LESSON 2

SEQUENCING AND DEBUGGING

KINDERGARTEN

CS FOR ALL

NSF
Award #1837380

SUMMARY AND STANDARDS

Summary: In this lesson, students will learn what is a sequence in a story and how to put the sequence into the right order by debugging. They will also take a quick look at the ScratchJr coding blocks.

ELA Standards:

K.1 The student will demonstrate growth in the use of oral language.
  a) Listen to a variety of literary forms, including stories and poems.
  b) Participate in a variety of oral language activities including choral and echo speaking and recitation of short poems, rhymes, songs, and stories with
  c) repeated word order patterns.

K.9 The student will demonstrate comprehension of fictional texts.
d) Begin to ask and answer questions about what is read.
e) Retell familiar stories, using beginning, middle, and end.

CS Standards:

K.1 The student will construct sets of step-by-step instructions (algorithms) either independently or collaboratively including sequencing that emphasize the beginning, middle, and end.

K.2 The student will construct programs to accomplish tasks as a means of creative expression using a block based programming language or unplugged activities, either independently or collaboratively, including sequencing, emphasizing the beginning, middle, and end.

K.3 The student will create a design document to illustrate thoughts, ideas, and stories in a sequential (step-by-step) manner (e.g., story map, storyboard, and sequential graphic organizer).

MATERIALS AND RESOURCES NEEDED FOR THIS LESSON:

- Teacher Slides
- A class copy of *Humpty Dumpty* on sentence strips or displayed on the board
- ScratchJr Blocks (printed or displayed)
- Word Wall Cards
- Nursery Rhyme Picture Cards (several sets)
- Student Checklist

You may also wish to review:
- ScratchJr Blocks
- Scratch Jr Interface Guide

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

Vocab:
- Sequencing
- 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
- ❏ 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 the content related to patterns from the last lesson. Show the "computer science", "computer", and "pattern" word wall cards (**slides 6-8)**.

<u>**Teacher:**</u> "Today we are going to learn more about **computer science and how we can think like computer scientists in many different situations** in Kindergarten!
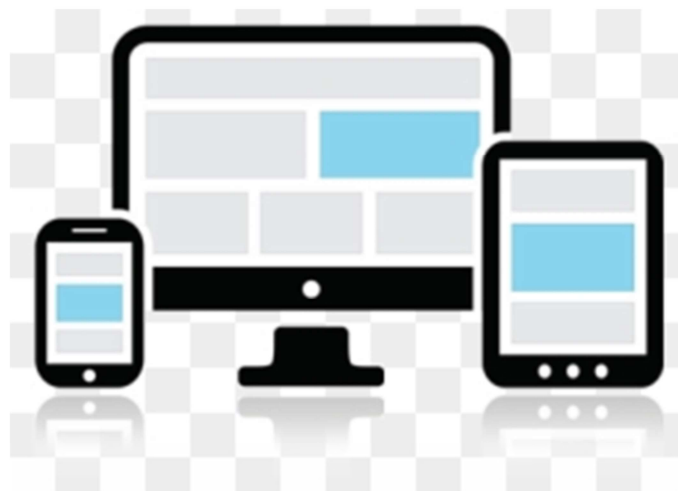
computer

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** and became **pattern** experts, just like computer scientists!"

INTRODUCTION

WHAT IS THE PATTERN? –CLICK 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
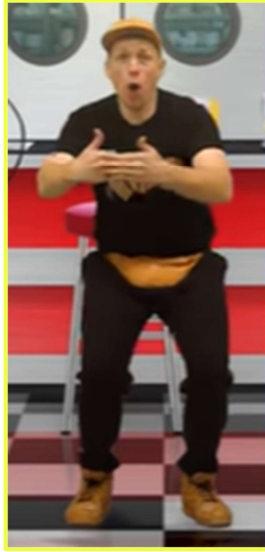
"Oh! A milkshake!"

Guide students to think about the beginning, middle, and end of the song. What was at the beginning/middle/end?   **(slides 11-14)**

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!
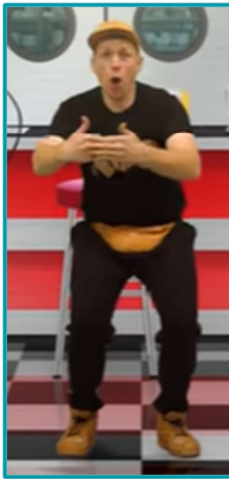
WHAT IS THE PATTERN?
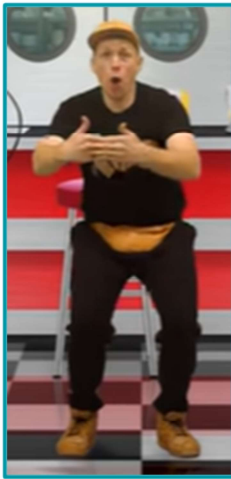
1   2
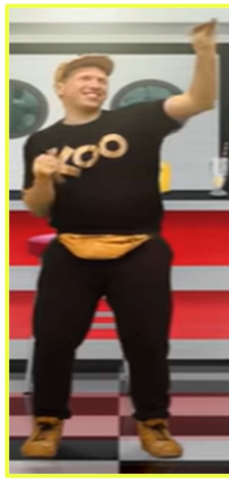
"A sticky, sticky waffle!"

