

Parallelism



What is this?

Parallelism is one of 10 modules in Getting Unstuck, a Scratch curriculum developed by the Creative Computing Lab. The aim of the curriculum is to foster classroom cultures that support creative and conceptual fluency with code.

Find more modules and the orientation to Getting Unstuck at gettingunstuck.gse.harvard.edu



What's inside?

For the teacher

[Prompt overview](#)

[Activities overview](#)

[Teaching the module](#)

For the student

[Design journal cover page](#)

[Foundational activities](#)

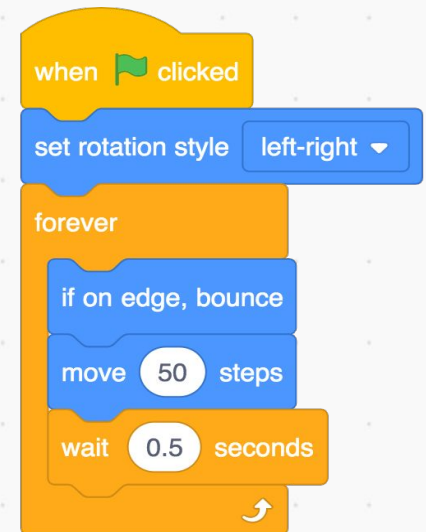
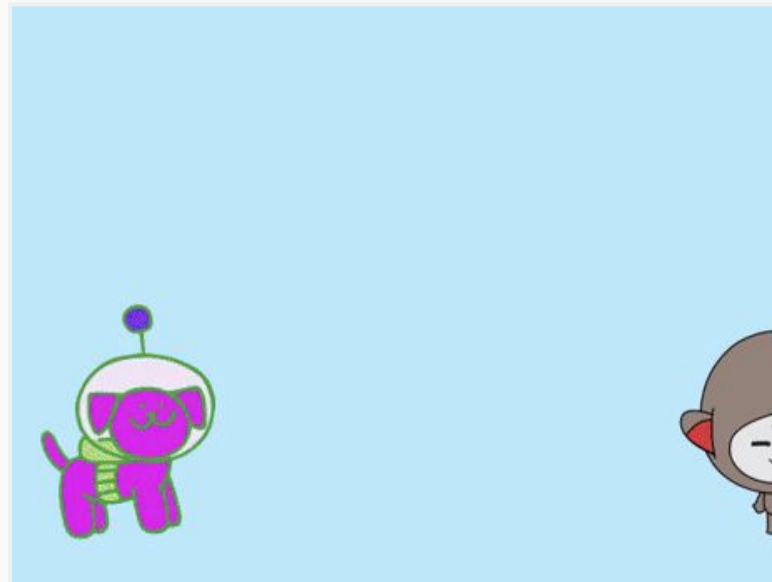
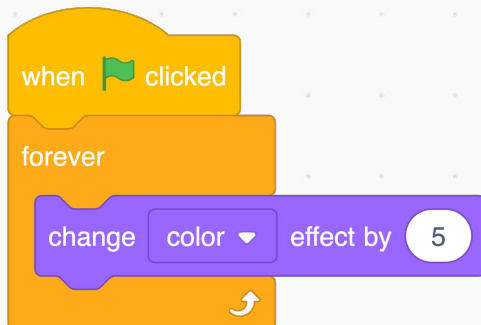
[Additional activities](#)

Prompt Overview

Create a project that uses multiple green flag blocks to make things happen at the same time.

What concept will we explore in this module?

In this module, students use the *when green flag clicked* block to explore the concept of parallelism: making two or more things happen at the same time.

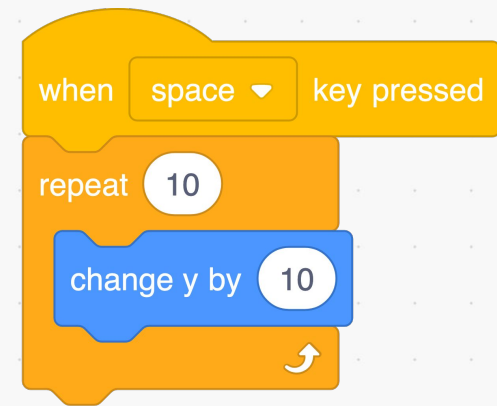


The code stack on the left is on the dog. The code stack on the right is on Nano. When the green flag is clicked, both sprites begin their actions simultaneously.

What can students make with parallelism?

In Scratch, parallelism can mean two or more code stacks running on the same sprite at the same time, causing the sprite to do multiple things simultaneously. Parallelism can also mean two or more code stacks running on different sprites at the same time, causing multiple sprites to do things simultaneously.

To encourage students to explore parallelism, this module asks students to create projects where multiple *when green flag clicked* blocks are used to make things happen simultaneously. This could mean multiple sprites doing different dance moves, having a conversation, or something else entirely! It could also mean background music or animation on the stage while a sprite performs some activity in the foreground.



