Lesson 1

PATTERN RECOGNITION

1ST GRADE

CS FOR ALL

NSF
Award #1837380

SUMMARY AND STANDARDS

Summary: In this lesson, students will be introduced to patterns in everyday life, in a song and in word families. They will also learn about coding blocks and how computer scientists use patterns.

ELA Standards:

Communication and Multimodal Literacies:
1.1 The student will develop oral communication skills.
   a) Listen actively and speak using agreed-upon rules for discussion.

Reading:

1.5 The student will apply phonetic principles to read and spell.

   f) Use word patterns to decode unfamiliar words.

CS Standards:

1.5 The student will compare and contrast a group of items based on the attributes oractions of each item, with or without a computing device.

MATERIALS AND RESOURCES NEEDED FOR THIS LESSON:

- Teacher Slides
- A class copy of "The Tall Man" poem displayed or screen share.
- A pointer
- ScratchJr Blocks
- Word wall cards
- Class set of highlighters, markers, or crayons
- Student Checklist

***Hello Ruby* Resources:** In preparation for this lesson, you may wish to read aloud *Hello Ruby* chapter 1 in advance.

LESSON OBJECTIVES: I CAN...

- ❏ Identify patterns in my environment (i.e., color patterns, big/small patterns, boy/girl, etc.)
- ❏ Follow a pattern (i.e., clapping, follow the leader, etc.)
- ❏ Identify word patterns (i.e., word families)
- ❏ Identify words in a word family using the family rule
- ❏ Find a word family within a poem
- ❏ Explain what computer code is
- ❏ Identify and organize coding blocks into patterns

INTRODUCTION

Computer Science

Teacher: "Welcome to **computer science** (show "computer science" word wall card) in First Grade! **Computer science** is using the power of **computers** (show "computer" word wall card) to solve our problems and express ourselves.
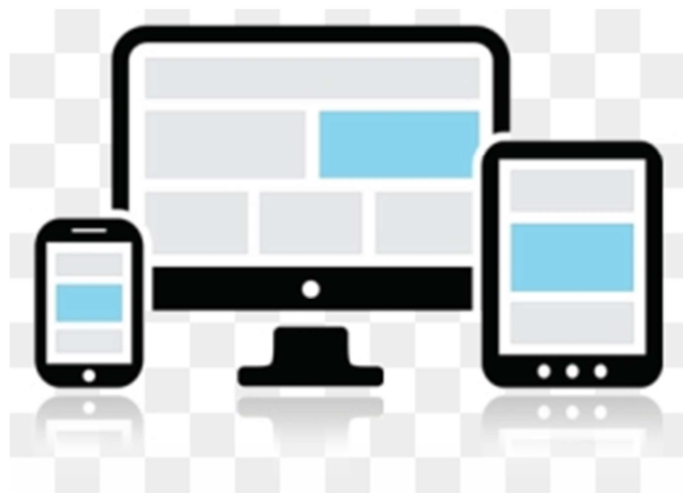
computer

pattern

Today, we're going to think like **computer scientists** and look for **patterns** (show "pattern" word wall card) (Slide 6). You might even see a **pattern** on this card right away! We see **patterns** everywhere -- especially in First Grade."

"WHAT'S A PATTERN?" --CLICK IMAGE TO PLAY VIDEO

"We are going to watch and listen to a song. I want you to think about where you see **patterns** in the classroom and where we have talked about **patterns** in reading and math."

Teacher: "We see **patterns** (draw attention to "pattern" word wall card) all around us. There was even a pattern in the song we just listened to. Can you guess what it was? *Turn and talk with a partner or brainstorm independently.* Great! Where have you seen a **pattern**?" (Wait time) "That's right! We see **patterns** in math! What kind of **patterns** do we see in math?" (Wait time) "That's right, we see color **patterns**, like yellow, blue, red, yellow… Where else?" (Wait time.) "That's right! We also see growing **patterns**, especially when things get bigger and bigger!"

Video link: https://www.youtube.com/watch?v=OAnbQRGmquQ

TURN AND TALK

# LET'S PLAY FOLLOW THE LEADER!-- CLICK IMAGE TO PLAY

Alternate Opening Activity in Place of 'Banana, Banana, Meatball' Play a game of "follow the leader." Jump, hop, run in place, crawl, dance, etc. using a specific pattern and students follow your actions. See if they can guess a pattern. (Ex: 'clap, clap, stomp, clap, clap, stomp')
*If some students are struggling to remember pattern concepts, it may be useful to take a few extra moments to reinforce grade-level content as you progress through the lesson or in small groups if doing balanced literacy or reading workshop.