Then what came in the middle? (wait time) Yes! A sticky, sticky waffle!
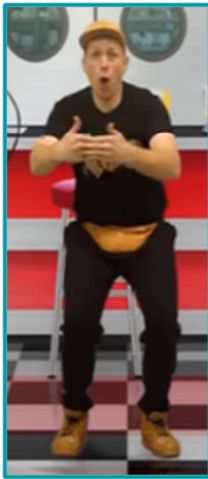
WHAT IS THE PATTERN?
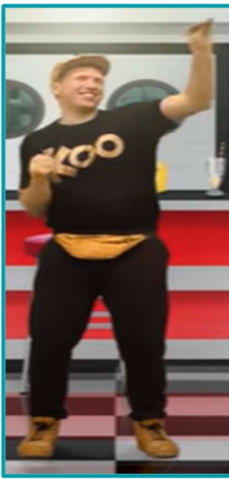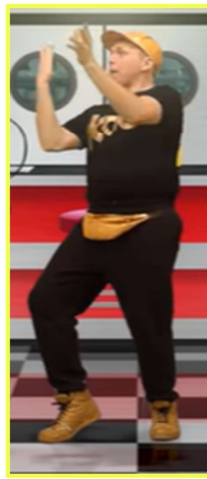
"A mozzarella pizza!"
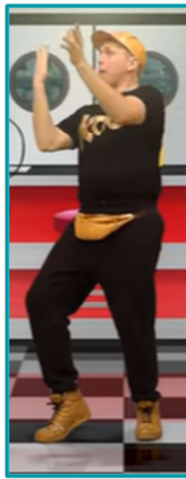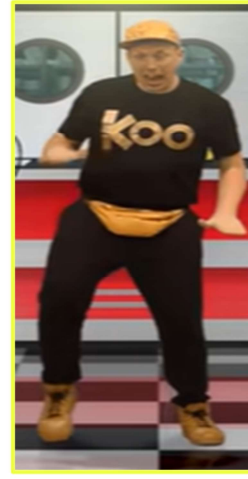
You're right, a mozzarella pizza too!

WHAT IS THE PATTERN?

"All the eggs, all the eggs are broken!"

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

GUIDED INTRODUCTION

YOU MIGHT BE ABLE TO GUESS THIS STORY...

1   2   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 16-23**).

Teacher: "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!"
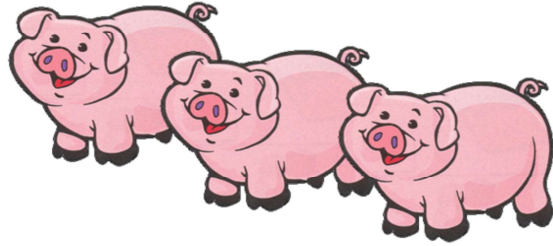
"I'm thinking of a story…(Hold out one finger).

In the beginning of the story...
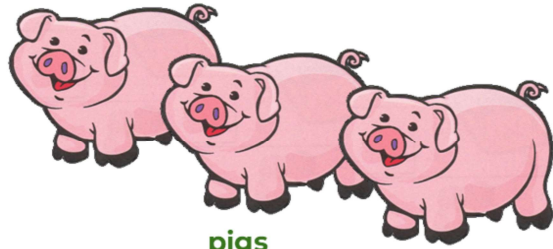
1

In the beginning, three pigs went out to build houses… the houses were built out of (wait time)

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

pigs

1

straw   sticks   bricks

Yes! Straw, sticks, and bricks!

In the middle of the story...

2

(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

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

And at the end… (hold out third finger) ? (wait time) Right! One of the pigs tricked the wolf! What story was this? (wait time)

That's right! It's the Three Little Pigs!!!

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.

"You try it! Turn to your partner or work independently to retell the story The Three Little Pigs across your fingers." Turn and Talk.

If time permits, try another story (Goldilocks and the Three Bears) in the same way (**slide 25-32**).

"Let's try another story. You're great at this!

In the beginning of the story...

1

(Hold out one finger) In the beginning, three bears go out for a walk because their porridge is too hot

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

1

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?

At the end of the story...

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)

Goldilocks and the Three Bears!

We just retold Goldilocks and the Three Bears!"

