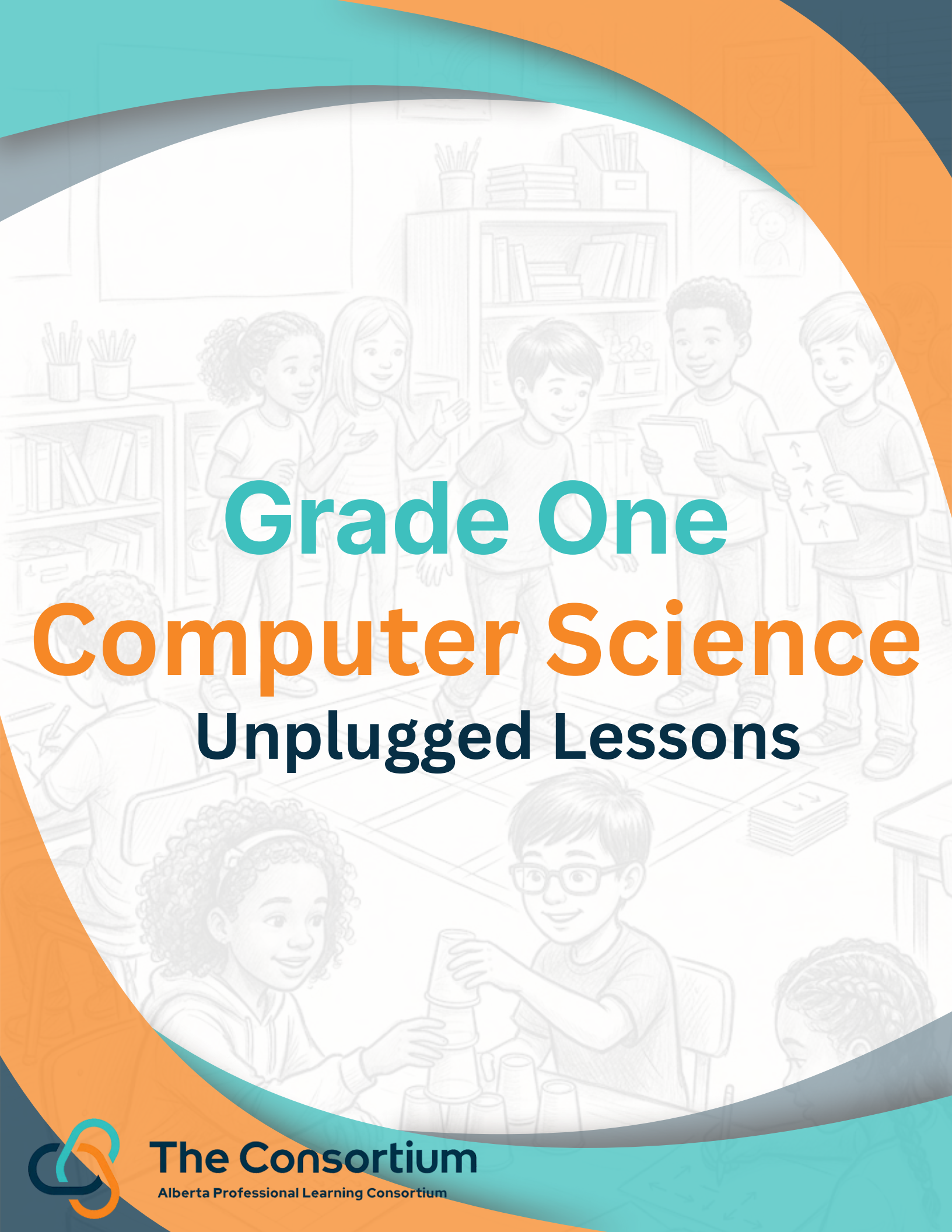




Grade One Computer Science Unplugged Lessons



The Consortium
Alberta Professional Learning Consortium

Unit Overview: Instructions and Outcomes

Organizing Idea: Computer Science: Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.

Guiding Question: How can instructions affect outcomes?

Learning Outcome: Students follow instructions and relate them to outcomes.

Lesson 1: Same Goal, Different Codes (Forms of Instructions)

Focus: Understanding that instructions can take various forms (verbal, audio, visual, and written) and that the form may not affect the final outcome.

Summary: Building on Kindergarten, where students learned speaking, pictures, and gestures, this lesson introduces audio (e.g., a bell ringing) and written (simple words) forms. Students will follow a set of two or three steps (e.g., "Stand up, turn around, sit down") delivered completely differently to different groups (one verbal, one visual flashcards, one written).

Assessment: Observation of students successfully following two or three steps given in different forms and discussing how they all reached the same outcome.

Lesson 2: Recipes, Rules, and Robots (When Order Matters)

Focus: Recognizing that many instructions need a specific order (like directions, recipes, computer programs, and safety protocols).

Summary: Students will look at a simple "recipe" (e.g., building a specific structure with blocks). The teacher will provide the instructions in the correct order, and then in a scrambled order. Students must determine if the instructions, when given in different orders, still produce the desired outcome.

Assessment: Students can correctly determine and explain whether changing the order of a 2-3 step instruction set ruined the "recipe" or if the desired outcome was still achieved.

Lesson 3: Safety Investigators

Focus: Learning that following instructions is a way to demonstrate respect and safety during investigations.

Summary: The class will conduct a simple, hands-on scientific investigation (e.g., a simple water transfer activity or sorting task). Before beginning, the class will establish safety protocols. Students will practice following exact instructions during the investigation to ensure everyone stays safe and the equipment is respected.

Assessment: Formative observation of students following instructions during investigations to demonstrate respect and safety.

