

UNIT 4, LESSON 1

DECOMPOSITION

5TH & 6TH GRADE



Lesson created by the GMU-ODU CSforAll Team. For more information about this lesson and our CSforAll initiative, contact Dr. Amy Hutchison at ahutchison1@ua.edu

SUMMARY AND STANDARDS

Summary:

In this lesson, students will use a summary strategy to decompose a story in Coco.

ELA Standards

The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.

- a) Engage in writing as a process.
- b) Identify audience and purpose.
- c) Use a variety of prewriting strategies.
- d) Use organizational strategies to structure writing according to type.
- e) Use transition words to vary sentence structure.

CS Standards:

The student will break down (decompose) a larger problem into smaller sub-problems, independently or collaboratively.

MATERIALS AND RESOURCES NEEDED FOR THIS LESSON:

- Chromebook/Laptop
- Internet Access
- [Teacher Slides](#)
- [Coco Link](#)
- [Read aloud](#) or [story of your choice](#) to summarize using SWBST
- [Practice Summary SWBST](#) graphic organizer

Reminder:

In this lesson, every student should be **assigned a story in CoCo** using **Level 5**.

The story should be titled "**Unit 4 Summary**."

Each student should save their work using this naming strategy: "**Student Name + Unit # + Descriptor**", for example, "**Johnny Unit 4 Summary**."



You will need....[read slide]

LESSON OBJECTIVES: I CAN...

- ☐ Review CS Vocabulary
- ☐ Identify features in Coco Level 5 Identify other types of writing (SUMMARIES) that could be used in Coco Level 5
- ☐ Identify and use NEW BLOCKS
- ☐ Brainstorm new writing ideas with a partner

Let's go over today's lesson's objectives: [read slide]

WARM UP

Computational thinking means “**thinking like a computer scientist.**”

We’ve learned about these computational thinking skills:

- Pattern recognition
- Sequencing
- Creating algorithms
- Abstraction
- Debugging

Pick one of these skills and write for 5 minutes about how this skill **helps you think like a computer scientist.**

INTRODUCTION

Today we are going to start with a new vocabulary word!

DECOMPOSE



Have you ever heard the word decompose? Or even decomposition? In science you may have learned about decomposers, those organisms that break things down. Well, today we are going to learn about how we can decompose in both computer science and in our writing and literacy!

DECOMPOSE: TO BREAK A PROBLEM DOWN INTO SMALLER PIECES

DECOMPOSITION (DEE-COMP-UH-ZI-SHUN): BREAKING A LARGE PROBLEM INTO SMALLER PARTS

Computer scientists have to solve coding problems and need to make think about what steps they need to take and what order to do them in.

Sometimes the problem is so big or complex, it can be hard to know where to start.

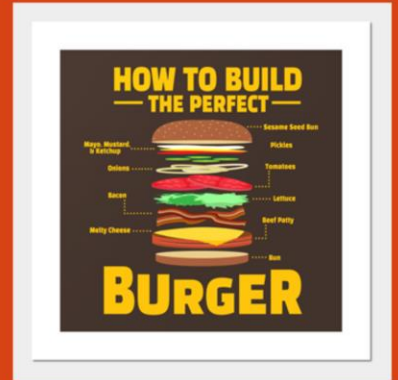
Decomposition is when we break a problem down into smaller parts to make it easier to tackle.

It has many advantages. It helps us manage large projects and makes the process of solving a complex problem less scary and much easier to take on.

This Unit, we're going to learn more about decomposition, our final computational thinking concept. Decomposition is going to be key in helping us to animate our new stories in Scratch with more Scratch blocks."

$$\begin{cases} 2x_1 + x_2 = 7 \\ x_1 + x_2 - 3x_3 = -10 \\ 6x_2 - 2x_3 + x_4 = 7 \\ 2x_3 - 3x_4 = 13 \end{cases}$$

WE CAN
DECOMPOSE
MORE THAN
JUST
COMPUTER
SCIENCE
PROBLEMS!



