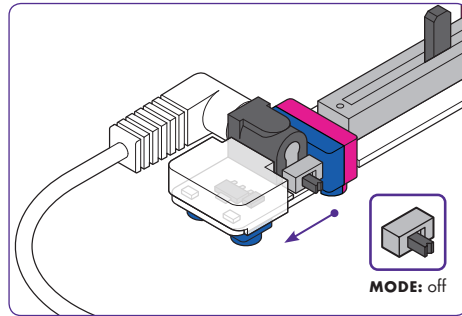
5. Let's test that your circuit works! Power on your circuit.



6. Slide the dimmer to the right. The long LED should light up.



7. Power off your circuit.

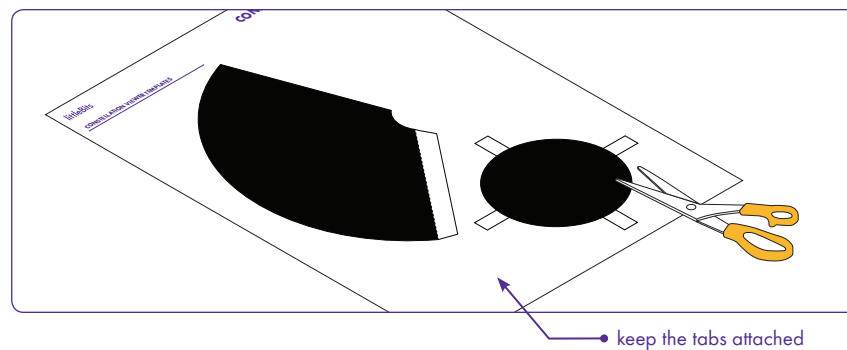


Let's create the constellation stencil

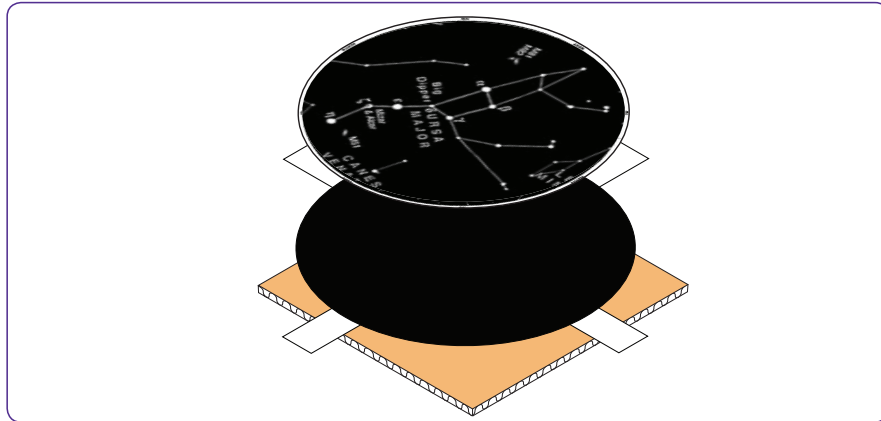
8. Cut out your assigned constellation from the stencil sheet.



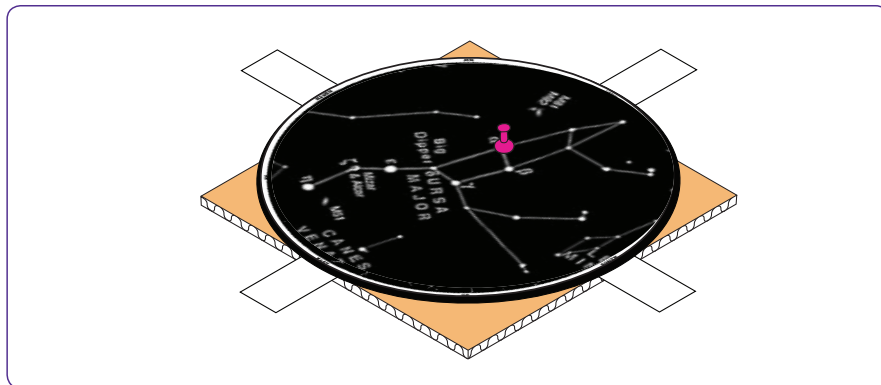
9. Cut out the circle shape from the constellation viewer template, making sure to include the tabs.



