



CREATIVE COMPUTING

Harvard Graduate School of Education

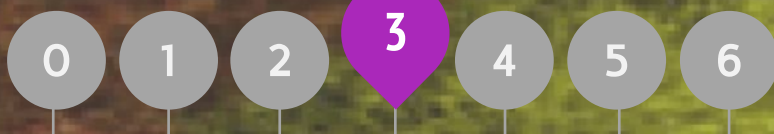
UNIT 3

STORIES



YOU ARE HERE

WHAT'S INCLUDED



CHARACTERS
CONVERSATIONS
SCENES
DEBUG IT!
CREATURE CONSTRUCTION
PASS IT ON

UNIT 3

OVERVIEW

THE “BIG IDEA”

In the introduction to his doctoral dissertation exploring remix culture, Andres Monroy-Hernandez (the lead designer of the initial version of the Scratch online community) included three quotes:

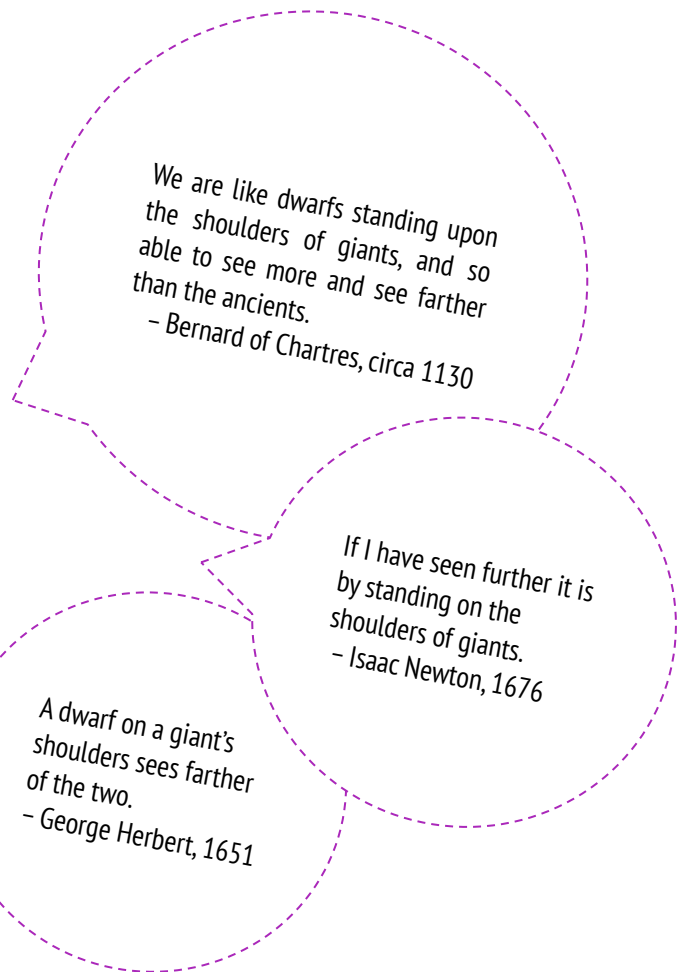
Building on other people’s work has been a longstanding practice in programming, and has only been amplified by network technologies that provide access to a wide range of other people’s work. An important goal of creative computing is to support connections between learners through reusing and remixing. The Scratch authoring environment and online community can support young designers in this key computational practice by helping them find ideas and code to build upon, enabling them to create more complex projects than they could have created on their own.

The activities in this unit offer initial ideas and strategies for cultivating a culture that supports reusing and remixing. How can you further support sharing and connecting?

LEARNING OBJECTIVES

Students will:

- + gain familiarity in and build understandings of the benefits of reusing and remixing while designing
- + develop greater fluency with computational concepts (events and parallelism) and practices (experimenting and iterating, testing and debugging, reusing and remixing)
- + explore computational creation within the genre of stories by designing collaborative narratives



We are like dwarfs standing upon the shoulders of giants, and so able to see more and see farther than the ancients.
– Bernard of Chartres, circa 1130

If I have seen further it is by standing on the shoulders of giants.
– Isaac Newton, 1676

A dwarf on a giant's shoulders sees farther of the two.
– George Herbert, 1651

KEY WORDS, CONCEPTS, & PRACTICES

- | | |
|------------------------|---------------------|
| + reusing and remixing | + pass-it-on story |
| + make a block | + pair programming |
| + backpack | + scratch screening |
| + stage | + design demo |