According to code.org: “Decompose—To break a hard problem up into smaller, easier ones”

- *This Unit, we’re going to learn more about decomposition, our final computational thinking concept. Decomposition is going to be key in helping us to animate our new stories in Scratch with more Scratch blocks.”*

CAN YOU THINK OF MORE EXAMPLES?

PAUSE HERE

When do you break things down?

Break down a recipe, a workout, picking out your outfit, ex

DECOMPOSITION

In literacy, we use decomposition quite often:

- When we sound words out (mis-com-mu-ni-cate)
- When we edit and fix mistakes
- When we create a set of instructions
- When we share the main idea
- When we create a summary of a story

We actually use the skill of decomposition quite often in literacy. We decompose when we break down a word or sentence into small parts, like sounding a word we don't know in a sentence. We decompose when we break down our writing to look for errors, like debugging. We decompose and abstract when we break down a series of steps, like a set of instructions, into the most important parts. We also decompose when we break a story down into the main idea or try to provide a summary. Today, we are going to talk more about summarizing!

SUMMARY: RESTATES THE MAIN IDEAS OF A STORY IN YOUR OWN WORDS

A summary restates the main ideas of a story in your own words. You have probably done this quite often after you have read or listened to a story. We don't want to retell everything that happens in the story, we just want to share the main idea

WE DECOMPOSE WHEN WE SUMMARIZE!

A summary restates the **main ideas of a story in your own words**.

Ask yourselves these questions while summarizing:

1. What are the main ideas of the story I just read?
2. What details from the story are important to include in my summary?
3. What details from the story are *not* that important to the main idea?

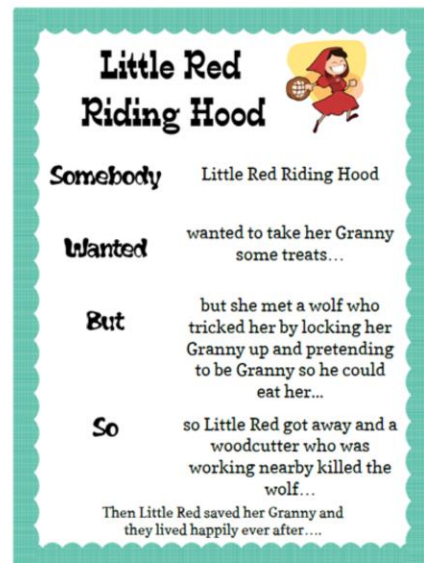
{Read questions}

You're decomposing because you're breaking down the entire story and identifying its most important parts.

SOMEBODY... WANTED...BUT....SO.... THEN

- **Somebody:** Character
- **Wanted:** Goal/motivation
- **But:** Conflict/problem
- **So:** Resolution
- **Then:** How does it end?

[Here is a link](#) to a YouTube video of the story of Little Red Riding Hood that you can use to remind yourselves of the story if you would like!



There are several ways that we can decompose a story, but Today, we're going to review one great strategy for summarizing. This strategy uses these anchor words to help us create a summary: "Somebody Wanted But So Then" {Read Slide}

Let's see how this strategy can help use decompose the familiar story of Little Red Riding Hood. To do this, we can use Coco, our favorite graphic organizer, to help us. Today, we are briefly going to be introduced to Level 4 of Coco, where we can record our summaries. Let me show you how.

COCO, LEVEL 5

1. Can write in ANY kind of story
2. New questions for animating your story
 - a. New motion blocks
 - b. New sound blocks
 - c. New look blocks
 - d. New control blocks
3. Coco still helps you decompose your coding!

