

Algorithms with Baloo Bear

CS Unplugged Lesson Plan

Grade	K-2
Setup Time	5 minutes
Duration	40 to 50 minutes
Group size	Pairs

Learning Objectives

Students will:

- Make a plan and use it to execute tasks.
- Practice computational thinking.
- Learn algorithms and write algorithms.
- Develop a list of steps needed to move their character to reach a goal.

Learning Summary

- **ENGAGE:** Getting Started (10 minutes)
Introduce students to Vocabulary
- **EXPLORE: Activity:** Learn to Code A (15 minutes)
 - **PLAN:** Words to Symbols
 - **PLAY:** Learn to Code 'A' [Help Baloo Bear reach Mama Bear] activity
 - **PLAY:** Learn to Code 'B' [Time for Bed, Baloo Bear] activity
- **EXPLAIN & ELABORATE:** Reflection and Discussion
- **EVALUATE:** Assessment

Guide for educators | Preparation & Materials

Student Materials

- Taco Playbits C-STEM Kit
- Playbits Wand
- Learn to Code A & B coding cards
- Learn to Code ABC coding chip
- Directional coding chips | Forward, Backward, Left & Right
- Printed Worksheets

Educator Materials

- Teacher Lesson Guide
- Coding chip tray

Teacher Preparation

- Print Learn to Code 'A' & 'B' coding worksheets
- Create pairs of students to ensure positive collaboration
- Create slides or write prompts and definitions on the board

Getting Started (10-15 minutes)

ENGAGE (Vocabulary)

- a. Tell the children that they will be learning about what an algorithm is
Ask them if they have ever heard of this word or used one before?
Write or post the definition on the board: Algorithm:
A list of steps or instructions needed to complete a task
- b. Based on the definition, ask students for examples of tasks in their everyday lives. Write them on the board
- c. Think, Pair, Share
Have each student write a list of steps for one task then share with a partner, then the whole class.

ENGAGE (Prior Knowledge)

- a. Choose a spot in the room and tell your students that they need to help you get from point A (where you're standing) to point B (the spot in the room).
- b. Have students write down their own ideas and then discuss as a class
- c. As students share, write down the agreed upon steps on the board.
- d. Reflect with students. Every task can be accomplished by a specific set of instructions. This set of instructions is called an Algorithm.

EXPLORE (20 minutes)

PLAN [Time for Dinner, Baby Bear]

- a. Hand out the Learn to Code A worksheet to students.
- b. Have them plan how Baby Bear will get home to Mama Bear using 4 coding chips: forward, backward, left turn and right turn.
- c. Ask them to write down the direction in the box next to the map.

PLAY [Learn to Code A]

- a. Hand out the four direction coding chips and the Learn to Code coding chip to teams of 2 students.
Make sure students collaborate to solve the challenge.
For example,
let one student tap on the chips while the other scribes
- b. Before they begin have them edit their steps from the PLAN phase based on the chips they have in front of them.
- c. Have students activate the game by turning on their PlayBits wand and tapping once on the "Learn to Code A, B, C" coding chip.
- d. Students should tap on the direction chips in the correct sequence as written down to check their work.
- e. Have them troubleshoot collaboratively if their answer is incorrect. Make sure they correct their steps on their worksheet as they go.

EXPLORE (20 minutes)

PLAN [Time for bed, Baby Bear]

- a. Hand out the Learn to Code B worksheet to students.
- b. Have them plan how Baby Bear will climb up to his bedroom using 4 coding chips: forward, backward, left turn and right turn.
- c. Ask them to write down the direction in the box next to the map.

PLAY [Learn to Code B]

- a. Instruct the students to have the wand, "Learn to Code" chip, and 4 directional coding chips ready.
- b. Instruct the teams to collaborate again.
For example, switch roles.
- c. Have students to activate the game by tapping on the "Learn to Code A, B, C" coding chip - Twice. The wand should say "Learn to Code B".
- d. Next ask the student whose turn it is to tap on the direction chips in the correct sequence based on what they have planned on their worksheet.
- e. If one of their steps is incorrect, have students collaborate to fix their steps on their worksheet. Make sure they can BOTH explain why they chose to tap a certain tip at a certain point in the game.