NOTES

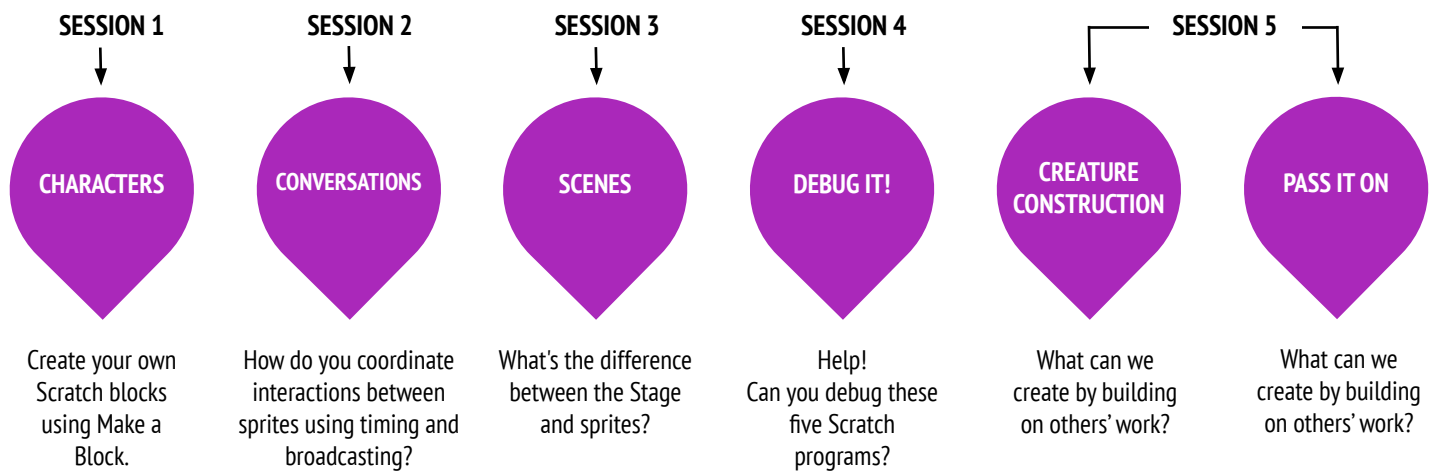
- + Reusing and remixing support the development of critical code-reading capacities and provoke important questions about ownership and authorship. Consider different strategies for how you might facilitate, discuss, and assess cooperative and collaborative work.

CHOOSE YOUR OWN ADVENTURE



This unit focuses on helping students develop their storytelling and remixing abilities through a variety of hands-on and off-computer design activities, providing opportunities for students to work collaboratively and build on the creative work of others. Building on initial experiences from Unit 2, the activities in this unit are designed to help students develop deeper fluency in the computational concepts of events and parallelism and the computational practices of experimenting and iterating and reusing and remixing. Each capacity-building activity is designed to help students build up storytelling projects by discovering new blocks and methods for programming interactions between sprites and backdrops, culminating in a Pass It On project.

POSSIBLE PATH



DEBUG IT!

 SUGGESTED TIME
15–30 MINUTES

OBJECTIVES

By completing this activity, students will:

- + investigate the problem and find a solution to five debugging challenges
- + explore a range of concepts (including events and parallelism) through the practices of testing and debugging

ACTIVITY DESCRIPTION

- Optionally, have the Unit 3 Debug It! handout available to guide students during the activity.
- Help students open the Debug It! programs from the Unit 3 Debug It! studio or by following the project links listed on the Unit 3 Debug It! handout. Encourage students to click on the “Look Inside” button to investigate the buggy program, tinker with problematic code, and test possible solutions.
- Give students time to test and debug each Debug It! challenge. Optionally, have students use the remix function in Scratch to fix the bugs and save corrected programs.
- Ask students to reflect back on their testing and debugging experiences by responding to the reflection prompts in their design journals or in a group discussion.
- Create a class list of debugging strategies by collecting students’ problem finding and problem solving approaches.

RESOURCES

- Unit 3 Debug It! handout
- Unit 3 Debug It! studio
<http://scratch.mit.edu/studios/475554>

REFLECTION PROMPTS

- + What was the problem?
- + How did you identify the problem?
- + How did you fix the problem?
- + Did others have alternative approaches to fixing the problem?