Video link: https://www.youtube.com/watch?v=riicsTE2TzQ

WHAT IS NEXT IN THESE PATTERNS?
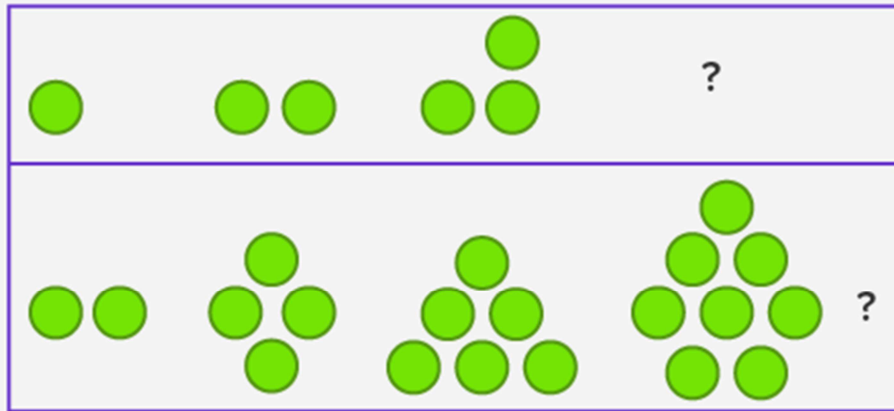
Teacher: "Let's look at these patterns and try to figure out what comes next. (Point to the top row on slide 9). What goes next here? Let's count the dots together. We start with one dot (Point to dot). How many are next? (Wait time.) That's right! Two! Okay, how many are next? (Wait time.) Yes, three! Okay, how many do you think should come here? (Point to the question mark.) (Wait time). That's correct, four! Let's try again with one that is a little bit harder. Let's count these together. How many are here? (Point to the two dots on the bottom row of slide 9.) (Wait time.) Yes, two! Okay, and how many are in the next group? (Wait time.) That's right - four! How many are in the next group? (Wait time.) Yes, six! How many are in the next column? (Wait time.) That's correct, eight! So how many do we think should come here? (Point to the question mark.) (Wait time.) Correct! Ten!"

"Just like we have learned in math, **patterns** are very important because they can help us see what could happen next. Today, we are going to learn about **patterns** in words and how they can help us to be a better reader! These word **patterns** are called word families." (To draw more attention to vocabulary, **consider challenging students to snap (or some other signal) each time they hear or use the vocabulary of the day**: word family.)

DID YOU GUESS "4" AND "10"?
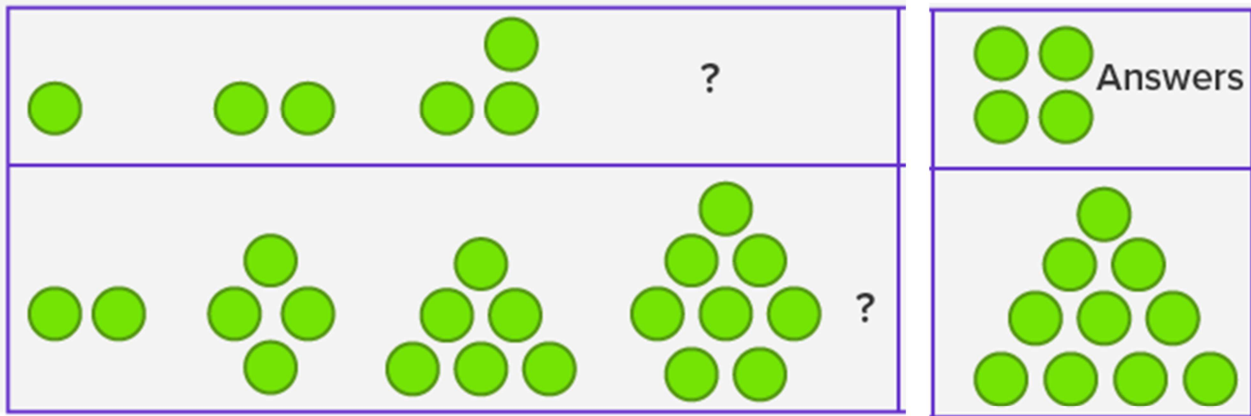
(Students may comment on other patterns and teachers can respond accordingly with links from prior learning - for example, hand-clapping games, musical patterns, rhyming patterns in their shared reading texts, etc.)

