




FACILITATOR GUIDE


Draw a Radio Text Message

A Sherry sends a text "LOL" to Darrell.

How does a text message travel from point A to B? Explain, write and/or draw your understanding.



B Darrell gets the message from Sherry



Name: _____ Date: _____

Learning Objectives

1. Make learner's initial ideas about how radio communications work visible.
2. Use this drawing activity to generate ideas to be discussed that lead to questions learners will want to investigate.

Activity Goals

- Elicit learners initial ideas about radio
- Encourage learners to share their ideas with their peers
- Encourage learners to engage with their peers' radio ideas
- Build strong social relationships between learners in the class

Materials

Prepare the following for each learner:

- Draw a Radio Text Message sheet (printable PDF, 11" x 17")

- Pencil, pens or markers

Activity Procedure

Make learners' ideas about radio communications visible:

1. Ask the following prompts to get learners thinking about messages:
 - a. Who has sent a text message to a friend or family member?
 - b. How far would you say the other person was when you sent that message?
 - c. What do you think needs to happen for the message to travel from your phone to your friend's phone?
2. Hand out the sheet to each learner.
3. Ask learners to draw and explain on their paper individually how they think a text message can travel from one person to another.
4. After learners are done, ask learners to share their models with a partner. Ask them to use a colored pencil to write ✓ next to ideas that both models share, and ? next to ideas that are different or unclear in their peer's model.
5. The ideas learners include in their model will be the basis to develop a group consensus model. See the **Deconstruct the Communication System** Facilitator Guide for how to build this model.
6. If you want learners to deep their understanding about radio and how radio communication systems work, show them the following videos:
 - a. [What the Physics? The Physics Behind Texting.](#)
 - b. [How does your cell phone work](#)
 - c. [What is Radio](#)
7. Collect the sheets at the end of class. Tell learners we will be revisiting these models after we learn more about how phones and radio work.

Notes to the Presenter

- Consider using the sheet as a pre/post assessment of their radio models. Bring the sheets out again after an activity where learners explored radio-related ideas. Using a different color pen, have learners add some of their ideas to their model. This model will help learners track the progress of their understanding.
- Consider sharing the **Lifespan of an LOL sheet** as a take home learning resource.

Supporting Equitable Participation

Some learners may shout out answers during the class discussion. Resist the urge to call on them more than once to allow others to join the discussion. Honor all ideas even if they might not fit the ideal model of radio communication. While building this model with a class, do not judge the accuracy of learners' ideas. Instead, use the following prompts to highlight areas of confusion or disagreement:

- a. Who has a similar idea?
- b. Who has a different idea about_____?
- c. Who can say in their own words what Franky said?

Tips for facilitating with younger participants:

Encourage learners to use a pencil instead of pen to draw their models. Mistakes made by pen are difficult to remove from the model, which might discourage learners from trying out different ideas.

Conversational Prompts

- How does the message go from your cell phone to someone in your neighborhood?
- How do you think a text message travels when it goes to the other side of the world?
- What is different when the distance between the sender and receiver is larger?
- Do we think the message travels straight from one device to the next?
- What can affect whether we can send and receive messages?

Content Background

Text messages primarily rely on terrestrial cellular networks to send information. Here's how it works:

Digital Conversion: Your phone converts your text message into digital data packets.

Radio Wave Transmission: The phone's antenna transmits these packets as radio waves to the nearest cell tower.

Network Routing: The cell tower relays the signal through a network of interconnected base stations and switching centers, seamlessly transferring you between towers as you move (a process called "handoff").

Delivery to Recipient: The signal ultimately reaches the cell tower closest to the recipient's phone.

Reception and Conversion: The recipient's phone receives the radio waves, decodes the data packets, and converts them back into the original text message.

Satellite involvement is rare. While most cell phones don't use satellites for texting, specialized satellite phones can connect directly to orbiting satellites, often used by the military and in remote areas.

Collaboration and Regulations: Cellular companies and satellite providers work together within regulatory frameworks to ensure seamless communication. This involves balancing technological advancements with business strategies and compliance with regulations.

Use these videos for more information about radio and how radio communication systems work:

- [What the Physics? The Physics Behind Texting.](#)
- [How does your cell phone work](#)
- [What is Radio](#)

List of Terms Related to this Activity

Radio wave: an electromagnetic wave used for long-distance communication. This wave transfers energy from one place to another through a series of pulses or repeating disturbances. Its frequency is between about 10^4 and 10^{11} or 10^{12} Hz.

Cell phone tower: Also known as cell sites or base stations, these are typically tall structures designed to support many antennas for telecommunications and broadcasting signals to enable cell phones and telephones to work. They work by transmitting and receiving radio frequency (RF) signals to and from mobile devices, such as cell phones and tablets.

Satellite: This is a piece of technology that is sent into space and rotates around our planet. Satellites can carry telecommunications equipment to enable global communication systems.

Communication Network: A group of technology devices, wires, towers, and/or stations that are connected together for communication. Telephone poles connect wires to send signals. Computers connect to each other through radio waves and wires to communicate data electronically.



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