

# LESSON 2

## SEQUENCING AND DEBUGGING

1ST GRADE



Award # 1837380

Lesson created by the GMU-ODU CSforAll Team. For more information about this lesson and our CSforAll initiative, contact Dr. Amy Hutchison at [achutchison1@ua.edu](mailto:achutchison1@ua.edu)

# SUMMARY AND STANDARDS

**Summary:** In this lesson, students will learn and practice retelling stories and putting them in the correct sequence. They will also review coding blocks and learn two new blocks.

## **ELA Standards:**

### **Communication and Multimodal Literacies:**

- 1.1 The student will use oral communication skills.
- e) Use increasingly complex sentence structures in oral communication.
  - i) Retell information shared by others.

### **Reading:**

- 1.9 The student will read and demonstrate comprehension of fictional texts.
- d) Describe characters, setting, and plot events in fiction and poetry.
  - g) Summarize stories and events with beginning, middle, and end in the correct sequence.

### **Writing:**

- 1.13 The student will write to communicate ideas for a variety of purposes.

## **CS Standards:**

1.1 The student will construct sets of step-by-step instructions (algorithms) both independently and collaboratively a. using sequencing; b. using loops (a wide variety of patterns such as repeating patterns or growing patterns); and c. identifying events.

1.3 The student will analyze, correct, and improve (debug) an algorithm that includes sequencing and simple loops, with or without a computing device.

1.4 The student will plan and create a design document to illustrate thoughts, ideas, and stories in a sequential (step-by-step) manner (e.g., story map, storyboard, sequential graphic organizer).

## MATERIALS AND RESOURCES NEEDED FOR THIS LESSON:

- Virtual [Teacher Slides](#) for L2G1
- A copy of The Gingerbread Man or a video read-aloud of [The Gingerbread Man](#) (read aloud prior to lesson)
- ScratchJr [Blocks](#)
- [Word Wall Cards](#)
- [Gingerbread Man Sequencing Cards](#)
- Blank index cards (3 per student)

You may also wish to review:

- ScratchJr [Blocks](#)
- ScratchJr [Interface Guide](#)

**Hello Ruby Resources:** In preparation for this lesson, you may wish to read aloud *Hello Ruby* chapter 2 in advance.

### •Vocab:

- Sequencing
- Bugs
- Debugging

## **LESSON OBJECTIVES: I CAN...**

- ❑ Ask and answer questions about a story
- ❑ Retell a story with beginning, middle, and end
- ❑ Sequence a story with a beginning, middle, and end
- ❑ Debug a story
- ❑ Design a story sequence
- ❑ Put a story in the correct sequence

# WARM UP

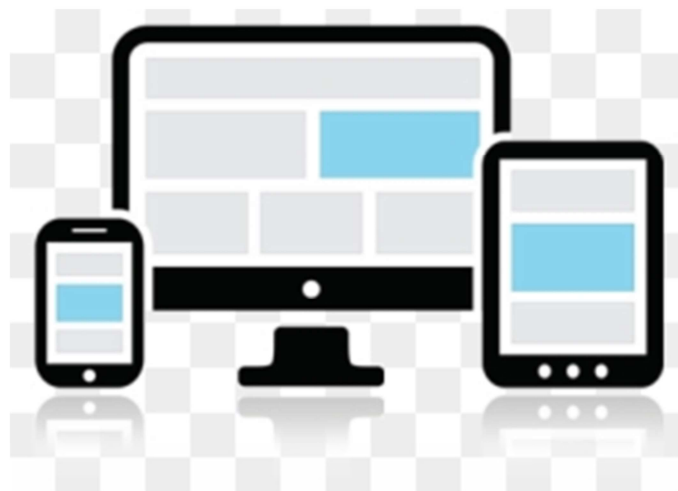
**NOTE: All slides for this lesson are scripted so that, if needed, you can see exact definitions and instructions for teaching this lesson in the notes at the bottom of the teacher slide deck.**



# Computer Science

Review what we learned about patterns and loops in lesson 1. Show the “computer science”, “computer”, “pattern”, and “loops” word wall cards (**slide 6-9**).