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

1   2   3

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

"You try it! Turn to your partner or work independently to retell the story of Goldilocks *and the Three Bears* across your fingers."Turn and Talk.
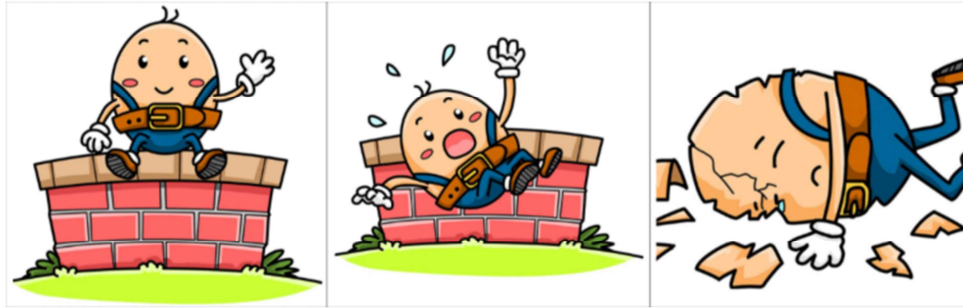
sequencing

Introduce Sequencing and Debugging and show students sequencing word wall card

Teacher: "You're so good at retelling stories! 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'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!"

debug [word wall card](#)

"Sometimes we run into a problem with our **sequence**. 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** . 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!"

Humpty Dumpty

Humpty Dumpty sat on a wall.
Humpty Dumpty had a great fall.
All the king's horses and all the king's men
Couldn't put Humpty together again.
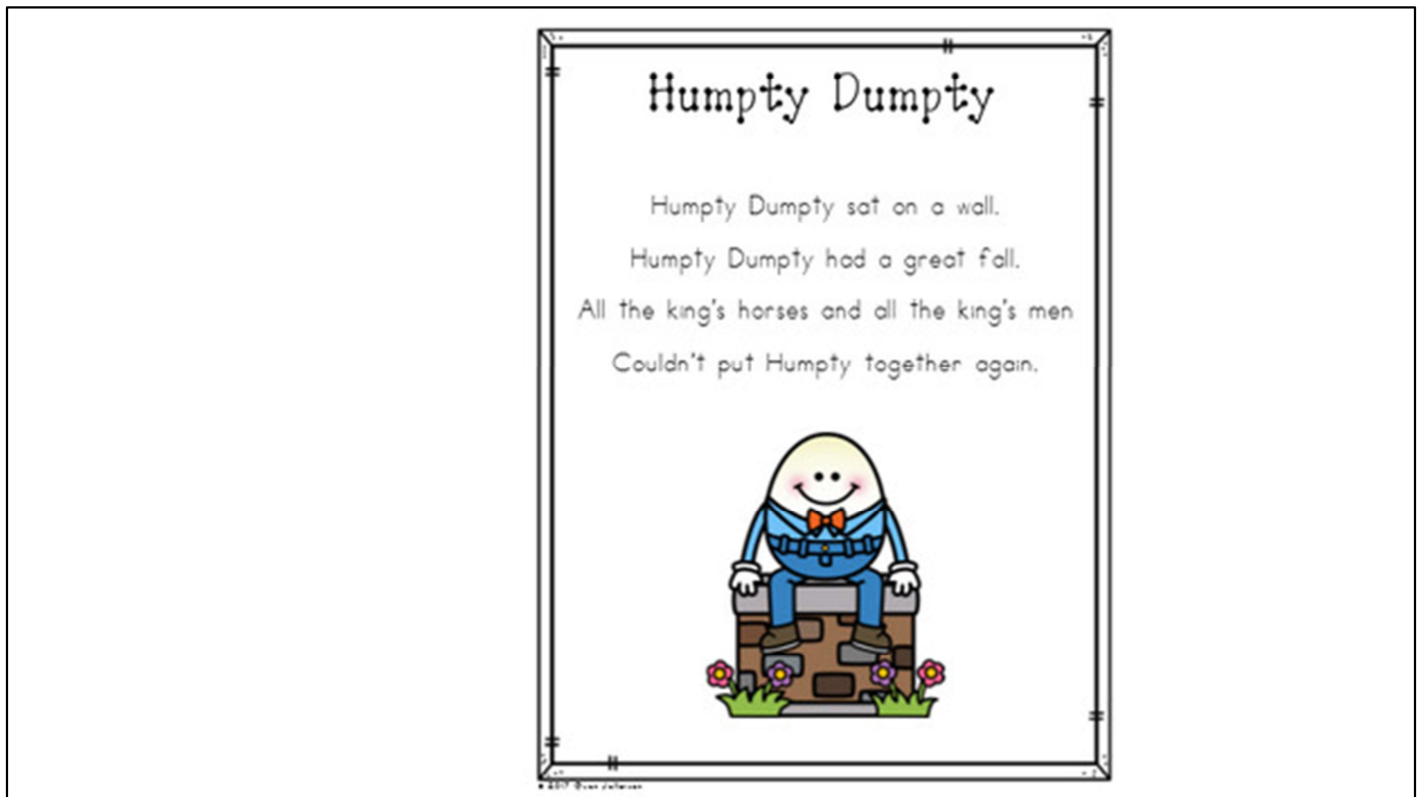
Read Humpty Dumpty and Retell: read the story together and look for what happens at the beginning, the middle, and the end.