Lesson 4: The 3-Step Programmer

Focus: Sequencing two or three instruction steps to achieve a desired outcome.

Summary: Stepping up from the 2-step grids in Kindergarten, students will act as computer programmers who must sequence two or three instruction steps. Using directional cards or a digital equivalent, students must plan a path to a goal, ensuring the steps are ordered correctly to produce the desired outcome.

Assessment: Students successfully sequence two or three instruction steps to navigate a path or complete a task.

Lesson 5: The Idea Exchange (Collaborative Coding)

Focus: Exchanging ideas for creating three-step instructions that achieve a desired outcome.

Summary: In this final lesson, students work in pairs or small groups. They must collaborate and exchange ideas to create their own original three-step instruction sets for a specific outcome (e.g., a secret handshake or a three-move dance). They will test their instructions on another group.

Assessment: Students actively participate in exchanging ideas and successfully create a three-step instruction set that achieves their planned outcome.

Grade 1 CS Lesson 1

Lesson Title: Same Goal, Different Codes

Subject Area: Science (Computer Science)

Grade Level: Grade 1

Duration: 50–60 minutes



Lesson Overview

Building on their Kindergarten knowledge, students will learn that instructions are directions that can be given in various forms, including verbal, audio, visual, and written. Through engaging activities, students will discover that while the form of the instruction might change, the form may not affect the final outcome.

Learning Objectives: By the end of the lesson, students will be able to:

- ☐ Identify instructions given in verbal, audio, visual, and written forms.
- ☐ Follow instructions with two or three steps given in different forms.
- ☐ Explain that different forms of instructions can lead to the exact same outcome.

Essential Questions:

- ★ How can instructions affect outcomes?
- ★ In what different ways can we give and receive instructions?

Curriculum Standards: Alberta Science (K-6) Curriculum – Grade 1 Computer Science: Follow instructions with two or three steps given in different forms; Instructions are directions that can be followed and given in various forms, including verbal, audio, visual, and written.

Materials & Resources

Category	Item Description
Classroom Tools	• A small bell, a tambourine, or a clap (for audio instructions). • Whiteboard and markers (for written instructions).
Technology	None required (Unplugged activity).
Files/Handouts	Large printed visual flashcards showing actions (e.g., a picture of a student standing, a picture of hands clapping, a picture of a student sitting).

Grade 1 CS Lesson 1

Instructional Procedure

5–10 min | The Hook

Activity Description: The Silent Greeting.

Teacher Instructions: Stand at the door or front of the room. Do not speak. Hold up a visual flashcard of a waving hand, then a flashcard of a student sitting on the carpet. Wait for students to follow the two steps.

Teacher Script:

(Once students are seated) "Good morning, Grade 1 programmers! Did you notice something different about how I asked you to sit down today? I didn't use my voice at all! I gave you visual instructions instead. Last year, we learned that instructions are directions we follow. Today, we are going to learn that instructions can be given in various forms, including verbal, audio, visual, and written!"

15–20 min | Direct Instruction

Activity Description: Exploring the Four Forms.

Teacher Instructions: Introduce the four forms of instructions explicitly. Model a simple one-step instruction in all four forms to show that the outcome remains identical.

Teacher Script:

*"Instructions can be given in different ways, but they can still mean the exact same thing. The form in which instructions are given may not affect the outcome. Let's test this! Our goal—our outcome—is for everyone to clap their hands once.

- **Verbal:** This is speaking. (Say: 'Clap your hands once'). Excellent!
- **Audio:** This is a sound that isn't a word. (Ring a bell once). Let's make a rule: when you hear this bell, it means clap. (Ring bell). Great!
- **Visual:** This is a picture. (Hold up a picture of clapping hands). Perfect!
- **Written:** These are words we read. (Write 'CLAP' in large letters on the whiteboard and point to it). Awesome!

Did the outcome change? No! You clapped every time, even though the form of the instruction was different."

Grade 1 CS Lesson 1

20–30 min | Guided Exploration

Activity Description: Same Goal, Different Codes (Stations).

Teacher Instructions:

Divide the class into three groups.

Explain that every group will be given a set of instructions with two or three steps. The desired outcome for all groups is the same: 1) Stand up, 2) Spin around, 3) Sit back down.

Deliver the instructions to Group 1 **verbally**: "*Group 1, please stand up, spin around, and sit back down.*"

Deliver the instructions to Group 2 **visually**: Hold up three flashcards in order (Picture of standing → Picture of spinning → Picture of sitting).

Deliver the instructions to Group 3 in **written** form: Point to the board where it says: "1. Stand. 2. Spin. 3. Sit."

Teacher Script:

"Did every group reach the same outcome? Yes! You followed instructions with two or three steps given in different forms. Now, I am going to challenge you with an **audio** sequence. If I ring the bell once, stand up. If I ring it twice, jump. If I ring it three times, sit down. Listen closely to the steps!" (Practice a few 2-3 step audio sequences).

10 min | Closure

Activity Description: Debriefing Outcomes.

Teacher Instructions: Have students reflect on their favorite form of instruction.

Teacher Script:

"You were fantastic instruction detectives today. Who can remind the class: if I write 'Jump' on the board, or if I say 'Jump' out loud, does the outcome change? (Expected answer: No!). That's right. The form in which instructions are given may not affect the outcome. Tomorrow, we are going to look at something that *does* affect the outcome: the order of our instructions! We will be looking at recipes and rules to see what happens when we mix up the steps."

