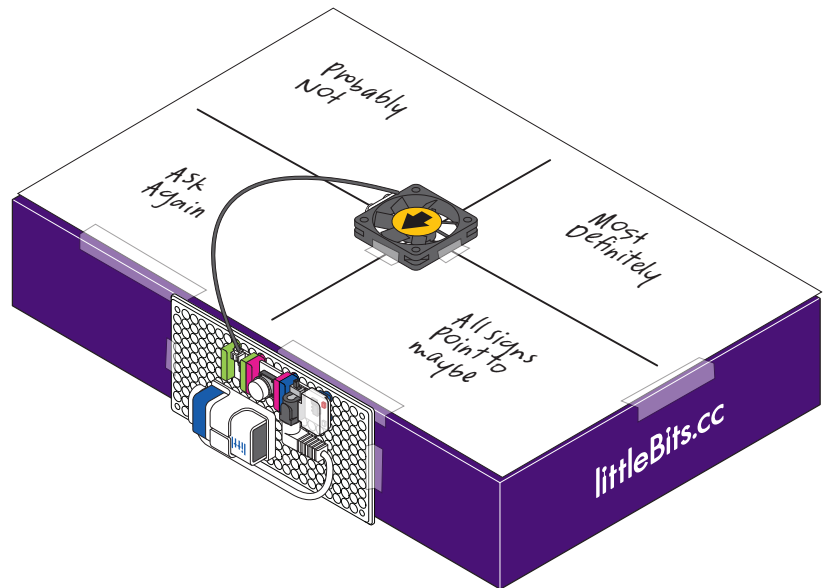


# FORTUNE TELLER



## GUIDED

### DESIGN CHALLENGE

Let's design a moving toy that uses at least three different forms of energy.



## WRITE

### EXPLORE

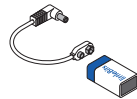
- Think of a moving toy that you have. What motion does it follow?
- Complete Writing Box #1 in your guided handout.



## CREATE

### CREATE

#### 1. Gather your invention tools.



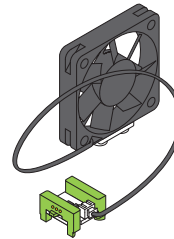
a1 battery & cable



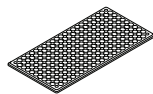
p4 power



i3 button



o13 fan



a30 mounting board

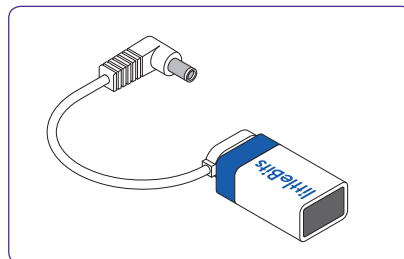
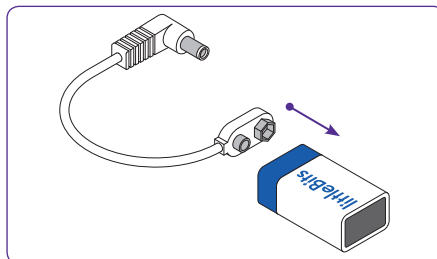


a31 battery clip

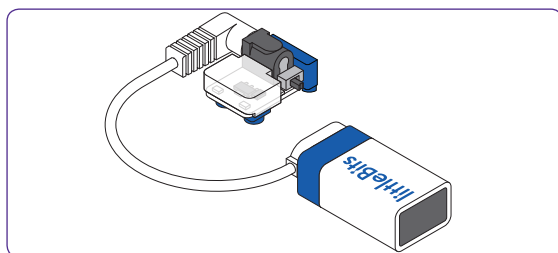
#### Other materials:

- 2 Sheets of paper
- Markers
- Scissors
- Tape

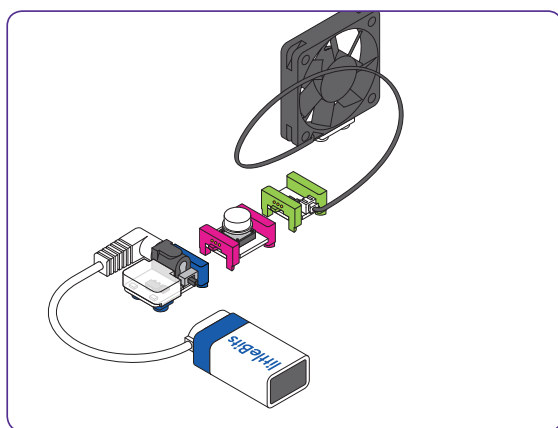
#### 2. Attach the battery cable to the battery.