Then guide the students to do the dot activity. Finally, introduce word patterns (word families).

GUIDED INSTRUCTION

Display a copy of a word family poem in a place where students can see and hear the poem. You may even consider giving a copy to each student to follow along. (*Depending on your class, you may want different levels of scaffolding. For more intense scaffolding, select a word family that your class may already be familiar with. For minimal scaffolding, select a new sort.*):

- -an word family*
- -op word family
- -ed word family
- -at word family
- -et word family
- -ig word family

The Tall Man

There was a man.
A tall, tall man.
Who ran and ran
into a can.

He fell right in,
his feet stuck out.
He made a plan
to scream and shout!

-an

Teacher: "Before we learn about word **patterns** (point to "pattern" word wall card), or word families (cue snap or other physical cue prompted earlier by explicitly modeling), let's warm up our reading brains! Let's read the poem "The Tall Man" together."

"Great job! We read as a team and your reading voices were so smooth!"

Teacher: "Today, I wanted to teach you how to find word **patterns** or word families (cue snaps) in our reading! Word families (cue snaps) are fun because they are words that are spelled the same, AND sound the same, _at the end_. Just like **patterns**, they usually come back again and again or repeat, in poems.

A tall, tall man

Who ran and ran

"I bet you noticed lots of words in the -an word family this time! Hmm… what words did you hear that sounded like -an, or were spelled like -an (point to the -an list on the board), at the end? ***Turn and talk with a partner or brainstorm independently."***
(Wait time) "That's right! 'man' and 'ran' sound almost exactly the same… and they're spelled the same at the end! They're in the same word family (cue snap). Listen closely:
Ask students to share what words they noticed by **turning and talking with a partner brainstorming independently**. Confirm the answers and read again to them stressing the words "man" and "ran".

TURN AND TALK

WHICH WORDS RHYME? HOW DO WE KNOW?

A tall, tall **man**

Who **ran** and **ran**

A tall, tall **man***
Who **ran** and **ran***
(* indicate words in the same word family by snapping your fingers <u>only</u> for "man" and "ran")

A tall, tall **m<u>an</u>**

Who **r<u>an</u>** and **r<u>an</u>**

Ask students to repeat after you reading the two words and remind them to pay attention to the spelling. Then start a list, with previous -an at the top, adding 'man' and 'ran'.

Repeat after me: **Man! Ran!** They sound the same at the end *and* are spelled the same at the end! What do you notice about the way these two words are spelled?" (Wait time.) "That's right! They both end in '-an!'. Let's make a list of all the -an word family words we find. We need to add **man** and **ran.**"

GUIDED PRACTICE

(If students already have an individual copy of The Tall Man, continue on with Guided Practice. If not, distribute individual copies of the poem and highlighters or markers now).

The Tall Man

There was a man.
A tall, tall man.
Who ran and ran
into a can.

He fell right in,
his feet stuck out.
He made a plan
to scream and shout!

-an

Encourage students to find more -an words and highlight them in the poem, start by highlighting -an in the box at the bottom of the poem.

Teacher: "We can find word families (cue snaps) in *lots* of places. Once we've trained our brains to think like a **computer scientist** and look for **patterns** and **loops**, we can find them everywhere!"

"You'll never believe this… but our poem has *even more* words in the -an word family that we haven't found yet! This time, we really need to think like **computer scientists** and find the places where the -an words repeat, or **loop**

Let's start by highlighting -an in the box at the bottom of the poem. Those are the words that we're looking for. Great! Now, let's highlight the word 'man'. 'Man' is in the -an word family. What else did we find? Ran! Let's think like a scientist and look for 'ran'. Perfect! Now we're really finding where they appear again and again… we found the **loops**! (point to word wall card)"

TURN AND TALK

A tall, tall **man**

Who **ran** and **ran**

into a **can**.

Ask them to **turn and talk with a partner or brainstorm independently** about other -an words they can find. Guide them to find "Can" and "plan" (cue snaps) and add them to the list.