Grade 1 CS Lesson 1

Differentiation

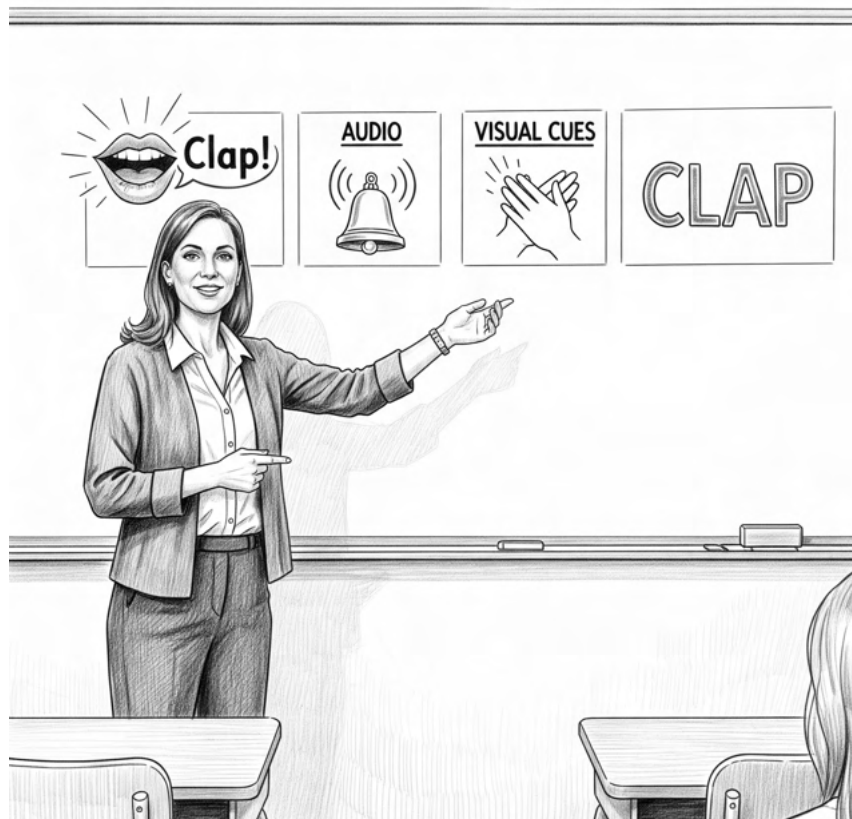
Support/Scaffolding: For the written instructions, pair the words with small icons (e.g., write "Stand" but include a small stick figure standing next to it) to support early readers in following the written form. Keep the sequence to exactly two steps for students who need more support.

Extensions: Challenge advanced readers by giving them a written set of three instructions that involves interacting with an object (e.g., "1. Pick up a pencil. 2. Tap it twice. 3. Put it down.").

Assessment

Formative Assessment: Observe the groups during Guided Exploration. Use a checklist to note which students successfully follow instructions with two or three steps given in different forms (verbal, audio, visual, and written). Check for understanding during the Closure to ensure they grasp that the form may not affect the outcome.

Summative Assessment: (None for Lesson 1).



Same Goal, Different Codes

Name: _____

Activity 1: Match the Code

Draw a line from the symbol to the word.

Symbol	Word
	Visual
	Verbal
	Written
	Audio

Activity 2: Same Outcome?

Instructions are directions we follow. Look at the two boxes below. Circle **YES** if they lead to the same outcome or **NO** if they are different.

Instruction A	Instruction B	Is the outcome the same?
	 "Please sit down."	YES / NO
	 RUN	YES / NO

Same Goal, Different Codes

Name:_____

Activity 3: Be the Programmer

Draw a goal (like jumping, waving, or standing) in the big box. Then, show two different ways you could tell a friend to do it.

My Goal Drawing

Way 1:	Way 2:

Grade 1 CS Lesson 2

Lesson Title: Recipes, Rules, and Robots
Subject Area: Science (Computer Science)
Grade Level: Grade 1
Duration: 50–60 minutes



Lesson Overview

In this lesson, students explore why the sequence of instructions is critical. They will learn that many types of instructions, such as directions, recipes, computer programs, and safety protocols, need to be in a specific order. Students will experiment with following steps in different sequences to see how it impacts the final result.

Learning Objectives: By the end of the lesson, students will be able to:

- ☐ Identify that certain instructions must be ordered in a way that will produce a desired outcome.
- ☐ Follow a set of three-step instructions to build a simple structure.
- ☐ Determine if instructions with two or three steps given in different orders still produce the desired outcome.

Essential Questions:

- ★ Why do recipes and rules have to be in a certain order?
- ★ How can instructions affect outcomes?

Materials & Resources

Category	Item Description
Classroom Tools	Sets of 3 distinct, interlocking building blocks (e.g., Lego or Duplo) for each student (e.g., 1 red block, 1 blue block, 1 yellow block).
Technology	Document camera or projector (to display the build steps).
Files/Handouts	"Robot Blueprint" cards showing the three steps to build a mini-robot.

Grade 1 CS Lesson 2

Instructional Procedure

5–10 min | The Hook

Activity Description: The Mixed-Up Recipe.

Teacher Instructions: Hold up a mixing bowl, a spoon, and a box of cereal. Pretend you are going to make breakfast but do the steps in a silly, incorrect order.

Teacher Script:

"Programmers, I am so hungry! I am going to follow a recipe to make cereal. Step 1: Eat with a spoon! (Pretend to eat an empty bowl). Step 2: Pour the milk! Step 3: Put the cereal in the bowl! Wait... did my recipe work? Did I get the desired outcome? No! My breakfast is a mess. What went wrong? (Allow students to answer). Exactly, my steps were mixed up! Today we are going to learn why the order of our instructions is so important."

15–20 min | Direct Instruction

Activity Description: Defining Ordered Instructions.