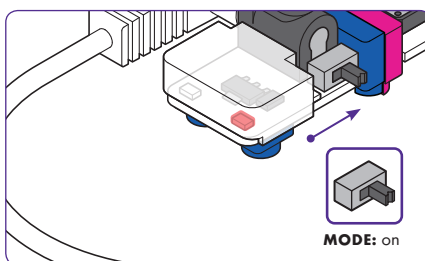
3. Attach the p4 power Bit to the battery cable assembly.



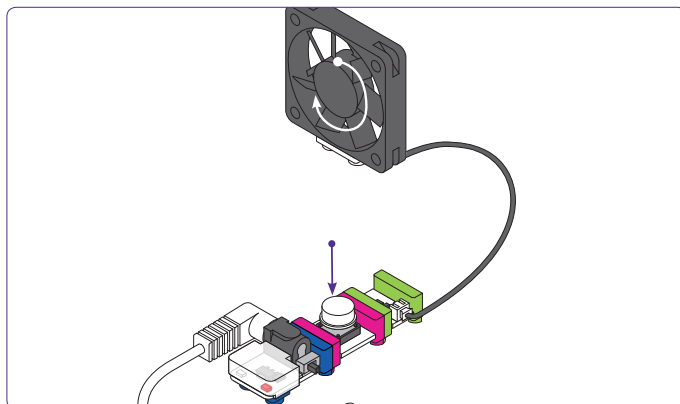
4. Snap this circuit together.



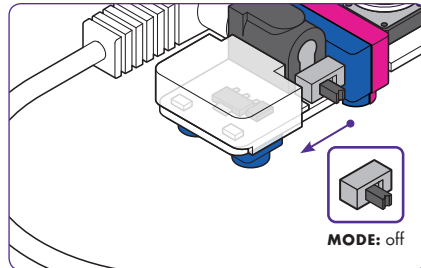
5. Let's test that your circuit works! Power on your circuit.



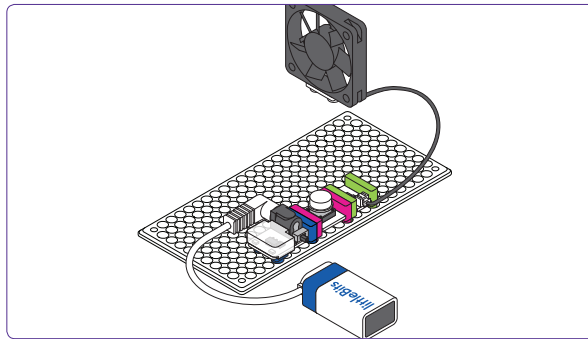
6. Push the button. The fan should spin while the button is pressed. When you let go of the button, the fan should stop.



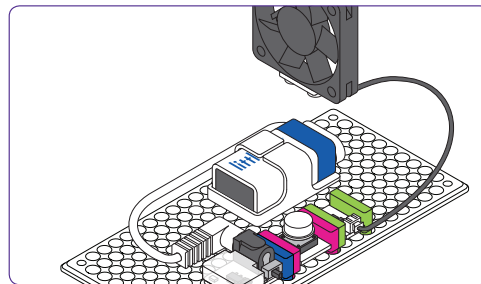
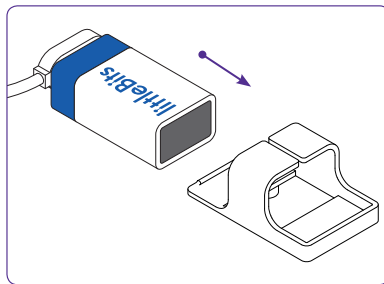
7. Power off your circuit.



