Barbie™ You Can Be Anything™ Teacher Guide

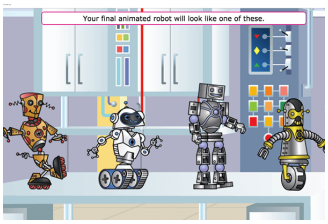
Programming is a way of thinking that is useful in any career. In this course, your students will discover how coding concepts can be applied to six exciting careers: Robotics Engineer, Musician, Astronaut, Farmer, Beekeeper, and Pastry Chef. Students will discover how programming can be used to animate characters, compose music, tell stories, design games, and even create art.

This course includes six lessons. Each lesson is designed for a class period of 45-60 minutes. Students will learn on their own as they are introduced to each career, learn coding concepts through interactive tutorials, solve coding puzzles, build their own projects using new coding skills, and take quizzes to review what they have learned. All student work is automatically tracked and assessed; and with access to Tynker's premium offerings, you'll even be able to monitor student progress and mastery charts.

Topics Covered: Sequencing, repetition, events, playing sounds, movement, animation, storytelling, keeping score, stamping, turning, problem solving, and debugging.

Lesson 1

Robotics Engineer



Lesson Objective

Use coding concepts to animate a robot dance party!

Lesson Plan

Lesson: Robotics Engineer

Time: 55+ mins

Introduction

Welcome to the first lesson in the Barbie™ You Can Be Anything™ coding course! In this lesson, students will use coding concepts to animate a robot dance party.

New Code Blocks

- 

: Start program when the play button is selected.
- 

: Change the costume of the Actor.
- 

: Pause the program for a specific number of seconds.
- 

: Keep repeating the blocks inside this loop forever.
- 

: Repeat blocks inside this loop a specified number of times.

Vocabulary

- **Code:** The language that tells a computer what to do
- **Actor:** A Tynker character or object that can talk and interact with others
- **Stage:** The background of the project where the Actors are placed

- **Command:** A specific action or instruction that tells the computer to do something
- **Loop:** An action that repeats one or more commands over and over
- **Counting Loop:** A loop that repeats one or more commands a specific number of times
- **Infinite Loop:** A loop that repeats forever and does not end until the program stops
- **Animation:** Changing costumes [images] of an Actor many times to give the illusion of movement
- **Robot:** A machine that is programmed or controlled to perform a task
- **Engineering:** Application of science, technology, and math to design structures and solve problems

Objectives

Students will...

- Apply new coding concepts such as Costumes, Loops, and Animation
- Use the "next costume" command to program a robot to stand
- Create simple animations using new coding concepts

Materials

- Computers or iPads (1 per student) with student account access to Tynker.com
- Headphones (1 per student)

Warm-Up (*10 minutes*)

1. Ask students what they think of when they hear the word “animation.”
2. Write their answers on the classroom board. Discuss.
3. Pair up students and have them discuss animated TV shows and movies (e.g., cartoons, The LEGO Movie).
4. Lead a discussion that explains how animation is created (e.g., series of still images).
5. Use your projector to display Tynker animation examples: https://www.tynker.com/programming-for-kids/explore/projects.html (https://www.tynker.com/programming-for-kids/explore/projects.html) and explain to your students that they're going to animate a robot on Tynker.

Getting Started (*15 minutes*)

1. Use your projector to display “Module 5: Concepts.”
2. Play each concept and make sure the volume is loud enough for students to hear Barbie™, or read each caption.
3. Open “Module 8: Animate Your Robot” and model how to use the tutorial.
4. Follow each step from the tutorial and drag blocks from the tutorial tab to the center coding area. If this is your students' first time using Tynker, tell students how to...

- **Grab a code block:** Select a code block and drag it to the center coding area. Release the block to drop it.
- **Remove unwanted code blocks:** Select a code block from the center coding area and drag it to the far left to make it disappear.

- **Attach code blocks:** Say, “Blocks are used to create code in Tynker, and they attach like a jigsaw puzzle.” Explain that if you put a code block to the side of another code block, they will not attach.

Activities (*30 minutes*)

Hand each student a pair of headphones and instruct students to work individually or in pairs on the Robotics Engineer modules, starting with Module 1:

1. Welcome (Video)

- This short video introduces the Barbie™ You Can Be Anything™ coding course.
- Emphasize that programming is more than just typing code into a computer—it’s a whole new way of thinking and can be helpful in any situation.
- Say, “Learning to code will teach you how to solve problems, work together, and create art.”

2. Introduction (Video)

- Learn about the Tynker Workshop in this short video.

3. Choose a Robotics Engineer (Video)

- For web: Tell students to click the left and right arrows to see different Actors then click to select the Actor.
- For mobile: Tell students to tap the left and right arrows to see different Actors then tap to select the Actor.

4. Intro to Robotics Engineer (Video)

- This short video introduces Robotics Engineering as a career.

5. Concepts (Introduction)

- This video introduces three basic coding concepts: Costumes, Loops, and Animation.