Teacher Instructions: Introduce the concept that specific tasks require a strict sequence to achieve the desired outcome. Write the four key examples on the board.

Teacher Script:

"We know that instructions are directions we follow. But did you know that many types of instructions need to be in a specific order? Think about these four things:

1. **Directions:** When walking to the library, you have to go out the door *before* you turn down the hall.
2. **Recipes:** Like my cereal, baking a cake has steps that must happen in order.
3. **Computer Programs:** A robot only does exactly what we tell it to do, in the exact order we say it.
4. **Safety Protocols:** In a fire drill, we must line up safely *before* we walk outside. Instructions are ordered in a way that will produce a desired outcome. Let's test this with some building blocks!"

Grade 1 CS Lesson 2

20–30 min | Guided Exploration

Activity Description: The Robot Blueprint Test.

Teacher Instructions:

1. Hand out 3 colored blocks to every student (e.g., 1 red, 1 blue, 1 yellow).
2. Display a three-step blueprint on the board: "Step 1: Put the blue block on the desk. Step 2: Snap the red block on top of the blue block. Step 3: Snap the yellow block on top of the red block."
3. Have all students follow the instructions exactly. Verify the outcome (everyone should have a blue-red-yellow tower).
4. Have students break their towers apart.
5. Provide the exact same three steps, but in a reversed order (Step 3, then Step 2, then Step 1).
6. Discuss the results.

Teacher Script:

"Look at your new towers. Do they look like the blueprint? We used the exact same three steps, but we changed the order. I want you to determine if instructions with two or three steps given in different orders still produce the desired outcome. (Expected answer: No!). You're right! Changing the order changed our robot completely."

10 min | Closure

Activity Description: Reflection and Real-World Connection.

Teacher Instructions: Gather students and collect the blocks.

Teacher Script:

"You were fantastic block-builders today! We proved that the order of our instructions completely changes what we build. Who can remember one of the examples we talked about where order matters? (Wait for students to list directions, recipes, safety protocols, or computer programs). Tomorrow, we are going to practice being super safe by following a strict set of safety protocols during a science investigation!"

Grade 1 CS Lesson 2

Differentiation

Support/Scaffolding: For students who struggle with working memory, physically act out the block building alongside the visual blueprint on the board. Provide a pre-built model of the "correct" outcome to keep on their desk as a visual reference point.

Extensions: Have early finishers write or draw their own three-step block recipe and hand it to a partner. The partner must follow the instructions to see if they achieve the creator's desired outcome.

Assessment

Formative Assessment: During the Robot Blueprint Test, observe if students can accurately determine and explain that the second (mixed-up) set of instructions failed to produce the desired outcome.

Summative Assessment: (None for Lesson 2).



Sequence Scientist

Name: _____

Activity 1: Match the Start to the Finish

Draw a line from the **First Step** on the left to the **Desired Outcome** on the right.

First Step	Desired Outcome
 Pour the cereal	 Safe line outside
 Walk out the door	 Yummy breakfast!
 Hear the fire bell	 The Library

Activity 2: Follow the Robot Blueprint

Our robot only works if we follow the code in order. Look at the Code below. Circle the Robot Tower that followed the steps correctly.

The Code:

- 1.  Blue Block (Bottom)
- 2.  Red Block (Middle)
- 3.  Yellow Block (Top)

Tower A	Tower B
 Yellow	 Red
 Red	 Yellow
 Blue	 Blue



Activity 3: Be the Programmer

Draw your own three-step instruction "recipe" for a friend to follow.

Step 1	Step 2	Step 3



Grade 1 CS Lesson 3

Lesson Title: Safety Investigators

Subject Area: Science (Computer Science)

Grade Level: Grade 1

Duration: 50–60 minutes



Lesson Overview

This lesson bridges computer science concepts with general science practices. Students will learn that many types of instructions, particularly safety protocols, need to be in a specific order. They will discover that following instructions is a way to demonstrate respect and safety during investigations. Students will then put this into practice by following a strict set of safety instructions during a hands-on sorting activity.

Learning Objectives: By the end of the lesson, students will be able to:

- ☐ Explain that instructions help to keep people safe.
- ☐ Recognize that following instructions is a way to demonstrate respect during an activity.
- ☐ Follow instructions during investigations.

Essential Questions:

- ★ How can instructions affect outcomes?
- ★ Why is it important to follow safety instructions in a specific order?

Materials & Resources

Category	Item Description
Classroom Tools	A small collection of safe "specimens" for each table group (e.g., a mix of smooth stones, plastic buttons, and large leaves), sorting trays or paper plates, and plastic tweezers.
Technology	None required.
Files/Handouts	"Safety Investigator Protocol" visual checklist displayed on the board.

Grade 1 CS Lesson 3

Instructional Procedure

5–10 min | The Hook

Activity Description: The Fire Drill Discussion.

Teacher Instructions: Gather students on the carpet.

Teacher Script: "Scientists, today we are going to talk about safety. Have you ever practiced a fire drill? Why do we have those? (Allow student responses). We have fire drills because we need to know exactly what to do if there is an emergency. Just like code needs to be in the right order, our actions during a fire drill need to be in the right order. Following instructions is how we keep ourselves and our friends safe. If we didn't have instructions, we wouldn't know where to go or how to stay together. Following instructions is our way of making sure everyone stays safe."

15–20 min | Direct Instruction

Activity Description: Protocols and Respect.

Teacher Instructions: Connect the idea of sequencing from the previous lesson to safety rules. Display the three-step "Safety Investigator Protocol" on the board.

