# STEM in the PARK™

Science, Technology, Engineering, and Mathematics

# How do you
# "tele"-communicate?

### *History:*

Early forms of distant communication include smoke signals, pony express riders, and maritime signaling flags. The telegraph significantly changed the speed at which people could communicate. Telegraph wires were strung on poles along the railroad tracks, upon which signals were sent via the telegraph key.

During the Civil War Abraham Lincoln used the telegraph daily. His commanders could communicate via telegraph giving updates in "real time." Orders could be given and troop movements could be followed. Later in history, people were able to communicate using telephones over wires strung on the telegraph poles. Then came radio, television, fax, internet, satellite, and wireless communication!

In 1837 **Samuel Morse** developed and patented the first electrical telegraph in the U.S. He sent his first message across two miles in 1838. In 1844 he set up his long distance system from Washington D.C. to Baltimore, Maryland.

## *Design of the Telegraph:*

The telegraph is an electromagnet connected to a battery via wires to a switch (key). This electrical device is used to transmit signals to a distant location. Morse invented a key (switch) that could create long and short pulses of electric current by tapping the key to create a short pulse (dot) or a longer pulse (dash). When the current is connected, there is sound. When the current is broken, there is no sound.

Morse Code, also developed by Samuel Morse, uses a combination of dots and dashes to represent the alphabet and numbers. **SOS (Save our Ship)** is the universal code of distress.  If you can tap out the letters "SOS" on any object to make a sound, or flash a light, using the short (dot) and long (dash) signals, you may be able to communicate with others who could to come to your aid.

## *Explore:*

Use the Morse Code
(shown on right) to tap out "SOS"
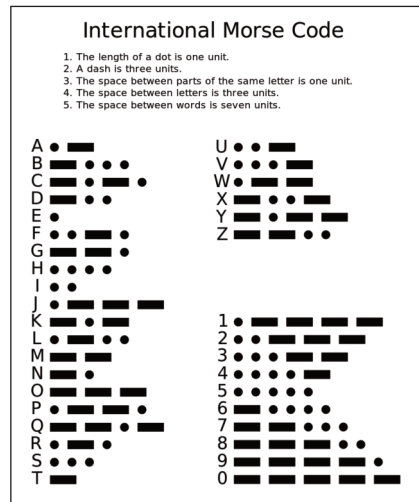
Tap out your name

Tap out a message for a
friend to decode

## *Investigate:*

Use the internet to find out more about telegraphs and telecommunications.

How could learning Morse Code help in our high tech society?

Visit **http://www.w1tp.com/perbuild.htm** to learn more about the science behind the telegraph, and learn how to build your own telegraph.

### International Morse Code

1. The length of a dot is one unit.
2. A dash is three units.
3. The space between parts of the same letter is one unit.
4. The space between letters is three units.
5. The space between words is seven units.

A • ▬
B ▬ • • •
C ▬ • ▬ •
D ▬ • •
E •
F • • ▬ •
G ▬ ▬ •
H • • • •
I • •
J • ▬ ▬ ▬
K ▬ • ▬
L • ▬ • •
M ▬ ▬
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Q ▬ ▬ • ▬
R • ▬ •
S • • •
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U • • ▬
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1 • ▬ ▬ ▬ ▬
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*This activity is brought to you by the Maumee Valley Historical Society*