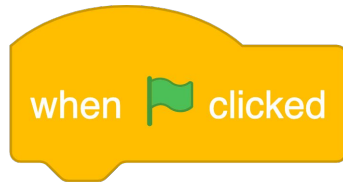
If a player presses the spacebar, this code stack causes the sprite to jump. Pressing space to jump can cause the sprite to avoid obstacles.



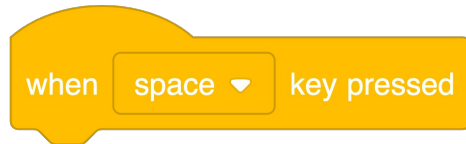
What else should I know about parallelism?

Parallelism can expand students' understandings of what is possible in Scratch. Talking to students about parallelism can encourage students who tend to be finished quickly to explore new concepts and ideas. For example, you could encourage students to add another sprite to their project and program that sprite to interact with existing project elements in new ways.

There are many different ways to go about creating this project.
Here are a few blocks that students might use:



This event block runs a code stack when the green flag (in the top corner of the project) is clicked. This block is almost always used to start a project in Scratch. If students are having trouble “restarting” their projects (e.g., their sprite has walked to the edge of the screen but has not returned to the original position), it can be useful to add some *when green flag clicked* code stacks to reset the project.



This event block causes a sprite to run a code stack when a specific key is pressed. The drop-down menu can be used to select the specific key.



The *if/then* block is a conditional [control](#) block. This block checks if the condition inside is true, and if so, runs a nested code stack. This block needs an event block to run it, and will also need a hexagon-shaped block (such as a sensing block or Boolean operator block) to provide the condition.

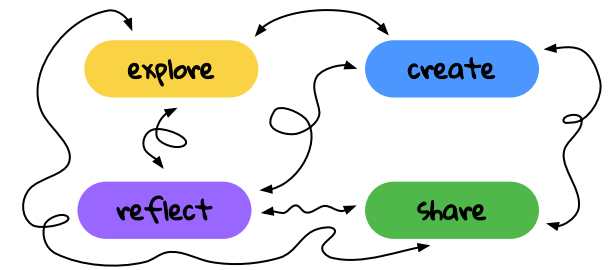
Additional resources

- [Animate a Character](#): Explore this educator guide (pp. 9–12) to familiarize yourself with ways to support students in animating their sprites
- [Getting Unstuck 2020 Studio](#): Explore additional *Parallelism* projects made by teachers

Activities Overview

The activities in this module are designed to help students create Scratch projects that are unique and matter to them, while exploring a particular computer science concept. This work is supported through the essential design studio practices of exploring, creating, sharing, and reflecting.

The *Parallelism* module includes 18 activities. We recommend using the 6 activities below as the foundation for the learning experience and incorporating additional activities as desired. Based on teachers' classroom use of the activities, we expect that this module will span five 45-minute sessions.



| Activity Type | Activity Name | Activity Description |
|---------------|--------------------|--|
| Explore | Inspiration Studio | Inspire imagination with a curated collection of Scratch projects |
| Create | Project Prompt | Dive into the project prompt and experiment with blocks |
| Create | Unstuck Strategies | Try some strategies to get unstuck when challenges are encountered |
| Share | Heart and Star | Support progress and exploration through peer feedback |
| Reflect | Journal Entries | Engage reflection on progress each session through formative assessment |
| Reflect | Self Assessment | Honor growth and explore potential next steps through summative assessment |

Along with the 6 foundational activities, we encourage you to include some of the 12 additional activities listed on the next page. These activities are intended to offer other ways of supporting your students' (and your own!) creative and conceptual fluency. We hope that you remix and reimagine these activities, as well as include activities you are excited about from other sources—whatever works best for you and your students!

| Activity Type | Activity Name | Activity Description |
|---------------|--------------------|--|
| Explore | Brainstorm Ideas | Connect to interests and experiences through an invitation to imagine |
| Explore | Read Me | Read a little bit of Scratch code featuring the key concept |
| Explore | Unplugged | Explore key concepts through teacher-led movement and play |
| Create | Make a Plan | Record ideas and intentions for projects using a planning template |
| Create | Storyboard | Document project dreams with visuals and text |
| Create | Remixable | Remix a project that was designed to be reimagined |
| Share | Red Yellow Green | Explore multiple perspectives with peer feedback |
| Share | Leave a Comment | Give and receive feedback via the Scratch website |
| Share | Gallery Walk | View and respond to others' projects through a class tour |
| Reflect | Think, Pair, Share | Consider progress individually and share with others |
| Reflect | Notes and Credits | Document thinking with the <i>Notes and Credits</i> feature on the Scratch website |
| Reflect | Code Comments | Make thinking visible through code commenting |

These activity pages are designed to be shared with students—to guide their work and to help them keep track of their learning. We call a student's collection of activity pages their **design journal**. To help organize the activity pages in students' design journals, we have included a cover page. This cover page offers an overview of the project prompt through text and video, as well as a list of key activities for quick reference. You will need to update the cover page to reflect the activities you choose to include.