6. Make the Robot Stand (Puzzle)

- In this puzzle module, students need to make the sitting robot stand.
- Remind students that “costumes” are not just the clothes an Actor is wearing. Costumes also include any pose or picture of the Actor.
- Ask, “Which code block should we use to animate the robot?” (switch costume)
- Remind students to attach the code blocks to each other.
- Optional: For younger students (grades K-1)...
  - Ask, “How many ‘switch costume’ blocks do you think we need?”
  - Solve the puzzle module as a class: on start - switch costume - switch costume - switch costume.
  - Ask, “How many times does the robot switch costumes?” (3 times)
  - Ask, “How do we know the robot switches costumes 3 times?” (because we used 3 “switch costume” blocks)

7. Intro to the DIY (Video)

- This short video introduces the DIY (do it yourself) activity.

8. Animate Your Robot (DIY)

- In this DIY, students will pick a robot and animate it to dance!
- Tell students to follow the step-by-step instructions and drag blocks from the tutorial tab to the center coding area.
- Is the animation too fast or too slow? Encourage students to experiment with different numbers inside the "wait" block. Give a hint: A bigger number inside a wait block makes the animation go slower, and a smaller number makes the animation go faster.

- To animate the other robots, students need to choose a different robot Actor on the right, then repeat "Steps 2-5" in the tutorial tab.

9. Quiz (Multiple-Choice)

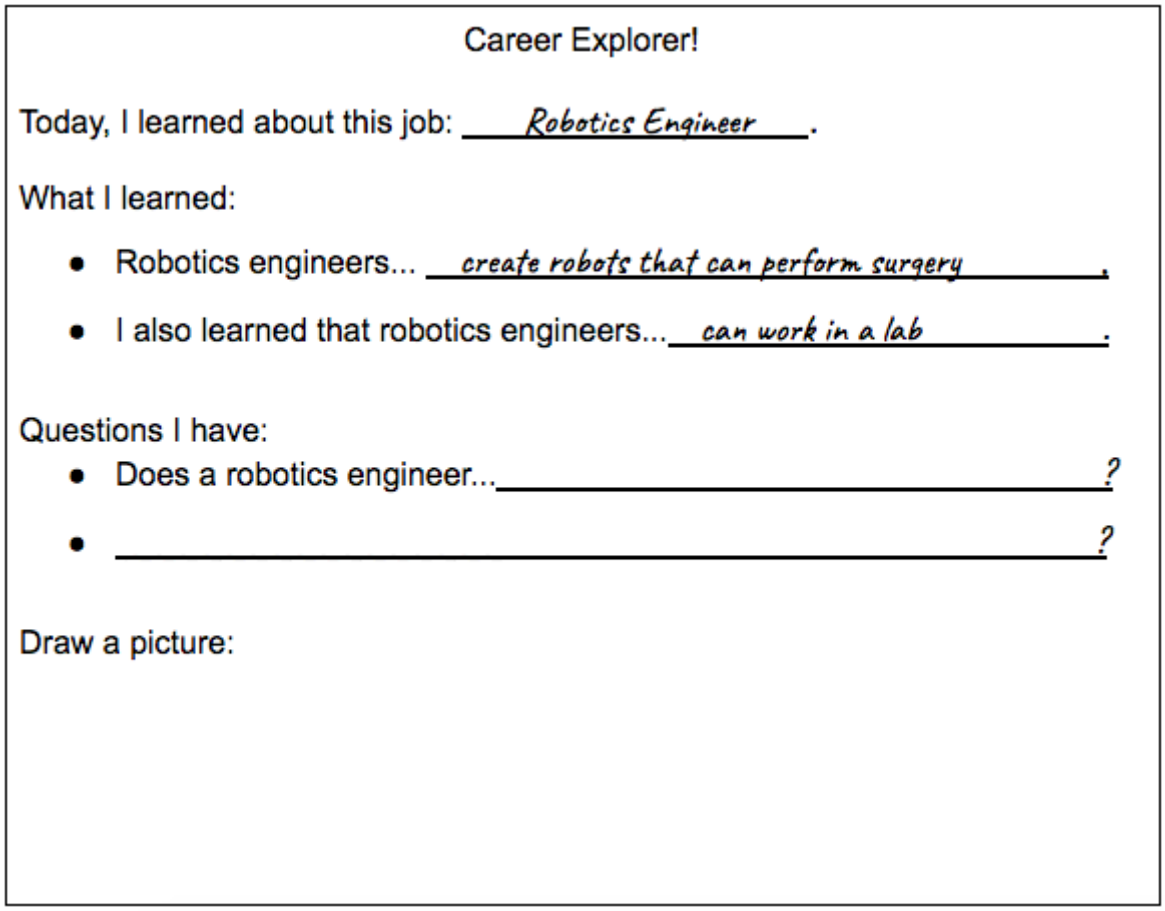
- Students will be asked 5 questions to review concepts from this lesson.

