2.4 Modeling an Ecosystem

Students will be able to:
1. Build a model of an ecosystem in Scratch

Learning Activity Summary
1. The teacher presents the connection circle project with an example and an explanation of the rubric (3 min)
2. Students plan their model of an ecosystem (10 min)
3. Students share their plan with their elbow partner (3 min)
4. The teacher walks students through the debugging exercise (9 min)
5. Students build their model of an ecosystem in Scratch (25 min)

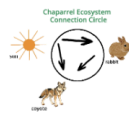| Student Materials	Teacher Preparation
● Computer with Internet ● Workbook	● [Slides](#) ● [Resources](#) ● Create a studio called "ConnectionCircle" ● Studio Grader to be used to grade student projects: bit.ly/act3StudioGrader ● Debugging Exercise: bit.ly/systemdebug ● Debugging Exercise: bit.ly/systemdebug ● Fix to the Debugging Exercise: bit.ly/fixsystemdebug ● Example Project #1: bit.ly/ECOSYSTEM1 ● Example Project #2: bit.ly/ECOSYSTEM2 ● Example Project #3: bit.ly/ECOSYSTEM3 ● **Project Template: bit.ly/Circletemplate**

Lesson Presentation

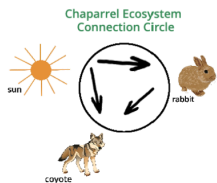|	
Building a Connection Circle Unit 2.4 Chaparrel Ecosystem Connection Circle Elementary Computing for ALL	"Last time we learned about how different parts of the Chaparral ecosystems are related. We also saw how the relationship of the different parts can be connected like in a connection circle. Today you are going to build your own connection circle."
Example Project: bit.ly/ECOSYSTEM1 Chaparrel Ecosystem Connection Circle sun rabbit coyote	"Here is an example project that you can use to create your own connection circle." Click the link (bit.ly/ECOSYSTEM1) and show the example project in front of the class. Click the sun sprite. It will play an audio message on what the sun does in a chaparral ecosystem. Then click the coyote sprite. It will play an audio message on what a coyote does in a chaparral ecosystem. Lastly, click the rabbit sprite. I will play an audio message on what a rabbit does in a chaparral ecosystem.

CONNECTION CIRCLE Checklist		
1: I did it! bit.ly/ECOSYSTEM1	**2: I did a little extra!**	**3: Challenge Accepted!**
SPRITES ☐ I used 3 picture sprites.	☐ I imported at least one of the 3 picture sprites into my project.	☐ I created a sprite that is an introductory "screen/cover" that hides the sprite, in addition to column 1.
EVENTS ☐ Each picture sprite has at least 2 "when this sprite is clicked" blocks. ☐ Each arrow has a "When I receive ___" block ☐ The backdrop has a "When the green flag is clicked" block that is attached to recorded instructions for the project.	☐ Two different sprites receive one of the broadcasted messages, in addition to column 1.	☐ The "change background" event block is used, in addition to column 1.
LOOPS ☐ The arrows blink when the appropriate picture sprite is clicked.	☐ One of the picture sprites is animated with a loop, in addition to column 1.	☐ Two of the picture sprites are animated with a loop, in addition to column 1.
Descriptions of the interactive interaction between the parts of the ecosystem ☐ The interactions between the parts are described accurately and clearly.	☐ I used intonation to make my voice more interesting to listening to, in addition to column 1.	☐ I added extra information about the ecosystem, in addition to column 1.

Go through each column of the connection circle checklist with the students. The first column ("I did it!") shows the simplest example. Just like the example in the link (bit.ly/ECOSYSTEMExample1). For column 1, go through each row to clarify what students need to create for "sprites," "events," "loops," and "descriptions of the interaction between the parts of the ecosystem."

If students are more ambitious, they can create a project following the second column's checklist. First, show the example project (bit.ly/ECOSYSTEM2) to students. Run the code by pressing the green flag. Click each sprite. Clicking each sprite will play an audio message of what the sprite does in a chaparral ecosystem. Ask students to compare the first example (ecosystem1) and the current example (ecosystem2) and share the difference between the two. Go through each row ("sprites," "events," "loops," and "descriptions of the interaction between the parts of the ecosystem") with the students to describe what the checklist requires for column 2.

If students want to challenge themselves, they can create a project following the third column's checklist (bit.ly/ECOSYSTEMExample3). Click on the link, and click on the green flag to start the project. Click each sprite. Discuss what each sprite does when clicked and the message that presents each sprite's role in the ecosystem. Ask students to compare this example (ecosystem 3) with the two previous examples (ecosystem 1 and ecosystem 2). Go through each row ("sprites," "events," "loops," and "descriptions of the interaction between the parts of the ecosystem") with the students to describe what the checklist requires for column 3.

Planning Your Connection Circle

a. Name of your ecosystem:

b. Parts of your ecosystem (at least three) (You can draw a picture or write a word)	c. How does it interact with another part of the system? (see page ___ for examples)	d. The part of the ecosystem that is affected by the part in column b
	→	
	→	
	→	

NOTE: If you have more ecosystem parts, continue planning on a separate piece of paper.