We have also created [how-to Scratch logistics pages](#) that may be helpful for students as they work through the module, including: how to share a project to a studio, how to fill in a Scratch project page, how to give credit, and how to give feedback.

Teaching the Module

How will you bring the *Parallelism* module to life in your classroom? Here we offer some planning prompts and reflection questions to help you get ready to explore, create, share, and reflect with your students!

- ❑ Choose activities (from the foundational and additional activities summarized in the adjacent table, or from other sources) that you'll use to teach this module.
- ❑ Create a Scratch studio for students to share projects.
- ❑ Set up students' design journals by customizing the cover page and including relevant activities.
- ❑ Create your own *Parallelism* Scratch project to help familiarize yourself with the prompt.
- ❑ Make plans for differentiation in order to support all of your students and their unique needs.
- ❑ Identify any specific computer science standards or cross-curricular connections you would like to make.
- ❑ Connect with other Getting Unstuck educators on [Twitter](#) or on [Facebook](#).

| Explore | Share |
|--------------------|--------------------|
| Inspiration Studio | Heart and Star |
| Brainstorm Ideas | Red Yellow Green |
| Read Me | Leave a Comment |
| Unplugged | Gallery Walk |
| Create | Reflect |
| Project Prompt | Journal Entries |
| Unstuck Strategies | Self Assessment |
| Make a Plan | Think, Pair, Share |
| Storyboard | Notes and Credits |
| Remixable | Code Comments |

What else will help you prepare? What will help your students imagine and create their wonderful projects?

We've included this page to help you map out your chosen activities across different sessions and to document your thoughts about how sessions went. You may have more sessions; you may have fewer sessions—just add or remove rows as needed.

| | What will you do? Which activities will you include? | How was it? What would you change? |
|-----------|--|------------------------------------|
| Session 1 | | |
| Session 2 | | |
| Session 3 | | |
| Session 4 | | |
| Session 5 | | |

Parallelism Design Journal

Name

Username

Create a project that uses multiple green flag blocks to make things happen at the same time.



*Click on the video
to learn more about this project!*

What do you want to do?

- [Explore the inspiration studio](#)
- [Create my project](#)
- [Try a strategy to get unstuck](#)
- [Share with a heart and star](#)
- [Reflect in my journal entries](#)
- [Self-assess my process](#)

Inspiration Studio


Name

Username

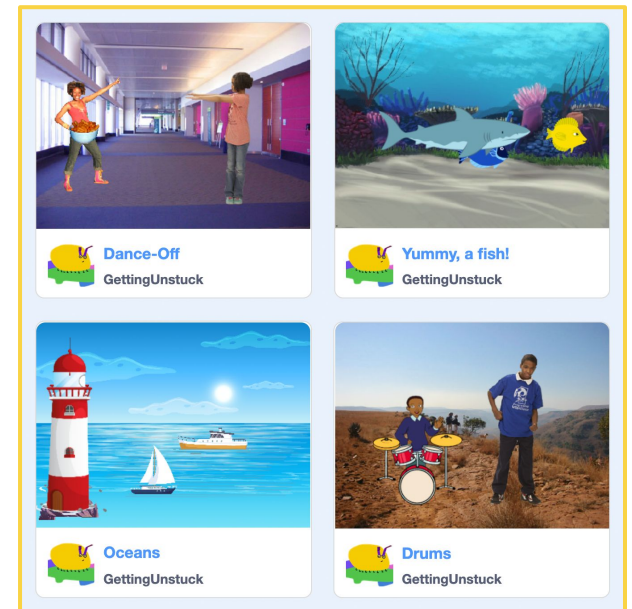
Exploring projects that other Scratchers have made can help us get inspired about what we want to make!

1. Click on this link: scratch.mit.edu/studios/27321000
2. Visit a few of the projects in the *Parallelism* studio.
Choose a project that you think is interesting.

Why is this project interesting to you?

3. Open that project and click  See inside
4. Find two *when green flag clicked* blocks and look at their code stacks to see what happens.

What are two things that happen when the green flag is clicked?



when  clicked

when  clicked

Create

Parallelism

Name

Username

Create a project that uses multiple green flag blocks to make things happen at the same time.

Studio link

Project link

Get started

- ❑ Sign into [Scratch](#).
- ❑ Click **Create** to start a project.
- ❑ Share your project in the class studio. ([Need help?](#))
- ❑ Start working on your project!