REVIEWING STUDENT WORK

- + Were students able to solve all five bugs? If not, how might you clarify the concepts expressed in the unsolved programs?
- + What different testing and debugging strategies did students employ?

NOTES

- + Being able to read others’ code is a valuable skill and is critical for being able to engage in the practices of reusing and remixing.
- + This activity is a great opportunity for pair programming. Divide students into pairs to work on the debugging challenges.
- + Students can explain their code revisions by right-clicking on Scratch blocks to insert code comments.

NOTES TO SELF

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DEBUG IT!

HELP! CAN YOU DEBUG THESE FIVE SCRATCH PROGRAMS?

In this activity, you will investigate what is going awry and find a solution for each of the five Debug It! challenges.

START HERE

- ❑ Go to the Unit 3 Debug It! Studio:
<http://scratch.mit.edu/studios/475554>
- ❑ Test and debug each of the five debugging challenges in the studio.
- ❑ Write down your solution or remix the buggy program with your solution.

**FEELING
STUCK?**

THAT'S OKAY! TRY THESE THINGS...

- ❑ Make a list of possible bugs in the program.
- ❑ Keep track of your work! This can be a useful reminder of what you have already tried and point you toward what to try next.
- ❑ Share and compare your problem finding and problem solving approaches with a neighbor until you find something that works for you!

❑ **DEBUG IT! 3.1** <http://scratch.mit.edu/projects/24269007>

In this project, the Scratch Cat teaches Gobo to meow. But when it's Gobo's turn to try -- Gobo stays silent. How do we fix the program?

❑ **DEBUG IT! 3.2** <http://scratch.mit.edu/projects/24269046>

In this project, the Scratch Cat is supposed to count from 1 to the number the user provides. But the Scratch Cat always counts to 10. How do we fix the program?

❑ **DEBUG IT! 3.3** <http://scratch.mit.edu/projects/24269070>

In this project, the Scratch Cat is doing roll call with Gobo's friends: Giga, Nano, Pico, and Tera. But everything is happening all at once! How do we fix the program?

❑ **DEBUG IT! 3.4** <http://scratch.mit.edu/projects/24269097>

In this project, the Scratch Cat and Gobo are practicing their jumping routine. When Scratch Cat says "Jump!", Gobo should jump up and down. But Gobo isn't jumping. How do we fix the program?

❑ **DEBUG IT! 3.5** <http://scratch.mit.edu/projects/24269131>

In this project, the scene changes when you press the right arrow key. The star of the project -- a dinosaur -- should be hidden in every scene except when the scene transitions to the auditorium backdrop. In the auditorium, the dinosaur should appear and do a dance. But the dinosaur is always present and is not dancing at the right time. How do we fix the program?

FINISHED?

- + Add code commentary by right clicking on blocks in your scripts. This can help others understand different parts of your program!
- + Discuss your testing and debugging practices with a partner, and make note of the similarities and differences in your strategies.
- + Help a neighbor!

CREATURE CONSTRUCTION

 SUGGESTED TIME
15–30 MINUTES

OBJECTIVES

- By completing this activity, students will:
- + be introduced to the computational practice of reusing and remixing by contributing to a collaborative drawing

ACTIVITY DESCRIPTION

- In this activity, students will draw a “creature” in three parts.
- Give each student a tri-folded sheet of blank paper and one minute to draw a “head” for their creature. Next, have them fold the paper over so that the head is hidden, with little prompts for where to continue the drawing. After the head is hidden, students will pass the creature to another student. Then, give students one minute to draw a “middle” for their creature, using the guides from the head, but without peeking! After the middles are hidden (and prompts drawn), pass the creatures. Finally, give students one minute to draw a “bottom” for their creature. When finished, unfold the papers to reveal the collaboratively constructed creatures!
- Post drawings on a wall or board and let students explore the outcome of their creative contributions.
- Facilitate a group discussion about co-authorship, collaboration, and reusing and remixing work.

RESOURCES

- blank paper (approximately 8.5” by 11”), folded into thirds
- things to sketch with (pencils, pens, markers, etc.)

REFLECTION PROMPTS

- + What is your definition of remixing?
- + Think about the creature you started (drew the “head” for). How did your ideas become extended or enhanced by others’ contributions?
- + Considering the creatures you extended (drew the “middle” or “bottom” sections for), how did your contributions extend or enhance others’ ideas?

REVIEWING STUDENT WORK

- + Can students explain remixing and its benefits?