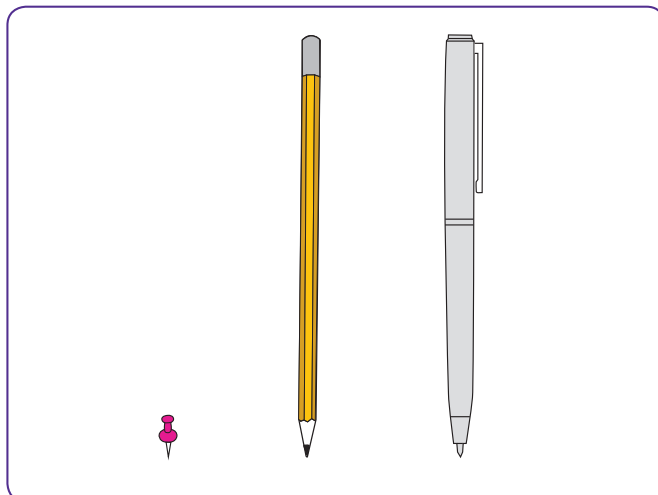
- 10.** Lay your circle template on top of a piece of corrugated cardboard. Then put your constellation stencil on top.



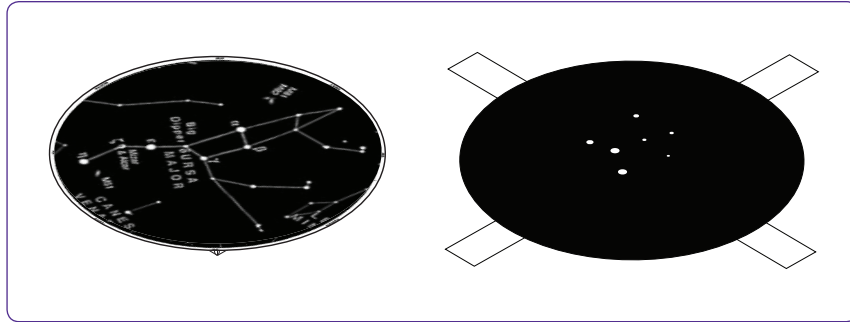
- 11.** Insert a thumbtack into one of the stars of your constellation. Leave this pin in place to secure the stencil.



- 12.** Use thumbtacks, pencils, and pens to poke holes of different sizes that correspond to the sizes of stars in the stencil.

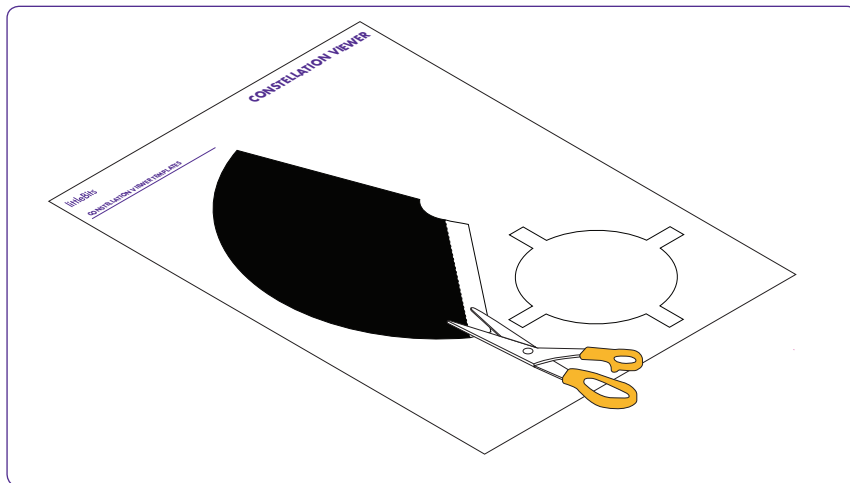


- 13.** When you are finished, remove the thumbtack and put your circle template aside for the next section.