Optional Activities (*20 minutes x 2*)

Career Explorer

1. Play "Module 4: Intro to Robotics Engineer" for your students.

2. Tell your students to complete a Career Explorer worksheet. Below is an example:



Career Explorer!

Today, I learned about this job: Robotics Engineer.

What I learned:

- Robotics engineers... create robots that can perform surgery.
- I also learned that robotics engineers... can work in a lab.

Questions I have:

- Does a robotics engineer...?
- ?

Draw a picture:

Review Questions

Discuss the following with students:

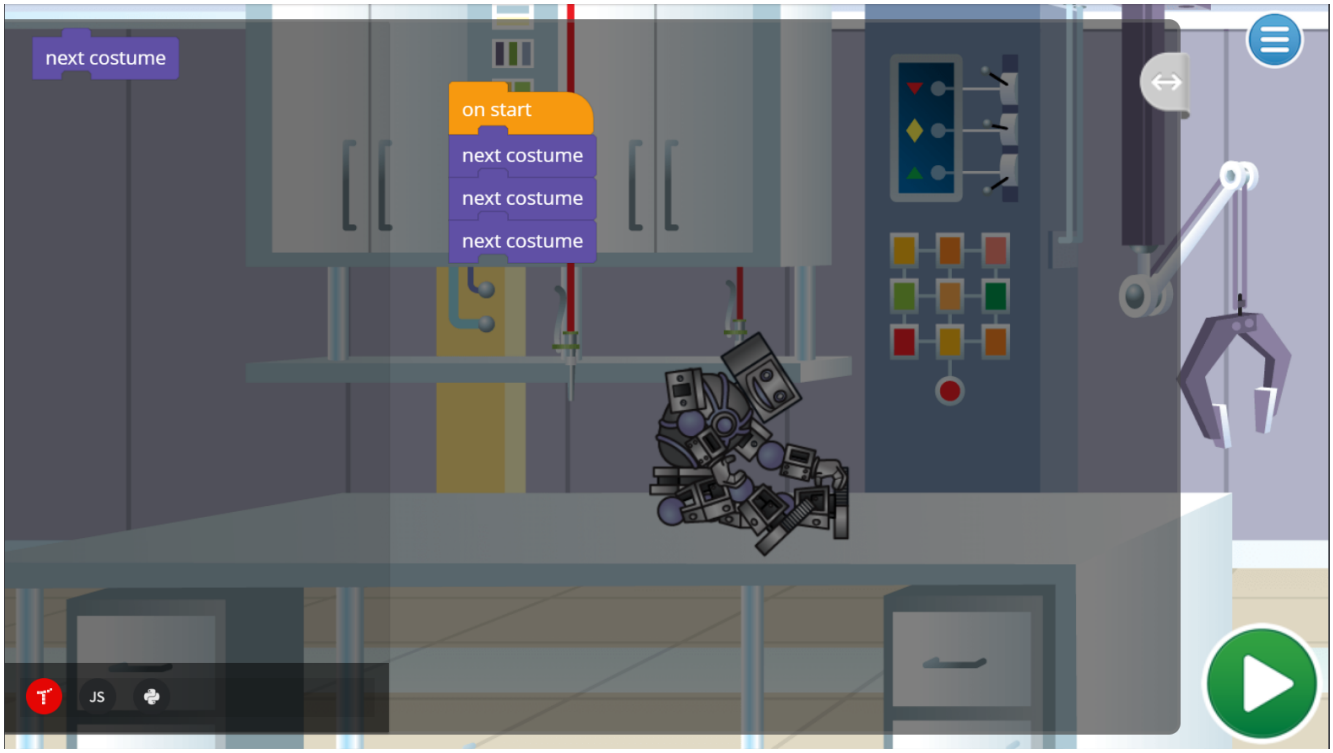
- What is code? (the language that tells a computer what to do)
- What is repetition? What is another name for it? (loop)
- True or false: A Counting loop is a loop that repeats a specific number of times. (true)
- If we want to use a Counting loop, should we use a "forever" block or a "repeat" block? (repeat)
- True or false: An Infinite loop is a loop that does not end until the program stops. (true)
- If we want to use an infinite loop, should we use a "forever" block or a "repeat" block? (forever)
- Who can give an example of an animation?
- How do you animate an Actor? (use code blocks, 'switch costume' block)
- What can learning to code teach you? (how to solve problems, work together, and create art)

Standards

CCSS-ELA: W.K.2, SL.K.1, SL.K.3, RF.K.4, W.1.2, SL.1.1, SL.1.3, RF.1.4.A, W.2.1, SL.2.1, SL.2.3, RF.2.4.A, SL.3.1, SL.3.3, RF.3.4.A, SL.4.1, SL.4.1.C, RF.4.4.A
CCSS-Math: MP.1, K.CC.A.2, K.CC.B.4
CSTA: 1A-AP-09, 1A-AP-10, 1A-AP-11, 1A-AP-14, 1A-AP-15, 1B-AP-10, 1B-AP-12, 1B-AP-15
CS CA: K-2.AP.10, K-2.AP.12, K-2.AP.13, 3-5.AP.10, 3-5.AP.12, 3-5.AP.13, 3-5.AP.14, 3-5.AP.17
ISTE: 1.c, 1.d, 5.d, 6.b, 7.c