"What other words in the -an word family (cue snaps) did you hear? *Turn and talk with a partner or brainstorm independently."* (Wait time.) "That's right! '**Can**' and is in the -an word family (cue snaps). Repeat after me: **Man! Ran! Can!** You can find and highlight can! (add 'can' to the list).

Students: Search for and highlight -an words

Teacher: "Hmm… there is one more word in the -an word family that's inside of this poem! Think like a **computer scientist** and see if you can find it. Remember, words in this word family will follow the **pattern**… they will sound and be spelled the same at the end: -an."

A tall, tall **man**

Who **ran** and **ran**

into a **can.**

He made a **plan**

"Okay computer scientists…. What was the last -an word that was hiding inside of our poem? That's right! It was '**plan**'! (Point to the word inside of the class display poem.) (Slide 18) Look how tricky it was hiding there! If you haven't found it yet, see if you can find and highlight the word. Great job!"

Why do patterns matter to computer scientists (CS)?
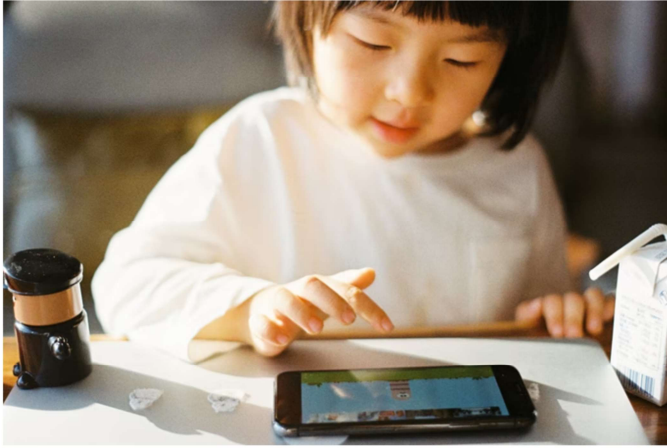
Well just like how there are patterns in the words we read and write, there are patterns in the language computer scientists use! It's called "code." Instead of communicating with humans, computer scientists write code to tell computers what to do.

CODE:
THE LANGUAGE THAT COMPUTER SCIENTISTS CREATE AND USE TO TELL A COMPUTER WHAT TO DO.

Code is the language that computer scientists create and use to tell a computer what to do. Code is how we can give instructions to a computer.

Patterns in code

Computer scientists rely on patterns to write their code correctly. If they don't, then their code will fail! They need to be very specific because a computer is just a machine and will do __exactly__ what it is told.

Here's an example of some code on the screen; let's figure out what it means.

CODING BLOCKS

coding blocks

Just like humans speak lots of languages like English, Spanish, French, German, and Arabic so do computers! Computer scientists often learn to code in more than one language. Today, we're going to learn to code with coding blocks.

Here are the ones we're going to use. Can you guess what they might tell a computer program to do?

(optional) Explain what each block means (https://www.scratchjr.org/learn/blocks)
- Green flag means go/start
- Go home: Resets the character's location to its starting position
- Move right: Moves the character a specified number of grid squares to the right
- Move left: Moves the character a specified number of grid squares to the left
- Start on bump: Starts the script when the character is touched by another character.
- Say: Shows a specified message in a speech bubble above the character.
- Move up: Moves the character a specified number of grid squares up
- Move down: Moves the character a specified number of grid squares to the right

