Communication Through Codes (Symbols)

Purpose: The objective of this activity is to allow the students to learn the fundamental concepts that are involved in developing codes to be used for communication. The students will utilize codes that they have developed to communicate with other students.

Overview: During class presentation, students have learned that human communication is the transfer of information to others through various media using recognized, agreed upon symbols (codes). The information must be encoded into a code that: 1. can be transmitted through the media, 2. can convey the essence of the meaning of the information, and 3. must be mutually agreed upon by the participants in the communication so that the code can be de-coded back into the information as accurately as possible.

Time: Two class periods. One class period to discuss the fundamental concepts needed in code development and time for student groups to develop their own code. One class period to practice sending messages within the group using their code and attempts to communicate between groups that do not share the common knowledge of the code.

Skills Required:

Problem solving
Group cooperation and consensus building
Writing
Creativity
Empathy

Materials and Tools:

No special tools required. Consideration for the type of media the groups select for transmitting the message (light, wireless technology, sight, sound, writing, pictures, gestures, touch) may require additional equipment to accommodate transmission method.

Preparation:

Review the codes covered in the class presentations (Morse, binary, ASCII, Braille, sign language), the components of each code, their unique qualities, information intended to encode, how the receiver is intended to decode, the media over which the code is intended to be transmitted, and other significant items of interest.

Encourage students to lead a discussion of the types of codes that they already use daily. This is a good opportunity to point out the unique vocabulary used by generations that are not common in other generations. Many words used by parents and grandparents are foreign to today' s students just as language used today puzzle their elders.

Encourage the students to develop their own unique code and attempt not to mirror existing codes. One tactic might be to encourage them to develop a code that cannot be ' broken' by their fellow students.

Background:

Now You're Talking pages 6.4- 6.9

ARRL Handbook, pages 30.27-30.29

Binary code:

http://www.tekmom.com/buzzwords/binaryalphabet.html
http://www.afb.org/braillebug/

Baudot Code:

http://www.dataip.co.uk/Reference/BaudotTable.php

Morse Code:

http://www.babbage.demon.co.uk/morseabc.html
http://www.kluft.com/~ikluft/ham/morse-intro.html
http://www.soton.ac.uk/~scp93ch/morse/index.html?http://www.soton.ac.uk/~scp93ch/morse/trans.html

ASCII:

http://www.asciitable.com/

Braille Code:

http://www.uronramp.net/~lizgray/codes.html

Sign Language Code:

http://commtechlab.msu.edu/sites/aslweb/browser.htm

What to do and how to do it:

1. Divide the class into small groups.

2. Task the students to develop an unbreakable code to communicate a message. Provide as much guidance on media, method of transmission, and type of code as deemed necessary. Mature groups can be left very much to their own devices to develop a code.

3. Provide a unique message for each group to use to develop their code. Messages that are group specific would be most intriguing for cross group decoding to be attempted later.

4. Once the groups have developed their code, give them a second message for some members of the group to encode that other members of the group will decode.

5. Have the groups share their original encoded message among groups and ask the groups to decode each other's messages.

6. Once groups have been exposed to each other's codes, have the groups communicate simple ideas with each other using a modified code created from both groups' codes.

7. Task the groups or individuals to write a reflective journal on the experience that will be shared during class discussion.

Data Analysis: The data collected from this activity will be anecdotal student comments on the experience. Some statistics may be gathered on success rates using the codes to relay information by measurement of error rates and also how successful groups were in 'breaking' other codes.

Activity questions:

1. Did the code your group developed meet the content needs of the message assigned to be relayed, the media chosen for the communication, the speed and timeliness required, the accuracy, the consensus that the code is agreed upon by all in the group?

2. Will your code work for other messages and other transmission media?

3. What are the similarities and differences between your code and the code developed by other groups?

4. Were you able to decode another group's code? Why or why not?

5. Was the code that you developed by combining the codes of two groups better or worse than the individual codes? Why or why not?

Adaptations for special needs: This activity would be more powerful if students with special needs are participants because it will cause the student groups to consider the abilities and limitations of all participants in developing their code. Students with special needs bring into the group their own unique experiences in dealing with codes developed for the general population.