Lesson 1-6A

Action Fractions Math+CT

Zoo Animals Number Story

Math Connections: Students use Scratch to show a multistep number story.

CS Connections: Students review and explore the Scratch workspace. Students learn that the Scratch workspace and computer programs are made up of different parts. They search for and try out different commands and learn which changes of and within commands can change the program's output.

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▶ **Before You Begin**

Create your class via your Teacher Account on the Scratch site and generate a list of student logins. Create individual credential cards to distribute to students. Decide how to manage these credentials in the event that students forget (e.g., keep a master list, have students tape their credential cards to their desks). Decide how students will get to the Scratch website (scratch.mit.edu). Consider pre-loading a bookmark on each child's desktop.

Computational Thinking

• **DECOMPOSITION:** Systems are made up of smaller parts.

① Warm Up 5–10 min

	Materials	
Starting with Scratch Students discuss using coding for extra math practice.	Student Credential cards (one per child)	
"I Can ..." Statements Students read the explicit Math and CS goals.		

② Focus 45–50 min

Logging in to Scratch Students log in and finish setting up their accounts.	Student Credential cards; computers	
Reviewing *TIPP&SEE* Students review a strategy for exploring Scratch projects.	*TIPP&SEE Poster*	
Zoo Animals Number Story *TIPP&SEE* Students use *TIPP&SEE* to explore a project.	*Zoo Animals Number Story* project; *Zoo Animals Number Story TIPP&SEE* journal page	**3.NBT.2**

"I Can ..." statements

• *I can log into my Scratch account.*

• *I can identify the important parts of Scratch.*

• *I can closely observe a Scratch program and find the scripts that caused the actions.*

• *I can remix, save, and share Scratch programs.*

• *I can make changes to a program so that it does what I want it to.*

Anticipated Barriers

• Logging in to a new program can be challenging for some students. Providing pictorial or video versions of the verbal/written directions would be helpful.

• Students often forget the procedure for remixing, even after being taught.

• Students often forget to remix.

Student Options

Consider these options for adapting the lesson to your students' preferences:

• Include simplified directions both within the Scratch projects and on a paper.

• Offer alternate versions of the directions (e.g., video).

"I Can …" statements

- •*I can log into my Scratch account.*
- •*I can identify the important parts of Scratch.*
- •*I can closely observe a Scratch program and find the scripts that caused the actions.*
- •*I can remix, save, and share Scratch programs.*
- •*I can make changes to a program so that it does what I want it to.*

Scratch Login Instructions

Scratch Student Login Instructions and Intro to the Scratch Workspace

Getting Started with Scratch

This guide shows you how to log into Scratch for the first time.

1. Get your login name and password card from your teacher.
2. Type in the URL: http://scratch.mit.edu
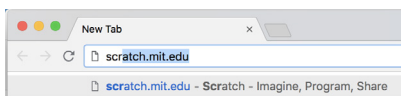
3. Click "Sign In"

4. Enter the Username and Password that your teacher gave you.

5. Click on Get Started. The first time you log into Scratch, you will be asked to enter a new password. Type in the password that your teacher provided for you.

① Warm Up 5–10 min

▶ Starting with Scratch

Start with a whole-class discussion about using Scratch to get extra practice with math and build coding skills. Tell students that they will be using computers to program in Scratch many times this year, and that today they will focus on how to get started. Explain that students should pay close attention when you demonstrate steps on your computer, so that they will have an easier time when they go to their own computers to use and modify the Scratch project (program).

Briefly poll the class about their experience with Scratch. If there are any students who claim to be very experienced, consider asking if they are willing to help their classmates and adjust seating arrangements to spread them out accordingly. You may also wish to briefly talk to students about how to be respectful of and careful with the computer equipment.

Distribute login credentials to each student, and keep an extra set for you to model the steps for a first-time login for students.

▶ I Can …

Display the "I Can …" statements and remind students that these statements express the goals for today's lesson and can give them clues about what to expect. Carefully read each statement and ask them to use their thumbs to show how true they feel each statement is for them right now (thumbs up for yes, thumbs down for no, thumbs sideways for maybe). Remind them that during the wrap up you will look at the "I Can …" statements again, and see how their opinions about the statements have changed.

② Focus 45–50 min

▶ Logging in to Scratch

WHOLE CLASS	SMALL GROUP	PARTNER	INDEPENDENT

Display your screen and model the steps to log in and arrive at the Scratch class home page. (See the Scratch Login Instructions document.)