My topic: <input type="text"/>	
My Ideas:	What I Want:
<div>1</div>	<div>1</div> Do I need to add a start block? <div>2</div> Do I need to add a sprite or object? <div>3</div> Do I need to add or change a background? <div>4</div> Do I need to make my sprite talk?
<div>1</div>	<div>1</div> Do I need to add or change a background? <div>2</div> Do I need to make my sprite talk? <div>3</div> Do I need to make my sprite think something? <div>4</div> Do I need to create a costume?
<div>1</div>	<div>1</div> Do I need to add or change a background? <div>2</div> Do I need to make my sprite talk? <div>3</div> Do I need to make my sprite think something? <div>4</div> Do I need to create a costume?
<div>1</div>	<div>1</div> Do I need to add or change a background? <div>2</div> Do I need to make my sprite talk? <div>3</div> Do I need to make my sprite think something?

First, let's take a quick look at Coco, Level 4. In this level:

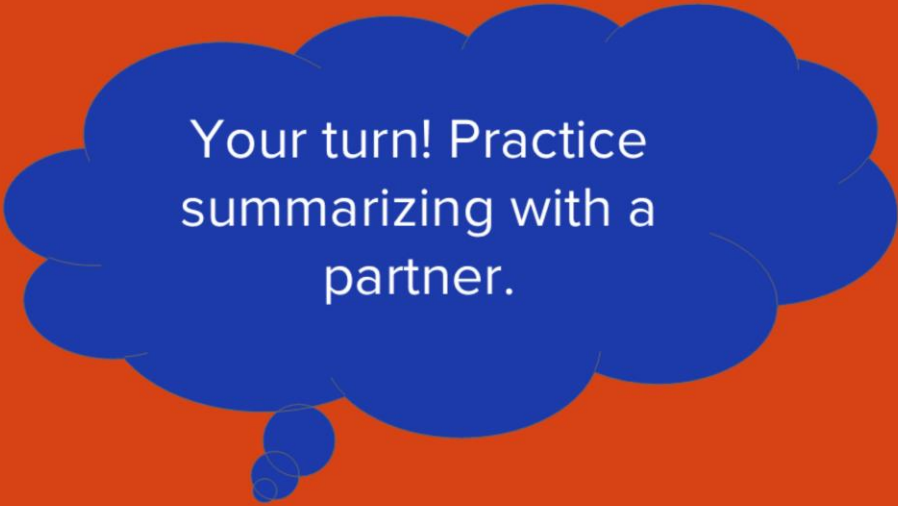
1. Boxes are completely empty, no suggested text. To write a story, to summarize, to write a set of instructions, etc.
2. You will also see many new questions in Column 2. These questions will prompt you to use new blocks in Scratch. There are blocks that move your sprite, create sound, change looks and also blocks to control your code and create loops.
3. Even though there are some new features in this level, Coco is still a great way for you to break down each step of your code and prepare for creating a scratch animation
4. The other two columns remain the same, when you say yes to any of the questions, the block you need will appear in the 3rd column. Remember, if you click on the block a video will appear to show you how the block works.

VIDEO MODEL

Somebody Wanted But So Then Tutorial Link

Introduction to Level 4: Explain you can now write anything in the boxes. We will explain new blocks next lesson.

https://www.dropbox.com/scl/fi/njnlqqdomsb1qv5p8zcwo/SWBST_2min.webm?rlkey=8n38wamttespicpsuyoze7o6&st=d1rqjac4&dl=0

A large, irregular blue thought bubble is centered on a solid orange background. Inside the bubble, the text "Your turn! Practice summarizing with a partner." is written in white. Three smaller blue circles of decreasing size trail off from the bottom of the main bubble.

Your turn! Practice
summarizing with a
partner.

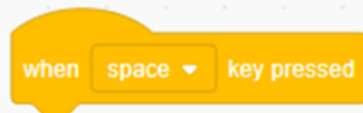
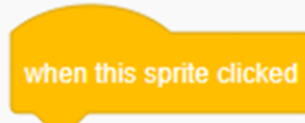
With a partner, practice summarizing a familiar story using the graphic organizer provided by your teacher.

