YES I CAN..NO YOU CAN' T

Purpose: The objective of this activity is for the students to identify the major components of the wireless communication system and relate those components to the components of human communication as defined in this curriculum

Overview: The background of wireless technology has been explored in earlier lessons and human communication has been defined. The next step is to connect the two concepts. In this activity, students construct a telephone from tin cans and string or wire. One can is the transmitter or input device, the wire or string is the medium used for transmission, and the other can is the receiver or output device. This simple activity, though not technically a wireless system, provides an opportunity for the students to make a communications device that parallels the components of an actual wireless system. Don' t let the simplicity of the device distract you from the complex concepts that can be explored and demonstrated.

Time: One half hour to prepare materials before class, one class period to construct the can telephones and to put them to use, one class period to review and discuss student observations.

Skills Required:

Collaboration
Speaking
Cognitive synthesis

Materials and Tools:

Clean soup cans with appropriate sized holes drilled in the can bottoms to accept the string, cord, and wire.
Heavy cord, wire, or string

Preparation: Have the cans and varying lengths of string or wire prepared before class. Review the concept of human communication and its component parts. Within that context, review the basic components of a wireless system and discuss the considerations that go into the design and development of a wireless system. Stress to the students that although the activity is technically not a wireless system, they will be exploring all the components, design, and development considerations of a real wireless system during the activity.

Background:

Now You' re Talking pages 8.4 – 8.8

What to do and how to do it:

1. Divide the class into groups of at least three students.

2. Provide the students with a transmitter can, a receiver can, and the medium (wire or string). The length of the strings should vary to provide different media used by the groups. For example: long, medium, and short lengths; course, smooth, and knotted; thick or thin string or wire, or insulated and bare wire.

3. Instruct the students in a way to make a secure knot in the wire or string inside the can.

4. Instruct the students to explore the capabilities of their can telephone system:
   - By varying tension on the string.
   - By varying tone of voice used.
   - What is the difference between normal conversation and a singing voice?
   - What are differences between sending information by voice versus sending simulated tones of a code?
   - What are differences between voice and music, and how does the can telephone affect music quality?
   - Try to send messages around a corner.
   - Have students hold the wire or string at various places along the string and see how it influences the effectiveness of the can telephone.
   - Try crossing two can telephone systems by firmly connecting the wires or strings in the middle to see if the students can create a "party line" or chat room.

Data Analysis:

Students can be assigned to make anecdotal comments and observations about each of the variations suggested by the teacher.

The quality or the variations (listed in 4 above) of the can be quantified by using a scale of 1 to 5 to provide statistical data.

Activity questions:

1. What is the relationship between the cans and the wire or string to a basic wireless system?

2. How do the component parts of the can telephone relate to the components of human communication as defined in this curriculum?

3. What are some of the limitations of your wireless system? How can you overcome those limitations? How can you overcome those limitations?

4. What are some of the strengths of your wireless system? Could you envision using your system in you home, classroom, or school?

5. Do you think that similar systems are actually being used today?

6. Pretend that you and your brother or sister are being punished by your parents by being sent to your adjacent rooms. Devise a wireless system that you might be able to use to communicate with your sibling while in " solitary confinement." Your system would have to use items normally available in your room.

Adaptations for special needs: Only minor accommodations for the hard of hearing may have to be considered for this activity. Instead of sensing a voice transmitted though the system through hearing, hard of hearing may be able to sense the audio vibrations through the sense of touch. As a learning experience, students may be tasked to develop changes to the activity to make accommodations for the hard of hearing.