Puzzle Answer Keys

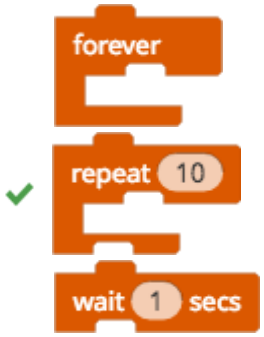
Make the Robot Stand



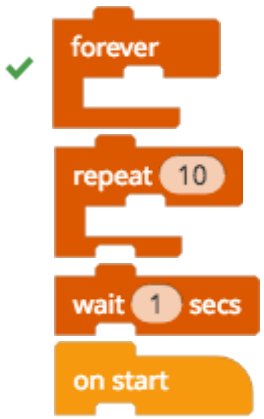
Quiz Questions

Quiz

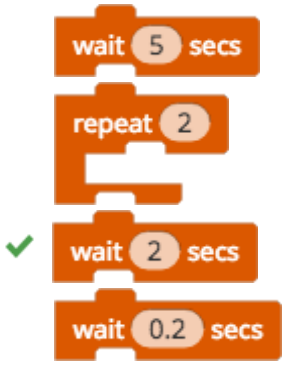
1. Which one of the following is a counting loop?



2. Which one of the following code blocks is an infinite loop?



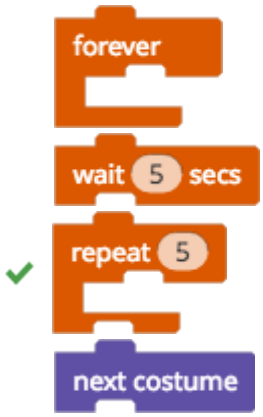
3. To pause your program for 2 seconds, which code block would you use?



4. Which of these animations will play the slowest?

5. When you press Play in your program, what is the first block that runs?

6. Which of the following repeats code blocks five times?



7. If you had an Actor with many Costumes and wanted to continuously change the Costumes to create an animation, which of the following sets of code blocks would you use?

8. Which of the following code blocks is a type of loop?

9. To change an Actor's Costume three times when the program starts, which code would you use?

10. Which of these code blocks pauses your program?

Lesson 2

Musician

Lesson Objective

Discover how you can use coding to edit a music video and mix your own songs!

Lesson Plan

Lesson: Musician

Time: 45+ mins

Introduction

Let's get this party started! In this lesson, students will discover how they can use coding to edit a music video and mix their own songs!

New Code Blocks

- when actor clicked : Run code attached to this block when the Actor is selected. Note: This block is titled "When Actor Touched" for mobile version.
- play sound : Play a sound effect or a short tune.
- play sound until done : Play the specified sound file and wait until it is finished playing.

Vocabulary

- **Sequence:** The order in which steps or events happen
- **Musical instrument:** An object or device that makes musical notes or sounds

Objectives

Students will...

- Apply new coding concepts such as When Actor Clicked (for web), When Actor Touched (for mobile), Play Sound, and Play Sound Until Done

- Apply simple sequencing logic to solve a puzzle by matching the music to the music video
- Add sounds to Actors and Backgrounds
- Arrange sound blocks in the correct order to solve puzzles
- Create songs using sound code blocks

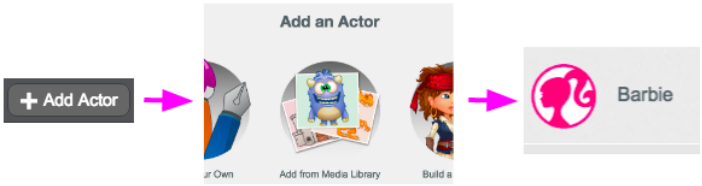
Materials

- Computers or iPads (1 per student) with student account access to Tynker.com
- Headphones (1 per student)

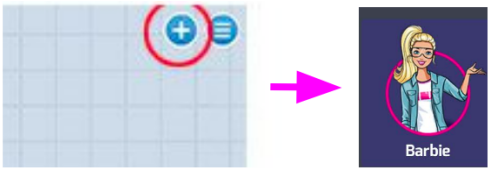
Warm-Up (*10 minutes*)

1. Say, “I’m going to show you how to add backgrounds and Actors to the stage.”
2. Use your projector to display “Module 6: Create Your Music,” and mute the volume.
3. Say, "Now I’m going to show you how to add Actors to the stage."

- **For web,** click Add Actor > Add from Media Library > Barbie:



- **For mobile,** select “+” to add an Actor, then choose Barbie:



4. Ask, “Which Actor should we choose?”
5. Select the Actor you want, then check that the Stage has the Actor you selected.
6. Say, “Great job! You will have the opportunity to add backgrounds and Actors with today’s Bonus activity.”