**Teacher:** “Today we are going to learn more about **computer science** and how we can think like computer scientists in many different situations in 1st Grade!



computer

Last time, we learned that **computer science** is using the power of **computers** to solve our problems and express ourselves.



pattern

We even looked for **patterns** that show up again and again,





loop

called **loops** and became **loop** experts, just like **computer scientists!**"

# INTRODUCTION

**WHAT IS THE PATTERN? -CLICK ON IMAGE TO PLAY**



Listen to a song, ask students to think about the pattern of the song and notice what happens at the beginning, middle, and end of the song.

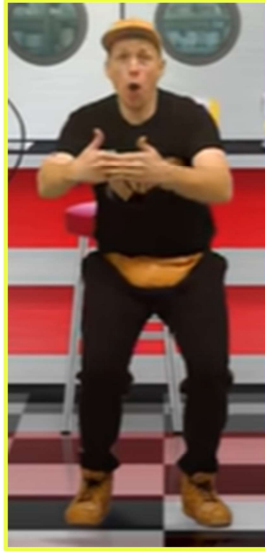
Engagement & Interest: play “Milkshake” by Koo Koo Kanga Roo (3 minutes).

**Teacher:** “We are going to watch and listen to a song. I want you to think about the **pattern** of the song and notice what happens at the beginning, middle, and end of the song.”

Video link: <https://www.youtube.com/watch?v=Y9LLfv7yauM>

## WHAT IS THE PATTERN?

1



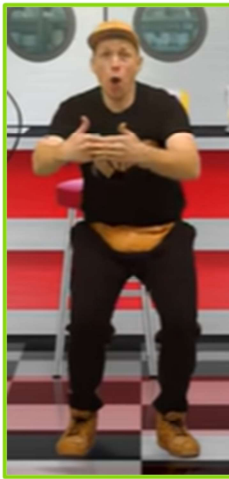
**“Oh! A milkshake!”**

Guide students to think about the beginning, middle, and end of the song. What was at the beginning/middle/end? **(slide 12-15)**

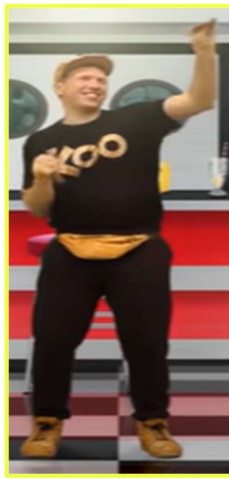
**Teacher:** “Every song and story has a beginning, a middle, and an end. We can even sing the song all by ourselves, or retell the story to a friend. What was at the beginning of the Milkshake song? (wait time) You’re right! It started with a milkshake!”

## WHAT IS THE PATTERN?

1



2



**“A sticky, sticky waffle!”**

Guide students to think about the beginning, middle, and end of the song. What was at the beginning/middle/end? **(slide 12-15)**

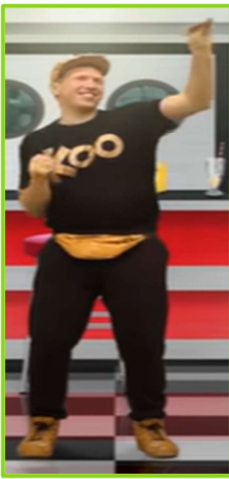
Then what came in the middle? (wait time) Yes! A sticky, sticky waffle!

## WHAT IS THE PATTERN?

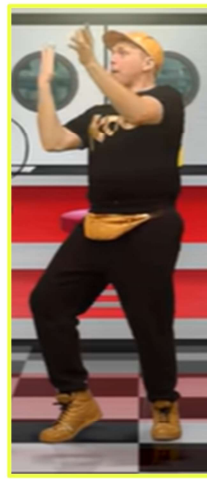
1



2



3



**“A mozzarella pizza!”**

Guide students to think about the beginning, middle, and end of the song. What was at the beginning/middle/end? **(slide 12-15)**

You're right, a mozzarella pizza too!

