

## **CAN YOU HEAR ME NOW?**

To introduce this topic, ask students if they can identify the product being advertised on television with this saying. Providing the commercial runs in your area you might know that this is used in a cell phone company's advertisement. Once the product is identified then ask students to tell how this product is used. They will probably say it is used to talk to someone a long distance away.

Write the word "communicate" on the board. Ask students if they can define the word (the process of sharing information). Once you have established the meaning of the word, then ask students to identify some ways we communicate in this classroom. Examples might include: talking, body language, written work, art work, school bells, television, computers, and phones.

Try a few demonstrations to discover how information is sent from one object and received by another. One possibility is to show students a radio controlled vehicle. Demonstrate how the vehicle works and then ask students to explain how we can control the actions of the vehicle. How do we communicate with it? Point out to students the point on the control where the signal is sent out and the point on the vehicle where the signal is received.

Another good demonstration to do would be using a television and a remote control. Again demonstrate how it is used and next identify the source of the signal and the point on the television that receives the signal. Allow children to use the remote to send a signal to the television to change channels. Next place tape over the receiver on the television and have the children try to use the remote to send a signal to the television. At this point you can explain that the transmitter sends out a signal in the form of a wave. The receiver receives the radio wave and decodes the message.

Another possible demonstration for this would be the use of a baby monitor. By placing the monitor in another classroom children can listen to a message being sent to them by a student. Again this works because a transmitter takes a message encodes it onto a sine wave and transmits it with radio waves. The receiver receives the radio waves and decodes the message from the sine wave it receives. Both use antennas to radiate and capture the radio signal. Communication is the sharing of information. At this point you can point out to students how vital that sharing is when an operator on Earth is trying to communicate with an astronaut in space.

Remember Valesare? Ask students how she was able to communicate with Commander Fraser and the people on Earth. Older students might find it enlightening to watch the film “Apollo 13” to better understand the importance of radio waves and communication.

Younger students might benefit from the following activity:

Materials: 1- inch square foam tiles-use at least four different colors, giving each team of two students 40 tiles, 10 of each color (For three dimensional designs use colored blocks-omit the grid.)  
1- container with lid per team (I used Dunkin Donut containers measuring 8 inches x 12 inches x 2 inches that opens on three sides allowing the back to be used as a screen.)  
1- grid of 80 one inch squares, these squares can be numbered (The grid is placed into the bottom of each box prior to the activity.)

Directions: Once again explain to students the importance of communication. Tell them you are going to ask them to create a design in their box using the tiles you have given them. You will not necessarily use all 40 tiles in the design. Explain to them the

importance of listening carefully and tell them directions will only be repeated three times. Students will be unable to see the design you create because the top lid of the box you are using acts as a screen blocking the view of the students. If you choose not to number the squares in the grid be certain students understand orientation of left and right.

Using various colored tiles begin giving students building directions specifying color and placement of the tiles. Children can work in teams of two following directions and completing the design. Shapes can be squares, triangles, rectangles or any abstract design you choose. When you are finished show your design and compare the students work to the original. Finally, have each team take turns communicating a design of their choice to their other teammate.

Another possibility would be to use a baby monitor. Place the receiver in your classroom and the transmitter in another room. Have a student give design directions in the other classroom using the transmitter.

Upon completion of the activity, discuss the importance of communication in building their designs. Ask students how this would be important in space exploration.