Getting Started (*5 minutes*)

1. Use your projector to display “Module 3: Concepts.”
2. Play each concept and make sure the volume is loud enough for students to hear Barbie™, or read each caption.

Activities (*30 minutes*)

Hand each student a pair of headphones and instruct students to work individually or in pairs on the Musician modules, starting with Module 1:

1. Choose a Musician (Video)

- For web: Tell students to click the left and right arrows to see different Actors then click to select the Actor.

- For mobile: Tell students to tap the left and right arrows to see different Actors then tap to select the Actor.

2. Intro to Musician (Video)

- This short video introduces Musician as a career.

3. Concepts (Introduction)

- This video introduces three basic coding concepts: When Actor Clicked (for web), When Actor Touched (for mobile), Play Sound, and Play Sound Until Done.
- Explain the difference between code blocks that do and do not wait until the code is done executing: Say, "Use a 'play sound' block to make sounds play at the same time, and use a 'play sound until done' block to make sounds play one after the other."

4. Match the Music (Puzzle)

- In this puzzle module, students need to match the music to the video.
- Give a hint: Tell students to sequence (identify and order) the instruments in the music video.
- Optional: For younger students (grades K-1)...
  - Ask, "Which instrument did you see first? The guitar, drums, or piano?" (piano)
  - Ask, "Which instrument did you see after the piano?" (guitar)
  - Ask, "What is the last instrument you saw in the music video?" (drums)
  - Ask, "Which 'play sound' block should I attach to the 'on start' block?" (play sound piano until done)
  - Say, "Correct! We need to attach a 'play sound piano until done' block."
  - Solve the puzzle module as a class: on start - play sound piano until done - play sound guitar until done - play sound drums until done.

5. Intro to the DIY (Video)

- This short video introduces the DIY (do it yourself) activity.

6. Create Your Music! (DIY)

- In this DIY, students will create a riff using different music tracks!
- Tell students to follow the step-by-step instructions and drag blocks from the tutorial tab to the center coding area.
- Say, "Use the drop down menu on the 'play sound' block to select which sound you want to play."
- If students want to complete the "DIY Bonus" activity, remind them of today's warm-up.

7. Quiz (Multiple-Choice)

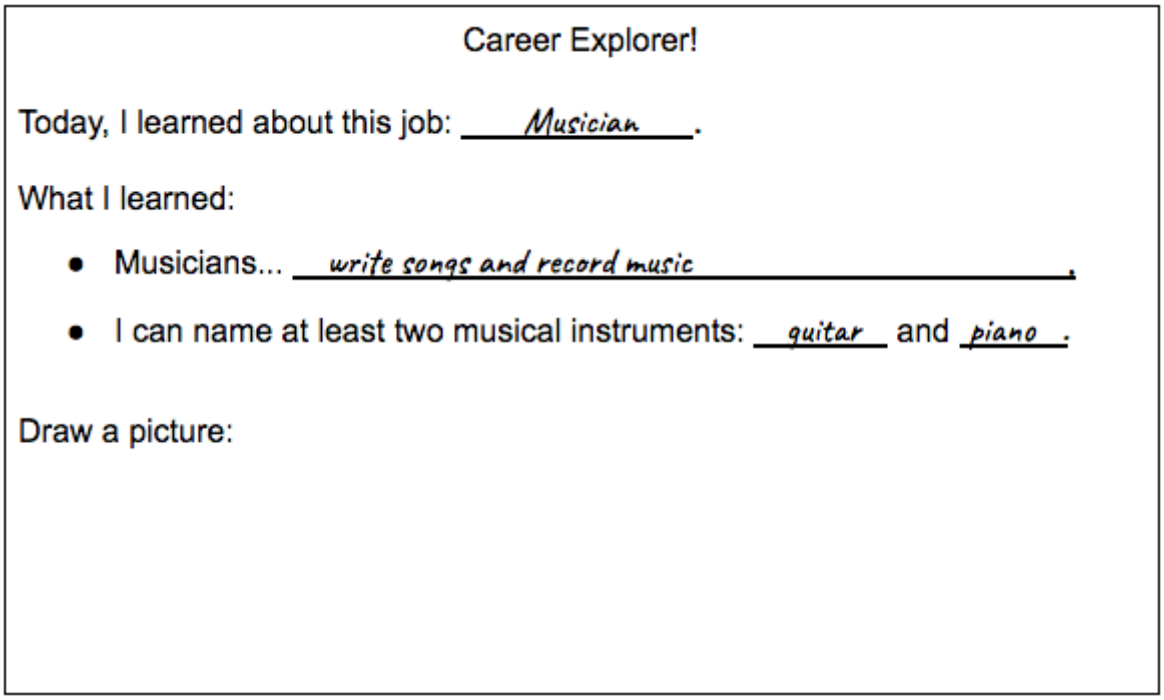
- Students will be asked 5 questions to review concepts from this lesson.

