

Lesson 2-3A

Action Fractions
Math+CT

Animal Number Story

Math Connections: Children use Scratch to show a simple number story.

CS Connections: Children explore the Scratch workspace. Children 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 children. Decide how to manage these credentials in the event that children forget (e.g., keep a master list, have children tape their credential cards to their desks). Decide how children will get to the Scratch website (scratch.mit.edu). Consider pre-loading a bookmark on each child's desktop.

► Vocabulary

event • sprite • script • block • remix

Computational Thinking

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

1

Warm Up 5–10 min

Materials

Starting with Scratch

Student Credential cards (one per child)

Children discuss using coding for extra math practice.

"I Can ..." Statements

Children read the explicit Math and CS goals.

2

Focus 45–50 min

Logging in to Scratch

Student Credential cards; computers

Children log in and finish setting up their accounts.

Programming Events

Children discuss events in a programming context.

Introducing TIPP&SEE

TIPP&SEE Poster; Intro to the Scratch Workspace project

Children learn a strategy for exploring Scratch projects.

Animal Number Story TIPP&SEE

Animal Number Story project; Animal Number Story TIPP&SEE journal page

Children use TIPP&SEE to explore a project.

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 children. Providing pictorial or video versions of the verbal/written directions would be helpful.
- Children often forget the procedure for remixing, even after being taught.
- Children 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).

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 children 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 children 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 children 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 children about how to be respectful of and careful with the computer equipment.

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

▶ I Can ...

Display the “I Can ...” statements and remind children 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.

NOTE Prior to teaching this lesson, you should have already created your class via your Teacher Account on the Scratch site and generated a list of student logins for distribution. You may also have pre-loaded a bookmark on each desktop for children to use to get to the site scratch.mit.edu. Even children with existing Scratch credentials will need to use these new credentials to access the materials for this class.

“I Can ...” statements

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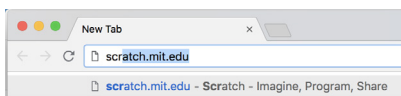
Scratch Login Instructions

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.

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 children go to their individual computers to attempt these steps. Each child 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 children as needed.

After each child 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 children experienced.

► Programming Events

WHOLE CLASS	SMALL GROUP	PARTNER	INDEPENDENT
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Engage children in a conversation to introduce the idea of **events** as they relate to programming. A question and answer dialogue could go like this:

- *Can anyone give me an example of an event? Sample answers: festival, 4th of July, wedding* Right – an event is a significant thing that occurs.
- *How about this?* (tap a child on the shoulder - the child will probably look at you) *What happened? I tapped X on the shoulder. What was the response? Sample answer: She looked at you. Was that an event? Answers vary.*
- *In programming that is an event. That was something I did to X, and X had a specific response to that event. Typically, when you tap someone on the shoulder, they look at you. Are there other events that happen to you that you have a specific response to? Sample answer: The bell rings at the beginning of the day, and we get in line at our classroom number.*
- *Computers have events they can respond to. What are the things you can do to a computer to make it do something? Sample answers: Type on keys, use the mouse to click places*
- *In Scratch, you will learn how to make the computer do fun things when you type keys or click specific places.*

► Introducing TIPP&SEE

WHOLE CLASS	SMALL GROUP	PARTNER	INDEPENDENT
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Display your screen showing your Scratch class home page. Introduce 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. You are going to teach them a strategy, *TIPP&SEE*, which will help them navigate Scratch and focus on the important parts of each project.

Narrate your steps while you scroll down to the class studio and find and open today's first project: Scratch Basics - Zood Goes Home (<https://scratch.mit.edu/projects/236148182/>). Model using *TIPP&SEE* to look at a Scratch project by using the following scripted think-aloud. Display the *TIPP&SEE* poster next to the project page, and be sure to point out each part of the Scratch project page as you refer to it.

Now we are going to use a strategy for exploring Scratch projects. This strategy is called TIPP&SEE.


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. Now let's look at our Scratch Project Page to see what we can find out about this project.

- **T** stands for **Title**. The title is at the top. First we read the title, which may tell us what the project might be about. Could someone help me read the title? *Scratch Basics - Zood Goes Home* What do you think might happen in this project? *Answers vary.*
- **I** stands for **Instructions**. The instructions are in the top right box. These tell you how to run the program. Could someone help me read the instructions?

SS: Scratch Basics - Zood Goes Home







TIPP&SEE Poster






Start with TIPP&SEE

Get a TIPP from the Project Page:

-  **T**itle: What is the title of the project? Does it tell you something about the project?
-  **I**nstructions: What do the instructions tell you to do?
-  **P**urpose: What is the purpose of this activity? What will this code teach you?
-  **P**lay: Run the project and see what it does! Which sprites are doing the actions?

SEE Inside:

-  **S**prites: Click on the sprite that you want to learn from or change.
-  **E**vents: Look at the event blocks starting the scripts. Which scripts are most useful?
-  **E**xplore: Try different changes to the scripts and observe what happens!

TIPP&SEE Poster



Start with

- Get a TIPP from the Project Page:**
- T**itle: What is the title of the project?
Does it tell you something about the project?
 - I**nstructions: What do the instructions tell you to do?
 - P**urpose: What is the purpose of this activity?
What will this code teach you?
 - P**lay: Run the project and see what it does!
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SEE Inside:

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Academic Language Development

A **sprite** is a character or object in Scratch that can have scripts that control what it does and when.