## WHAT IS THE PATTERN?



**“All the eggs, all the eggs are broken!”**

Guide students to think about the beginning, middle, and end of the song. What was at the beginning/middle/end? **(slide 12-15)**

What was at the end? (wait time) You're right! All the eggs, all the eggs were broken!

# GUIDED INSTRUCTION



## YOU MIGHT BE ABLE TO GUESS THIS STORY...




1





2



3

Beginning 

Middle 

End 

Play Beginning, Middle, End game: retell each part of the Three Little Pig story (*You are welcome to use familiar stories that your class has recently read/studied in Reading or Writing Workshop.*). Use three fingers to indicate the beginning, middle and end (**Slide 17-24**).

“Let’s play a new game to warm up our brain. The name of the game is Beginning, Middle, End. While we play the game, I’m going to retell each part of the story across my three fingers... like this!”

In the beginning of the story...



1

Play Beginning, Middle, End game: retell each part of the Three Little Pig story (*You are welcome to use familiar stories that your class has recently read/studied in Reading or Writing Workshop.*). Use three fingers to indicate the beginning, middle and end (**Slide 17-24**).

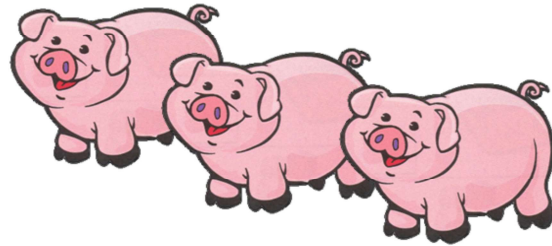
"I'm thinking of a story..."

(Hold out one finger) In the beginning , three pigs went out to build houses...

In the **beginning** of the story...



1



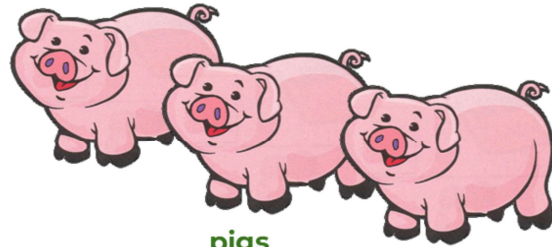
Play Beginning, Middle, End game: retell each part of the Three Little Pig story (*You are welcome to use familiar stories that your class has recently read/studied in Reading or Writing Workshop.*). Use three fingers to indicate the beginning, middle and end (**Slide 17-24**).

the houses were built out of (wait time)

In the beginning of the story...



1



pigs



straw



sticks



bricks

Play Beginning, Middle, End game: retell each part of the Three Little Pig story (*You are welcome to use familiar stories that your class has recently read/studied in Reading or Writing Workshop.*). Use three fingers to indicate the beginning, middle and end (**Slide 17-24**).

Yes! Straw, sticks, and bricks!

In the middle of the story...



2

Play Beginning, Middle, End game: retell each part of the Three Little Pig story (*You are welcome to use familiar stories that your class has recently read/studied in Reading or Writing Workshop.*). Use three fingers to indicate the beginning, middle and end (**Slide 17-24**).

(Hold out second finger) In the middle, a wolf came by and... what did he do? (wait time)

## In the middle of the story...



2



Play Beginning, Middle, End game: retell each part of the Three Little Pig story (*You are welcome to use familiar stories that your class has recently read/studied in Reading or Writing Workshop.*). Use three fingers to indicate the beginning, middle and end (**Slide 17-24**).

That's right! He blew down some of the houses!

At the end of the story...



3

Play Beginning, Middle, End game: retell each part of the Three Little Pig story (*You are welcome to use familiar stories that your class has recently read/studied in Reading or Writing Workshop.*). Use three fingers to indicate the beginning, middle and end (**Slide 17-24**).

And at the end... (hold out third finger) ? (wait time)  
Right! One of the pigs tricked the wolf!