Keep going

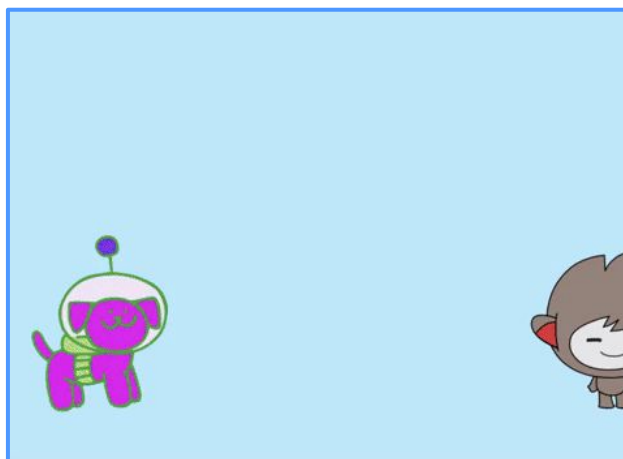
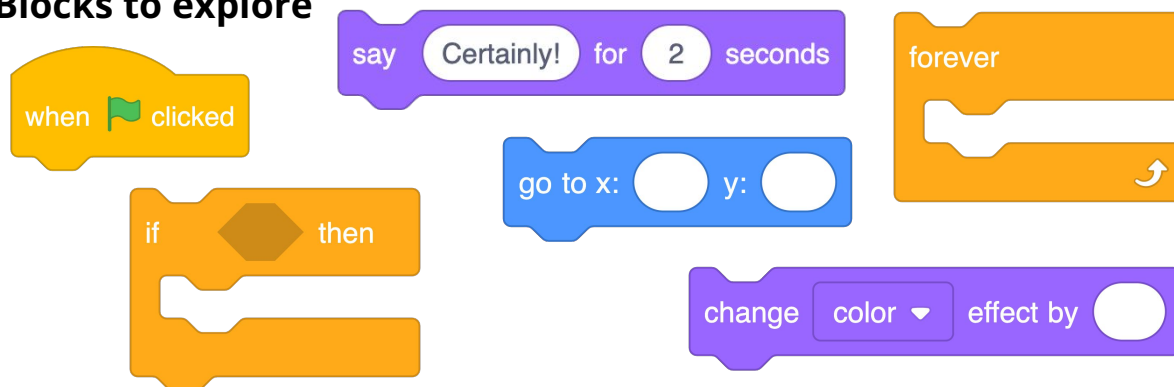
Stuck? Try using the strategies on the *Unstuck Strategies* page!

Done? Explore ideas for what you could do next:
scratch.mit.edu/projects/541477729

Finish up

- ❑ In your project's *Instructions*, explain how others should use your project. ([Need help?](#))
- ❑ In your project's *Notes and Credits*, explain how you made your project. ([Need help?](#))

Blocks to explore

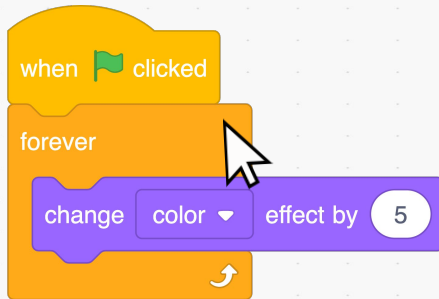


Unstuck Strategies

Name

Username

Getting stuck is part of the process when working on projects! Here are some strategies to help.



A stack at a time

Click on a stack to run those specific blocks in your project. Do they work?

If not, try pulling the stack apart into smaller sections, then click on each of those sections.



Talk it through

Saying ideas out loud can help you figure out what to do next.

Talk to a friend about what you're working on, and try to be specific. Ask them for ideas about what to do next!



Try something else

There are many ways to do the same thing in Scratch.

What's another way you might try? You could experiment with different blocks or edit your sprites' costumes.

Which strategies did you try for this project? Which strategies worked for you?

Heart and Star

| | |
|----------|--|
| Name | |
| Username | |

Sharing your project with classmates can help you get feedback about what to work on next.

1. Show your project to a classmate.
2. Ask them to say one thing they like about your project.



My favorite part
was...



I like the way
you... because...



You should
continue to...

3. Ask them to say one thing you could try in your project.



What if you...



Something you
could do next is...



You could try...

4. Switch!

Reflect

Journal Entries

Name

Username

Use the boxes below to write or draw your thinking, or share a link to a video or audio reflection.
Try using these sentence starters to help you share your ideas!

Today I learned...

I need help with...

I wonder how I could...

Today I was proud of...

| Date | Student reflection | Teacher response |
|------|--------------------|------------------|
| | | |
| | | |
| | | |
| | | |
| | | |

Reflect

Self Assessment

Name

Username

| Write in each box: what is something you are proud of? | Expectations | Write in each box: what is something else you could try? |
|--|--|--|
| | Personalization: I customized my project with sprites, sounds, and/or backdrops to make it look the way I want. | |
| | Prompt: My <i>Parallelism</i> project uses multiple green flag blocks to make things happen at the same time. | |
| | Community: I helped someone with their project and got help from someone else. | |
| | Effort: I persevered through challenges and tried different strategies to solve problems. | |

What inspired you to make your project?