Teacher Script:

"Yesterday we learned that instructions need to be in a specific order, like recipes. Today, we are looking at safety protocols. Safety protocols are just instructions that keep us safe! Let's look at our protocol for today:

1. Sit quietly with your hands in your lap.
2. Look at the specimens with your eyes only.
3. When the teacher says 'Go', use the tweezers to sort them gently.

Can we do Step 3 before Step 1? No! Following instructions in the right order shows that we are ready to learn. Following instructions is a way to demonstrate respect and safety during investigations. It shows respect for our tools, respect for our classmates, and respect for our classroom."

Grade 1 CS Lesson 3

20–30 min | Guided Exploration

Activity Description: The Specimen Sort.

Teacher Instructions:

1. Send students back to their table groups, which have the materials pre-set in the center but covered with a piece of paper or a towel.
2. Remind them of the protocol.
3. Lead them through the steps one by one, ensuring they follow instructions during investigations.
4. Students will pretend the objects they are sorting are dangerous to touch or easily damaged by touch, which is why they must use the tweezers.
5. Have them sort the items by color or texture, pausing occasionally to give a new instruction (e.g., "Pass the tweezers to your right").

Teacher Script:

"Now we are going to test your skills. I am looking for scientists who follow instructions during investigations. Remember our ordered protocol. Step 1: Show me your hands in your lap. (Wait for compliance). Excellent, that shows respect! Step 2: I will uncover the trays. Use your eyes only. (Uncover trays). Step 3: Go! You may carefully use your tools to sort."

10 min | Closure

Activity Description: Debriefing the Investigation.

Teacher Instructions: Have students clean up their spaces safely according to a quick clean-up protocol.

Teacher Script:

"Look around the room. Are all of our tools safe? Yes. Are all of our scientists safe? Yes! Because you followed the steps perfectly. Following instructions is a way to demonstrate respect and safety during investigations. You proved that today. Tomorrow, you are going to use everything you know about steps and order to write your own computer programs to move a robot!"

Teacher Tip

Teacher Tip: Any sorting activity or science investigation can be adapted to these objectives. The core goal is to help students understand that following specific, sequential steps is essential for safety and respect. You can use this "protocol-first" approach for any hands-on task to reinforce that following the proper process is the primary goal of the investigation.

Grade 1 CS Lesson 3

Differentiation

Support/Scaffolding: For students who struggle with impulse control when presented with physical objects, have them practice the three-step safety protocol using imaginary objects on the carpet first before moving to the tables with the real specimens.

Extensions: Have students suggest a "Step 4" to add to the safety protocol that would help keep the classroom clean after the investigation is over.

Assessment

Formative Assessment: Actively monitor the table groups during the Guided Exploration. Check off which students successfully follow instructions during investigations, specifically noting if they wait for the correct sequential step before touching the materials.

Summative Assessment: (None for Lesson 3).



Safety Investigators

Name: _____

Activity 1: The Right Order

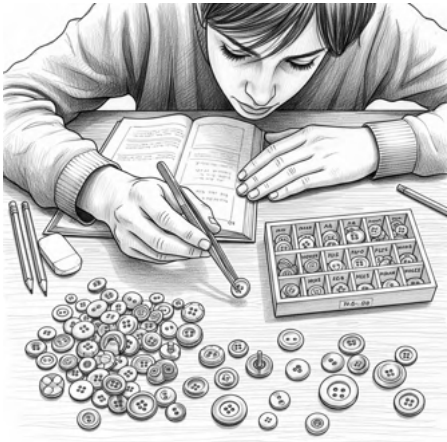
Instructions need to be in the right order to keep us safe. Write the numbers **1, 2, and 3** to put the fire drill instructions in order.

What Happens?	Order (1, 2, 3)
Siren Sounds 	
Walk Outside Quietly 	
Line Up at the Door 	

Activity 2: Our Science Protocol

Look at the pictures of our science rules. Circle the rule that shows respect for our tools.

Picture A	Picture B
 Hands in lap	 Grabbing materials
 Look with eyes	 Touching everything
 Using tweezers gently	 Banging the specimens



Safety Investigators

Name: _____



Activity 3: Safe Scientist

Draw a picture of yourself following a safety instruction during our specimen investigation.

My Safety Drawing



Grade 1 CS Lesson 4

Lesson Title: The 3-Step Programmer
Subject Area: Science (Computer Science)
Grade Level: Grade 1
Duration: 50–60 minutes



Lesson Overview

In this lesson, students step into the role of computer programmers. Building on their understanding that the order of instructions matters, students will practice creating their own small programs. They will use directional arrow cards to plan a path on a grid, focusing on how to sequence two or three instruction steps to achieve a desired outcome.

Learning Objectives: By the end of the lesson, students will be able to:

- ☐ Sequence two or three instruction steps to achieve a desired outcome.
- ☐ Explain that instructions are ordered in a way that will produce a desired outcome.
- ☐ Test and "debug" their code if the outcome does not match their goal.

Essential Questions:

- ★ How can instructions affect outcomes?
- ★ How do we put instructions in the correct order to reach a goal?

Curriculum Standards: Alberta Science (K-6) Curriculum – Grade 1 Computer Science: Sequence two or three instruction steps to achieve a desired outcome; Instructions are ordered in a way that will produce a desired outcome.

Materials & Resources

Category	Item Description
Classroom Tools	Small 4x4 paper grids (one per pair), small movable play pieces (e.g., a toy car or plastic animal), and target tokens (e.g., a paper star or "battery" icon).
Technology	None required (Unplugged activity).
Files/Handouts	Sets of printed and laminated "Arrow Coding Cards" (Forward, Turn Right, Turn Left) for each pair.

Grade 1 CS Lesson 4

Instructional Procedure

5–10 min | The Hook

Activity Description: The Powerless Robot.

