Fuzzy Friend Speaks:
Empathy and Coding

Instructional Time:
45 minutes

Introduction

In *Fuzzy Friend Speaks,* students will be introduced to algorithmic thinking and following sequential steps. Students will empathize with Fuzzy Friend, who speaks in his own code, and are challenged to learn Fuzzy Friend's code to decipher the name of his favorite animal.

This is a sample STEM Connections lesson. Please find more information at https://explore.avid.org/experience-avid/stem-connections

Essential Question

How can I use coding skills to communicate?

Lesson Objectives

Students will:

- Decipher a code to learn about Fuzzy Friend's favorite animal.
- Understand that coding is a way to use letters, numbers, or symbols to give instructions.

Materials and Resources

Resources below are available in additional formats such as Microsoft and PDF with a subscription to AVID STEM Connections. Links provided below are in a Google format. (If another format is needed, please contact cskeen@avid.org)

Hands-on:

- *Fuzzy Friend Speaks* Presentation
- Physical object to represent Fuzzy Friend
- *Fuzzy Friend Speaks Interactive* (use either the printable PDF or interactive PowerPoint or Google Slides file) student resource
- Optional Extension: *Independent Code Extension – 1*
- Optional Extension: *Independent Code Extension – 2*

Minds-on:

- Empathy
- Communication
- Problem solving

Teacher Preparation

Design Thinking:

This lesson explores the indicated stages in the design thinking process:

- ☒ Empathize
- ☒ Define
- ☐ Ideate
- ☐ Prototype
- ☒ Test

Standards and Goals:

International Society for Technology in Education Standards:

- ISTE 5: Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

Next Generation Science Standards:

- NGSS SEP 1: Define a simple problem that can be solved through the development of a new or improved object or tool.
- NGSS SEP 8: Communicate information or design ideas and/or solutions with others in oral and/or written forms using models, drawings, writing, or numbers that provide detail about scientific ideas, practices, and/or design ideas.

- Review the *Fuzzy Friend Speaks* Presentation.
- If using the *Fuzzy Friend Speaks (*interactive) slide, ensure that each student has an individual digital copy.
- If using the *Fuzzy Friend Speaks* (print), copy one page per student.
- Prepare a physical object to represent Fuzzy Friend as students move through the grid. This could be a fuzzy pom-pom, a plastic counter, a penny, or a small cube.

Essential Question: *How can I use coding skills to communicate?*

ENGAGE (5 minutes)

Build Empathy:

Display *Turn and Talk* (Slide 3). Ask students to turn and talk with a neighbor and share a time when they felt that others could not understand them. Share a few of the experiences with the entire class to build common background.

Introduce students to Fuzzy Friend using Slide 4.

Tell students, "When Fuzzy Friend talks, he speaks a different language than we do. He speaks in a code using arrows."

Ask students, "How do you think Fuzzy feels when he wants to tell us something, but we do not understand?" (Suggestions could be "sad, lonely, frustrated.")

Display *Let's Learn a New Language!* (Slide 5) and describe the challenge that Fuzzy Friend wants to tell us what his favorite animal is. We have to learn his code to find the name of his favorite animal.

Resources:
Fuzzy Friend Speaks Presentation

EXPLORE (10 minutes)

Introduce Coding:

Tell students, "We will practice learning our Fuzzy Friend's code. Did you know that computers communicate using a code, too? Instead of saying words, Fuzzy Friend's code uses arrows."

Display *Let's Practice* (Slide 6) and explain the practice activity.

Resources:
Fuzzy Friend Speaks Presentation

- When we practice, you will not hear my words, but you will follow the direction of the arrow.

- When I show the "up" arrow, you will walk forward one step. When I show the "down" arrow, you will walk backward one step.

- When I show the arrow to the right you will walk one step to the right, while still facing forward and when I show the arrow to the left you will walk on one step to the left, while still facing forward.

Display Slides 7–11 to allow students to practice following the direction of the arrow shown.

Ask students to sit back down in their seats.