What else should your teacher know?

Teacher response:

Explore

Brainstorm Ideas

Name

Username

Let's brainstorm ideas for what project you could make. Start by thinking about what happened yesterday. What did you do? What did you see or hear? What did you notice?

Write down three things you did yesterday.

Draw yourself doing something you love.

Draw something you saw yesterday.

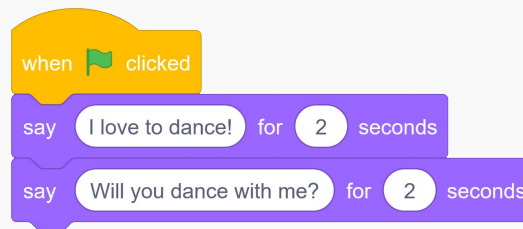
Write down one idea for your Scratch project.
Tell a classmate about your idea!

Name

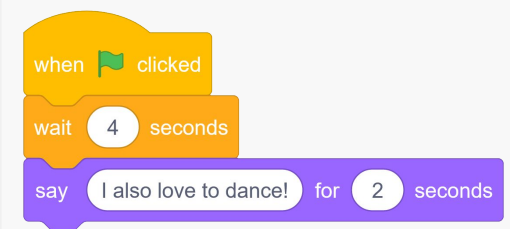
Username



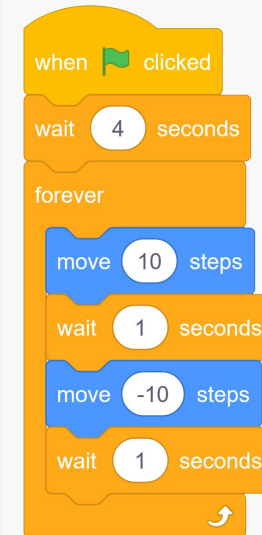
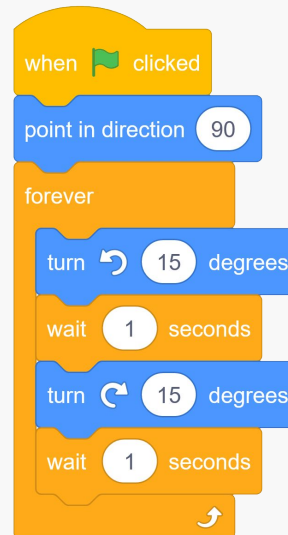
Bear



Fox



Read the code for this *Parallelism* project.
What happens in this project?



Unplugged

In this teacher-facilitated unplugged activity, students will explore parallelism: making different things happen at the same time.

Activity

- Ask each student to think of an action. They might dance, clap their hands, or sing a song.
- Tell the students that when you say “Go!” they should all do their actions, and when you say “Stop!” they should all pause their actions.
- Say “Go!” and “Stop!” a few times to give students a chance to perform their actions.

Discussion

- What did we just do in this activity?
- How would we do this activity in Scratch? What blocks would we use?
- In Scratch, the same event, such as a “Go!” broadcast, can cause different sprites to do different things at the same time. This is called parallelism. For example, you could have two sprites doing different dances when the user clicks the green flag. What kinds of things could sprites do at the same time?
- What kinds of projects could you make involving parallelism?



Create

Make a Plan

Name

Username

Write or draw your ideas to share what you're currently thinking about for your *Parallelism* project!

What is your project about?

What will happen in your project?

What are two things that will happen when the green flag is clicked?

Which blocks will you use to make those things happen?