8. Press your circuit into the mounting board.

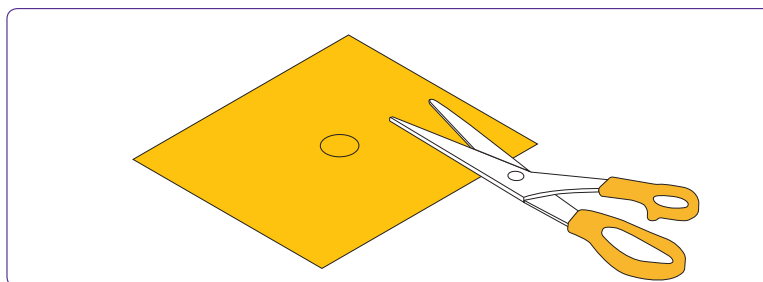


9. Slide the 9-volt battery into the battery clip and press it onto the mounting board.

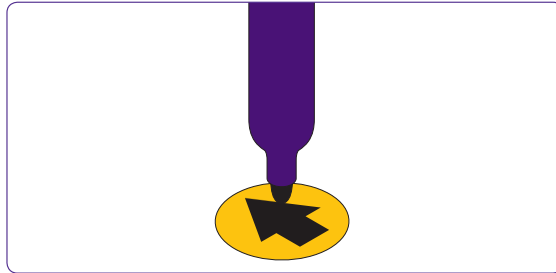


### Let's design the toy

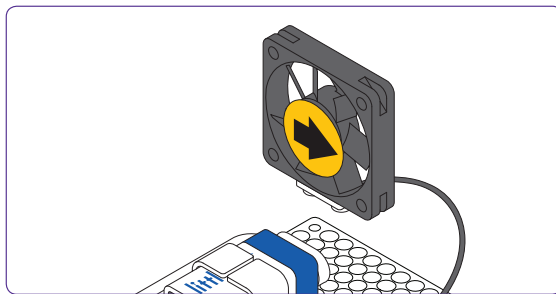
10. Use a marker or pen to draw a small circle about the size of a quarter on paper. Then cut it out.



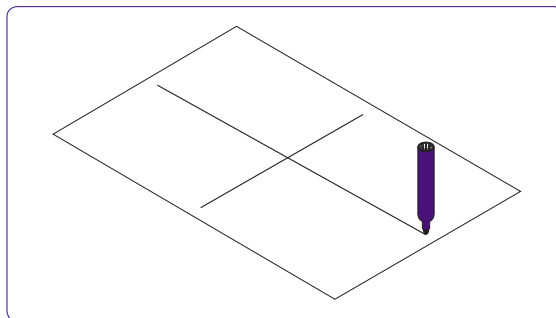
- 11.** Draw an arrow on the circle.



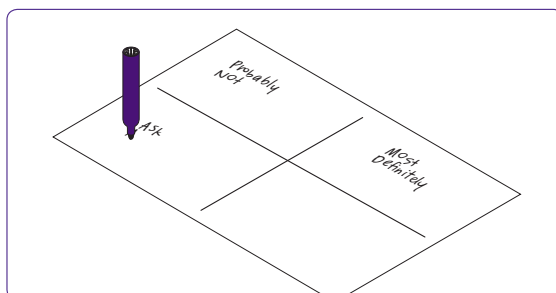
- 12.** Tape the arrow onto the center of the fan on the side that spins.



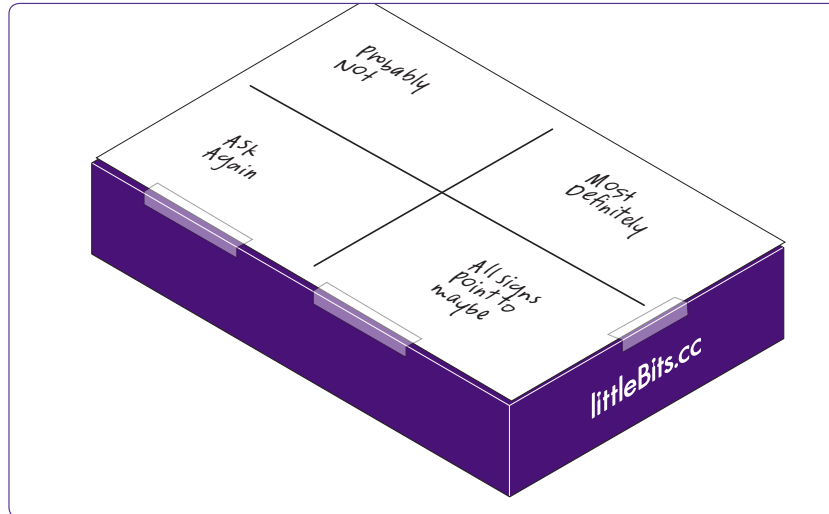
- 13.** Take a full-sheet of paper and draw two lines, one straight down and one across, to divide the paper into four equal sections.



