

Decode the Message



Learning Objectives

1. Introduce the idea of coding and decoding a message.
2. Practice effective communication and teamwork as they decode and share messages with their peers

Activity Goals

- Grasp the concepts of coding and decoding messages by actively participating in an icebreaker activity

Materials

- Printable sheet of codes
- Pencils

Safety

- N/A

Advance Preparation

Prepare two coded messages. Ideally, both messages should be related to one another. In this case, the first message is a question and the second is the answer. This is an example of two encoded messages about radio:

	Encoded message	Decoded message
1	Xifsf bsf sbejp tjhobmt ?	Where are radio signals?
2	Bmm bspvoe vt, bmxbz	All around us, always

Print a sufficient number of coded messages so that half of the class can access one coded sentence while the other half can access the second sentence.

Activity Procedure

1. **Introduce Encoded Messages:** Tell the learners that you have a couple of written messages, which are special because they are encoded.
2. **Discuss the Word "Code":** Ask some learners if they have heard of the word "code." Discuss all answers.
3. **Demonstrate Encoding with a Simple Word ("bus" to "cvt"):** To help learners understand what a code is, choose a short word, such as "bus," and write its coded version on the board: "cvt."
4. **Introduce the "One Letter Back" Decoding:** Inform the learners that these letters represent an english word that was encoded using the "one letter back" code. Demonstrate how to find the original word using this code. Ask, "What letter comes before 'C' in the alphabet?" Learners should respond with "B."
5. **Write the Decoded Letter:** Write the letter "B" below the letter "C" and continue with the second letter by asking, "What letter comes before 'V' in the alphabet?" Learners should say "U."
6. **Continue the Decoding Process:** Write the letter "U" below the letter "V." Then ask, "What letter comes before 'T' in the alphabet?" They should say "S." Write this letter below the letter "T."
7. **Define the term decoding:** After the demonstration, define the term decoding to the group. You can say something like, "*The process of converting back the coded message to its original form is called decoding*". Explain that there are many codes out there, and

provide a couple of real life examples, such as the barcodes in products to identify products, or the binary code used by computers.

8. **Ready to Play:** Now that they understand how to use the code, inform them that they are ready to begin the activity.
9. **Pair Learners:** Organize learners in pairs. Give half of the pairs one of the coded sentences, and the other half the other coded sentence.
10. **Explain the Goal:** Tell them that these sentences have been encoded, and their goal is to decode the message. Also, mention that both messages are connected – one is a question, and the other is the answer – so they will need to decode both to make sense of them.
11. **Set a 5-Minute Timer:** Their initial instinct might be to use the "one letter back" code, but they will quickly realize that this is not the right code. If some pairs feel that the task has no solution, encourage them to try a different coding system. Most learners will identify the correct way to decode the message.
12. **Pair learners with matching decoded messages:** As learners finish, pair those who have decoded the question with those who have decoded the answer. Let them read each decoded message to each other.
13. **Create your own code:** Have learners work individually or in small groups to create their own secret code system. They can invent rules for encoding and decoding messages. Encourage them to be creative with symbols, letters, or numbers. Once they have developed their codes, learners can exchange coded messages with their peers and challenge each other to decode them. This exercise not only reinforces their understanding of coding and decoding but also promotes creativity and critical thinking.
14. **Define the term coding:** Explain that transforming a message using a code is known as coding. Help them understand that they created codes to be able to transform messages into different types of symbols and representations.
15. **Debrief ideas about coding and decoding:** Have a discussion using the following prompts:
 - a. Can you explain the difference between coding and decoding in your own words? How are they related?
 - b. What would be the characteristics of a good code used for communication?
 - c. Why would people use coded messages to communicate with each other?

