

3.3 Parallelism & Synchronization: Quest & Plan

Students will be able to:

1. Identify the differences between back and forth synchronization and parallelism.
2. Modify an existing Scratch project to fix the timing and add parallel actions to both sprites.
3. Plan a project that uses both parallelism and synchronization.

Learning Activity Summary

1. [Review the concepts of parallelism & synchronization](#) (5 minutes)
2. [Complete the Quest tasks](#) (15 min)



[Optional: Turn and Talk](#). Have students discuss the “bugs” they may have encountered

3. [Planning the Create Project](#)
 - a. Discuss the Example project (5 minutes)
 - b. Review the project Planning Sheet and Rubric (10 minutes)
 - c. Project Planning time (15 min)



[Optional Turn and Talk](#): Students share plans

Student Materials

- [A2:U3 Student Workbook](#)
- Computer with Internet

Teacher Preparation

- **Create a class studio: “Knock, Knock”**
- [A2:U3.3 Teacher Slide Deck](#) - projected
- [Roar and hiSS video](#)
- Project Example: bit.ly/a2u3example
- Project Example Exemplary: bit.ly/a2u3exemplary



[A2:U3.3 Knock, Knock Quest](#)



[A2:U3.3 Planning Pages Fillable Slide](#)

(Each student will need a copy)

3.3 Lesson Presentation

Parallelism & Synchronization: Quest & Plan

Act 2: Unit 3.3



EXPLAIN EXPLORE

Review of Parallelism & Synchronization

Exploring Parallelism

Which scripts will run at the same time?

What event will cause the scripts to run at the same time?

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Exploring Parallelism

Which event will make the sprite say "Hello" and move 10 steps at the same time? Check the correct answer below.

☐ when green flag clicked ☒ when this sprite clicked

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Exploring Synchronization

When the green flag is clicked, the cow says "Hello" and the sheep says "Hello".

How would you change the scripts to make the cow and sheep say "Hello" at the same time?

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Exploring Synchronization

Find the error in the scripts below.

How would you fix the error to make the cow and sheep say "Hello" at the same time?

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As a class or in groups, have your students discuss the questions from Exploring Parallelism and Exploring Synchronization worksheets in the student workbooks (pages 50-51).

Click the space key to reveal answers and other parts of the slides.

UNIT 3.3 Quest & Plan

TURN AND TALK (optional)

Share a favorite Knock Knock joke with a partner or with the class.

This is a review slide from the last lesson. Remembering Knock Knock jokes will help them in the Quest task.

QUEST

UNIT 3.3 Quest & Plan

Before you begin your Quest:

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Make sure to have students sign in to Scratch and RoaR & hiSS before they begin their Quest and modify the Knock Knock project.

You may want to step through the Quest Tasks to ensure that students know what is expected and maybe have them brainstorm ways to accomplish the tasks.

If time permits, ask students to share their projects!

UNIT 3.3 Quest & Plan

Quest: Parallelism & Synchronization

2. Your Quest (check ✓ tasks as you complete them)

✓ Sign in to your Scratch Account

✓ Reload, Remix, Share, and Add to Studio

c. Make the Cow's "Moooooo!" interrupt the sheep while it is thinking "Interrupting cow who?" Hint: change the timing in the Cow's wait block.

d. Add a say, think or sound block to make the sheep laugh after the cow interrupts. Be careful of the timing. You may need to add a wait block too.

e. Add a when key pressed event of your choice to both sprites. Have both sprites change color (change color - effect by).

at the same time (in parallel) when your chosen key is pressed.

bit.ly/synchcow

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Present the Quest. Read through the requirements and brainstorm ideas of how to complete the tasks. Ask students to check off the completed tasks as they code and check their code when they are finished.

Remember, the Quest is designed to be challenging. Encourage the students' productive struggle!

You can choose to use the workbook page or provide a link to the virtual version of this form.



[A2:U3.3 Quest Google Form](#)

(Make a copy of the google form and "send" url link to students.)

UNIT 3.3 Quest & Plan

Quest: Parallelism & Synchronization

3. Reflect:

a. Describe a useful bug you or your friend had.

b. What did you learn from that bug?

4. If You Finish Early:

It's Coded It Works

- Add another Knock-Knock joke using the other think and say blocks on the Cow and Sheep sprites or make up your own!
- Have the scripts start with a **when green flag clicked** event of your choice.
- Use a loop block to make the Cow and Sheep move while they are saying the Knock-Knock joke. Have the scripts start with the same **when green flag clicked** event block as the Knock-Knock joke above.

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 Remember that a bug is something that happens that you did not want or expect to happen in your project. A helpful bug is one where you learn something about coding. For example, a student learns that they need to use the same event block in order for multiple scripts to run in parallel.

 Ask students to list their helpful bug(s) or to state that they did not experience a bug.

If students finish the Quest required activities and reflection early, then can optionally work on the “If You Finish Early” tasks.

 Remind students that the “If You Finish Early” tasks can be challenging.

Turn and Talk (optional)

UNIT 3.3 Quest & Plan

 **TURN AND TALK** (optional)

Did you or your friend encounter a bug in your code? Describe how you fixed it.

 While you were completing the Quest, did you or your partner experience any “bugs” with your code? If so, discuss how you fixed the bug.

PLANNING the CREATE PROJECT

UNIT 3.3 Quest & Plan

Create Plan

Let's practice with **Parallelism & Synchronization** by creating a unique project!