Link Here:

https://www.dropbox.com/scl/fi/jm43x1gqg71rq204yk4cq/SWBST_Practice-graphic-organizer.docx?dl=0&rlkey=bni0elmi28e8ikw8hwfovryz

New scratch blocks

EVENT BLOCKS

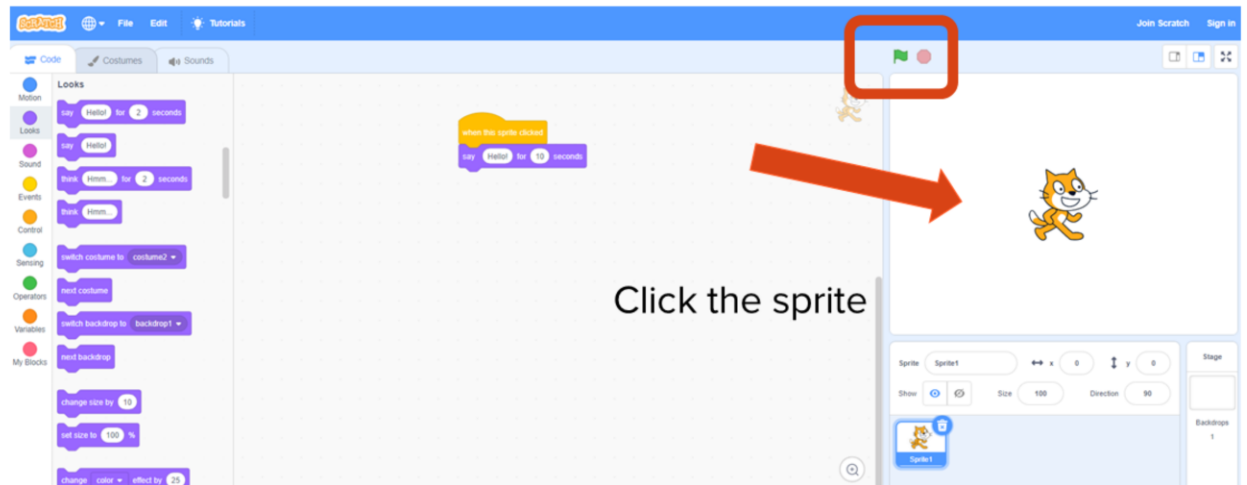


Another category of Scratch block is the ‘Event blocks.’ These blocks are yellow where control blocks are more orange in color.

Events in computer science are the triggers for making action happen, like selecting the play button on any screen.

Events in Scratch are represented by the yellow codes including: when flag clicked, when sprite clicked, when key pressed. You’ve already seen the “when flag clicked” event block so today we will review the “when sprite clicked” and “when key pressed” blocks.

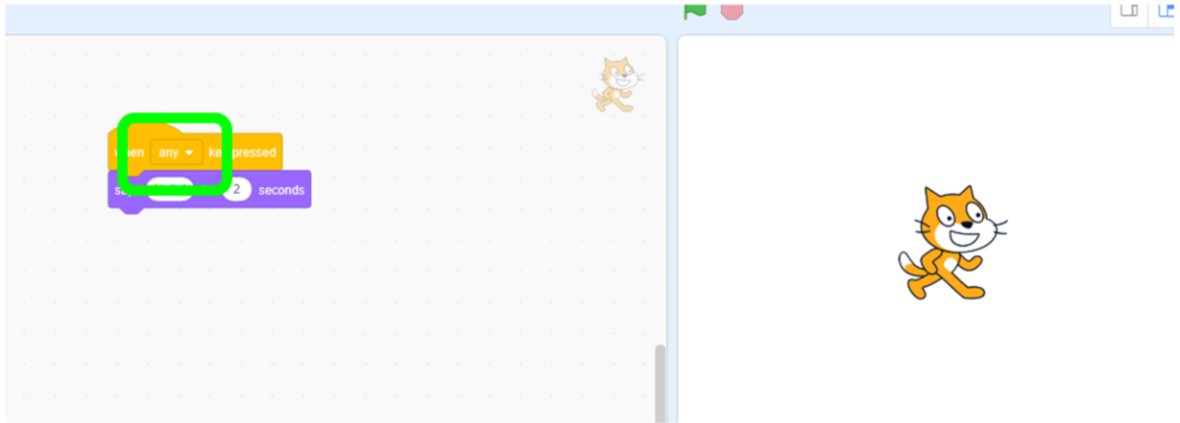
WHEN THIS SPRITE CLICKED BLOCK (VIDEO) Instead of the green flag.