**THAT'S RIGHT! IT'S THE THREE LITTLE PIGS!!!**



What story was this? (wait time) That's right! The Three Little Pigs is correct!"



**YOUR TURN...TRY RETELLING THE STORY TO A FRIEND!**



1



2



3

Have students try retelling the story with a partner or independently. Turn and Talk.

“You try it! Turn to your partner or work independently to retell the story across your fingers.”

## LET'S TRY ANOTHER STORY...




1





2



3

Beginning 

Middle 

End 

If time permits, try another story (Goldilocks and the Three Bears) in the same way (**slide 26-32**).

“Let’s try another story. You’re great at this!”

In the **beginning** of the story...



1

(Hold out one finger)

In the **beginning** of the story...



1

In the beginning, three bears go out for a walk because their porridge is too hot.

**In the middle of the story...**



2

(Hold out second finger) In the middle... Oh, someone thinks they know what happens in the middle?

In the middle of the story...



2



That's right! Goldilocks finds the bears' house and starts to try out all their furniture and food.

At the **end** of the story...



3

(Hold out third finger) And at the end?

## Three Finger Retell



3



You got it! The bears return and find Goldilocks sleeping in the Baby Bear's bed . She wakes up and runs home. What story was this? (wait time) We just retold Goldilocks and the Three Bears!"



**Your turn...try retelling the story to a friend!**




1





2



3

Beginning 

Middle 

End 

Have students try retelling the story with a partner or independently.

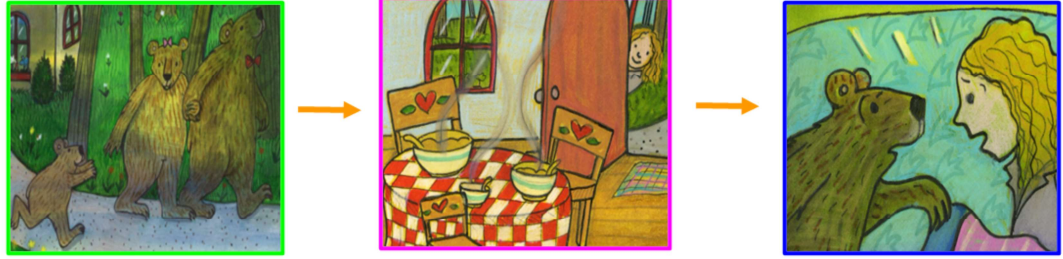
“Remember, we can retell a story across our fingers. How do we start retelling a story? Right! From the beginning! Then what do we tell? Yes, the middle! And last comes... (wait time) the end! You try it!

Turn to your partner or work independently to retell the story Goldilocks and the Three Bears across your fingers.”

1	2	3
		
		

**Slide 34 provides a scaffold for students while they retell. *Turn and talk with a partner or brainstorm independently. Students can do this whole group or small groups.***

“You’re so good at retelling stories! You’re right! When we retell a story in order, we call it **sequencing**. **Computer scientists** use **sequencing** too to tell a computer what to do. They put all of the steps in order, just like you did!”



# sequencing

“Sometimes we run into a problem with our **sequence** .

1



2



3



**Out of order!**

Sometimes, the parts of the story are all out of order! When that happens, we need to do something fancy that good computer scientists do. We need to... are you ready for this?



debug

## Introduce Sequencing and Debugging

**DEBUG.** Can you say that word? (prompt choral response) You're right! When we **debug**, we find where things went wrong and where the story, or **sequence**, is out of order!"

# GUIDED PRACTICE

*The Gingerbread Man –Click on Image to Play*



*For the sequencing activity below, we've selected The Gingerbread Man. It is helpful for your students to have read the book frequently prior to this lesson. You're welcome to use a story and matching sequencing cards of your choice. Guide students to retell the Gingerbread Man across fingers. **You may choose to play video if students need a refresher or let students know the resource will be available as an asynchronous resource.***

Model how to retell the story across the fingers again (**slide 38-42**)

“We’ve been reading The Gingerbread Man. “When we retell a story, we can tell it across our fingers, like this (hold out one finger) :

Video link: <https://www.youtube.com/watch?v=7NjDUMeBaUo>





1



Model how to retell the story across the fingers again (**slide 38-42**).

