# Treasure Hunt

## Summary:
This activity reinforces the use of algorithms to complete a task. Students will follow and create their own sets of instructions, (algorithms), to find a piece of treasure. This activity can be completed inside or outside, and reinforces the compensatory access, recreation and leisure, and orientation and mobility areas of the ECC.

<table>
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<tr>
<th>Audience: Grades k-12, (complexity of the hunt can be increased or decreased based on developmental age of student)</th>
<th>Plugged or unplugged: Unplugged</th>
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## California State Standards for Language Arts:
- Writing: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. (CA.1.W.2)
- Speaking and Listening: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. (CA.1.SL.3)
- Language: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. (CA.1.L.1)

## Materials needed:
- Treasure, candy, sweets, fidgets, juice (your choice)
- Braille paper, bold line paper, or blank paper + writing tool to write instructions
- Tactile graph paper or large print graph paper
- Foam stickers or bump dots and graphing tape

## Prerequisite skills:
- Concepts of right/left/forward/backward

## Time Estimate:
- 1 hour

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Objectives:
1. Students will learn the purpose of explicit instructions to program the successful completion of a task.
2. Students will learn to analyze errors they make in their instructions and redesign a solution.
3. Students will work on skills in following a series of steps to complete a task.

Key Terms:
1. Algorithm: a set of instructions given to a computer to tell it what to do
2. Code: the language used to write the instructions so that computers can understand
3. Bug: an error in the instructions that can be fixed through test and redesign

Instructional Sequence:

Step 1: Hide Treasure
First, either you or your student hides the piece of treasure.
Next, select a starting point, the student’s chair, the front door, the 3rd desk in the 2nd row. This starting point will be where the hunter’s route will originate.
*If your student benefits from modeling, you may choose to be the treasure hider first.
Create a short hunt containing 2 or 3 instruction steps.
*It is encouraged that the student’s first attempt at hiding the treasure and writing the instructions only involves 3 steps. This way students have the opportunity to build and refine skills in critical thinking, and do not become frustrated or hyper focused on the treasure.

Step 2: Writing the Instructions
Next, the treasure hider creates a set of instructions (an algorithm) for the treasure hunter to follow to find the treasure. It is imperative that these instructions are very clear so the finder knows exactly what to do.
If your student is the hider, have them write out their instructions in their preferred medium, or use a voice recorder on a phone or tablet to record the instructions. It may be beneficial for the student to physically walk...
through what they are writing as they write it. For example, if they want the hunter to walk forward 6 steps, then they can also walk 6 steps to test whether the instruction has the desired result.

Examples of Explicit Instructions:
*example 1, “Take 10 steps forward
*example 2, “Crouch down to look under the table directly in front of you”
*example 3, “Turn left and hop forward 6 times”
*Example 4: “Turn to the left and open the door in front of you.”
[The more descriptive, the better]

Step 3: Test & Redesign
After creating a written set of instructions, students will use the tools referenced in the materials section of this lesson plan to map out the path during the test and redesign phase. Using the graph paper, each individual square will represent 1 of every action described in an instruction, 1 step, 1 hop, 1 turn, etc. Students will place markers on the graph paper to show where the instructions land them, connecting each marker with a visual or tactile line. This is also a great way to reinforce directionality, spatial reasoning, and other O&M skills, and may be used as an alternative if physically navigating the route (as mentioned in the previous step) poses challenges. This is the step in which errors (bugs) in the instructions (algorithm) will be found and can be adjusted.

Example of how to use materials for mapping:
Using a piece of graph paper, markers and/or graphing tape, students can place a foam sticker in the bottom middle square. This will represent your starting point. If your 1st set of instructions is to walk forward 5 steps, draw a line from the starting square extending 5 squares up. Place another sticker or visual marker on the landing square. If the next instruction is to turn left and jump forward 2 times, then a line will be drawn from the previously placed marker to a square 2 spots to the left. Place another marker. Continue in this manner until all directions and markers
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<tr>
<th>Step 4: Problem Solving</th>
<th>Help your student use critical thinking and problem solving strategies to find and fix the bugs in the algorithm. Ask your student: Which step did not go as expected? What was supposed to happen? What happened instead? How can we change the instruction so that it results with what you wanted to happen?</th>
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<td>Step 5</td>
<td>Keep rewriting the instructions until the treasure hunter is able to successfully locate the treasure. Success!</td>
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<td>Step 6: Rinse &amp; Repeat</td>
<td>Switch places, or invite a classmate into the fun and repeat the steps above with different students as hunter and hider, adding more steps to the instructions, or taking this adventure outside.</td>
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