Starts the animation by clicking the sprite on the screen.

<https://www.dropbox.com/s/k3lnv577zxkaq9f/whenthisspriteclicked.mp4?st=4o1lpaq8&dl=0>

WHEN ANY KEY PRESSED BLOCK (VIDEO)



Starts the animation by pressing any key on your keyboard.

But be careful! The block's default is set to "when space key pressed" which would only start the animation by pressing the space key. (review space key if students are unfamiliar)

<https://www.dropbox.com/s/r0oq5aouycuzbhg/whenkeyispressed4.mp4?st=iunelzu4&dl=0>

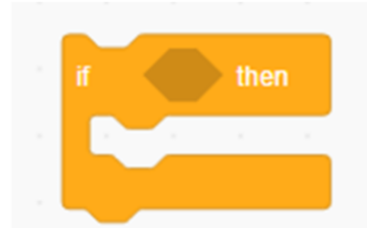
Instruct students to create an animation of a sport or outside activity they like to do with two Sprites. Use one of the new event blocks for each Sprite. Share with a partner!

Introducing conditionals

- If
- When
- Until

Discuss conditionals: In computer science, a condition is something that must be true in order for something to happen. A condition is said to "evaluate to true" or "evaluate to false." In Scratch, any block whose label says "if," "when," or "until" is a sort of conditional construct.

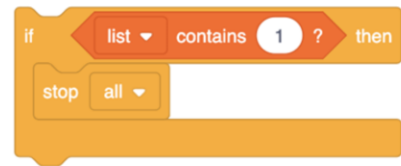
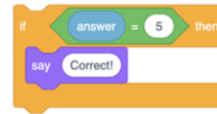
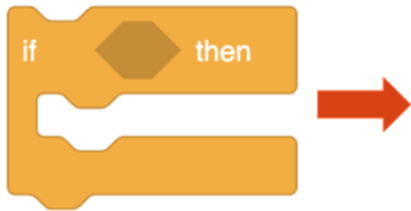
CONDITIONAL CONTROL BLOCKS



Today, we will learn about the “if/then” block

- The if () then block is a control block in Scratch. If the condition written inside the block is true, the blocks inside it will run. If the condition is false, the blocks inside the block will be ignored. The condition is only checked once; if the condition turns to false while the script inside the block is running, it will keep running until it has finished.

IF/THEN BLOCK (VIDEO)



If the condition inside is true, the blocks inside it will run. If the condition is false, the blocks inside the block will be ignored.

There are many ways to use the if/then block. If the condition inside is true, the blocks inside it will run. If the condition is false, the blocks inside the block will be ignored.

Watch or share this

<https://www.dropbox.com/scl/fi/abt0ef63lluquxy6ftutd/IfThenBlock.mov?rlkey=ikoa5bf7wwy6x6ryr8nx5opgw&st=6o1g467n&dl=0>

YOUR TURN: PAUSE HERE AND TRY OUT THE “IF/THEN” BLOCK

Create an animation using the “If/Then” block. Have your sprite ask a question. Using “If/Then” change the backdrop to green if the answer was correct. Once you are done coding, have a partner try your animation and answer the question!

TURN & TALK

- Have students get with a partner or small group and discuss when they may want to use an if/then block in their coding.



NEXT TIME...

In our next lesson, we will be summarizing and planning how we will animate our summaries in Scratch!