

UNIT 1 LESSON 3

PATTERNS AND SEQUENCES IN WRITING

3RD & 4TH GRADE



Lesson created by the GMU-ODU CSforAll Team. For more information about this lesson and our CSforAll initiative, contact Dr. Amy Hutchison at ahutchison1@ua.edu

SUMMARY AND STANDARDS

Summary:

In this lesson, students will identify and create patterns and sequences in writing and also code a pattern and sequence.

ELA Standards:

The student will read and demonstrate comprehension of nonfiction texts.

The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.

- a) Engage in writing as a process.
- c) Use a variety of prewriting strategies.
- d) Use organizational strategies to structure writing according to type
- g) Use transition words to vary sentence structure

CS Standards:

The student will construct sets of step-by-step instructions (algorithms), both independently and collaboratively

- a) using sequencing;
- b) using events.

MATERIALS AND RESOURCES NEEDED FOR THIS LESSON:

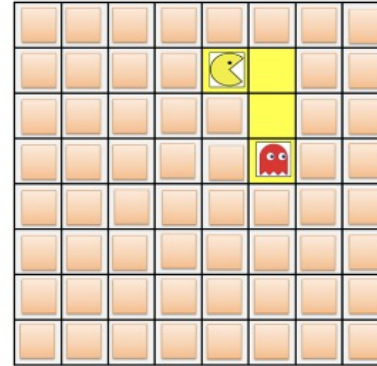
- Teacher slide deck
- Student slide deck
- Chromebook/Laptop
- Internet Access
- [Drink recipe graphic organizer:](#)



WARM UP

PATTERNS & SEQUENCING REVIEW ACTIVITY

1. Open your [student slides](#)
2. Click on the [link to the warm up](#)
3. Answer each question
4. Review [answers](#) as a class!



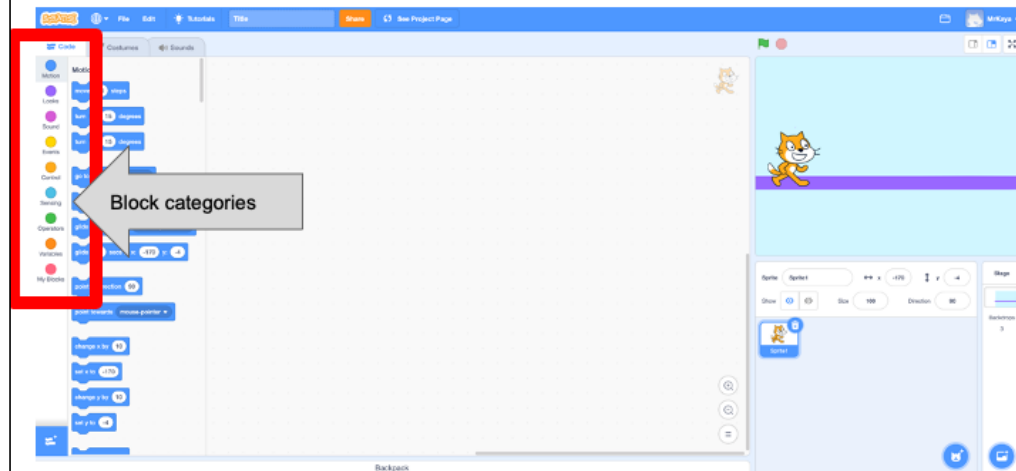
Explain: In this activity you will need to identify the pattern and sequence needed to move objects around on a grid similar to this one. You will need to figure out the best and most efficient way to solve these puzzles. For example, to get the pacman to the red ghost, you would move right, down, down.