Teacher: "Now, it's your turn to think like a **computer scientist**! We've been learning the nursery rhyme Humpty Dumpty. Let's reread it together. As we read, I want you to think like a **computer scientist** and look for what happens at the beginning, the middle, and the end."

Display a copy of "Humpty Dumpty" in a place where students can see and hear the poem. You may even consider giving a copy to each student to follow along.
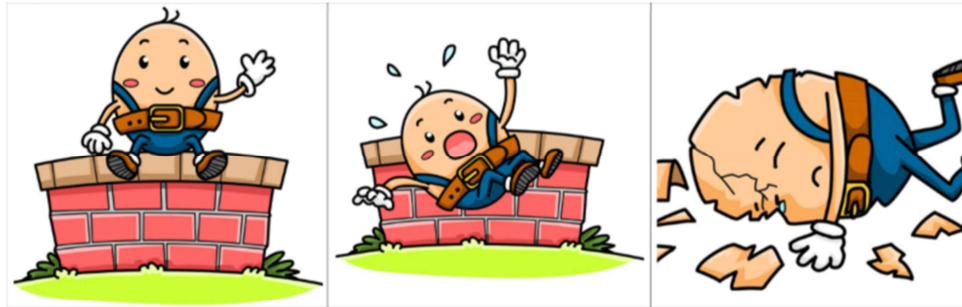
"Great job! Now… with your partner or independently, work on retelling this story across your fingers. The first finger is for the beginning (hold out one finger), the second finger is for the middle (hold out second finger), and the third finger is for the end (hold out third finger). See! 1… 2… 3. Beginning, middle, and end!" (Slide 33)

"Great job thinking like a **computer scientist**! You were retelling the beginning, middle, and end across your fingers!

Pair students with a partner (allow working independently) and cue them to begin retelling the nursery rhyme across their fingers. Circulate as students retell to listen in, encourage them to retell it across their fingers, and ensure that they're telling the story in order.

GUIDED PRACTICE

Practice Debugging: display mixed-up [picture cards](#) **that match Humpty Dumpty and guide students to fix the sequence of the cards one by one. Let them turn and talk to figure it out in the process. (slides 39-46**)

Teacher: "Now that we've warmed up our reading brains, and we know how to retell the story, we're ready to practice... **debugging**! I have some [picture cards](#) here that match Humpty Dumpty. But, we have a problem! All of the cards are out of order! Can you help me to **debug** the **sequence**, just like a **computer scientist**?"

Which part of the sequence comes first?

1

"Hmm… I know that Humpty Dumpty sat on a wall… but WAIT! What happened here?! That's right, we need to debug!

Which part of the sequence comes first?

1
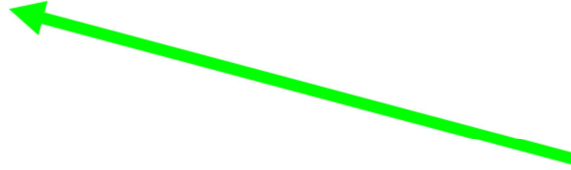
Which part of the sequence comes *second*?
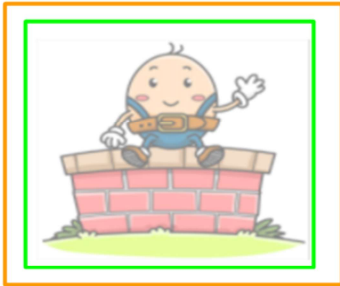
1   2

What really goes next in our sequence? Turn and talk to your partner or work independently.

Which part of the sequence comes second?

1   2
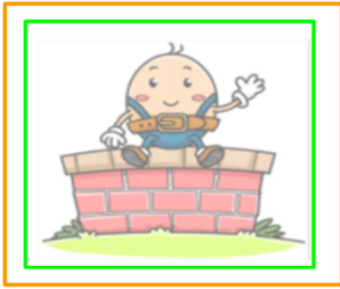
That's right! Humpty Dumpty fell off of the wall next! (Move cards to demonstrate debugging)

Which part of the sequence comes *third*?
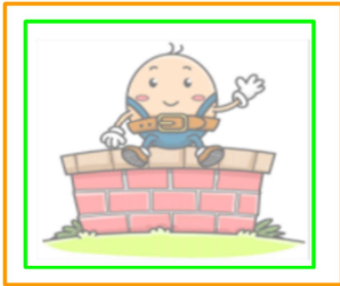
1   2   3

?

Okay, we've fixed the sequence so far! Hmm… where does this last card go? Humpty had a great fall! Turn and talk to your partner or work independently.