NOTES

- + This activity is a perfect warm-up activity for the Pass It On project! We recommend facilitating Creature Construction directly before Pass It On.
- + Optionally, have students sign their names at the bottom of each creature drawing they worked on to identify the contributing artists.

NOTES TO SELF

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PASS IT ON



OBJECTIVES

By completing this activity, students will:

- + be able to create a Scratch project that tells a story by reusing and remixing the work of others
- + experience pair programming by working in pairs to develop a collaborative storytelling project

ACTIVITY DESCRIPTION

- Divide the group into pairs. Introduce students to the concept of a pass-it-on-story, a Scratch project that is started by a pair of people, and then passed on to two other pairs to extend and reimagine. Optionally, print out the Pass It On handout.
- Encourage students to start in whatever way they want – focusing on characters, scene, plot, or whatever element excites them. Give each pair 10 minutes to work on their collaborative story before having them rotate to extend another story by remixing the project. Encourage students to give credit for reusing or remixing content.
- After two rotations, allow students to revisit story projects with their contributions. We suggest hosting a Scratch screening: with projector and screen, present the story projects with students gathered around to watch. Optionally, invite students to add their projects to the Pass It On studio or a class studio.
- Ask students to respond to the reflection prompts in their design journals or in a group discussion.

RESOURCES

- Pass It On handout
- Pass It On studio
<http://scratch.mit.edu/studios/475543>
- Projector and screen to present student work (optional)

REFLECTION PROMPTS

- + How did it feel to remix and build on others' work? How did it feel to be remixed?
- + Where else in your life have you seen or experienced reusing and remixing? Share two examples.
- + How was working with someone else different from your prior experiences of designing your Scratch projects?

REVIEWING STUDENT WORK

- + What parts of projects did students contribute to?
- + Do students seem comfortable with the concepts of events and parallelism and practices of reusing and remixing?
If not, in what ways can these be further clarified?

NOTES

- + Consider organizing your Scratch screening as an event! Invite students from other classes to the viewing, offer snacks and drinks, or host the event in an auditorium or room with a large wall or screen for displaying projects.
- + Introduce students to the backpack (located at the bottom of the Scratch project editor) as another way to remix projects. Learn more about this tool in the Backpack video tutorial: <http://bit.ly/scratchbackpack>

NOTES TO SELF

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PASS IT ON

WHAT CAN WE CREATE BY BUILDING ON OTHERS' WORK?

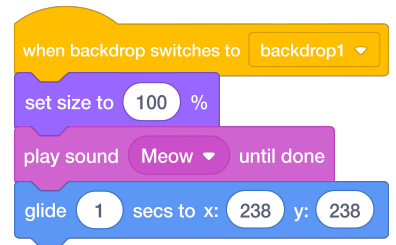
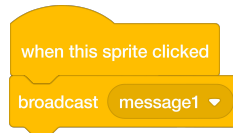
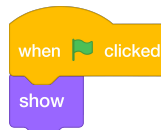
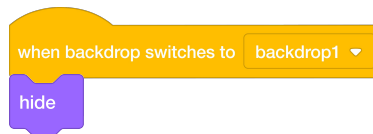
In this project, you will start developing an animated story project, and then you will pass the story on to others to remix, extend, or reimagine!

START HERE

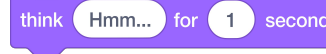
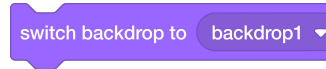
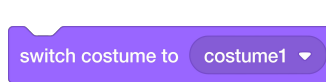
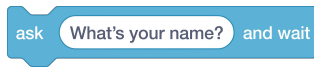
- ❑ Work on a story project that focuses on characters, scene, plot, or whatever element excites you.
- ❑ After 10 minutes, save and share your project online.
- ❑ Rotate & extend another story project by remixing it.
- ❑ Repeat!

THINGS TO TRY

- ❑ Brainstorm different possibilities for remixing, extending, or reimaging a story. Do you want to add a new scene to the end? Could you imagine what happens before the story begins? What if a new character was added? How about inserting a plot twist? What else?
- ❑ Adding comments in your code can help others understand different parts of your program. To attach a comment to a script, right click on a block and add a description.



BLOCKS TO PLAY WITH



FINISHED?

- + Add your project to the Pass It On studio: <http://scratch.mit.edu/studios/475543>
- + Help a neighbor!
- + Return to all the projects you contributed to and check out how the stories evolved!