littleBits MORSE CODE DEVICE



GUIDED

DESIGN CHALLENGE

Design a Morse Code device to communicate with another group.

EXPLORE



• Complete Writing Box #1 in your guided handout.



CREATE

1. Gather your invention tools.



al battery & cable

a25 wheel



p4 power

a30 mounting board



Other materials:

- Construction paper
- (any color) • Markers/Pens
- Toothpick or
- wooden skewer
- TapeScissors
- 2. Attach the battery cable to the battery.



i3 button

a31 battery clip

MORSE CODE DEVICE

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



4. Snap this circuit together.



5. Set the servo to "swing" mode.



6. Attach the circuit to one end of the mounting board as shown.



MORSE CODE DEVICE

7. Slide the battery into the battery clip and press it into the center of the mounting board.



8. Pick up a wheel and lay it on the table with the longer axle side facing up.



9. Line up the servo axle with the cross shape of the wheel and gently press together.



10. Press the feet of the servo mount into the mounting board, as shown.



MORSE CODE DEVICE

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



12. When the button is pushed down, the wheel should swing to one side, and then shift back into place. When the button is released, the wheel should stop.



13. Power off your circuit.



 Using the corner of a piece of construction paper, cut out a small "flag" to be taped on top of a toothpick.



15. Tape the flag to one end of the toothpick or piece of wooden skewer.



16. Using the remaining piece of the construction paper, cut out a half moon shape along the long edge.



 Draw a line down the center of your cut out. Write the word "Dash" on the left side and "Dot" on the right side of the crescent.



 Place the paper so that the center line is even with the servo/wheel on the mounting board.



MORSE CODE DEVICE

19. Tape your flag to the right side of the wheel, at about 3 o'clock if the wheel were a clock. Power on your circuit.





PLAY

20. Test that when the button is briefly pressed, the flag only enters the "Dot" portion, and that when held longer, the flag passes into the "Dash" area. Adjust your flag's placement if needed.





SHARE

• Complete Writing Box #4 in your guided handout.



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.



WRITE

WRITE

littleBits MORSE CODE DEVICE

Name:

CHALLENGE OVERVIEW

Let's build a Morse code device!

GUIDING QUESTIONS TO REACH LEARNING OBJECTIVES

How can we engineer a device to communicate? How can we perfect our design?



1. Why do we need codes? Name all of the reasons you can think to have a code.



MORSE CODE DEVICE





2. Now it's time to plan our message! Come up with a short phrase (no longer than ten characters—a character is either a letter or a space) of encouragement that you'll secretly transmit. Now write its corresponding Morse code!

OUR MORSE CODE

MORSE CODE DEVICE





3. Ready to decode other messages? Use the space below for your decoding!