Explain the information on *Follow the Code* (Slide 12):

- The arrows are arranged in a sequence of steps.
- We start on the top row and read the arrows left to right before moving on to the next row—just like students read words in a book.
- Have students point with their arms, like an air traffic controller, which direction Fuzzy Friend should move according to the arrows on the slide.
- Move Fuzzy Friend on the grid following the arrows.

Check for understanding by asking students to follow the sequence of the arrows using the grid and determine what letter they would land on as they "move" throughout the grid.

Teacher Tip:
Have students demonstrate what one step looks like before completing the practice exercise.

EXPLAIN (2 minutes)

Coding Practice:

Explain the process of coding. Students will use Fuzzy Friend's code to learn his favorite animal. They have to follow the arrow directions or code in the correct order. Following a code in order is like following letters in the right order to make a word. If letters are in the wrong order, they will not make the correct word. If they follow a code in the wrong order, they will not get the right answer or arrive at the right place.

Display *Using the Arrow Code* (Slide 13).

Resources:
Fuzzy Friend Speaks (print or interactive)

Teacher Tip:
If students are having a tough time with this concept, share with them when the same letters in a word are out of order, they might make a

Tell students, "You will use the arrow code to help you move on the grid to find the letters that will spell the name of Fuzzy Friend's favorite animal. Start with arrow number one and follow the arrows in number order. Every time you pass a lily pad, write down that letter. Remember that you will only move one square at a time."

different word such as: read and dear, or left and felt.

ELABORATE (20 minutes)

Read the Code:

Say to students, "Place your Fuzzy Friend (or marker) on the star to start. Each numbered arrow will show you which direction to move to the next square. Remember to only move one square at a time. Write the letters that you pass through on the grid in the blank lily pads in the order you cross over them."

Consider using the Interactive Slide Show to allow students to practice computer and mouse skills. Model how to move the Fuzzy Friend throughout the grid, then drag and drop the letters onto the lily pads.

Answer Key: FROG

EVALUATE (8 minutes)

Test the Code:

Ask students to turn and talk (Slide 15) with a neighbor to share the letters they passed through as they moved Fuzzy Friend. Have partners share their Fuzzy Friend's favorite animal.

Teacher Tip:
For emerging readers, have your students blend together the sounds to read "frog."

Share with students that they have earned how to understand Fuzzy Friend's language by deciphering his special code. They followed the arrows to discover that his favorite animal is a frog.

Discuss with the class the questions on *Classroom Discussions* (Slide 16).

- What happened if you did not follow the arrows correctly?

- How would you fix the problem if you didn't solve the code the first time?

- How do you think Fuzzy Friend feels now that we understand his code?

Computer Coding:

Connect this activity to computer coding. Tell students that Fuzzy Friend's special code allowed us to understand him. Coding is how computers understand information, too. The steps in a good code tell the computer exactly what to do.

VOCABULARY

- **Code:** A system of letters, figures, or symbols used to represent other words to send messages or give directions
- **Decipher:** To change a code into words or symbols that can be understood

Vocabulary slides are included in the Presentation that accompanies this lesson.

CAREER CONNECTIONS

- **Code Breakers:** use logic to decipher and uncover secret messages.
- **Computer Programmers:** write algorithms (code) to develop many different applications.
- **Interpreters:** translate one type of language into another.

Career Connections slides are included in the Presentation that accompanies this lesson.

See the Occupational Handbook of the Bureau of Labor Statistics for specific career information: https://www.bls.gov/ooh/

EXTENSIONS AND MODIFICATIONS

Coding Extension:
- Have students use the Independent Code Extension grids and arrows to create their own special codes for a classmate to solve.
  - *Independent Code Extension – 1*
  - *Independent Code Extension – 2*

Coding Extension:
- Discuss and explore different types of coding on code.org/learn or Scratch Jr. (iPad/tablet only).

Social Studies Extension:

- Read *Chester Nez and the Unbreakable Code* by Joseph Bruchac. This 32-page picture book biography is about Chester Nez, one of the Navajo men who was recruited in WWII to create an unbreakable military code.

Literature Extension:

- Read *Knuffle Bunny* by Mo Willems to students.
- Read *Hello Ruby: Adventures in Coding!* by Linda Liukas to students.