Which part of the sequence comes *third*?
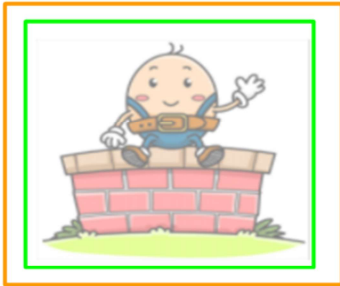
1   2   3
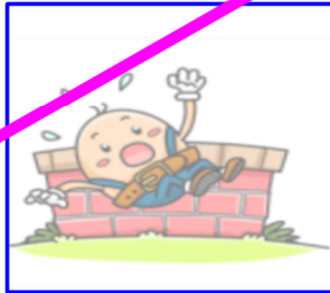
That's right! Humpty fell at the end of our **sequence**.
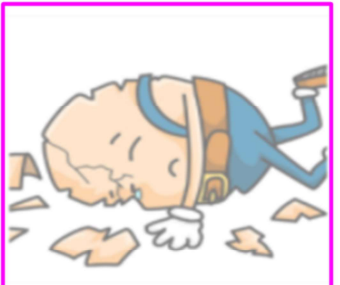
Great job **thinking like a computer scientist**!"

INDEPENDENT PRACTICE

Distribute picture cards to students

We have provided resources for [nursery rhyme sequencing](#) during independent practice. It may be helpful to ensure that students are familiar with these nursery rhymes before this lesson. Or, you may create your own sequencing activities aligned with a story of your choice.

Distribute sequencing cards so that students all have cards to the same nursery rhyme, or distribute sequencing cards for a variety of the included nursery rhymes if your class is familiar with them. Allow students to continue working in pairs in order to build vocabulary and encourage troubleshooting during the sequencing activity.

Your Turn!

1   2   3   4
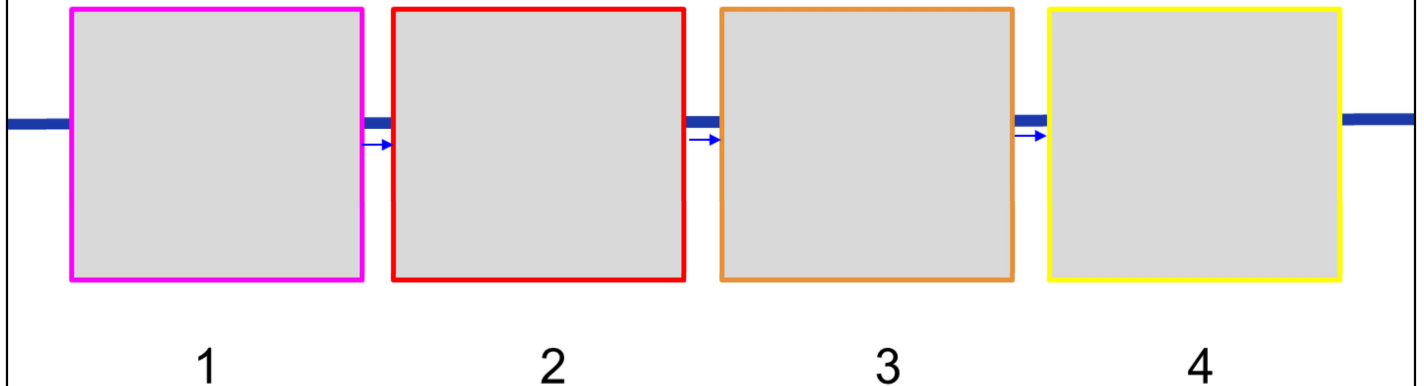
"Now, you're going to be able to retell a new nursery rhyme **sequence** with pictures. (Hold up a group of cards for students to see) On each card, there's a picture of the beginning... the middle...OR the end. With your partner or independently, see if you can put the **sequence** in order. Remember, if the **sequence** doesn't look right, you can work together to **debug** it… just like a **computer scientist**! If you finish the first one, raise your hand, I'll come check your cards, and I'll bring you another mystery story to put in order!"
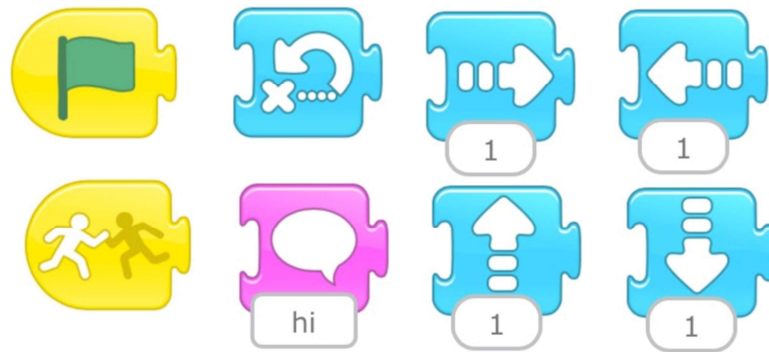
coding block

Explore Coding Blocks: show coding blocks on the [word wall card](#) **(slide 49-54)** and examples of coding [blocks](#) here. Briefly ask questions and introduce the colors of blocks and what they do.

"Nice work! Next time, we're going to sequence our story with **coding blocks**

Computer scientists tell the computer what to do with **coding blocks**. **Coding blocks** look like this. Look at all the choices we have for **coding blocks**!"

"What do you notice about these **coding blocks**? That's right! A lot of them are blue!