Optional Activities (*20 minutes x 2*)

Career Explorer

1. Play "Module 2: Intro to Musician" for your students.

2. Tell your students to complete a Career Explorer worksheet. Below is an example:



Review Questions

Discuss the following with students:

- What is a sequence? (the order in which steps or events happen)
- How do you make sounds play at the same time? (use a 'play sound' block)
- How do you make sounds play one after the other? (use a 'play sound until done' block)
- If using a web device, how do you program an Actor to react when clicked on? (use a 'when actor clicked' block)
- If using a mobile device, how do you program an Actor to react when tapped on? (use a 'when actor touched' block)

Standards

CCSS-ELA: W.K.2, SL.K.1, SL.K.3, RF.K.4, W.1.2, SL.1.1, SL.1.3, RF.1.4.A, W.2.1, SL.2.1, SL.2.3, RF.2.4.A, SL.3.1, SL.3.3, RF.3.4.A, SL.4.1, SL.4.1.C, RF.4.4.A
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CS CA: K-2.AP.10, K-2.AP.12, K-2.AP.13, 3-5.AP.10, 3-5.AP.12, 3-5.AP.13, 3-5.AP.14, 3-5.AP.17
ISTE: 1.c, 1.d, 5.d, 6.b, 7.c

Puzzle Answer Keys

Match the Music

Quiz Questions

Quiz

1. Which of the following code blocks will play a drum sound?

2. How would you add music to a project?

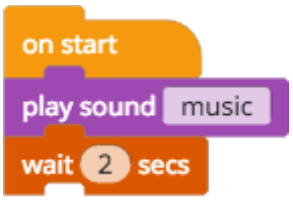
3. To make an Actor play a guitar sound when clicked, which code blocks would you use?

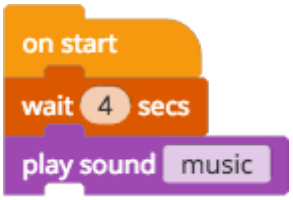
4. Which of these will make code run when an Actor is clicked?

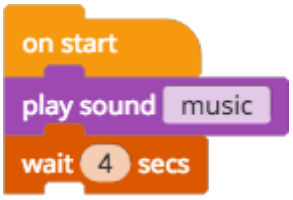
5. How would you make two sounds play at the same time?

6. How would you make two sounds play one after the other?

7. How would you wait for two seconds before playing a music track?

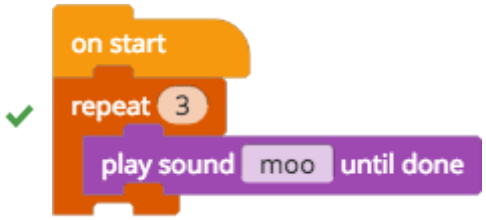


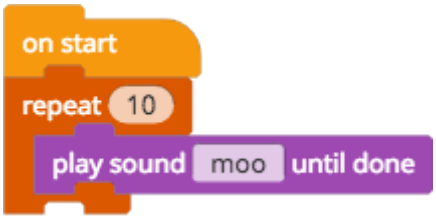


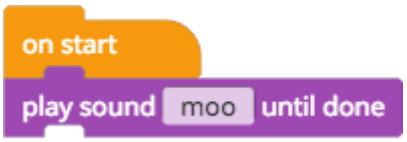


8. How would you change an Actor's Costume when it is clicked?

9. If you want to make a cow moo three times, which code blocks would you use?





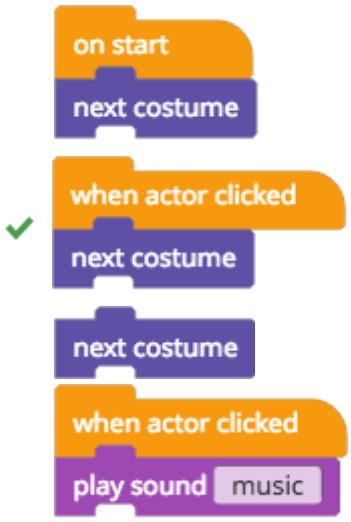


10. How would you make an Actor play a chime sound and change Costumes at the same time?

11. To make an Actor play a guitar sound when tapped, which code blocks would you use?

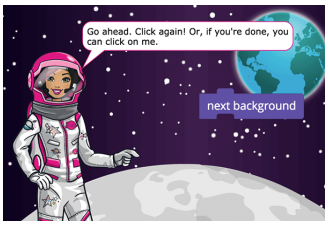
12. Which of these will make the code run when an Actor is tapped?

13. How would you change an Actor's Costume when it is tapped?



Lesson 3

Astronaut



Lesson Objective

Go on a space mission and use programming to report on your adventure!

Lesson Plan

Lesson: Astronaut

Time: 45+ mins

Introduction

Shoot for the stars! In this lesson, students use programming to report on an exciting space mission! By the end of the lesson, students will learn about adding speech, holding conversations, and changing backgrounds.

