

### 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](http://bit.ly/a2u3example)
- Project Example Exemplary: [bit.ly/a2u3exemplary](http://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?

☐ when green flag clicked ☒ when this sprite clicked

### Exploring Synchronization

Find the error in the script below.

How would you change the script to make the two say blocks happen at the same time?

☐ Add a 'wait for 2 seconds' block before the first 'say' block.

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:

WB Page 2

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 Roar 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](http://bit.ly/synchcow)

WB Page 52

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.)

## 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 parties 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. ☐ ☐

WB Page  
52-53



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)

### 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

### 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

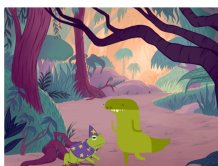
*The actions between the sprites are coordinated by timing using wait blocks.*



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](https://bit.ly/a2u3example)

|                 |                                                                                                                                                                                                                   |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SYNCHRONIZATION | My 2 sprites each have:<br><input type="checkbox"/> a script where my 2 sprites take turns performing ONE action more than one time.                                                                              |
| PARALLELISM     | My 2 sprites each have:<br><input type="checkbox"/> a script with actions.<br><input type="checkbox"/> scripts that run at the same time.                                                                         |
| PROJECT DETAILS | My 2 sprites each:<br><input type="checkbox"/> Say or Think something to each other.<br><input type="checkbox"/> has a script to start it in the same place with the same costume when the green flag is clicked. |
| ARIATION        | <input type="checkbox"/> I used 2 looks, motion, OR sound blocks for EACH sprite to personalize the project.                                                                                                      |
| PERSEVERANCE    | <input type="checkbox"/> 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](https://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: Quest & Plan

# DIALOGUE PROJECT PLANNING GUIDE

Example Project:

[bit.ly/g2Sexample](http://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 [click]

synchronize with web blocks

when [click]

ask

seconds

ask

seconds

ask

seconds

ask

seconds

Script 2:

when [click]

synchronize with web blocks

when [click]

ask

seconds

ask

seconds

ask

seconds

ask

seconds

Design and Plan

parallel ( happens at the same time )

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

when

key pressed

when

key pressed

WP Page

55

 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!



*(Each student will need a copy)*


UNIT 3.3: Quest & Plan

# DIALOGUE PROJECT PLANNING GUIDE

Example Project:  
[bit.ly/3u3ocxample](http://bit.ly/3u3ocxample)

*Optional*

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## BUILD YOUR SCRATCH SKILLS

Follow these video instructions on how to:



Image Editor: Vector Mode

[bit.ly/VectorMode](http://bit.ly/VectorMode)



Switch Background

[bit.ly/backswitch](http://bit.ly/backswitch)



WR Page
55

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



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.