Start over **Move right 1** **Move left 10** **Move up 7** **Move down 6**
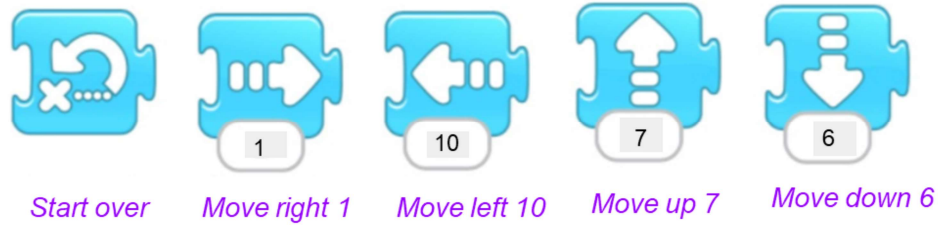
motion blocks
motion = move

The blue blocks are called **motion blocks**. They can be used to make characters move. The colors of the blocks tell us what they can be used for. The blue blocks are used as **motion blocks**.
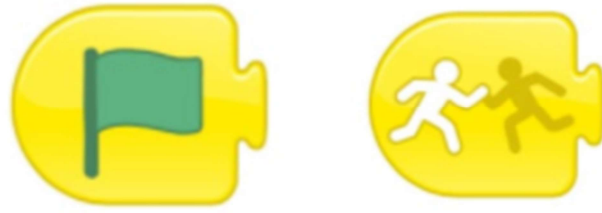
triggering blocks

The yellow blocks are called **triggering blocks**, which tells the computer when to start. Later, we might see other colors and learn what they will be used for, too."

green flag

Starts the script when the Green Flag is tapped.

start on bump

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

WRAP UP

Review what we learned about sequence and debug.

"Great job, computer scientists! You were working together to remember the **sequence**, **debug** it if there was a problem, and retell the story. I even saw many of you retelling the beginning, middle, and end across your fingers! Remember, we can be just like **computer scientists** when we fix up the problems that we see in a **sequence**!"

TODAY WE...

sequence

debug

motion blocks

triggering blocks

retell

Review what we learned about sequence and debug.

"Great job, computer scientists! You were working together to remember the **sequence**, **debug** it if there was a problem, and retell the story. I even saw many of you retelling the beginning, middle, and end across your fingers! Remember, we can be just like **computer scientists** when we fix up the problems that we see in a **sequence**!"

TODAY...

- ❏ I watched the "Milkshake" video.
  - ❏ I talked with my teacher and classmates about the pattern in the "Milkshake" video.
- ❏ I listened as my teacher told the beginning, middle, and end of *The Three Little Pigs*.
  - ❏ I told the beginning, middle, and end of *The Three Little Pigs* to a friend.
- ❏ I learned about sequencing - telling a story in order.
- ❏ I learned about debugging - fixing the parts of the story so that they are in order.
- ❏ I helped my teacher and classmates sequence and debug the story of *Humpty Dumpty*.
- ❏ I talked with my teacher about coding blocks.
  - ❏ I learned that blue coding blocks are motion blocks. They make a character move.
  - ❏ I learned that yellow blocks are called triggering blocks. They tell the computer when to start.

Optional: Hand out a copy of the student checklist to each student OR display it on the board. Talk about each activity you did and have students check off their progress as you talk through each one.

Additional Resources

The spider needs your help...

Debug the story sequence for "Itsy-Bitsy Spider"

Words to know...

spider

rain
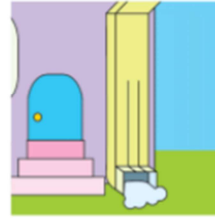
water spout

sun

Remember, you're going to do a "three-finger **retell**" so **read** and **listen** closely so you can **retell** what happened 1st, 2nd, and 3rd in the story...