Teacher Instructions: Place a toy robot (or car) on a large floor grid at the front of the room. Place a "battery" token three squares away.

Teacher Script:

"Grade 1 programmers, we have an emergency! Our robot is out of power, and its battery is all the way over there. It needs instructions to move, but its computer brain can only remember three steps at a time! Today, it is your job to write a three-step code to save the robot. We have to sequence two or three instruction steps to achieve a desired outcome. Let's get to work!"

15–20 min | Direct Instruction

Activity Description: Modeling the Sequence.

Teacher Instructions: Use the large floor grid and oversized arrow cards to model thinking aloud.

Teacher Script:

"Remember yesterday, when we learned that instructions are ordered in a way that will produce a desired outcome? We can't just throw arrow cards down randomly. We have to plan! My desired outcome is to reach the battery. Step 1: I need to move Forward. (Place a Forward arrow card on the board). Step 2: I need to move Forward again. (Place a second Forward arrow card next to the first). Step 3: Let's do one more Forward. (Place a third Forward arrow card). Let's read our sequence: Forward, Forward, Forward. Let's test it! (Move the robot three spaces). We did it! We were able to sequence two or three instruction steps to achieve a desired outcome!"

Grade 1 CS Lesson 4

20–30 min | Guided Exploration

Activity Description: Partner Programming on Grids.

Teacher Instructions:

1. Divide students into pairs.
2. Distribute a paper grid, a toy, a target token, and arrow cards to each pair.
3. Have students place the toy on a "Start" square and the target token exactly three spaces away (straight lines first, then introduce turns).
4. One student (the Programmer) selects and lines up three arrow cards to sequence two or three instruction steps to achieve a desired outcome.
5. The other student (the Robot) moves the toy exactly as the cards say.
6. Have pairs switch roles and move the target token to a new location.

Teacher Script:

"Programmers, time to write your code! Look at where your toy needs to go. Sequence two or three instruction steps to achieve a desired outcome. Remember, place your cards in a straight line from left to right, just like reading a book. If your toy doesn't reach the target, that is called a 'bug'! Just fix the order of your cards and try again."

10 min | Closure

Activity Description: Code Review.

Teacher Instructions: Bring the class back together and collect the materials.

Teacher Script:

"You were all incredible problem-solvers today! Who had a 'bug' in their code where the toy ended up in the wrong spot? (Raise hands). How did you fix it? (Expected answer: We changed the cards/changed the order). Exactly! You proved that instructions are ordered in a way that will produce a desired outcome. Tomorrow, in our final lesson, you will get to invent your own original three-step code and teach it to your classmates!"

Grade 1 CS Lesson 4

Differentiation

Support/Scaffolding: For students overwhelmed by three steps, have them start by practicing how to sequence just two steps to reach a closer target before adding the third step.

Extensions: Have advanced pairs place an "obstacle" (like a red block) on their grid. They must write a three-step sequence that navigates *around* the obstacle to reach the target, introducing basic problem-solving.

Assessment

Formative Assessment: Circulate the room during Guided Exploration. Observe whether students can successfully sequence two or three instruction steps to achieve a desired outcome on their grids. Ask pairs to "read" their code out loud to you before moving their toy to check for comprehension of the symbols and the order.

Summative Assessment: (None for Lesson 4; practical skills will culminate in Lesson 5).



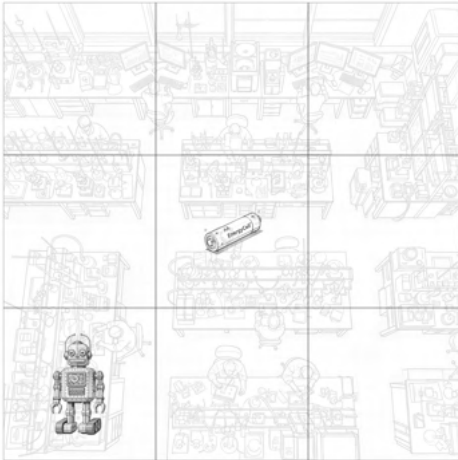
3-Step Programmer

Name: _____

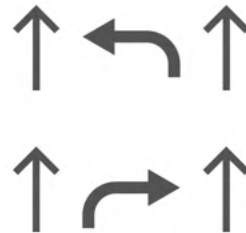


Activity 1: Help the Robot!

The robot  needs to reach the battery .

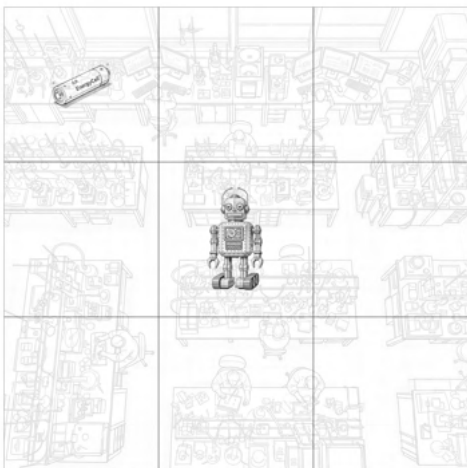


Circle the correct code.



Activity 2: Find the Bug!

Circle the instruction that is wrong.



Debug the code.