LESSON OBJECTIVES

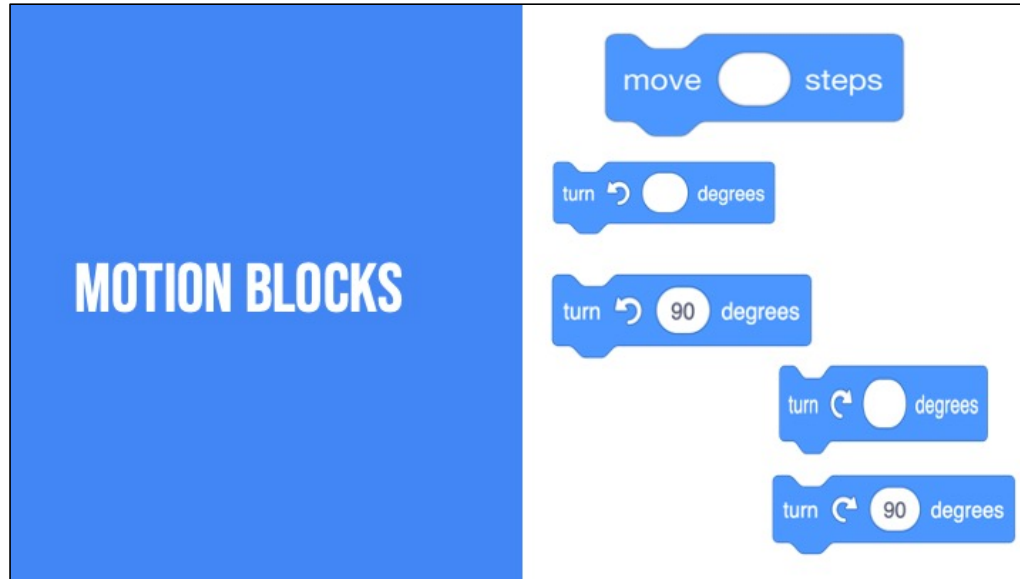
- Create a pattern and sequence a set of written instructions (Whole group)
- Identify patterns found in writing (EXPLANATORY)
- Participate in Pair Programming
- Identify and Operate Scratch blocks to create a sequence, using Move and Wait Blocks (Create a square)

INTRODUCING MOVE, TURN, & WAIT BLOCKS

REMEMBER...

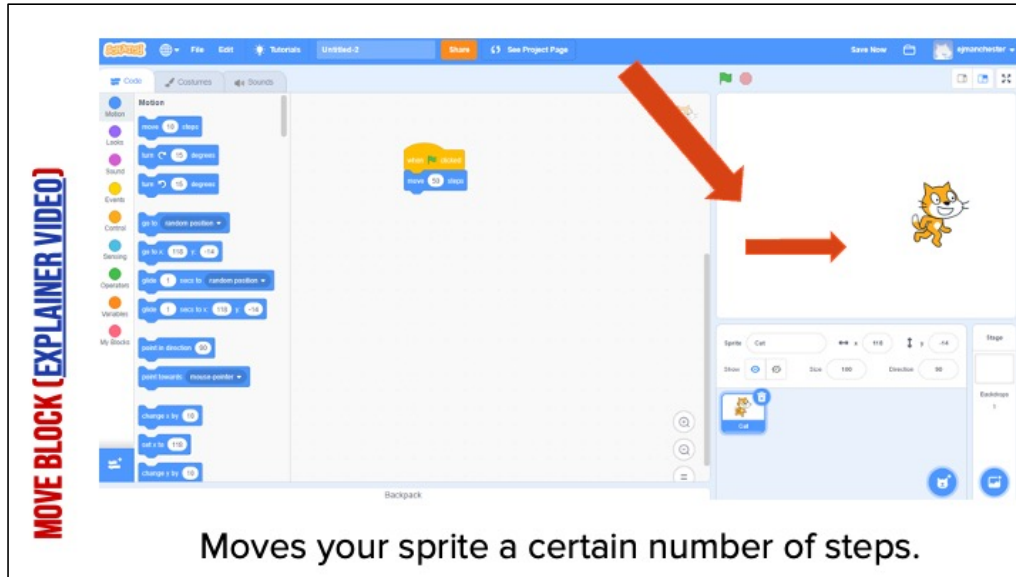


Remember that on the far lefthand side of our page, we see a color palette. Each color corresponds to a different type of block. Today, we'll focus on motion blocks, which are BLUE, and control blocks, which are YELLOW.



There are lots of motion blocks. We're going to learn about two of them today.