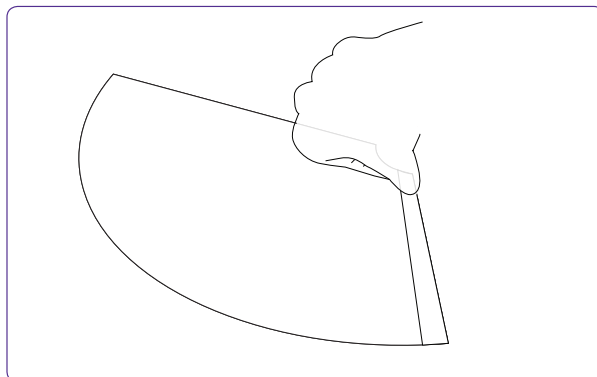


Let's create the constellation viewer

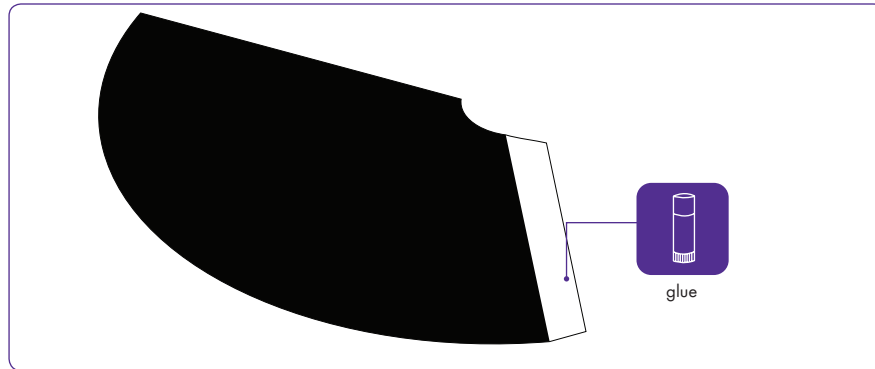
- 14.** Cut out the half circle shape from the constellation viewer template. Be sure to keep the white tab intact with your cutout.



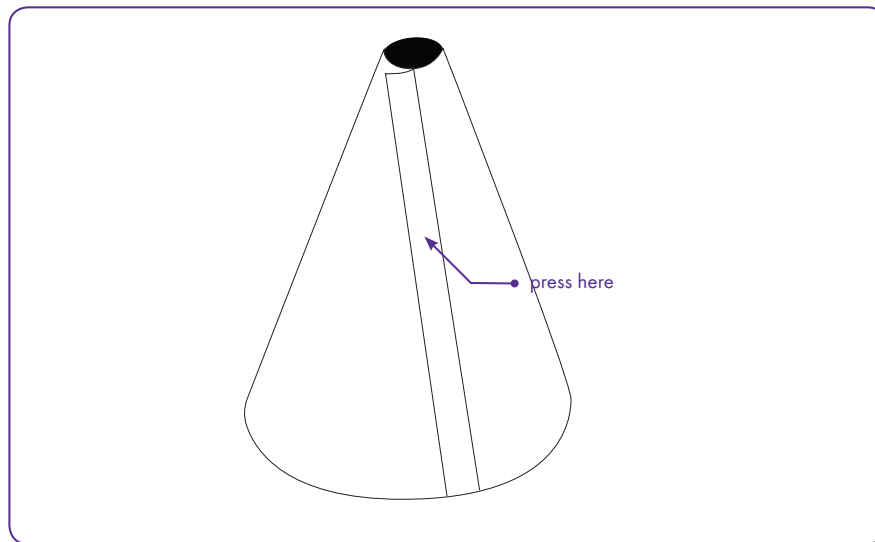
- 15.** With the black side of the template facing down, fold the flap over along the fold line.