New Code Blocks

- 

: Show a message.
- 

: Show a message for a specified amount of time.
- 

: Change the picture on the Stage.
- 

: Change the appearance of speech bubbles.

Vocabulary

- **Speech bubble:** A shape with words, usually next to the head of an Actor, containing the Actor's speech or thoughts
- **Caption:** A rectangle at the top of the Stage that contains a short explanation or description of an image
- **Astronaut:** A person trained to navigate a space vehicle
- **Mission Control:** A group of people on the ground that communicate with the space vehicle

Objectives

Students will...

- Apply new coding concepts such as Say, Set Bubble To, and Background
- Add Backgrounds to the Stage
- Add captions to the Backgrounds
- Arrange "say" blocks in the correct order to solve a puzzle by programming a shuttle Actor to countdown to liftoff
- Create a conversation with say blocks
- Use code blocks to create a report on a space mission

Materials

- Computers or iPads (1 per student) with student account access to Tynker.com
- Headphones (1 per student)

Warm-Up (*10 minutes*)

1. Say, “Today, we’re going to learn how to make an out-of-this-world story on Tynker!”
2. Write the words "character" and "setting" on the classroom board.
3. Encourage students to tell you what they know about the characters and setting of a story (e.g., list examples of characters from recent stories you've read in class, state definitions)
4. Write their answers on the classroom board. Discuss.

Getting Started (*5 minutes*)

1. Use your projector to display “Module 3: Concepts.”
2. Play each concept and make sure the volume is loud enough for students to hear Barbie™, or read each caption.

Activities (*30 minutes*)

Hand each student a pair of headphones and instruct students to work individually or in pairs on the Astronaut modules, starting with Module 1:

1. Choose an Astronaut (Video)

- For web: Tell students to click the left and right arrows to see different Actors then click to select the Actor.
- For mobile: Tell students to tap the left and right arrows to see different Actors then tap to select the Actor.

2. Intro to Astronaut (Video)

- This short video introduces Astronaut as a career.

3. Concepts (Introduction)

- This video introduces three basic coding concepts: Say, Set Bubble To, and Background.

4. Countdown to Liftoff! (Puzzle)

- In this puzzle module, students need to add the countdown speech before the launch of the space shuttle.
- Tell students that "say for" commands are similar to holding a conversation--they let you wait for the person to finish talking before speaking.
- Optional: For younger students (grades K-1)...
  - Say, "We need to program the Mission Control Actor to count down from 5 seconds."
  - Ask, "Who can count down from 5?" (5-4-3-2-1)
  - Ask, "Which 'say' block should we attach?"
  - Say, "Correct! We need to attach a 'say Four...' block."
  - Solve the puzzle module as a class: on start - wait 5 seconds - say Five... - say Four... - say Three... - say Two... - say One...

5. Intro to the DIY (Video)

- This short video introduces the DIY (do it yourself) activity.

6. Slideshow Report (DIY)

- In this DIY, students will create a space shuttle mission report.
- Tell students to follow the step-by-step instructions and drag blocks from the tutorial tab to the center coding area.
- Encourage students to create their own captions--for example:
  - Day 1: Blast off!
  - Day 2: Whoa, I can see Earth from here!
  - Day 3: Hello Moon!
  - Day 4: I'll add this to my rock collection!
  - Day 5: Time to return home.
  - Day 6: We made it back safely! What a trip!

7. Quiz (Multiple-Choice)

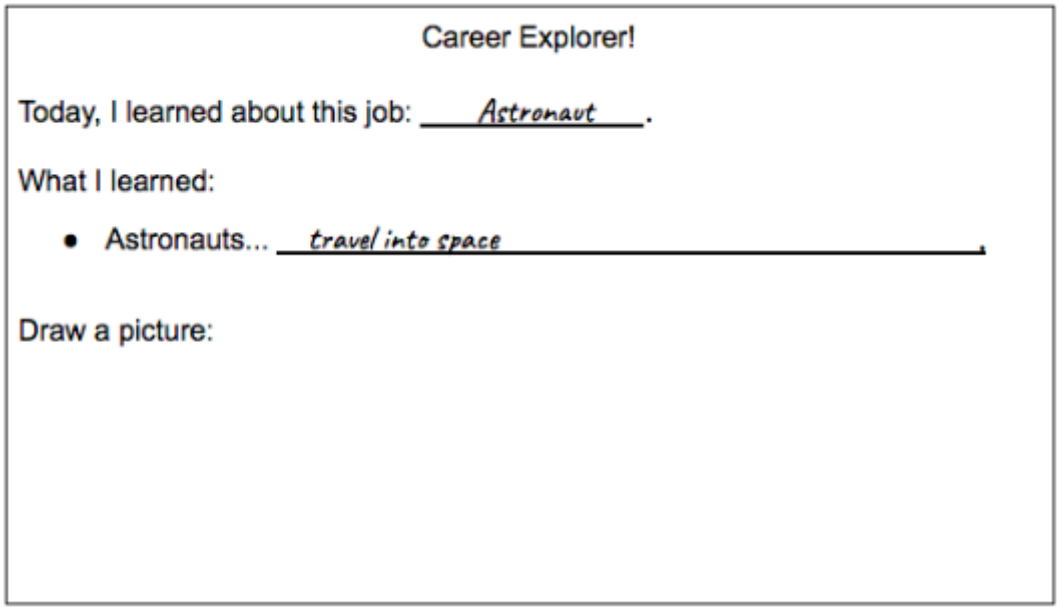
- Students will be asked 5 questions to review concepts from this lesson.

