

Telegraphy

Guglielmo Marconi invented wireless telegraphy in the late 1800s, but it was in 1901 that he was able to send radio signals through the air over great distances. Marconi had studied sound waves for many years. He created the wireless telegraphy and was successful in sending radio waves across the Atlantic Ocean, a distance of more than 2,000 miles (3,200 kilometers). The messages that Marconi sent were in Morse code, a method of communication using dots and dashes or short and long clicking sounds which represent letters of the alphabet.

Communication Web

Ask your students to think about the ways people communicate today. How do we send messages to people we know? How do we gather information about people and events in other countries? Create a communication web by drawing a large circle labeled “Communication.” Draw lines radiating from the circle and at the end of each line, write a different form of communication we use in daily life, such as the telephone, the television, the radio, letters, newspapers, and magazines.

Impact of the Invention

Ask your children to share why they think the wireless telegraphy was an important invention. How did people communicate before this invention?

How Radio Waves Work

Demonstrate to your students how radio waves behave with the following activities:

- Tie a length of rope to a stationary pole (such as a tetherball pole). Holding the free end of the rope, manipulate it so that the rope continually moves in an “S” shape.
- Line up six croquet balls (one behind the other) for this experiment. Hit the end ball with a croquet mallet. Observe how the ball at the opposite end moves off while the others stay in place.
- Fill a shallow pan with water. Drop a marble into the center of the pan and watch the waves ripple outward from the center of the water. This can also be done by placing a clear glass or plastic pan of water atop an overhead projector. All children will be able to see the water ripples on the screen.

Sound Investigations

Have children work in pairs to investigate sound.

1. Find out which travels faster, light or sound. How fast do they travel? How fast do radio waves travel?
2. Conduct experiments to find out if sound can travel through water, walls, tables, soft materials, etc. Record your results and share your findings with your classmates.



Telegraphy (cont.)

Morse Code

Learn to read and write messages in Morse code. Use the chart below to read the messages on page 27. Substitute the dashes and dots for each letter in a word.

A ● —	B — ● ● ●	C — ● — ●	D — ● ●	E ●	F ● ● — ●
G — — ●	H ● ● ● ●	I ● ●	J ● — — —	K — ● —	L ● — ● ●
M — —	N — ●	O — — —	P ● — — ●	Q — — ● —	R ● — ●
S ● ● ●	T —	U ● ● —	V ● ● ● —	W ● — —	X — ● ● —
Y — ● — —	Z — — ● ●	1 ● — — — —	2 ● ● — — —	3 ● ● ● — —	4 ● ● ● ● —
5 ● ● ● ● —	6 — ● ● ● ●	7 — — ● ● ●	8 — — — ● ●	9 — — — — ●	0 — — — — —
period ● — ● — ● —	comma — — ● ● — —	? ● ● — — ● ●	SOS ● ● ● — — — ● ● ●		Start — ● —
End of Message ● — ● — ● ●	Understand ● — ●		Error ● ● ● ● ● ● ● ●		



Telegraphy (cont.)

Directions: Use the Morse code on page 26 to discover each of the following messages. Write your own message in the box at the bottom of the page.

Message 1:

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Message 2:

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Message 3:

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—•• • •— •—•
•— •— — ••• —— —•
 •—•—•

Write your own message.

Answer Key

Page 23

1. Mercury
2. Pluto
3. Mars
4. Venus
5. Saturn
6. Earth
7. Mars
9. Mars
10. Jupiter
11. Mercury
13. Mars
14. Jupiter
15. Venus
16. Jupiter
18. Mercury
19. Earth
20. Venus
22. Uranus
23. Pluto
25. Jupiter
26. Neptune
27. Saturn
28. Venus

Page 27

1. Say no to drugs.
2. Learning science is fun.
3. Elementary my dear Watson.

Page 37

Primary sources of carbohydrates: butter cookies, doughnuts, pasta, pancakes, bread, rice, candy bars, crackers

Pages 49 and 50

- refrigerator—1900s
 portable camera—1900
 air conditioner—1911
 fax machine—1930s
 Xerox® machine—1940s

- electric oven—1900s
 microwave oven—1967
 pocket calculator—1970
 personal pager —1970s
 personal computer—1975

Pages 51–53

1. microwave oven
2. Xerox® machine
3. pocket calculator
4. personal pager
5. personal computer
6. refrigerator
7. electric oven
8. answering machine

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1. A dog used for photography by advertising.
2. England
3. Chipper
4. RCA
5. Accept reasonable answers.
6. Accept reasonable answers.
7. “His Master’s Voice”
8. Accept reasonable answers.

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