For now, we're not going to worry about coding ourselves. Let's focus on making visual patterns based on the blocks' icons and colors.
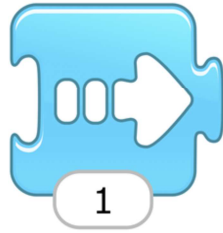
CODING BLOCK PATTERN #1
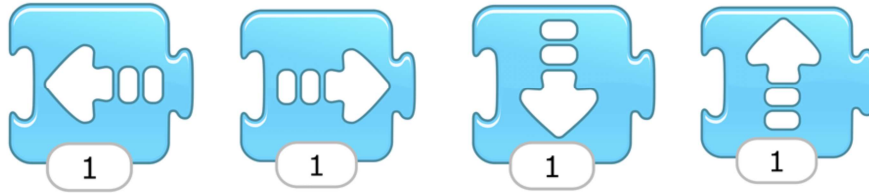
In this example, all the blocks are blue but they're arranged in a pattern based on the direction of the arrow icon. Can you identify the pattern?
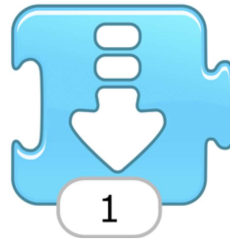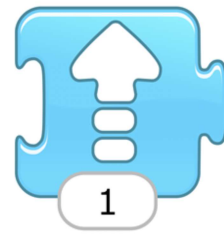
CODING BLOCK PATTERN #1
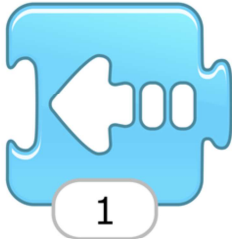
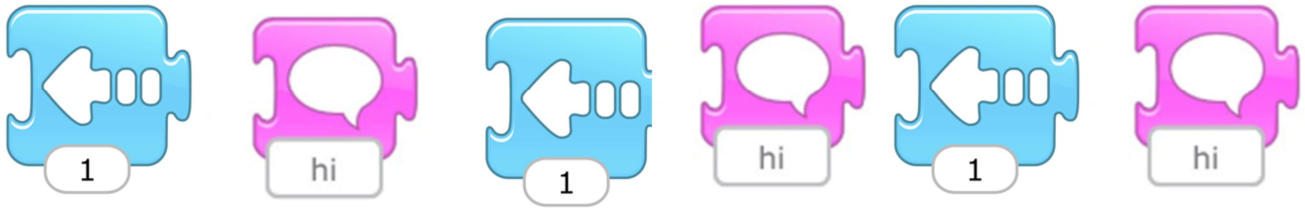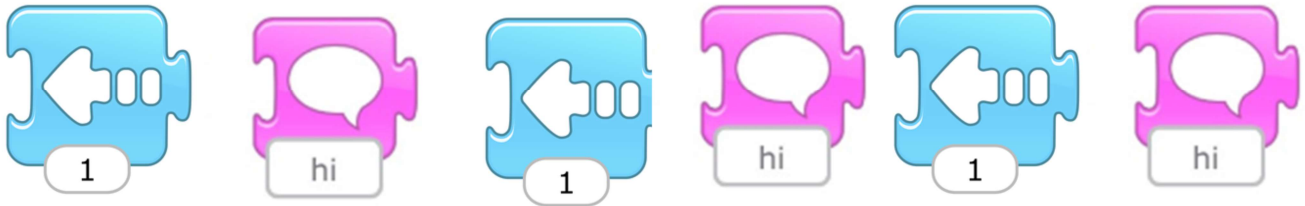|			
move left **1**	move right **1**	move down **1**	move up **1**

Left, right, up, down is the pattern. If it were going to repeat, which most patterns do, we'd do it over again.
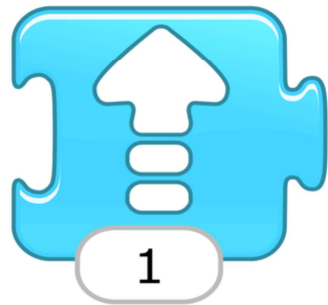
CODING BLOCK PATTERN #2

But we could also arrange a coding pattern by color.
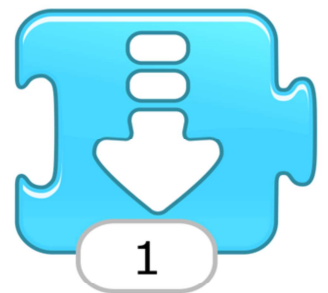
CODING BLOCK PATTERN #2

In this case, we'd be coding the computer to move an object left one step, say hi, left one step, say hi, left one step, say hi. That's a pretty silly thing to do but the computer doesn't care! It knows how to interpret these commands.
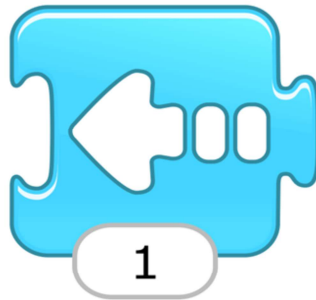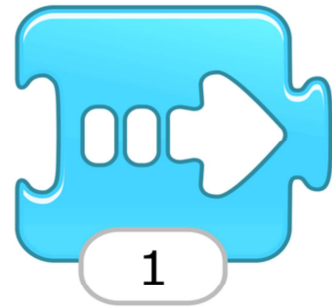
MOTION BLOCKS

UP **1** space

DOWN **1** space

LEFT **1** space

RIGHT **1** space

The blue blocks are called <u>motion blocks</u> because they tell a computer where to move an object.