When ready, have students go to their individual computers to attempt these steps. Each student should log in using their credentials and follow the prompts to finish setting up their accounts. Children will need to enter their own Birth Month, Birth Year, Gender, and Country. Circulate and assist students as needed.

After each student has had sufficient time to log in, have them close their devices or gather as group away from their desks. Lead a whole-class discussion on their experience getting to the Scratch site and logging in. Be sure to address any challenges (e.g., typing in the url, finding the bookmark, etc.) that students experienced.

Reviewing *TIPP&SEE*

WHOLE CLASS	SMALL GROUP	PARTNER	INDEPENDENT

Display your screen showing your Scratch class home page and remind students of the purpose of *TIPP&SEE*. Explain that Scratch is very powerful, so it has a lot of buttons, tabs, and pictures, and it can be overwhelming or distracting. In these lessons we use the *TIPP&SEE* strategy, which will help them navigate Scratch and focus on the important parts of each project.

Display the *TIPP&SEE* poster and ask students to remind you about what each letter in the acronym stands for. Read each section next to the project page, and be sure to point out each part of the Scratch project page as you refer to it.

Narrate your steps while you scroll down to the class studio and find and open today's project. As needed, model using *TIPP&SEE* to look at a Scratch project by using the following scripted think-aloud.

Now we are going to review the **TIPP&SEE** *strategy for exploring Scratch projects.*

First, we get a **TIPP** (point to the first four letters of the word) *from the project page. A tip is a clue or helpful hint.*

- •**T** *stands for* **Title***. First we read the title, which may tell us what the project might be about.*
- •**I** *stands for* **Instructions***. The instructions are in the top right box. These tell you how to run the program.*
- •**P** *stands for* **Purpose***. The purpose comes after the instructions. This tells you what you, the programmer, are supposed to do with this project today.*
- •**P** *stands for* **Play***. When we play a project it is important to remember three questions – what event did we do, what* **sprites** *did something, and what action did each sprite do? Event, sprite, and action. I can record what I saw happen on my TIPP&SEE journal page. Scratch programs begin when you press the green flag.*

After previewing the Scratch Project page using **TIPP***, we can* **SEE** *inside to learn about the code that makes the program work! We go inside the project to find code that made the actions happen. Remember that when we played the program, we noted event, sprite, and action.*

- •**S** *stands for* **Sprites***. We can look and see how many sprites there are in the project and click on them to find some code.*
- •**E** *stands for* **Events***. First we use events to find which* **script** *did which action. In Scratch, a script is a set of* **blocks***, or instructions, that are linked together with an event block at the top.*
- •**E** *stands for* **Explore***. Now is the time to figure out how blocks and scripts work by making changes to a script and seeing what happens. We can add blocks, delete blocks, or change a number or other information that is typed in a block.*

TIPP&SEE Poster

Start with **TIPP&SEE**

Get a TIPP from the Project Page:

Title: What is the title of the project? Does it tell you something about the project?

Instructions: What do the instructions tell you to do?

Purpose: What is the purpose of this activity? What will this code teach you?

Play: Run the project and see what it does! Which sprites are doing the actions?

SEE Inside:

Sprites: Click on the sprite that you want to learn from or change.

Events: Look at the event blocks starting the scripts. Which scripts are most useful?

Explore: Try different changes to the scripts and observe what happens!

SS: *Zoo Animals Number Story*

Zoo Animals Number Story TIPP&SEE, p. 1

TIPP&SEE
Zoo Animals Number Story

NAME

Lesson 1-6A
SCRATCH ID   DATE   TIME

Objective: I can closely observe a Scratch program and find the scripts that caused the actions.
Scratch Link: Zoo Animals Number Story (https://scratch.mit.edu/projects/236238013)

Start with **TIPP&SEE!**   Get a **TIPP** from the Project Page.
Read carefully: **T**itle   **I**nstructions   **P**urpose
Play the project and circle or write down the action(s) that happened for each event below.

① When I clicked ⚑ :
This animal moved: This animal talked: nothing happened

② When I clicked on [orangutan]:   The gorilla says "I know I weigh 180 pounds."

③ When I clicked on [wolf]:   The wolf says "I weigh 170 pounds."

④ When I clicked on [lion]:   The lion says "Hmm... How much do I weigh?"