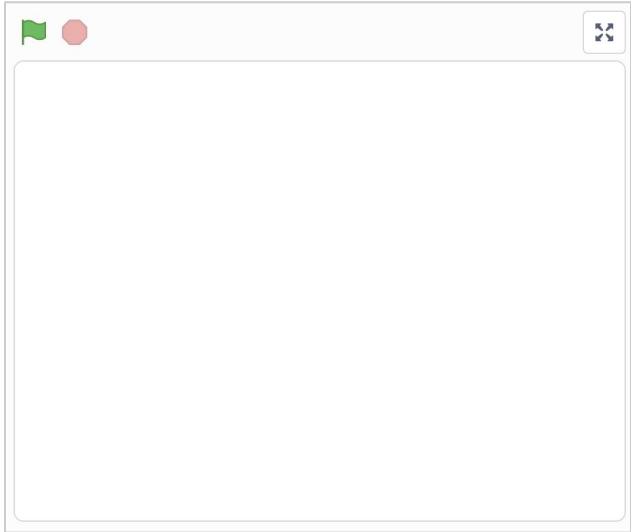
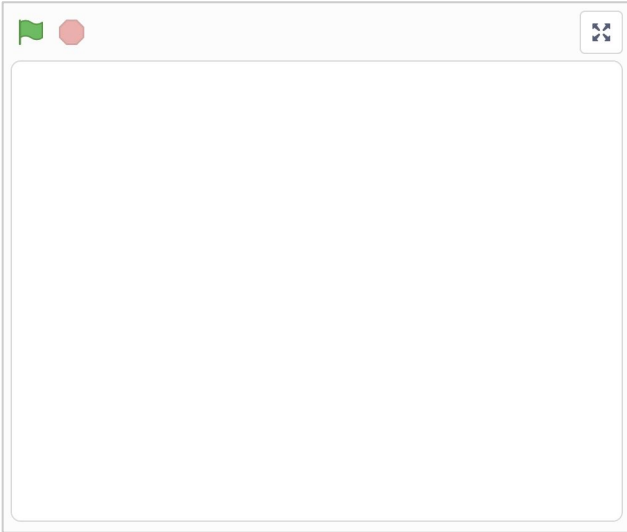
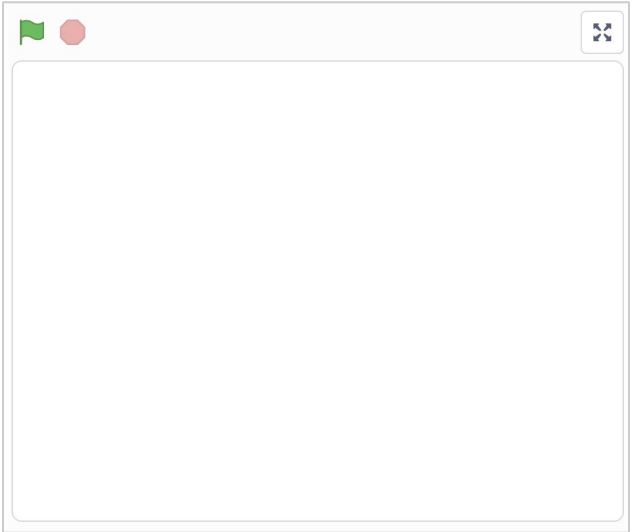
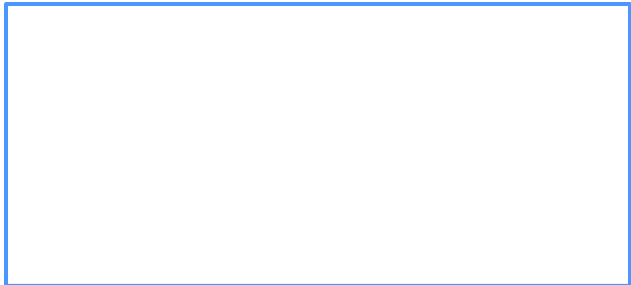
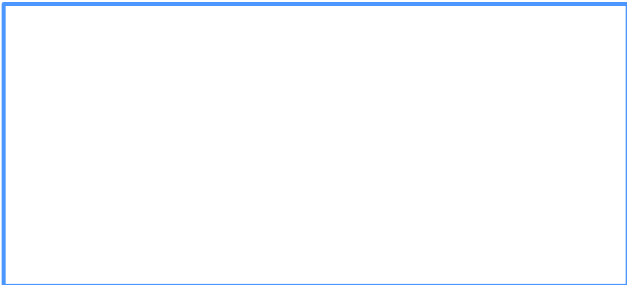
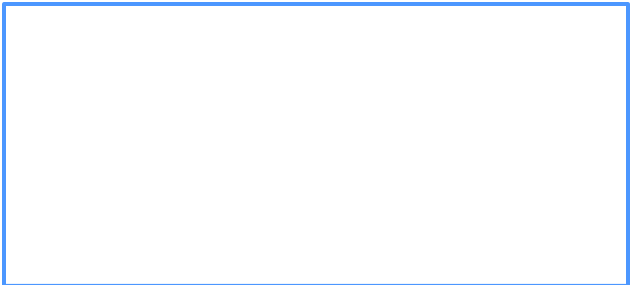
Create

Storyboard

Name

Username



What happens in your project? Draw the important events and write about them underneath.