MOVE BLOCK (EXPLAINER VIDEO)

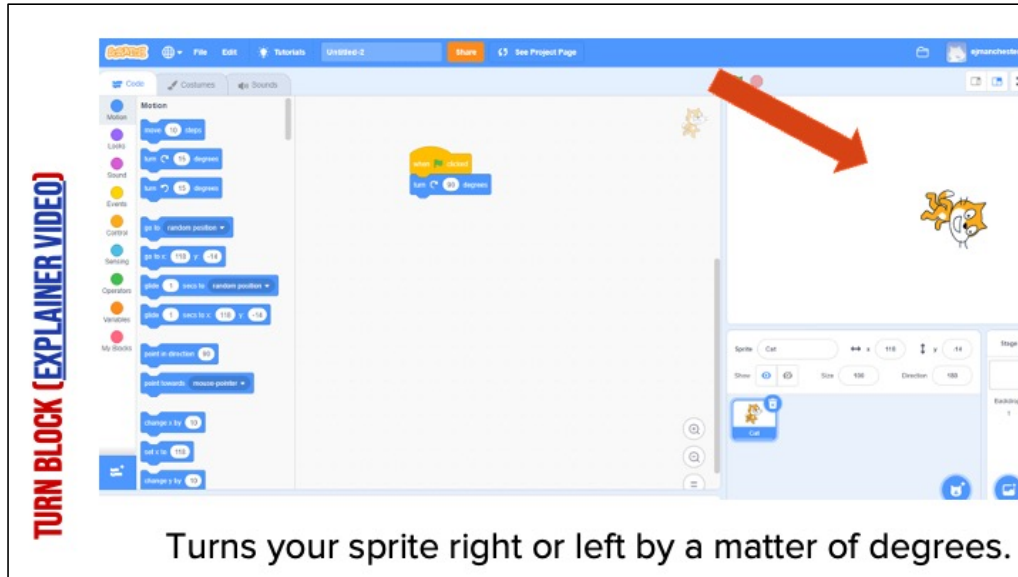


The image shows the Scratch editor interface. On the left, the 'Motion' category is selected in the 'Blocks' palette. A 'Move' block is highlighted and being dragged towards a cat sprite on the stage. Two red arrows indicate the movement: one from the 'Move' block to the stage, and another from the stage to the cat sprite. The 'Properties' panel on the right shows the selected sprite is a 'Cat' with a 'Size' of 100. A 'Backpack' is visible at the bottom of the stage.

Moves your sprite a certain number of steps.

It may not be obvious but this cat looks different from the one automatically in scratch. This one looks like it's running.

TURN BLOCK (EXPLAINER VIDEO)



The image shows the Scratch code editor interface. On the left, the 'Motion' category is selected in the block palette. A script containing a 'Turn' block is visible. A red arrow points from the 'Turn' block to a cat sprite on the stage. The 'Turn' block has a dropdown menu set to 'degrees' and a numerical input field set to '90'. The cat sprite on the stage is in a running pose. The bottom right of the editor shows the 'Sprite' panel with the 'Cat' sprite selected.

Turns your sprite right or left by a matter of degrees.

It may not be obvious but this cat looks different from the one automatically in scratch. This one looks like it's running.

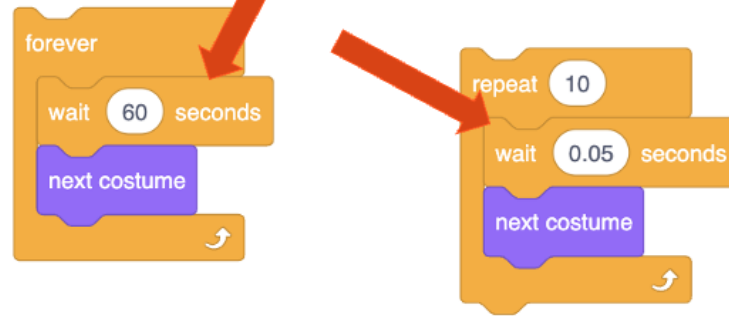
CONTROL BLOCKS



The yellow blocks are our control blocks. You already know one of them: the start block. Today you will learn about the wait block.

The wait block simply codes the sprite to wait a set number of seconds before executing the next command.

WAIT BLOCK (EXPLAINER VIDEO)



Your Sprite will PAUSE or wait for a specified amount of time.

Play video and explain:

ACTIVITY: WALK IN A SQUARE

IN SCRATCH, PROGRAM YOUR SPRITE TO WALK IN A SQUARE

Use the new move, turn, and wait blocks we just learned to program your sprite to walk in a square.



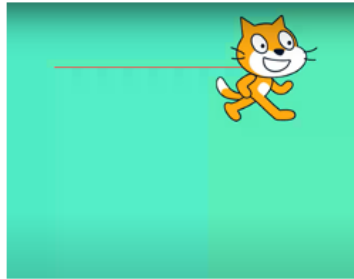
1. *"I am going to use my command blocks to program our robot to walk in a square. But wait! I can't find a block that says walk in a square. What do you think I should do? I think I first need to make my robot walk forward. Can you find a block that would make the robot walk forward?"* (prompt students to identify the forward block and consider how many steps the robot should walk).