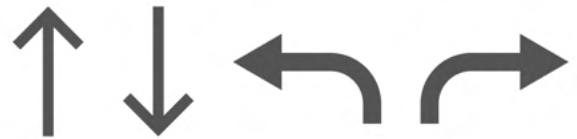
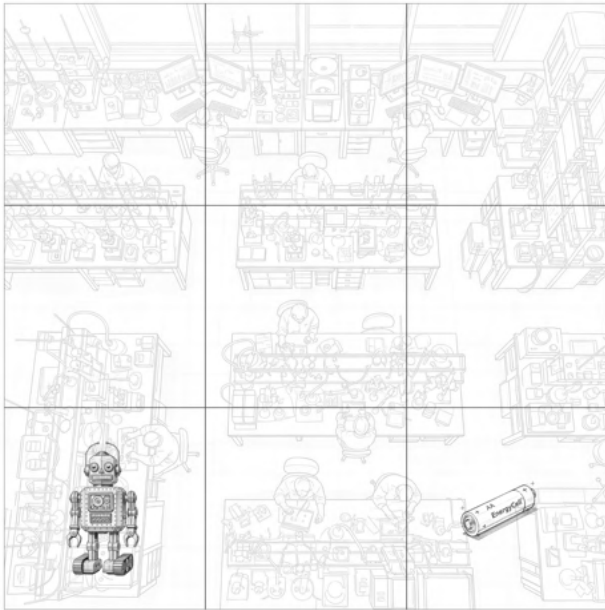


3-Step Programmer

Name: _____



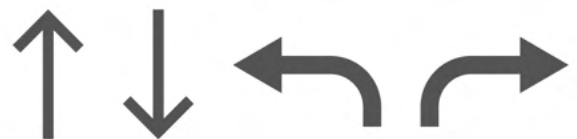
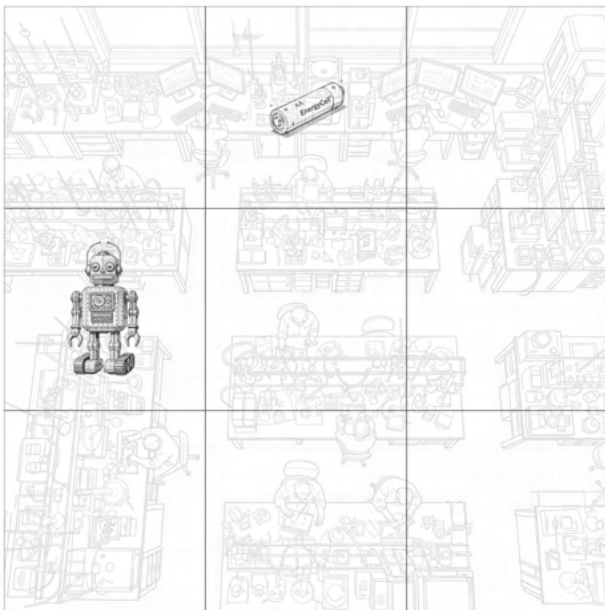
Activity 3: Be the Programmer



DRAW arrows in the boxes

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How did you do?  



DRAW arrows in the boxes

--	--	--

How did you do?  

Grade 1 CS Lesson 5

Lesson Title: The Idea Exchange

Subject Area: Science (Computer Science)

Grade Level: Grade 1

Duration: 50–60 minutes



Lesson Overview

In this final unit lesson, students transition from following instructions to actively creating them together. Working collaboratively, they will exchange ideas for creating three-step instructions that achieve a desired outcome. By designing a physical routine (like a secret handshake or a mini-dance), they will solidify their understanding of sequencing and teamwork in computer science.

Learning Objectives: By the end of the lesson, students will be able to:

- ☐ Exchange ideas for creating three-step instructions that achieve a desired outcome.
- ☐ Sequence two or three instruction steps to achieve a desired outcome.
- ☐ Test their instructions by having peers follow them.

Essential Questions:

- ★ How do we work together to write code?
- ★ How can instructions affect outcomes?

Curriculum Standards: Alberta Science (K-6) Curriculum – Grade 1 Computer Science: Sequence two or three instruction steps to achieve a desired outcome; Exchange ideas for creating three-step instructions that achieve a desired outcome.

Materials & Resources

Category	Item Description
Classroom Tools	Blank paper, pencils, and crayons for drafting instructions. Clipboards for each pair to use while moving around the room.
Technology	None required (Unplugged activity).
Files/Handouts	"My 3-Step Program" worksheet (a simple template with three blank boxes numbered 1, 2, and 3).

Grade 1 CS Lesson 5

Instructional Procedure

5–10 min | The Hook

Activity Description: The Secret Handshake.

Teacher Instructions: Invite a student volunteer or a co-teacher to the front of the room. Perform a highly visible, exact three-step handshake (e.g., 1. High five, 2. Fist bump, 3. Wiggle fingers).

Teacher Script:

"Good morning, WRPS programmers! Did you see that amazing secret handshake? We had to sequence two or three instruction steps to achieve a desired outcome—our outcome was the perfect greeting! But I didn't invent that handshake by myself. My partner and I had to talk, listen, and exchange ideas for creating three-step instructions that achieve a desired outcome. Today, you get to do the exact same thing!"

15–20 min | Direct Instruction

Activity Description: How to Exchange Ideas.

Teacher Instructions: Model the collaborative process of brainstorming and compromising.

Teacher Script:

*"When computer programmers build games or robots, they never work entirely alone. They talk to each other! If I say, 'Let's make step one a jumping jack,' my partner might say, 'That's a great idea, but let's make step two a spin!'

Today, your job is to exchange ideas for creating three-step instructions that achieve a desired outcome. Your outcome will be a brand new 3-step workout, a 3-step dance, or a 3-step handshake. You will draw your three steps on your paper so you don't forget the order. Remember, instructions are ordered in a way that will produce a desired outcome!"*

Grade 1 CS Lesson 5

20–30 min | Guided Exploration

Activity Description: The Idea Exchange.