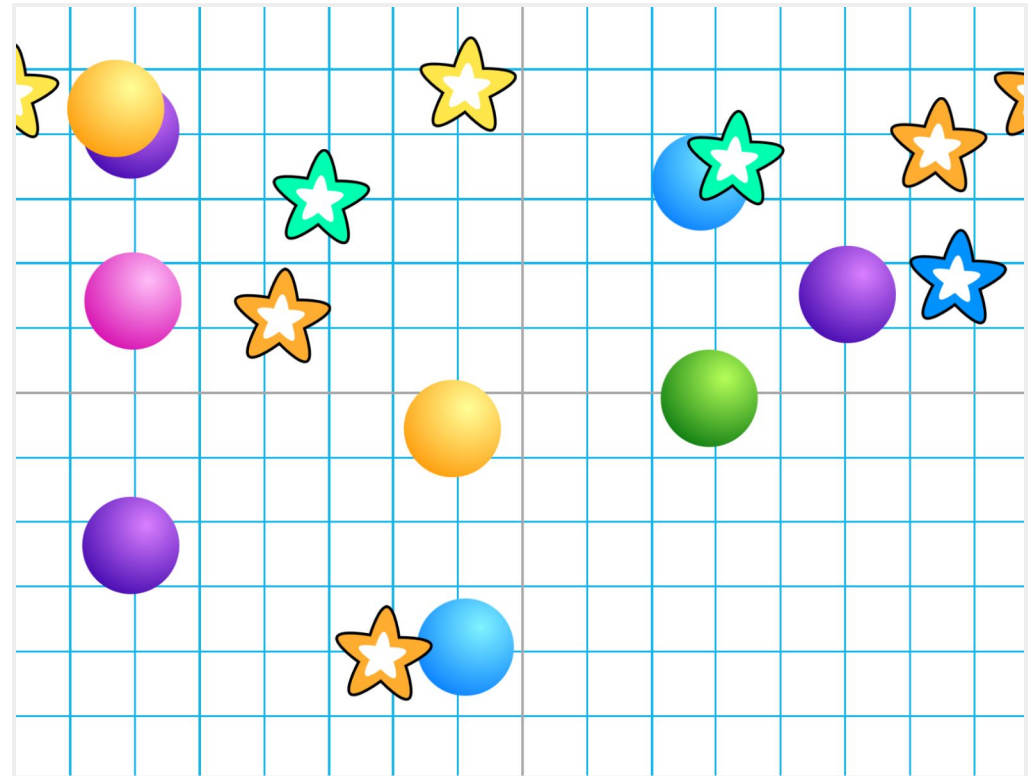
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|  |  |  |
|  |  |  |

Now that you've made a storyboard, what are you going to work on next in your Scratch project?

Name

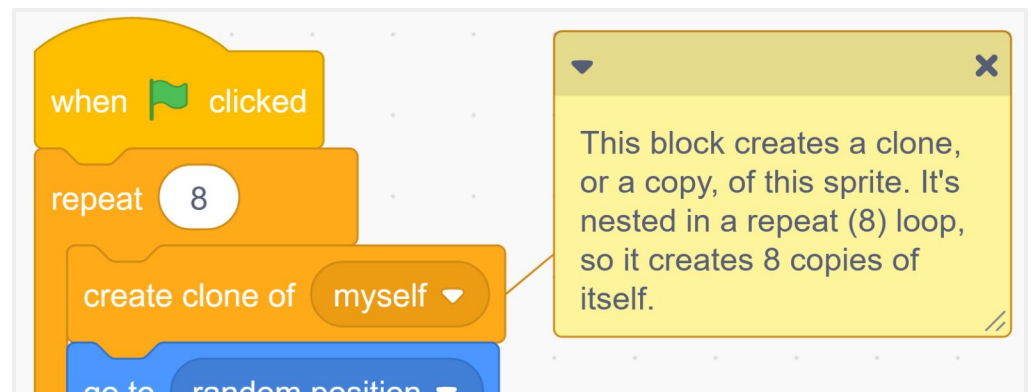
Username

1. Go to the Remixable for *Parallelism* at scratch.mit.edu/projects/542032331
2. Read the instructions and notes.
3. Try out the project! What do you notice?
4. Click  See inside to explore the code.
5. Click  Remix to create a remix.



What are 3 things you could change in this project to make it your own?

- 1.
- 2.
- 3.



| | | | |
|-------|------------------|----------|--|
| Share | Red Yellow Green | Name | |
| | | Username | |

Find three peers to give you feedback on your project. Read their feedback and decide what to do next.

For peers: Write your name and red, yellow, and green suggestions in the table.

| Peer Name | RED Something I'd change | YELLOW Something I wondered | GREEN Something I liked |
|-----------|-----------------------------|--------------------------------|----------------------------|
| | | | |
| | | | |
| | | | |

For you: Based on this feedback, one thing I'm going to work on next is...

Share

Leave a Comment

Name

Username

Feedback from others can help you decide what to work on next. One way that we can share feedback is by leaving comments on Scratch projects!

1. Log onto [Scratch](#), and find your class studio.
2. Click on a project that you want to explore.
3. After you've tried it out, scroll down to the *Comments* section.
4. Write a constructive comment for the project creator to help them work on their Scratch project.
5. Click the **Post** button.
6. Go back to the class studio to view another project. Try to find projects that have no comments to help everyone get feedback!



I love how you drew your own sprites! They're so colorful! What if you added music too?