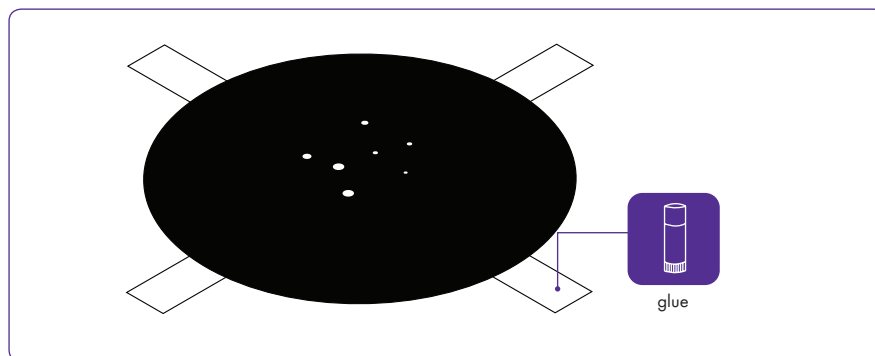
- 16.** Flip your template over and add glue to the white strip.



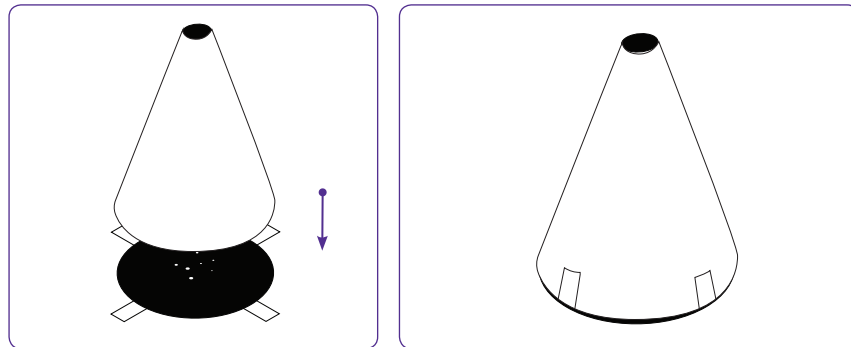
- 17.** Take the larger template and roll the paper into a cone, with the white side facing out towards you. Press the glued flap to the other side of the paper.



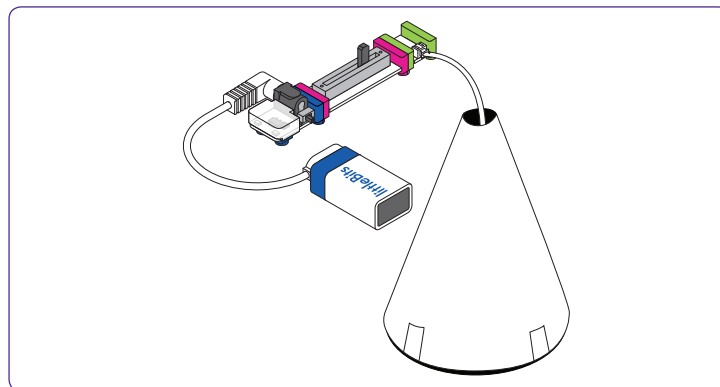
- 18.** Pick up your circle template so that the black side is facing up. Add glue to each white tab.



- 19.** Place the cone on top of the circle template. Press the four tabs to the sides of the cone to glue them together.