- **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. Could someone help me read the purpose?
- **P** stands for **Play**. It is not just enough to play – when I play, it is very important that I remember three questions – what event did I do, what **sprites** did something, and what action did each sprite do? Event, sprite, and action. Each time I do something, I can record what I saw happen on my TIPP&SEE journal page. Scratch programs begin when you press the green flag. (Press the green flag to play the program.) What happened? **Zood talked**. Now let’s press the space key. What happened? **Zood walked**. You can also click on sprites. If we click on Zood, what happens? **Zood walks the other way a bit**. What about if we click on the rocket? **It blasts off**.

I have previewed the Scratch Project page using TIPP. Now it is time to **SEE** inside so that I can learn about the code that makes it 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. For example, we can find the code that made Zood talk when I pressed the green flag. Inside the project, we start with:

- **S** stands for **Sprites**. What does S stand for? **SPRITES!** I can see that there are two sprites in this project. I first click on the Zood sprite to find some code.
- **E** stands for **Events**. What does E stand for? **EVENTS!** Now I can find which **script** did which action. A script is a set of instructions for a computer that go together. In Scratch, a script is a set of **blocks**, or instructions, that are linked together.

Look at Zood’s green flag script! Look at those say blocks!

Okay, let’s find the script that makes the spaceship blast off! What did we do to make the spaceship blast off? **clicked on the spaceship** Click on the Spaceship sprite, then look at its Events for when this sprite clicked. I see that it kept moving up.

- **E** stands for **Explore**. What does this E stand for? **EXPLORE!** Now is the time when I get to figure out how blocks and scripts work by making changes to a script and seeing what happens. I can change a number or other information that is typed in a block. I can also add a block or delete a block.

I’m going to try changing how long the wait block waits. (Change the number in the wait ___ secs block from 0.1 to 0.2, press green flag, then press the space key to run the script.) **Wow! Zood went slower when I changed that block.**

I wonder what happens when I add another say block. I am going to try to have Zood ask us to help him get home. (Add a say ___ for ___ sec block from the Looks category to the script starting with when green flag is clicked and have it say “Can you help me get home?”) **Now let’s play it with the green flag again and see what happens. Wow! I can make Zood speak!**

There seem to be lots of things that I can do when I explore and I can’t wait to keep experimenting with Scratch!

Animal Number Story TIPP&SEE, p. 1

NAME _____
Lesson 2-3A
SCRATCH ID _____ DATE _____ TIME _____

TIPP&SEE
Animal Number Story

Objective: I can closely observe a Scratch program and find the scripts that caused the actions.
Scratch Link: Animal Number Story (<https://scratch.mit.edu/projects/227391112/>)

Start with **TIPP&SEE!** Get a **TIPP** from the Project Page.
Read carefully: Title Instructions Purpose

Play the project and circle the action(s) that happened for each event below.

① When I clicked :	moved talked	moved talked	nothing happened
② When I clicked on	moved talked	moved talked	the background changed
③ When I clicked on	moved talked	moved talked	nothing happened
④ When I pressed the space key:	moved talked	moved talked	the background changed

SEE inside. (Click the button at the top right.)
First click on the **Sprite**, then find the **Event** that starts the script, then find the code.

⑤ Explore: Circle your answer.

a. Which block makes the **crab** move?

b. Which block puts the **crab** in its start position?

c. Which block makes the **hippo** talk?

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▶ Animal Number Story TIPP&SEE

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

Tell children that they will now get a chance to try TIPP&SEE on a different project, *Animal Number Story* (<https://scratch.mit.edu/projects/227391112/>). Direct them back to their computers and distribute the *Animal Number Story TIPP&SEE* journal page. As necessary, remind children about the steps they need to open the project. Have children use the project to complete the journal page individually or in pairs.



▶ Wrap Up

WHOLE CLASS | SMALL GROUP | PARTNER | INDEPENDENT

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

Then call them together to discuss today’s experience. You may wish to have children 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 and ask children to use their thumbs to show their opinion of each statement.

NAME _____
Lesson 2-3A
SCRATCH ID _____ DATE _____ TIME _____

TIPP&SEE
Animal Number Story (con’t)

d. Which button stops the program before it is finished?

Ⓒ Explore: Make these changes to the Crab’s script and see what happens.

a. Change **move 40 steps** to **move 100 steps**. Run and watch. **Crab appears to be on top of Hippo.**

b. Remove the **Setup** block. Click the crab three times. What happens? **The crab keeps moving to the very right of the screen.**

c. Add another say block that says “Hi, how are you today?” Run and watch. What happens? **The crab talks two times.**

Ⓓ Now modify the project!

- Reload, Remix, Rename, and Share the project. **Reload - click on the refresh button**
- Make the hippo move 30 steps before it talks. **Remix - click the green “Remix” button**
- Change the Hippo script to make the hippo say “I have 7 counters.” **Rename - click title and type in new name**
- Change the Crab script to make the crab say “I have 5 counters.” **Share - click on the orange “Share” button**
- Write the new number sentence: **7 + 5 = 12**
- Run the program and make sure it does all of the above.

Did the final number sentence change? Why or why not? **No, because the backdrop (stage) was not changed to show the new number sentence.**

Save your finished program.

Ⓔ If you finish early:

- Make the hippo play the drums after talking. **Add a play sound block.**
- Change the backdrop (in the stage) to match the new number sentence. **Click on the stage, then the backdrop, and then change the number sentence.**
- Change the colors of the Hippo and the Crab (click on the costumes tab).
- Make both animals say “Hi!” when the green flag is clicked. **Add a say block for both sprites in the script for When the green flag is clicked.**

“I Can ...” statements

- I can log into my Scratch account.
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