15 seconds ago

[reply](#)



I really liked how fun this game was to play! Next time, you could add another level to make it longer?

2 minutes ago

[reply](#)



My favorite part was how the mermaid said my name. Maybe you could add clearer instructions to start?

1 day ago

[reply](#)



You should continue to add pictures of your neighborhood, because I liked learning more about your interests. What if you added some things to click on in your project?

23 seconds ago

[reply](#)

Gallery Walk

Name

Username

For the project sharer

- Show your project to your classmate.
- Share something you like about your project.
- Share a question you have about your project.



Something I like
about my project is...



Something I'm
excited about...



Something I
wonder is...

For the feedback giver

- Share something you like about their project.
- Share something they could try in their project.
- Switch! Show your project and get feedback!



Something you
could try is...



My favorite part of
your project was...



Could you tell me
more about...

When both of you have shared your projects, find a new partner.
Show your project and give feedback to at least three other people!

Reflect

Think, Pair, Share

Name

Username

Think: By yourself, think about the questions below. You can write or draw in the boxes.

What is something going well in your project?

What is something that you are working on?

What do you want to work on next?

Pair: With a partner, take turns sharing your responses to the questions above. After you listen to your partner, ask them one question about their project.

Share: What is one thing you want to share with the whole class?

Notes and Credits

| | |
|----------|--|
| Name | |
| Username | |

Writing in the *Notes and Credits* helps others learn about your ideas and how you created your project.

1. Log onto [Scratch](#), and find your project.
2. Go to the *Notes and Credits* section of your project.
3. Using the sentence starters below, write 1–2 sentences about what you did today.
4. When you're done, go to your class studio and read what others have written about their projects!

Instructions

Tell people how to use your project (such as which keys to press).

Notes and Credits

2/5: Today I worked on...

2/6: I'm stuck on...

2/7: Today I programmed my sprites to...

Today I worked on...

I was inspired by...

Next I want to make...

My project is about... because...

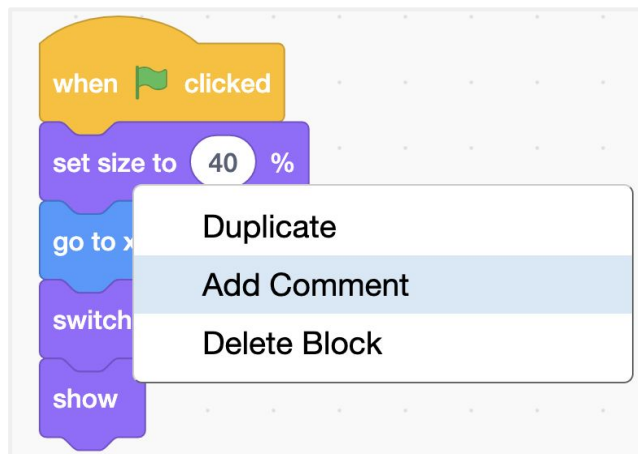
Something new I tried was...

Code Comments

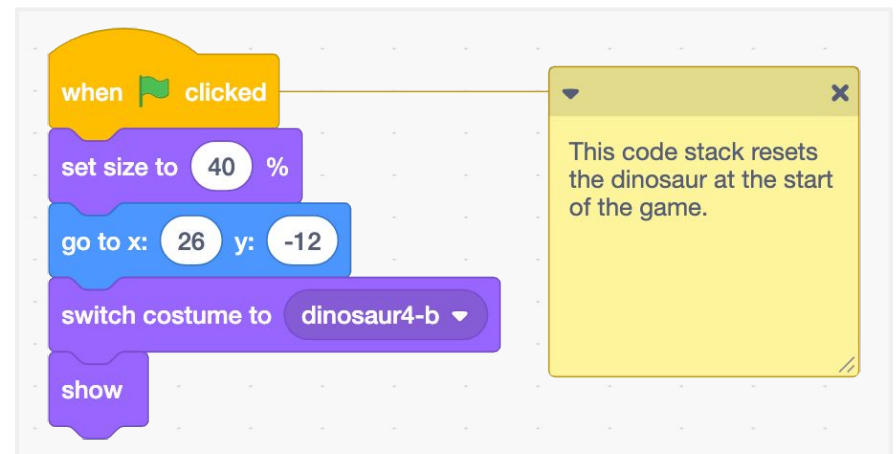
| | |
|----------|--|
| Name | |
| Username | |

Writing comments about specific code stacks can help others learn about how your code works.

First, right-click on a code stack in your project. Then, click on *Add Comment*.



Once the sticky note pops up, write a 1-2 sentence comment on the sticky note.



Try using these sentence starters to write a comment that explains your thinking.

When you're done, go to your class studio and read what others have written about their projects!

This code stack makes...

This code stack resets...

I used these blocks to...

I added this code so that...



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