WB Page

Have students plan their connection circle. First, give students some time to think about what their ecosystem will be. Have students research online if necessary. Then, ask students to identify 3 parts of this ecosystem. Students will fill these out in their workbook page #, in column b. These 3 parts interact with other parts of the ecosystem. Have students fill out part d with the other parts in the system that interact with parts in b.

Planning Your Connection Circle

e. Write one sentence about the ecosystem in this project.

f. Write the instructions that tells the user what to do in your program.
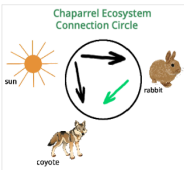
WB Page

Guide students to fill out part e in their workbook to write one sentence about the ecosystem. Students can use the sentences that they have seen from the previous examples as examples to write their own sentences.

Guide students to write the instructions for those who would be playing their code in Scratch. (e.g., "What buttons should the users press to start your code?")

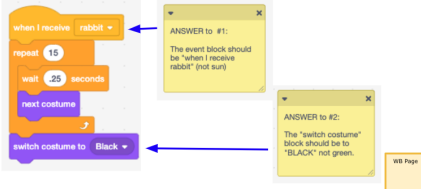|	
DEBUGGING **DEBUGGING:** Go to bit.ly/systemdebug Chaparrel Ecosystem Connection Circle 1. The arrow between the rabbit and the coyote should blink when the rabbit is clicked, but doesn't. Why not? 2. When the arrow stops blinking, it is green. How do you make it black when it finishes blinking? sun, rabbit, coyote WB Page	"Before building your own connection circle, we will do a little debugging exercise. You will fix the bugs in the code to make the connection circle run correctly." Have students go to this link (bit.ly/systemdebug). Read the sticky note with the students to indicate what the bugs are in the program. Give some time for students to independently debug issue #1 and issue #2. Encourage students to work together to problem-solve together.
DEBUGGING SOLUTION bit.ly/fixsystemdebug when I receive rabbit repeat 15 wait .25 seconds next costume switch costume to Black ANSWER to #1: The event block should be "when I receive rabbit" (not sun). ANSWER to #2: The "switch costume" block should be to "BLACK" not green. WB Page	After students try debugging on their own, go through the solutions using this Scratch link that shows the solutions (bit.ly/fixsystemdebug). Run the code and click on each sprite to share with students that the code works correctly. Go through the answers in the sticky notes. Have students click on each sprite from their own computer using the fixsystemdebug link above to explore the blocks and why these blocks work correctly.
Building Your Connection Circle Remix the Connection Circle Template Project Sign into your Scratch account. Go to bit.ly/Circletemplate hi**SS** your project (**S**hare Share & +Add to **S**tudio Add to Studio)	"Now you will build your own connection circle. You will use the ecosystem that you identified and planned in your workbook. You will present the parts of the ecosystem and the relationship between the parts in Scratch." Students will use this link (bit.ly/Circletemplate) to create their own connection circle. There are sprites already loaded and an empty circle created in the backdrop. Students can remix by following "hiSS"--share and add to the teacher's studio ("connection circle.") Make sure to create a studio named "connection circle" so your students can add their connection circle projects.
Building Your Connection Circle Choose your sprites Delete the sprites that you do not want to use. Import or draw any other sprites you want to use. Check your planning page to see how many arrows you will need. Create your scripts Each ecosystem part should have at least TWO (one with a block, the other with a and a). Each arrow should have one block that is connected to The backdrop should have a Connected to a Add information Add the information about how the parts interact in the SAY and PLAY SOUND blocks. Add the introduction and instructions to the backdrop script.	Students will first delete the sprites they do not want to use for their ecosystem. Then students will import any other sprites they may want to use that are not already in the Scratch code. Students should look at their planning page to see how many arrows (interactions they will represent) in their ecosystem. -The backdrop should have an initiation block (when the green flag is clicked) to start the program. -Review the steps with the blocks to include in "Create your scripts" section using the slide. Remind students to add information about the parts of the ecosystem and the interaction between parts through either the say block (via text displayed) or the play sound block (in which case students record the message). Give students an option to choose either to record their voice through audio or display the message via text without recording their voice. To grade the student projects, you can copy the URL of your Scratch

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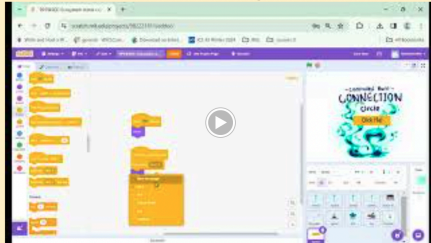|	studio for the Connection Circle project, and paste it in [this link](). This **studio grader** will go through the student projects to check that they completed the project checklist.
Checking Your Connection Circle Make sure you have done everything in your connection circle with this auto grading system! bit.ly/act3ProjectChecker	Have students use the auto-checking system: Guide students will go to this website [bit.ly/act3ProjectChecker]() <press space> shows the steps for students to copy the URL of their own project. <press space> shows the steps to go to the auto-checking system, paste the URL, and press Go! This will reveal whether the students completed the items on the checklist.
EXTRA Challenge (optional)	If some students are finished early or if there is instructional time left, students can try the extra challenge to create an introductory page where users can click a button to start the project. Students can watch the video to follow along.