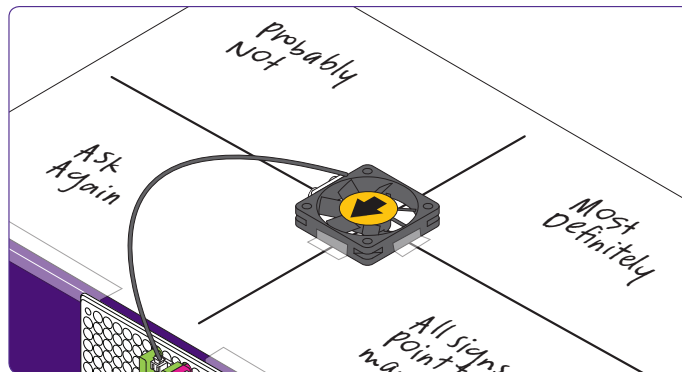
- 14.** Label each section with a different "fortune" that answers a yes/no question. Each member of the group should choose a fortune and write it in one of the quadrants.



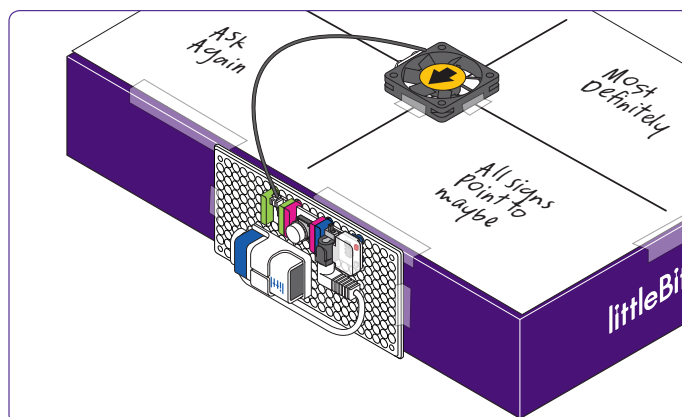
- 15.** Tape your paper to the top of the littleBits kit box.



- 16.** Use a rolled piece of tape to attach the bottom of the fan to the middle of the paper where the lines intersect. Make sure that the tape doesn't prevent the fan blades from spinning.



- 17.** Place the mounting board on the side of the box. Tape the mounting board to the box if you need extra support.



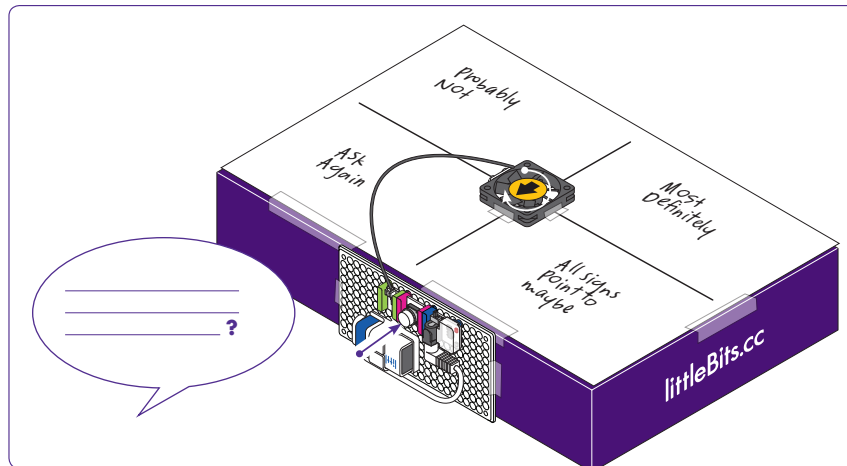


PLAY

## PLAY

---

- 18.** Test out your toy! What does your future hold? Will you be rich and famous? Will you get an A on your next science test? Let's find out! Turn your circuit on. Ask a yes/no question, press the button, and let the toy decide your fate! Take turns playing with the toy.



WRITE

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



SHARE



WRITE

## SHARE

---

- 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.

# FORTUNE TELLER

Name: \_\_\_\_\_

## CHALLENGE OVERVIEW

Let's invent a toy that can predict the future!

## GUIDING QUESTIONS TO REACH LEARNING OBJECTIVES

What types of energy can we observe in a moving toy?

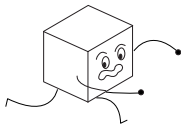


CREATE

1. Sketch and label your toy to show the different forms of energy you observe when your toy is in motion.

A large grid of dots for sketching and labeling the toy.





PLAY

2. Is all the electric energy used up by the energy of motion as the fan blades are spinning?  
What happens to the rest of the energy?

---

---

---

---

---

---



SHARE

3. What other types of energy do you observe? Sketch your circuit and label the following:  
potential energy, kinetic energy, electrical, motion, heat, mechanical, and sound.

Grid area for sketching and labeling.