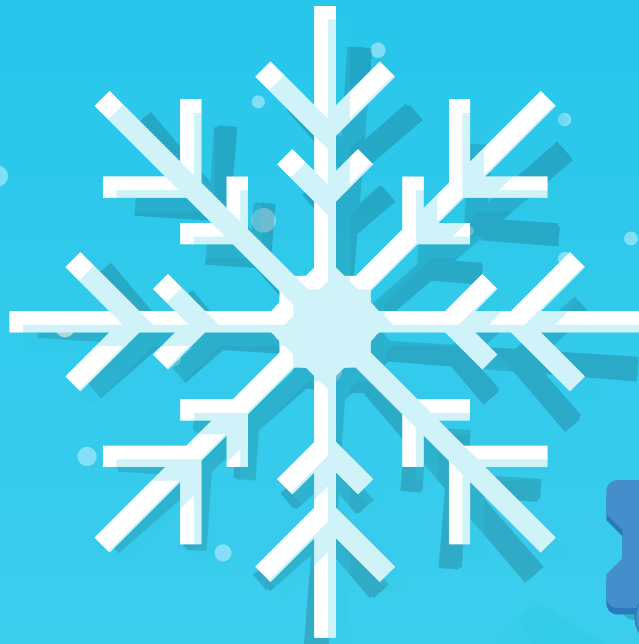


Google
Santa Tracker

5-Step Lesson Plan Template

Grades K–2

Using Code to Give Directions





Standards:

ISTE 2016: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

Objective:

"I will demonstrate how to use code to direct Santa's elves through a maze."

Essential Question:

How can you use code to help someone move through a maze?

Key Points:

1. **Coding** is kind of like giving directions. When you code, you tell a computer to follow your directions using words the computer can understand.
2. In coding, you can use a **loop** to repeat directions. It's kind of like telling the computer, "Do that part over and over again, until I tell you to stop."

Opening:

1. Tell students that you're a robot and you need their help to get from point A to point B in the room.
 - When the students give directions, take them very literally. For example, if they say, "Go forward," walk forward without stopping.
2. Once the point has been demonstrated, say something like, "Computers can do a lot, but they can only understand certain instructions. They actually have their very own language!"
3. Next, explain that, as a robot, you can only understand 4 things.
Write them on the board:
 - Go forward one step
 - Go back one step
 - Go right one step
 - Go left one step
4. Ask students to give you directions again, using only these instructions.
5. Write the steps as students suggest them. Then, try out the steps.

Introduction of New Material:

- Introduce the vocabulary term **coding**. Explain that, just as you were able to follow the students' directions, a computer can follow directions. Giving those instructions to a computer is called "coding."
- Explain that today, students are going to put blocks of computer code together to help Santa's elves get through a maze to pick up presents.

Guided Practice:

Materials needed:

- A device connected to a screen projector
- The **Code Lab** Santa Tracker game: <https://santatracker.google.com/#codelab>

Model how to use the Code Lab game for students:

1. Project your computer or tablet screen for students to see.
2. Go to the Code Lab game on the Santa Tracker website: <https://santatracker.google.com/#codelab>
3. In levels 1 and 2, put the blocks together. Show how the blocks fit together in a certain order to create the picture.
4. Once you get to level 3, show students the purple arrows on the left side of the screen. Ask students what they think they mean



Go north one space



Go east one space

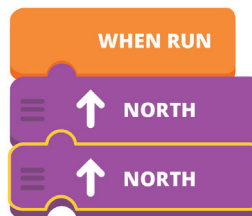


Go south one space



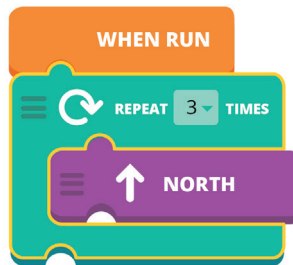
Go west one space

5. Drag a purple block under the orange block named "WHEN RUN," until it locks in place. ("WHEN RUN" essentially means "when started.") Ask students to guess what'll happen when you press play at the bottom of the screen.



6. Press the orange play button. Were students right?

- Continue until level 6, when the blue REPEAT block appears in the workspace. Ask students what they think this block does.



Explain that this block is a REPEAT block, which means it will repeat whatever is inside of it. Ask students how many steps forward they think the elf will take now.

- Press the orange play button. What happened? Point out that the elf went 3 steps because the blue block said to repeat the directions 3 times. (Notice the “3 times” dropdown option.) This kind of action is called a **loop**.
- Ask the students how many times the directions should repeat to help the elf get to the present. 4? 5? Try out their suggestion.

By this point, students should be familiar with how to give the elf directions through the maze, and ready to try it on their own.

Independent Practice:

Now have students try Code Lab on their own.

Materials needed:

- Computers or tablet devices, one for each student or pair of students
- Optional: Several cards with arrows on them
- The Code Lab Santa Tracker Game: <https://santatracker.google.com/#codelab>

- Direct students to: <https://santatracker.google.com/#codelab>
- The game will guide students through its steps.

Tips:

- Make sure the blocks are connected to WHEN RUN at the top. They won't play otherwise.
- To remove a block, drag it back to the left where it came from. (To move just one block, it needs to be at the bottom of the stack.)
- To repeat actions, make sure the blocks are inside the blue loop — not underneath it.
- Level 10 can be completed using only 5 blocks. If students have trouble figuring this out on their own, you might prompt them to look for patterns in the elf's steps.



Differentiated Instruction

Some students may want to help the elf get to the present, while others might just want to experiment and see what the blocks will do. Emphasize that planning is a big part of engineering, or coding. Encourage students to write down their plan before placing the blocks. You might even create some cards with arrows on them that students can arrange on the table before arranging them on screen.

Closing:

Materials needed:

– The Code Lab Santa Tracker Game: <https://santatracker.google.com/#codelab>

To conclude the lesson, ask students:

1. **What is coding?**
Coding is reading or writing directions in a computer's language.
2. **What is a loop?**
A loop is a type of action that tells the computer to do something over and over again, until you tell it to stop.
3. **How did you make a plan for how to help the elf get the present?**
Counted the number of steps, noticed which way the elf needed to turn, noticed when the elf would need to repeat a step, etc.



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