1   2   3

Read, *listen*, and *watch* "The Itsy Bitsy Spider"
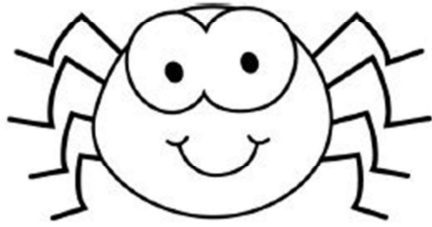
The itsy bitsy spider
Climbed up the water spout.
Down came the rain
And washed the spider out.
Out came the sun
And dried up all the rain,
So the itsy-bitsy spider
Climbed up the spout again!
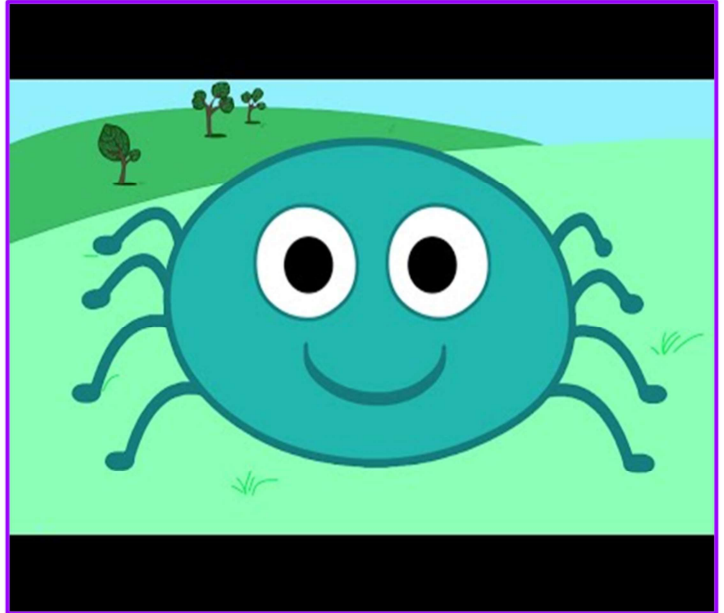
Itsy-Bitsy Spider: https://youtu.be/w_lCi8U49mY
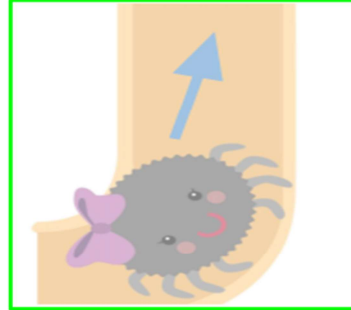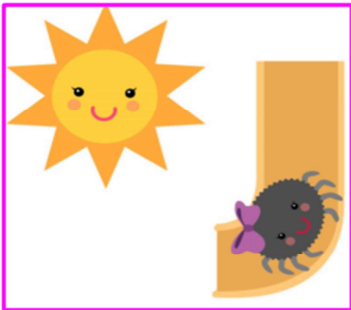
Uh, oh!

Let's debug our story sequence...
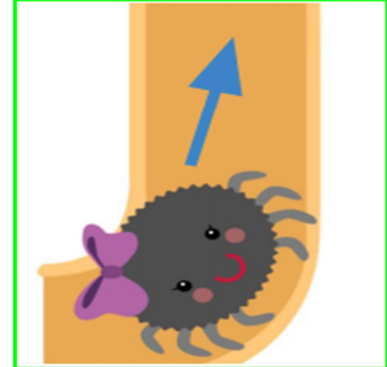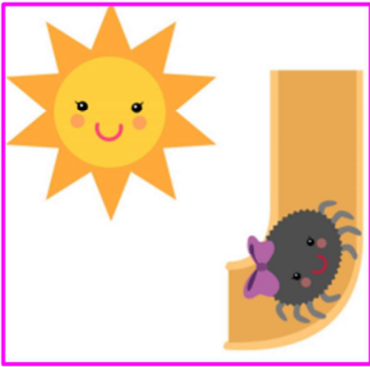
Which part of the sequence comes first?
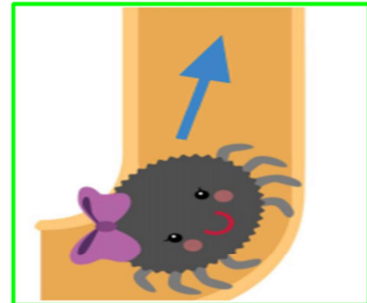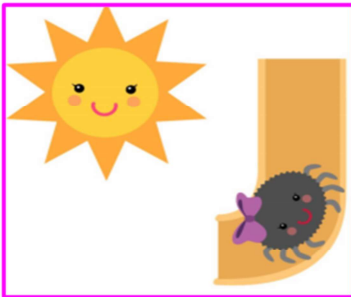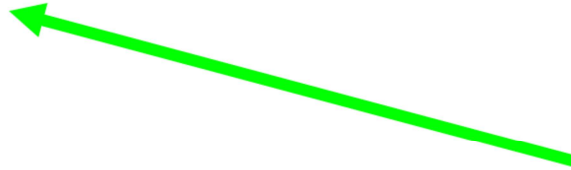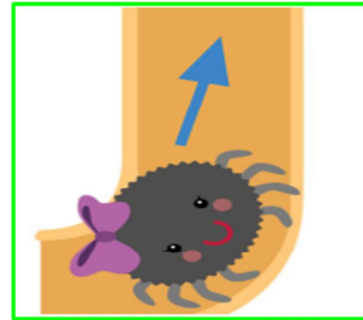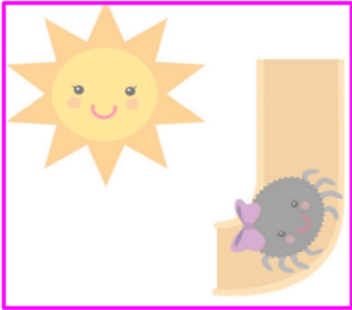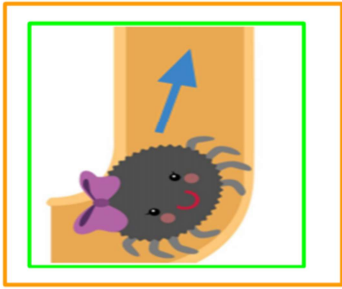
1

Which part of the sequence comes *first*?