WHAT DO WE THINK THESE COMMANDS MEAN?

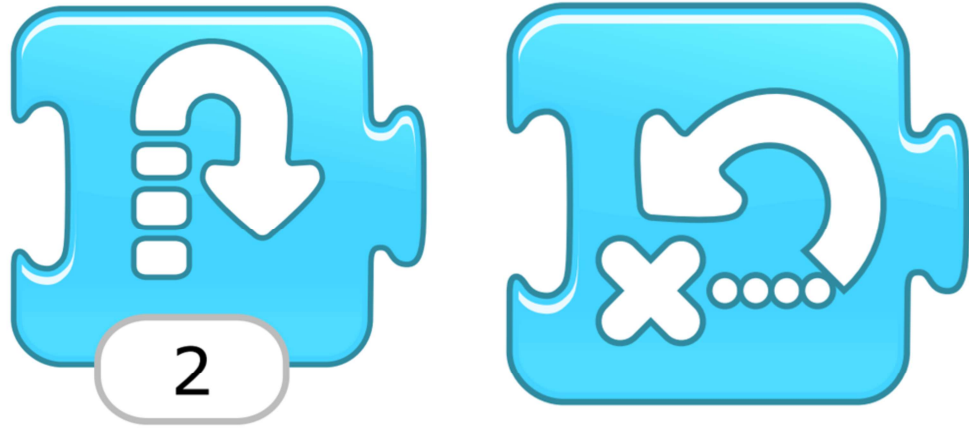Sample pattern

WHAT DO WE THINK THESE COMMANDS MEAN?

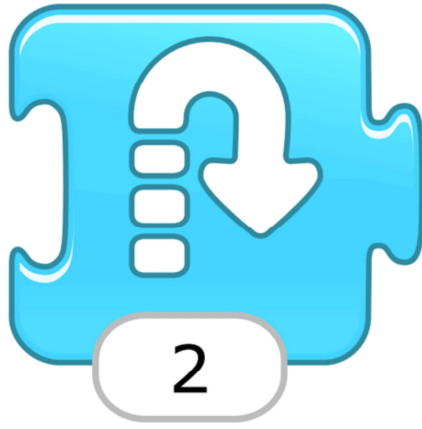|	
1	**1**
Turn LEFT 1 time	**Turn RIGHT 1 time**

Sample pattern

Sample pattern

WHAT DO WE THINK THESE COMMANDS MEAN?

HOP **2** times

Go "home" (back to where you started)

Sample pattern

WRAP UP

Review the concept of pattern (point to word wall card) (next page), the -an word family.

NOTE: Students are beginning to learn computer science *and* literacy vocabulary. It's important to integrate both throughout instruction to help students see connections

LET'S REVIEW!

patterns

br-   bl-

My favorite colors are black and blue because I just love to eat blackberries and blueberries.

computers

Computer science

Review spelling pattern-consonant blend br- and bl-, code, patterns in code.
"Today, we learned about a new type of spelling **pattern** (point to word wall card), called a consonant blend. The consonant blends we learned about were br- and bl-. *And* we saw that these spelling **patterns** can be everywhere.

We were just like computer scientists (point to kids in the "computer science" word wall card picture) and used **patterns** to help us guess what will happen next. Today and every day, I want you to think about where you see other **patterns**. They'll help us when we start to use **computers** (point to "computer" word wall card), too!"

LET'S REVIEW!

- ❏ I watched "Banana, Banana, Meatball" (or played "Follow the Leader") and talked about the patterns in that song.
- ❏ I talked with my teacher about where we see patterns all around us.
- ❏ I read a poem that has word families in it.
  - ❏ I found the -an word families in the poem and talked with my teacher and classmates about this word family.
- ❏ I looked at the coding blocks that computer scientists use.
  - ❏ I talked with my teacher and classmates about the patterns we could make with the coding blocks.

Hand out a copy of the student checklist to each student OR display it on the board (**slide 40**). Talk about each activity you did and have students check off their progress as you talk through each one