At the beginning of the story, the old woman is baking Gingerbread. How did she make the gingerbread? (wait time?) That's right! She mixed up the dough (act out mixing)



2



(hold out a second finger) Then what did she do? (wait time) That's right! She rolled it out (act out rolling) and she used her little cookie cutter to cut out the gingerbread man!



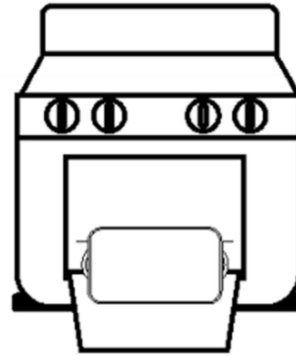
3



(hold out third finger) Then what happened? (wait time) Correct! She put him in the oven (act out putting the cookie in the oven)



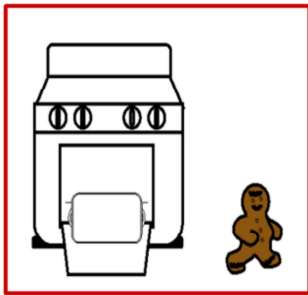
4



(hold out fourth finger) What happened last? (wait time) Oh my goodness! You're right! The gingerbread man came to life and ran away!"

# Uh, oh!

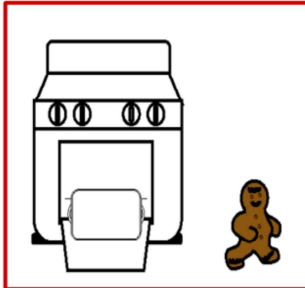
Is this story in the correct **sequence**?



I have some picture cards here (asynchronous [picture cards](#) also available) that match the old woman baking the Gingerbread Man. But, we have a problem! All of the cards are out of order! Can you help me **debug** the **sequence**, just like a **computer scientist**?"

Which part of the **sequence** comes *first*?

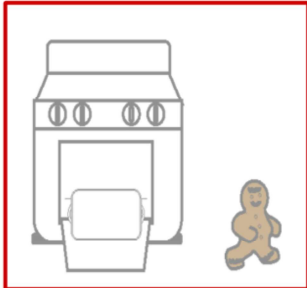
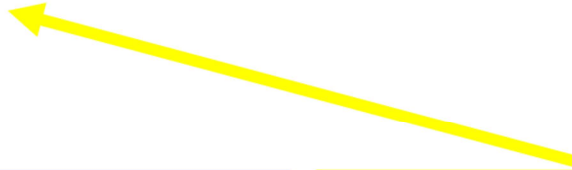
1



“Get ready to think like **computer scientists**! Where did the **sequence** go wrong? What do we need to do to **debug** this **sequence**? Let’s figure out what we need to do!”

Which part of the sequence comes *first*?

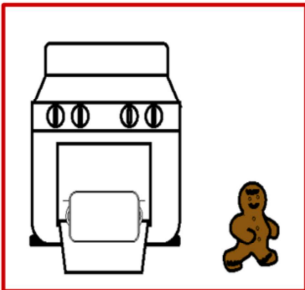
1



Which part of the **sequence** comes *second*?

1

2





Which part of the **sequence** comes *third*?

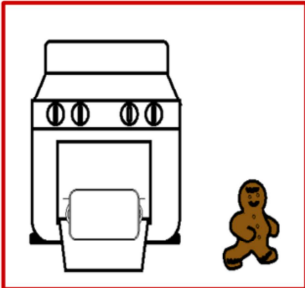
1



2



3



Which part of the sequence comes *third*?