Explain and Elaborate (5-10 minutes)

Have students answer the following questions for homework or in a full class discussion:

- Were you able to help Baby Bear reach Mama bear?
- Which color flashed when a step was correct?
- Which color showed when a step was incorrect?
- If you saw a red light when you tapped a chip, what did you do to fix it?
- Did your plan work? If yes, why? If not, what did you do to change it?
- What was challenging about these activities?
- What did you like or find interesting?
- The Playbits want uses color and light to tell us what to do. Can you think of some other way lights or colors are used to show us the way to go?

Example answers:

- Traffic lights
- Street signs

Note to the Teacher

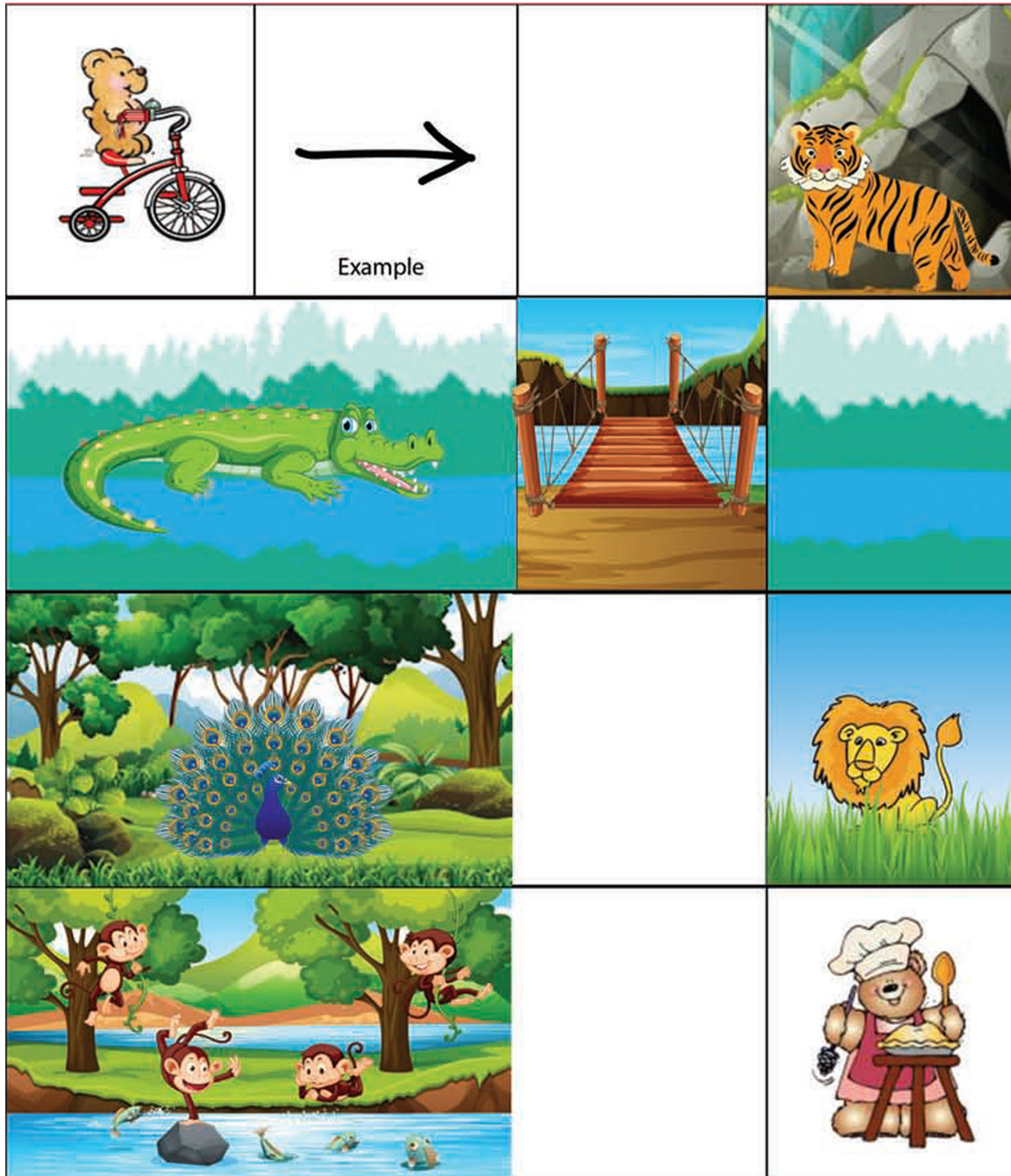
- This lesson serves as a starting point to get students to develop their computational thinking skills. Computational thinking is a problem solving process that helps learners find solutions across various disciplines.
- One of the elements encountered in this activity is Algorithm design.
- Algorithm design helps learners to tackle problem solving via:
 - Thinking ahead, making a plan & execute the steps in the plan
 - Developing the step by step instructions for completing a task or solving a problem
 - This is also known as working through Sequential coding : the order that a program has to follow