1

Which part of the sequence comes *second*?

1

2

?

Which part of the sequence comes *second*?

1   2
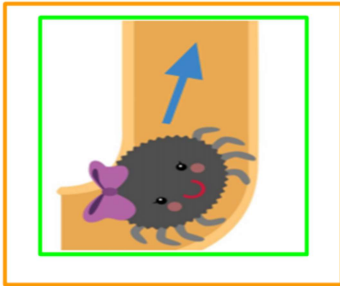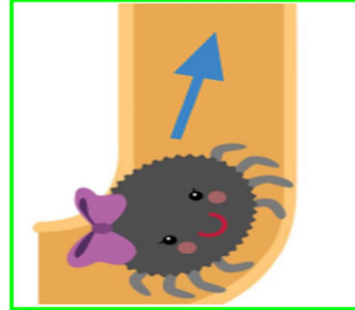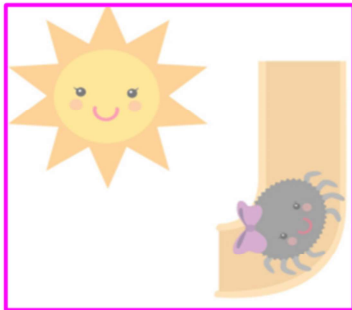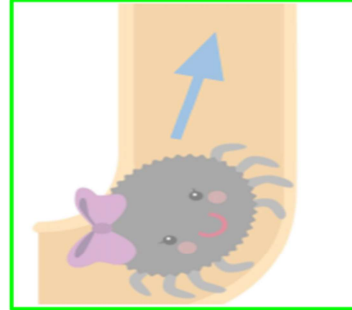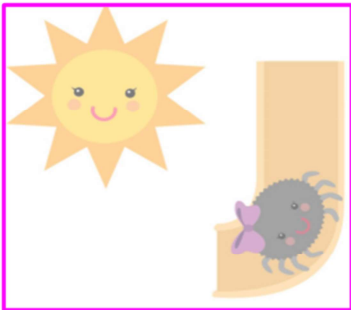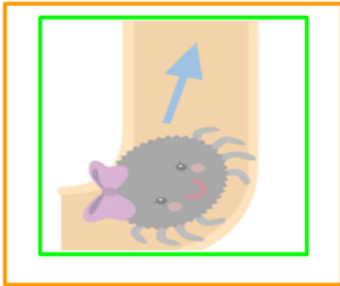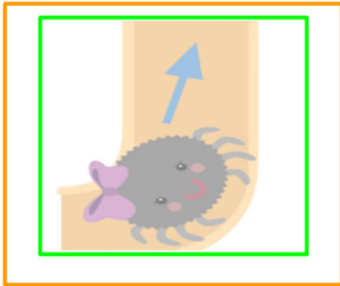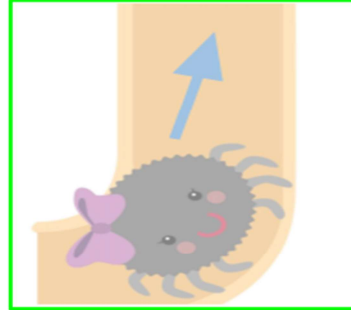
Which part of the sequence comes *third*?
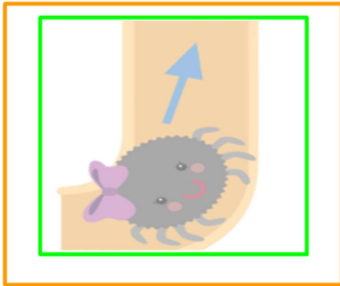
Which part of the sequence **comes** *third*?
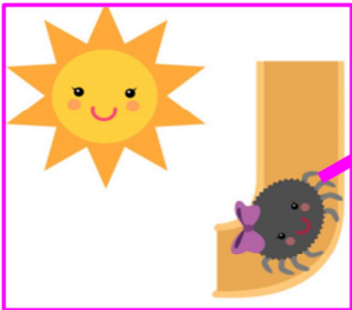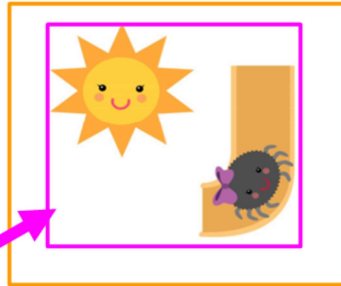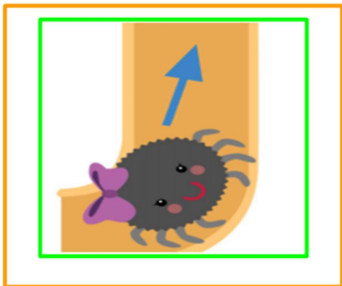
Yay! You did it! You debugged our story sequence...

1	2	3