SOLUTION

Now, let's look at one solution for this activity. There are many possible solutions, so yours may be different.

COMMANDS FOR WALKING IN A SQUARE

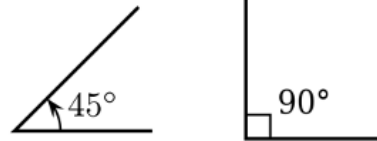
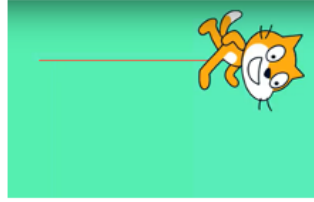
Step 1 (First): Walk forward 2 steps



If you choose this block, you would be correct. This block says "Move ___ steps". I want my robot to move 2 steps, so that would go in this blank. **CLICK** This means our robot should move directly forward 2 steps. If you are the robot, move forward 2 steps.

COMMANDS FOR WALKING IN A SQUARE

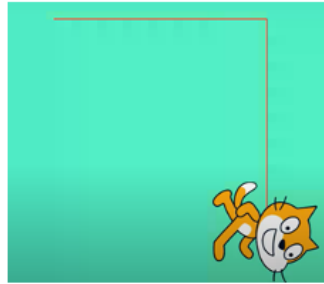
Step 2 (Then): Turn right



We need our robot to TURN. This common block **commands** the robot to turn right 90 degrees, which is like turning one corner of our square. Go ahead robot, turn right 90 degrees or one of our corners.

COMMANDS FOR WALKING IN A SQUARE

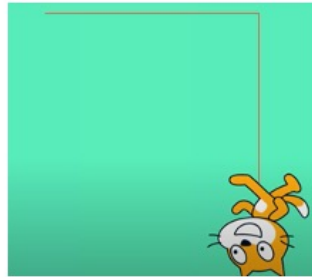
Step 3 (Next): Walk 2 steps



The sides of a square are equal, so we need our robot to walk to same number of steps as it did the first time, 2! So now our robot needs to take two steps. Things should start to get a little easier now.

COMMANDS FOR WALKING IN A SQUARE

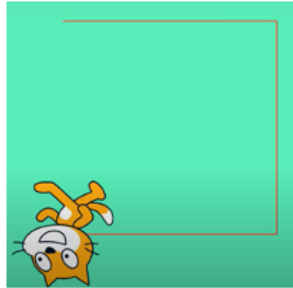
Step 4 (Then): Turn right



You got it! The robot turns right again 90 degrees! Go ahead robot, turn.

COMMANDS FOR WALKING IN A SQUARE

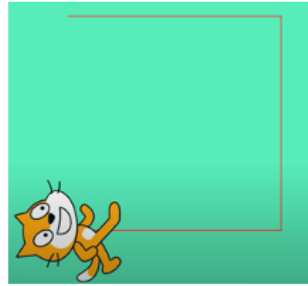
Step 5 (Next): Walk 2 steps



Move 2 steps! Go ahead robot, move two steps again!

COMMANDS FOR WALKING IN A SQUARE

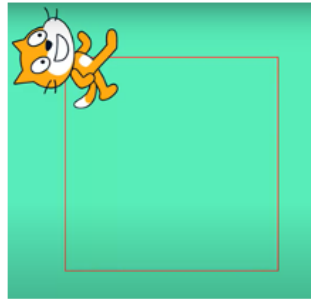
Step 6 (Last): Turn right



Turn right 90 degrees again. Go ahead robot!



COMMANDS FOR WALKING IN A SQUARE

Step 7 (Finally): Walk 2 steps



Finally, our last step is to take 2 steps and complete our square. How did your robot do?

COMMANDS FOR WALKING IN A SQUARE

Written commands	Computer commands (code)
Walk forward 2 steps	
Turn right	
Walk 2 steps	
Turn right	
Walk 2 steps	
Turn right	
Walk 2 steps	

Let's review the commands we gave the "robot" using code. We told our robot to walk forward 2 steps, turn right, forward 2 steps, turn right, forward 2 steps, turn right...until we completed our square. We had to put our commands in the correct sequence or our robot would not create a square! Think if we had put them out of order, what would our robot had done?

