Let's Build a Tree house	Grade 1: Materials, Objects and Everyday Structures

Lesson Plan	Coding Tool	Worksheet
	Cross-curricular	Language Arts (Oral Communication)

Big Ideas
- Materials are used to create structures and objects
- Different materials have different purposes/functions
- Fasteners are used to connect materials together

Learning Goals
- Identify materials and fasteners that would be needed to build a tree house
- Use visual code (arrows) to guide students to finding the materials they need

Specific Expectations

2.3 investigate, through experimentation, the properties of various materials

2.4 use technological problem-solving skills, and knowledge acquired from previous investigations, to design, build, and test a structure for a specific purpose

2.5 use appropriate science and technology vocabulary, including *experiment, explore, purpose, rigid, flexible, solid,* and *smooth*, in oral and written communication

3.5 identify the materials that make up objects and structures *(e.g., wood, plastic, steel, paper, polystyrene foam, cloth)*

3.8 list different kinds of fasteners *(e.g., tape, glue, button, zipper)*, and describe the uses of each

Description

This is **lesson one** of two where students will learn that materials are things that are used to make objects, and fasteners are used to connect objects together. They will be using floor tiles to create a grid. Desks may need to be pushed to the side to create more space for the class. Students will have to write a code to their partner to guide them to where the materials are.

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Materials	Computational Thinking Skills
- Worksheets - Pencils - Markers, Pencil crayons or crayons (yellow, blue, orange) 3x3 tile grids taped on the floor (1 grid per 2 students) - Projector	Students will have to think sequentially to brainstorm an analogue code for a map.

Introduction

- Show a picture of a Tree house (slide 2)
- Ask: Raise your hand if you see 1 thing in this picture.
- *Students will likely all raise their hands. Invite a student to share what they see. Listen for the answer "Tree house" and "Tree". State that both the tree and the tree house are structures.*
- Ask: What does the tree do for the tree house?
- *Listen for: "It holds it up."*
- Ask: What structure is natural, and what one is man-made?
- *Listen for: "The tree is natural because it grew from the ground. The tree house is man-made because a human built it."*
- Zoom in on the tree house.
- Ask: "Ready for a challenge? Look at the picture and try to find 4 things. Raise your hand when you are ready to share. If someone says something that you see too, touch your nose."
- *Listen for: "wood, nails, paint, fabric". Explain that these things are materials and that materials are used for build structures and objects.*

Action

We are going to build a tree house!

- Materials are used to make structures.
- Go through slides 4-8 with the class. Invite students to stand when they see a material they would use, and sit when they see a material they wouldn't use. Invite students to share why they would or wouldn't use that item (e.g., *"I wouldn't use cardboard because it would get soggy in the rain", "I wouldn't use dirt because you can't make a floor with dirt"*)
- You may get mixed results when you get to a safety item. At this point discuss why this is important when building.

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Let's Play a Game!

- **Students will be walking around in this game. Students should be sitting/standing in a space where they will be able to safely walk two steps in any direction without hitting something.**
- (Slide 9) Explain to students that we are going to play a coding game.
- Ask: "What do you think of when you hear the word **code**?"
- *Allow some students to share their ideas.*
- (Slide 10) Explain: Coding is a set of instructions. There are many different types of code. We use code to talk to computers (like in the image on the left). We also use code to talk to humans (like the image on the right).
- Ask: Who recognizes the type of code on the right? (Point to the LEGO instructions). LEGO instructions are a picture code that tells us how to build something.
- Ask: Has anyone seen someone use Google Maps? The instructions they give are a code that tells us how to get somewhere. Let's try our own type of code!
- (Slide 11) This is what our code is going to look like.
- Ask: What do you think this code is telling us to do?
- *Listen for: To walk in a rectangle.*
- (Slides 12-17) One slide at a time, students stand and take a step in the direction given by the arrow on the screen.
- Ask: How can you make this easier?
- *Listen for: By walking on a grid.*

Partner Challenge

- Explain: In groups of 2, you are going to create a code to help your partner collect the items they need to build your tree house!
- Step 1 is to identify all the materials you will need to build. You are going to colour safety materials in orange, building materials in yellow and fastener materials in blue.
- In step 2, you are going to draw the materials you need in the grid on page 2 of your booklet. If you want to challenge yourself, place the items far apart in the grid. (**This is a challenge because more code will be needed to guide your partner to the items*). Make sure that you leave space in your square for an arrow!
- In step 3, you are going to write the code on your grid (in the activity booklet).
- Step 4: Test it out! Partner 1 cuts out the items cards (pg. 4 of booklet) and places them on the corresponding grid tiles. Partner 1 then shows partner 2 the code. Partner 2 walks the code. When partner 2 steps on a tile with an item on it, they pick it up. The goal is for partner 2 to pick up all the items from the grid.
- Step 5: Students switch roles. Partner 2 now places item cards according to their grid code and guides Partner 1 through the grid to pick up the tree house materials.

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Consolidation/Extension

Walk the room

- Once students have completed the challenge with one partner, they are to try the code of **three** other students.
- They write their name and circle the happy face if they are successful in collecting the materials.

Assessment

The teacher can check for understanding through questioning and class discussion. The teacher can also check for understanding by review the students' worksheet from the lesson.