Standards Alignment K-2

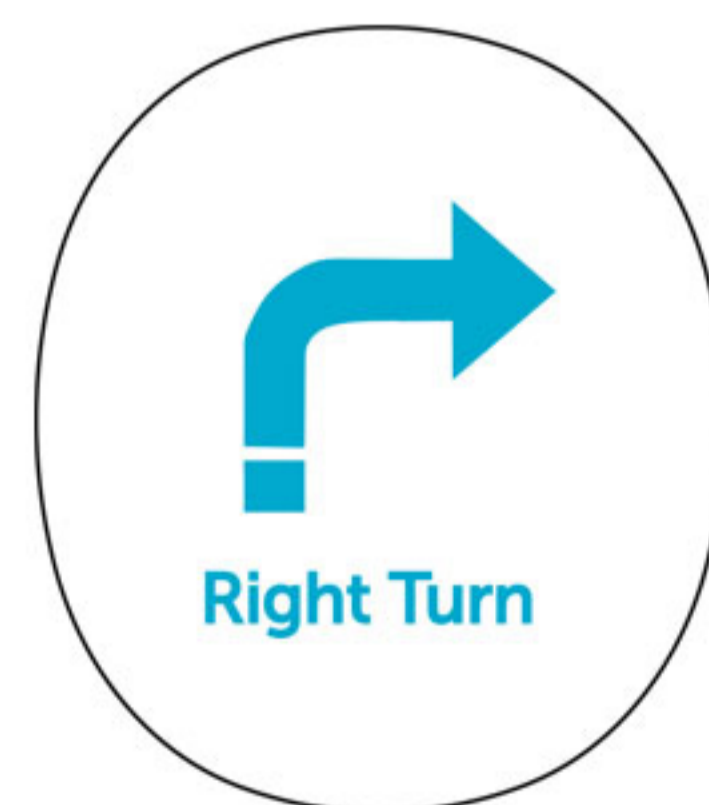
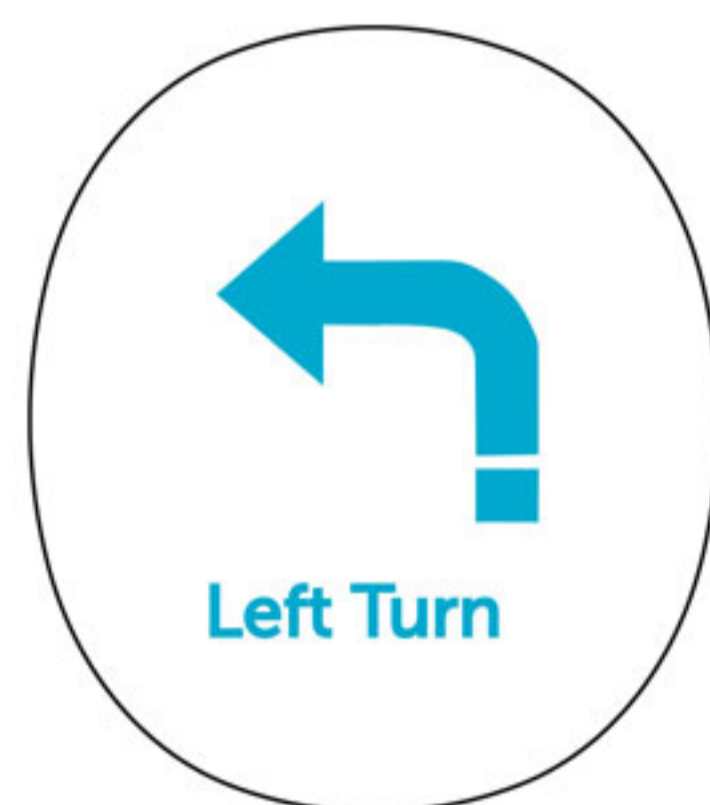
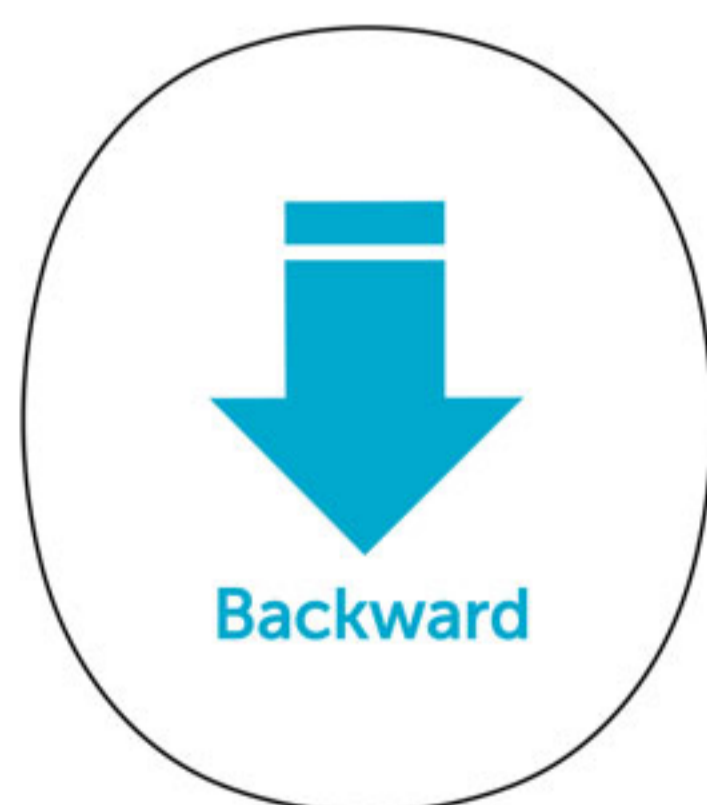
Computer Science Teachers Association, K-12 Computer Science Standards Alignment

- 1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use.
- 1A-DA-07 Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions
- 1A-AP-08 Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.
- 1A-AP-09 Model the way programs store and manipulate data by using numbers or other symbols to represent information.
- 1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.
- 1A-AP-12 Develop plans that describe a program's sequence of events, goals, and expected outcomes.
- 1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.

Learn to Code - A: Time for Dinner, Baloo Bear Worksheet



Write the Correct Code (arrow) to help Baby Bear reach home in the spaces below:



Learn to Code - B: Time for bed, Baloo Bear Worksheet



Write the Correct Code (arrow) to use the rainbow steps to help Baloo Bear climb up to his bedroom in the spaces below