⑤ When I pressed the space key: The scale says the number sentence "490 - (170 + 180) = 140 pounds."
(Students may not know that it is the scale that says this at this point.)

SEE inside. (Click the ⟳ See inside button at the top right.)
First click on the **S**prite, then find the **E**vent that starts each script, then look at the code.

⑥ **E**xplore: Circle your answer.
a. Which block makes the **orangutan** talk?
wait 6 seconds | go to x: -114 y: -140 | say The zoo wants us to weigh in! for 4 seconds | glide 1 secs to x: -75 y: 10

b. Which block puts the **orangutan** on the scale?
wait 6 seconds | go to x: -114 y: -140 | say The zoo wants us to weigh in! for 4 seconds | glide 1 secs to x: -75 y: 10

c. Which block starts the **wolf** on the grass?
wait 6 seconds | go to x: -114 y: -140 | say The zoo wants us to weigh in! for 4 seconds | glide 1 secs to x: -75 y: 10

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Zoo Animals Number Story TIPP&SEE, p. 2

TIPP&SEE
Zoo Animals Number Story

NAME

Lesson 1-6A
SCRATCH ID   DATE   TIME

⑦ **E**xplore: Write your answer.
a. Which event makes the scale talk?   When space key is pressed

b. Which event makes the animals get off the scale?   When "x" key is pressed

⑧ Now modify the project!
☐ Reload the project.   Click on the curved arrow by the url.
☐ Make the three animals move to the scale at the same time.   Change the wait block to 4 seconds for the wolf and lion to match the say ___ for 4 seconds for the gorilla.
☐ Change the wolf's script to make the **wolf** say "I weigh 150 pounds."
☐ If the total weight of the three animals is still 490 pounds, write the new number sentence to find the weight of the mountain lion: 490 - (180 + 150) = 160 pounds
☐ Change the **scale**'s script to say the new number sentence.
☐ Run the program and make sure it does all of the above.
☐ Remix, Rename, and Share the project.

⑨ If you finish early:
☐ Make the **wolf** growl before she moves.   Add a play sound "growl" until done block to wolf's script. Students will need to add the sound to the list of sounds by clicking on the sounds tab.
☐ Make the second **lion** get on the scale with the others. What is the new total weight?   650 pounds
☐ Change the scale's costume to match the new total weight.
☐ Change the colors of the animals (click on the costumes tab).

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▶ Zoo Animals Number Story *TIPP&SEE*

| WHOLE CLASS | SMALL GROUP | **PARTNER** | **INDEPENDENT** |

Tell students that they will now get a chance to try the *TIPP&SEE* strategy on the *Zoo Animals Number Story* project (https://scratch.mit.edu/projects/236238013/). Direct them back to their computers and distribute the *Zoo Animals Number Story TIPP&SEE* journal page. As necessary, remind students about the steps they need to open the project. Have students use the project to complete the journal page.

Zoo Animals Number Story
by LTEC2   ⟳ See inside

⚑ ⬤   **Instructions**

Click the green flag. Click the orangutan. Click the wolf. Click the lion. Press the spacebar. You will see the animals tell a number story.

Purpose: Use this project to learn some basics about Scratch. Click See Inside to look at the Scratch workspace.

▶ Wrap Up

| **WHOLE CLASS** | **SMALL GROUP** | PARTNER | INDEPENDENT |

When students have had sufficient time to make changes to their projects, have them **Remix**, Rename, and Share. Remind students that when they start with someone else's project, and they want to change how it works, they will need to Remix and Share it.

Then call them together to discuss today's experience. You may wish to have students Pair and Share for some questions. Suggestions:

- *Describe Scratch to your friend. Share out with the group.* Answers vary.
- *Which "I can ..." statements did you do today?* (Think/Pair/Share) Follow up: *Which "I can ..." statement was most fun?* Answers vary.
- *What was your favorite/the most surprising/the trickiest thing about using Scratch today?* Answers vary.
- *Did your project do anything you did not expect it to do?* Answers vary.
- *What can you change to make a project do something different?* Sample answer: You could change the blocks. You could change the numbers or the words in the blocks.
- *What do you understand and remember about the sprites / blocks?* Answers vary.
- *What questions do you still have about Scratch?* Answers vary.

Now "I Can ..."   Review today's "I Can ..." statements (see page 2) and ask students to use their thumbs to show their opinion of each statement.