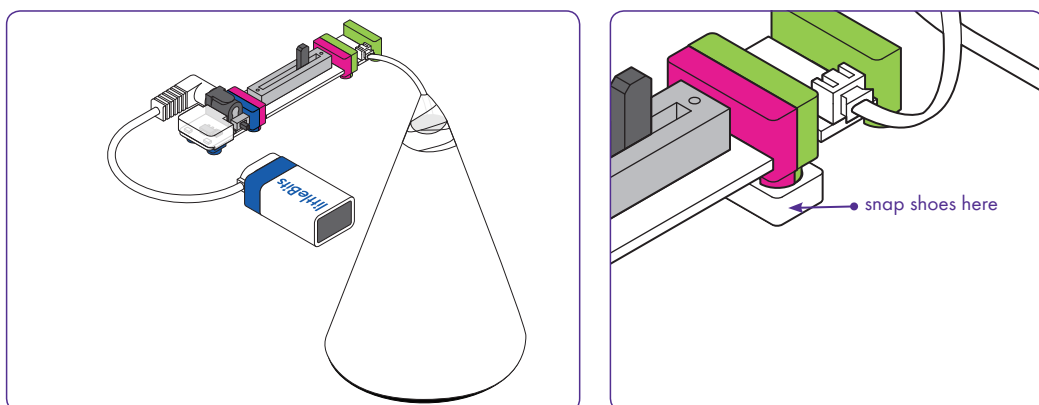


- 20.** Now stick the end of the long LED into the hole in at the top of the cone.



- 21.** Tape the wire of the long LED to the cone to block out any extra light. Voila! Now you have a constellation viewer!

TIP! If you find that the Bits in your circuit are unsnapping as you lift it, try adding shoes to the feet of the slide dimmer to provide extra support.

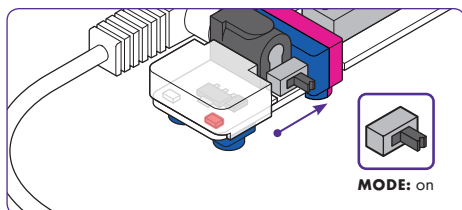




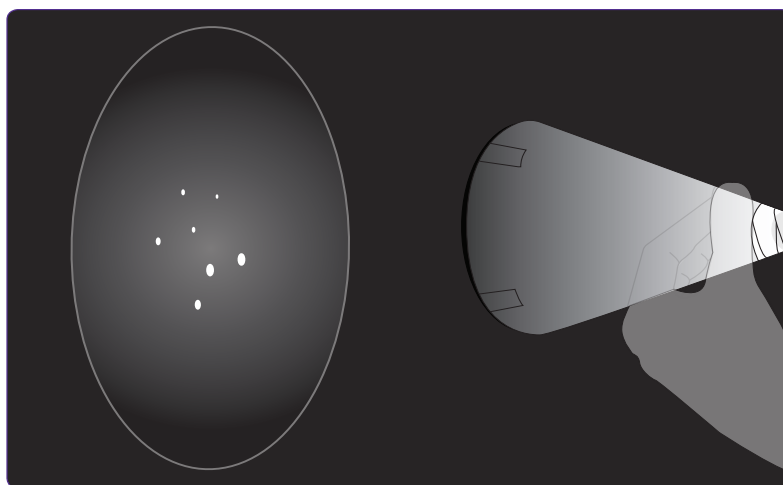
PLAY

PLAY

- 22.** Let's try it out! Turn your power Bit "on."



- 23.** Turn off the lights and point the wide end of your viewer towards a wall or flat surface to admire the night sky view.



WRITE

- 24.** Complete Writing Box #2 in your guided handout.



REMIX



WRITE

REMIX

- Complete Writing Box #3 in your guided handout.



CLEAN

CLEAN UP

- **Until next time, littleBits!** Place the Bits gently back in the box according to the diagram on the back of the Bit Index; return classroom materials to their proper place and check the area around your workstation.

littleBits CONSTELLATION VIEWER

Name: _____

CHALLENGE OVERVIEW

Let's build a constellation viewer to see a model of the stars right here in the classroom!

GUIDING QUESTIONS TO REACH LEARNING OBJECTIVES

Why do some stars appear larger/brighter in the sky than others?
What did our ancestors believe about the stars above them?



CREATE

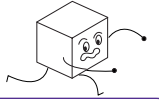
1. Why are some stars brighter than others? What star is closest to us?



PLAY

2. Looking through your viewer, draw your group's constellation below. What do you think our ancestors thought this outline was? An animal? An object? Use your imagination!





REMIX

3. How could you improve your constellation viewer? Sketch your ideas below!