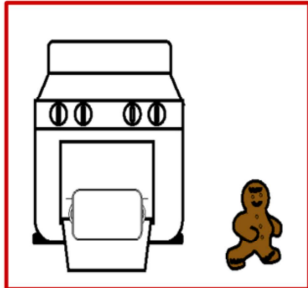
1



2



3



Which part of the **sequence** comes *fourth*?

1



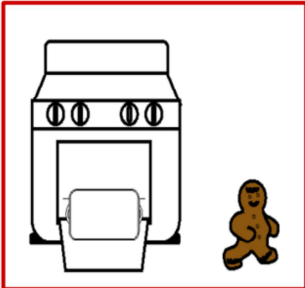
2



3



4



Which part of the **sequence** comes **fourth**?

1



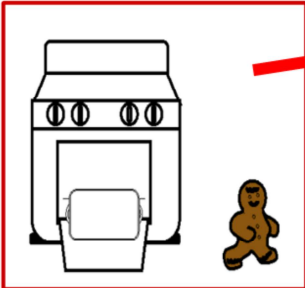
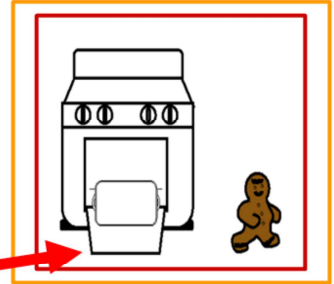
2



3



4



# Great job!



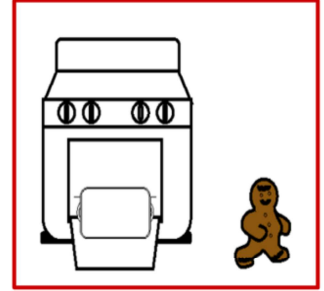
1



2



3



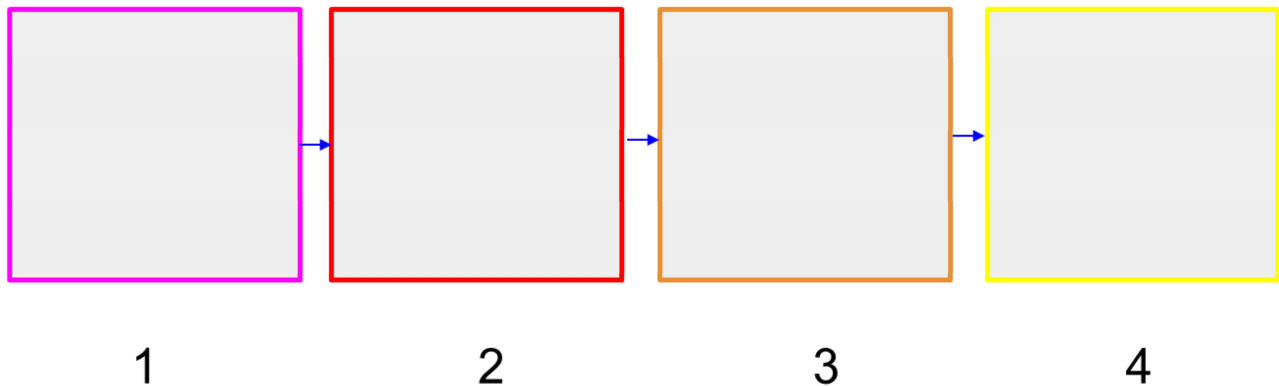
4

“Great job, **computer scientists**! You’ve worked together to retell the story, **debug** the **sequence**, and put it back together in the correct order!”