Teacher Instructions:

1. Pair students up and hand out the "My 3-Step Program" worksheets and clipboards.
2. Give pairs 10 minutes to brainstorm and draw their three steps in the boxes. Encourage them to compromise and include ideas from both partners.
3. Once the instructions are written, have pairs team up with another pair (groups of four).
4. Pair A will communicate their 3-step instructions to Pair B. Pair B must act as the "robots" and follow the sequence exactly.
5. Then, switch! Pair B reads their instructions to Pair A.

Teacher Script:

"Programmers, get to work! Talk to your partner and exchange ideas for creating three-step instructions that achieve a desired outcome. Will it be a dance? A cheer? Draw your steps carefully. Once you are done, we are going to have an Idea Exchange, where you will test your code on another team!"

10 min | Closure

Activity Description: Unit Celebration.

Teacher Instructions: Bring the class back to the carpet for a final wrap-up of the entire unit.

Teacher Script:

"I loved watching you all share and collaborate! You did a brilliant job as you worked to exchange ideas for creating three-step instructions that achieve a desired outcome. Think about all the things you learned in this unit: you learned that instructions come in different forms (visual, audio, written). You learned that following rules keeps us safe. And you learned how to sequence two or three instruction steps to achieve a desired outcome. You are officially Grade 1 computer scientists!"

Grade 1 CS Lesson 5

Differentiation

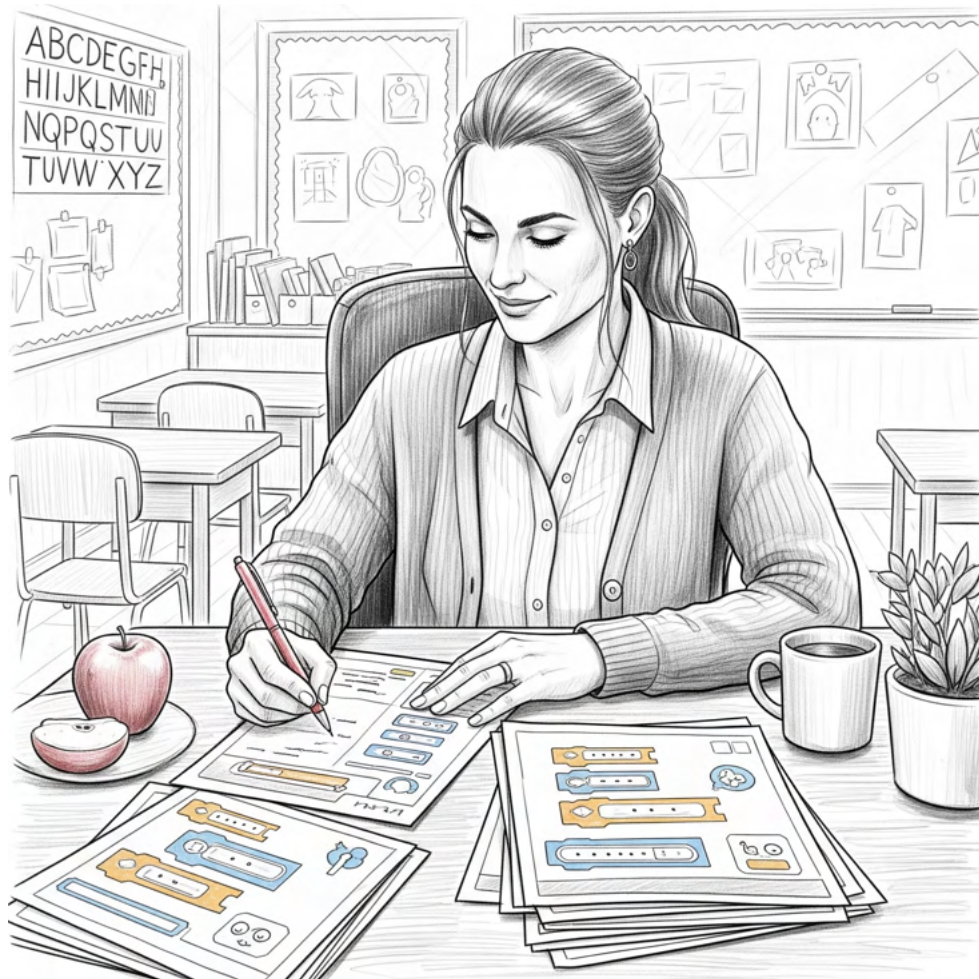
Support/Scaffolding: If a pair is struggling to exchange ideas or agree on a sequence, provide them with a "menu" of 5 pre-drawn action cards. They can simply choose three cards together and place them on their paper, removing the pressure of generating original actions from scratch.

Extensions: Challenge advanced pairs to write the physical word for the action beneath their drawings (e.g., sounding out and writing "J-U-M-P" under a picture of a student jumping) to integrate literacy skills.

Assessment

Formative Assessment: Walk around the room with a clipboard during the Guided Exploration. Check off whether students are actively listening to their peers and able to safely exchange ideas for creating three-step instructions that achieve a desired outcome.

Summative Assessment: Collect the "My 3-Step Program" worksheets to verify that each student pair successfully documented a sequence of two or three instruction steps. This serves as an artifact of their learning for the unit.



The Idea Exchange

Name: _____



Activity 1: My 3-Step Program

Draw your three instruction steps in order. Will it be a handshake, a dance, or a workout?

Step 1	Step 2	Step 3



Activity 2: The Robot Test

Share your steps with your friend. Did the "Robot" follow your sequence? Circle the thumb that shows what happened.

The Robot followed my code!	We need to fix our code.
	

The Idea Exchange

Name: _____



Activity 3: Working Together

Programmers exchange ideas! Draw a picture of you and your partner working together to build your code.