 Let students know that they will experiment with Parallelism and Synchronization in Scratch by planning and building a unique project of their own design!

Parallelism & Synchronization

How do these scripts show **parallelism**?

The actions for the 2 sprites start at the same time. The 2 scripts start with the same event block (when green flag clicked).

How do these scripts show **synchronization**?

The actions between the sprites are coordinated by timing using wait blocks.



Ask students: How do these scripts show **parallelism**?

<Press space key> to reveal answer

The actions for the 2 sprites start at the same time. The 2 scripts start with the same event block (when the green flag is clicked).

<Press space key>



Ask students: How do these scripts show **synchronization**?

<Press space key> to reveal answer

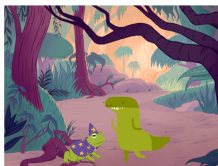
The actions between the sprites are coordinated by timing using wait blocks.



Point out to students how Dino's first wait block is for 4 seconds which equals the sum of time of Wizard's first **two** say blocks (2 seconds + 2 seconds).

<Press space key> to illustrate this.

Example Project



bit.ly/a2u3example

SYNCHRONIZATION	My 2 sprites each have: ☐ a script where my 2 sprites take turns performing ONE action more than one time.
PARALLELISM	My 2 sprites each have: ☐ a script with actions. ☐ scripts that run at the same time.
PROJECT DETAILS	My 2 sprites each: ☐ Say or Think something to each other. ☐ has a script to start it in the same place with the same costume when the green flag is clicked.
VIARIATION	☐ I used 2 looks, motion, OR sound blocks for EACH sprite to personalize the project.
PERSEVERANCE	☐ I asked for help before I figured it out for myself.



Tell students that you will show them an example Scratch project using both parallelism and synchronization.

Click on the bit.ly/a2u3example link at the bottom of the slide to show the students the example project. Press the 1 key after the sprites' conversation to show the sprites' movement.



Ask students: How does this project show synchronization? *One sprite talks while the other sprite waits, so the conversation is synchronized.*



Ask students: How does this project show parallelism? *Both sprites move across the stage at the same time.*

Go through the project criteria in the rubric table on the slide. These are the basic requirements for the project.


UNIT 3.9 Games & More

DIALOGUE PROJECT PLANNING GUIDE

Project Example:
bit.ly/2u3examp1

BRAINSTORM: a synchronized joke, conversation, story, or dance off between two sprites

CHOOSE your project theme (check or circle your choice):

- ☐ Friends telling one (or more than one) joke(s)
- ☐ A conversation between two friends (or text messages)
- ☐ A story dialog between two characters
- ☐ Create your own: _____

Sprite 1

DRAW or WRITE about the TWO sprites that you will use in your project.

Sprite 2

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UWVET 3.3. Quest & Plan

DIALOGUE PROJECT PLANNING GUIDE

Example Project:
bit.ly/a2u2sexample

Design and Plan

when **tr** clicked

My 1st **sprite** will _____ (synchronized action) **and then**
 my 2nd **sprite** will _____ (synchronized action).

when _____ key pressed

My 1st **sprite** will _____ (parallel action) **at the same time**
 that my 2nd **sprite** will _____ (parallel action).

My **background** will be _____

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UNIT 3: Quest & Plan

DIALOGUE PROJECT PLANNING GUIDE

Example Project:

bit.ly/g2Sexample

NOTE: In what the script will say, three, or do with synchronization AND parentheses. Note: you may put more than one action inside each gray block and you may add more blocks to your script.

Script 1:

when clicked	synchronize with web blocks
say: words	
say: words	
say: words	
say: words	

Script 2:

when clicked	
say: words	
say: words	
say: words	
say: words	

parallel (happens at the same time)

Include the blocks you choose (Repeat, when, wait, change script, etc.)

when:	key pressed

when:	key pressed

Design
and
Plan

WB Page

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UNIT 3.3: Quest & Plan

DIALOGUE PROJECT PLANNING GUIDE

Example Project:
bit.ly/a2u3example

Optional



BUILD YOUR SCRATCH SKILLS

Follow these video instructions on how to:

Image Editor: Vector Mode

Switch Background

bit.ly/VectorMode


bit.ly/backswitch


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Use the next three slides to review the project planning sheet.



 For this project you will either choose or design a backdrop for your project. To start this process, you will choose a theme from the list in your workbook.



Next, you will decide which two sprites you will use for this project. The planning sheet has students focus on an interaction between two sprites, but they are free to add as many sprites as they'd like! You will also plan what the sprites will do and what your background will be.



 — Next, you will plan your code for both the synchronization part of the project (sprites actions are coordinated by time) and the parallel part of the project (sprites are performing actions at the same time). Remind the students that their projects may end up different from the plan and that that is fine!



A2:U3.3 Planning Pages Fillable Slide

(Each student will need a copy)

Students can learn how to: (1) about the vector mapping features to edit their sprites' costume to help them animate their sprite (i.e. make it look like a sprite is walking), and (2) switch their background to change settings in their project.

TURN and TALK



TURN AND TALK (optional)

Ask a classmate to share his/her plan with you.
Share your plan.

Feel free to borrow ideas from each other.
Projects become better when ideas are shared!

(Optional) Have students share their plan with each other. Tell them that it is ok to change their plan if they want to borrow their partner's idea. Projects become better when ideas are shared and borrowed.