# INDEPENDENT PRACTICE

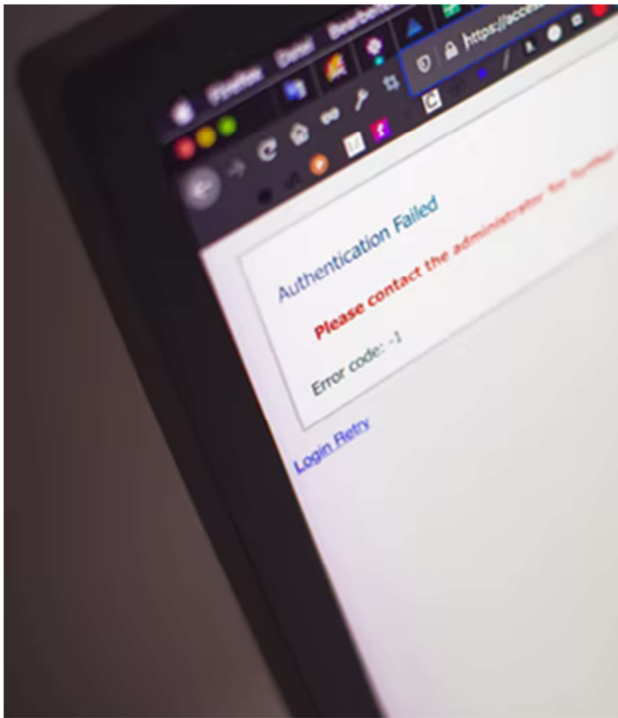
Give some stories to students and let them choose one to identify the beginning, middle, and end, then shuffle them up and put the sequence out of order. Choose a few students to share their correct sequence.

# Your Turn!



“Now, it’s your turn to design like a **computer scientist**. Choose a story that we’ve read in class before. On index cards or a piece of paper, draw and write about what happened at the beginning, the middle, and the end. When we’re finished, we’re going to shuffle them up and put the **sequence** out of order. Then, we’ll choose a few students to share their correct **sequence**! Remember that if you get stuck, you can retell the story across your fingers to remember what happened next.”

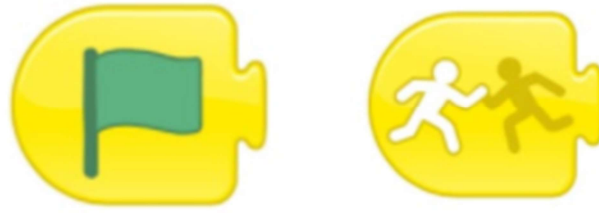
- *Consider displaying class read-aloud text ideas for students to choose from. Be sure to select stories that have a clear sequence, such as Goldilocks, the Three Little Pigs, The Little Red Hen, etc. \*\*\*If students have index cards available, encourage them to use them for this activity. Otherwise, ask students to get three pieces of paper or to draw three boxes on a piece of paper like on [\*\*\*or provide this graphic organizer prior to the lesson or use **slide 57** to write/type on the virtual graphic organizer using your available virtual classroom tools].*
- *\*\*\*Allow time for students to draw and write their sequencing cards. When finished, you can facilitate small groups or pairs for student teams to debug the sequence.*



Today we learned that writers have to put their words, sentences, and stories in the right sequence! The same is true for computer scientists. Even though they write in code instead of English, it's still very important to put the code in the correct sequence!

Otherwise, the code WON'T work.





## start blocks

Let's use this example. These are both start block. It tells the computer to "start" reading the code. It wouldn't make sense to END with a start block. No, it must come first in the correct sequence!

The green flag tells the computer to start reading, or "running" the code when the green flag is clicked by someone. The other one is "start on bump" which means it'll start when two objects touch.



## green flag

Starts the script when the Green Flag is tapped.

### Introduce new triggering blocks

The green flag makes our script start.



## start on bump

Starts the script when the character is touched  
by another character.

### Introduce new triggering blocks

This one **Start on Bump** makes our character move when another character touches it. Later, we might see other colors and learn what they will be used for, too.



stop block

This is the stop block: it stops all the code from continuing to run. It must always come at the end. If you accidentally put this before your other code, nothing will run because the computer will read that block and “stop” there.

**WRAP UP**

## TODAY WE REVIEWED AND LEARNED...



sequencing



retelling



coding blocks

“Great job, computer scientists! What important words and ideas did we learn today?  
(wait time)

- Review what we learned today by asking students to think about it and share (**slide 65-66**).
- Provide the opportunity for students to share understanding within a small or whole group.*