



Electricity: Building a Telegraph

Hands-On Activity

Background Information

The original telegraph system set up by Samuel Morse back in 1837 used electromagnets and switches in a series circuit to send a signal via a system of "dots" and "dashes" instantly over a great distance. In this activity, you'll build your own visible telegraph communication system.

What You Need

- ◆ 6-volt lantern battery
- ◆ 3-volt light bulb in a socket
- ◆ 25-30 feet of insulated bell wire

What to Do

1. Start by building a long simple circuit. Place the bulb on one side of the classroom and the battery on the other. Make sure to connect both terminals on the light bulb socket but only connect one terminal on the battery.
2. To activate the telegraph, touch the loose wire to the second terminal of the battery. This should cause the light to go on at the other side of the room.
3. Divide your group in half—Senders and Receivers. Have the Senders stay with the battery and the Receivers stay with the light bulb.
4. Have the Senders complete the "Send A Message" portion of the activity worksheet and use the telegraph you've built to send a message. The Receivers should record and translate the message that is sent under "Receive a Message."
5. Now switch roles, and repeat Step 4 (meaning, send a message if you received one last time).
6. The telegraph system you have only works in one direction. What could you do to change that? Fill out "Two-Way Messaging" on your worksheet.

Building a Telegraph Worksheet

Name _____

Send a Message

What message do you want to send? First, write your message in the shaded squares, placing one letter in each box. Then, translate each letter into Morse Code using "Know the Code," and write it in the box below the letter.

- ◆ To send a dash, hold the battery connection for one full second.
- ◆ To send a dot, just touch the battery connection and remove it immediately.
- ◆ Pause two full seconds between letters and four full seconds between words.

text									
code									

text									
code									

text									
code									

Receive a Message

What did you hear? First, write the code in the shaded squares. Then, translate the coded message into text using "Know the Code."

code									
text									

code									
text									

code									
text									

Two-Way Messaging

How could you modify your telegraph system so that it works in two directions? What additional components would you need?

Know the Code

Samuel Morse demonstrated the first successful long-distance telegraph system in 1840. He strung a line from Washington, D.C., to Baltimore, Maryland, and sent the message, "What hath God wrought?" Because the early telegraph could only send clicks, Morse had to first develop a code system to translate a message to and from English. He actually developed his "Morse Code" in 1838, using a system of dots and dashes to spell out individual letters.

A	• —	T	—
B	— • • •	U	• • —
C	— • — •	V	• • • —
D	— • •	W	• — —
E	•	X	— • • —
F	• • — •	Y	— • — —
G	— — •	Z	— — • •
H	• • • •		
I	• •		
J	• — — —	1	• — — — —
K	— • —	2	• • — — —
L	• — • •	3	• • • — —
M	— —	4	• • • • —
N	— •	5	• • • • •
O	— — —	6	— • • • •
P	• — — •	7	— — • • •
Q	— — • —	8	— — — • •
R	• — •	9	— — — — •
S	• • •	0	— — — — —