When you look at the code you created, you can see how these blocks would fit together. This is your algorithm, or your list of commands!

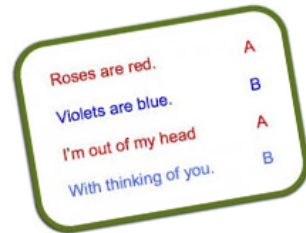
PATTERNS



You may have noticed walking forward and turning left are the two repeating commands; move, turn, move, turn...

PATTERNS IN WRITING

EXAMPLES OF PATTERNS IN OUR WRITING



BEGINNING

MIDDLE

END

1. Ask students if they can think of any patterns they see in books or stories they read (if needed, prompt students with patterns such as beginning, middle, and end; characters, setting, and plot; etc.)

GUIDED PRACTICE: EXAMPLE A

Daquan was watching TV and saw a commercial for pizza and that gave him a great idea! "I'll just make my own pizza here at the house!" he thought. He found his mom's recipe, which said:

"First, roll out the squishy pizza dough with the rolling pin. **Then**, use a spoon to spread on the red pizza sauce on top of the dough. **Next**, add shredded cheese all over the top. **Last**, top it with pepperoni slices, covering the whole pizza. **Finally**, put the pizza in the oven at 425 degrees."

After about 15 minutes in the oven, his homemade pizza was ready to eat!

DO YOU NOTICE A PATTERN?

Read slide and ask students if they can identify a pattern.

WHAT IS EXPLANATORY WRITING?

Explanatory writing:

- **Explains** something to someone or helps them understand how to do something. So it is important to provide many details!
- Is written in a specific order or **sequence**
 - A sequence is a set of things that follow each other in a particular order, where order matters!
- Often uses sequencing words such as **first, next, then** and **last** to communicate the correct order of steps, also known as their sequence

These transition words are especially important when we're giving instructions to someone. We call this type of writing, explanatory writing. Explanatory writing....[read slide]

**FIRST
THEN
NEXT
LAST
FINALLY**

FOR BOTH WRITING & COMPUTER SCIENCE, SEQUENCE IS VERY IMPORTANT!



Transition words help us to put our writing in the correct sequence—it's just as important for human readers as it is for computers!

INDEPENDENT PRACTICE

INDEPENDENT PRACTICE

Open your student slides.

Write a recipe for making a drink.

You may choose to write about lemonade, Koolaid, or another drink of your choice!

<https://www.dropbox.com/scl/fi/af1i67ajog6tu0gacc460/Lemonade-or-Koolaid-recipe.docx.docx?dl=0&rlkey=4vm66w2jppnter0oqmqmw8i2t>



In a moment, you will navigate to your student slide deck. In the deck is an outline for you. You will choose whether you want to write instructions for making lemonade or tea. Then you will type your instructions in. There is also a link to this document in the handouts, for the option to hand write your instructions. Your teacher will let you know what to do next.

WRAP UP


Can anyone share at least one “tip” for finding and using patterns in our writing or our code?

And remember: anyone can be a computer scientist!





OPTIONAL

SHARING YOUR .SB3 FILE FROM CS FIRST TO COCO

1. Create the file in CS First
2. In the Scratch editor, find the word "File" in the top-left corner.
3. Click on "File" menu and you'll see some choices pop down.
 1. Choose "Save to your computer." This will download your Scratch project.
 1. Look in your "Downloads" folder. That's where your saved project might be.
 1. Go to the CoCo website and log in to your [account](https://wego.gmu.edu/scratchgo/login.php), <https://wego.gmu.edu/scratchgo/login.php>
1. Click proceed on the correct story in CoCo.
1. Navigate to the section of CoCo where you can upload your project. (only sb3 type and 10Mb max).

Uploading your coding file (only sb3 type and 10Mb max):


1. Click "Save".

Model how students can share Scratch creations to their teacher's studio

HERE IS AN OPTIONAL VIDEO TO LEARN HOW TO SHARE YOUR PROJECT IN SCRATCH.

Pause here.

Video modeling how students can share Scratch creations to their teacher's studio

[Scratch - Imagine, Program, Share](#)

SCRATCH CHECKLIST

- ✓ I LOGGED INTO SCRATCH
- ✓ I SHARED MY PROJECT
- ✓ I ADDED MY PROJECT TO MY TEACHER'S STUDIO