Troubleshooting

It is important that learners see the connection between both coded messages to see the purpose of this activity. If some learners express frustration about the difficulty of the task,

you can give them a hint, such as “Maybe the message was not coded using the one letter back system. Try a different code”

Notes to the Presenter

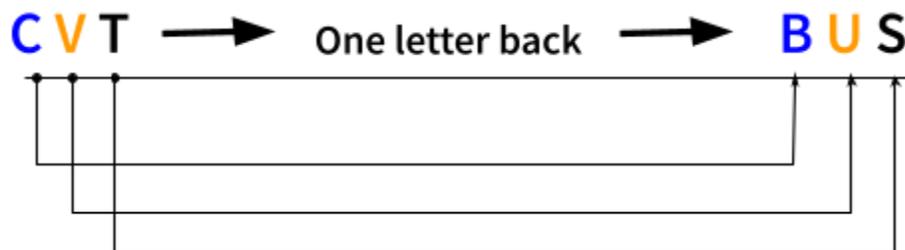
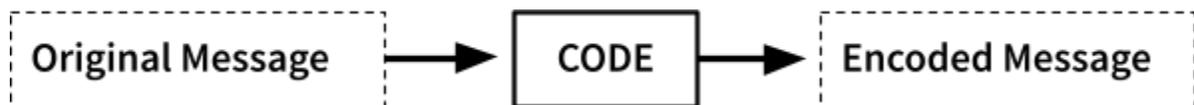
Working with small groups: Regardless the size of the group, this activity will maximize participant engagement when working in pairs.

Working with large/class groups: Some pairs will finish faster than others. Prepare additional coded messages, using a slightly more sophisticated coding system. Here are some examples:

- **Caesar Cipher:** This is similar to the "one letter back" code but with different shift values. You can use any fixed number of positions to shift the letters.
- **Number Substitution:** Assign numbers to each letter of the alphabet (A=1, B=2, etc.), and encode messages using these numerical values.
- **Reverse Text:** Reverse the order of letters in words to create a code. "Hello" becomes "olleH."

Extension: The Ideas about the role of encoding and decoding information that learners develop during this activity will serve as an introduction to coding. The [Sending Digital Images](#) activity is an extension opportunity for using ideas about coding and decoding digital images.

Tips for Facilitating with Younger Participants: Young learners benefit from concrete representations of abstract concepts. If you are facilitating this activity with younger participants, create a graphical representation that shows the flow of information from the original message to the coded message. The image below is an example of such representation. Use this to capture learners ideas about coding and decoding.



Supporting Equitable Participation

- **Extended Time:** Provide extended time for learners who may need it. Equitable participation includes accommodating different learning paces.
- **Visual Aids:** Use visual aids, such as diagrams or charts, to complement verbal instructions. Visual cues can be particularly helpful for visual learners and those who may have difficulty with language processing. (See tips for facilitating with young learners)
- **Mixed-Ability Pairing:** When organizing learners in pairs, try to create mixed-ability pairs. If you don't know your group well enough, you can ask: Who feels very good at solving puzzles? Or Who likes puzzles? Pair learners who respond 'yes' to either of these questions with learners who did not.

Conversational Prompts

- Can you explain the difference between coding and decoding in your own words? How are they related?
- What would be the characteristics of a good code used for communication?
- Why would people use coded messages to communicate with each other?

Content Background

Coding and decoding, in the context of radio communication, refer to the transformation of information into a format that can be transmitted and received efficiently. When we talk about coding, we mean the process of converting audio signals, which are analog in nature (like the sound of a voice or music), into digital signals. This digital coding is essential because it allows radio signals to be transmitted more accurately and efficiently over long distances without significant loss of quality. It involves the use of encoding algorithms to represent the original analog audio as a series of binary digits (0s and 1s), making it suitable for transmission through radio waves.

Conversely, decoding is the process of transforming these digital signals back into their original analog form for us to hear. Decoders, often present in radios and other receiving devices, interpret the binary data received and recreate the audio signal as it was before coding. This process ensures that the audio we hear on our radios is clear and faithful to the original source. The ability to code and decode audio signals effectively is a cornerstone of modern radio technology, enabling us to enjoy high-quality broadcasts and communications across various radio platforms.

List of Terms Related to this Activity

Encoding: Transforming a piece of information or a message into a different form using a specific code or set of rules. This transformation is done to make the message more secure, private, or understandable for those who have the key to decipher it.

Decoding: Converting a coded or encoded message back into its original, understandable form. It is the reverse of coding and involves using a specific method or key to interpret the coded message correctly.



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