Optional Activities (*20 minutes x 2*)

Career Explorer

1. Play "Module 2: Intro to Astronaut" for your students.

2. Tell your students to complete a Career Explorer worksheet. Below is an example:


Career Explorer!

Today, I learned about this job: Astronaut.

What I learned:

- Astronauts... travel into space.

Draw a picture:

Review Questions

Discuss the following with students:

- How do you create a conversation between two Actors? (use 'say' blocks)
- How can you make your Actor seem excited? (use a 'set bubble to excited' block)
- How do you change the Background in a project? (use a 'next background' block)

Standards

CCSS-ELA: W.K.2, SL.K.1, SL.K.3, RF.K.4, W.1.2, SL.1.1, SL.1.3, RF.1.4.A, W.2.1, SL.2.1, SL.2.3, RF.2.4.A, SL.3.1, SL.3.3, RF.3.4.A, SL.4.1, SL.4.1.C, RF.4.4.A
CCSS-Math: MP.1
CSTA: 1A-AP-09, 1A-AP-10, 1A-AP-11, 1A-AP-14, 1A-AP-15, 1B-AP-10, 1B-AP-12, 1B-AP-15
CS CA: K-2.AP.10, K-2.AP.12, K-2.AP.13, 3-5.AP.10, 3-5.AP.12, 3-5.AP.13, 3-5.AP.14, 3-5.AP.17
ISTE: 1.c, 1.d, 5.d, 6.b, 7.c

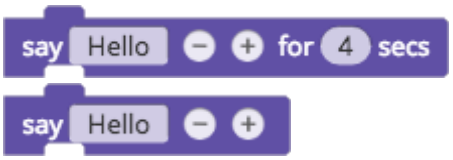
Puzzle Answer Keys

Countdown to Liftoff!

Quiz Questions

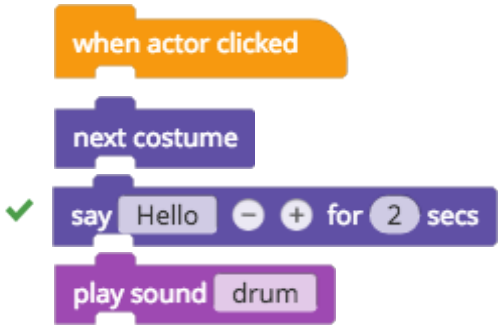
Quiz

1. Which code block will display a message for exactly two seconds?

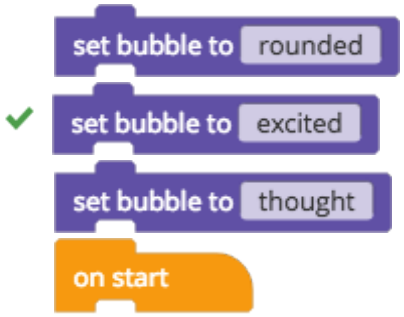


2. Which code block would you use to make an Actor talk?

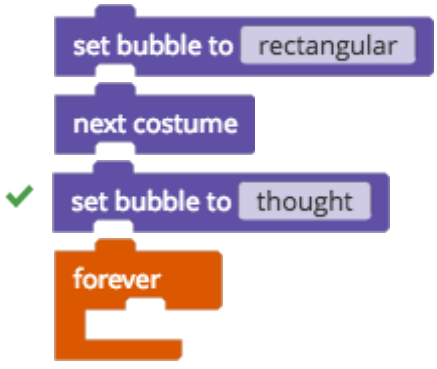
3. Which code block would you use to make a caption?



4. If you want an Actor to talk excitedly, which code block would you use?



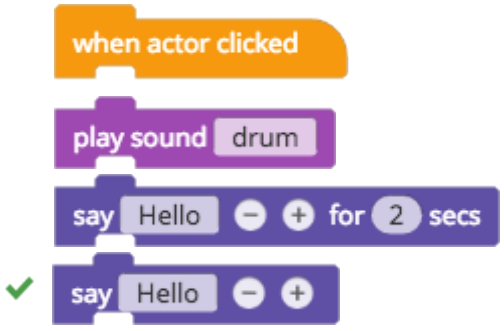
5. If you want to show an Actor thinking, which code block would you use?



6. Which code block will change the Background?

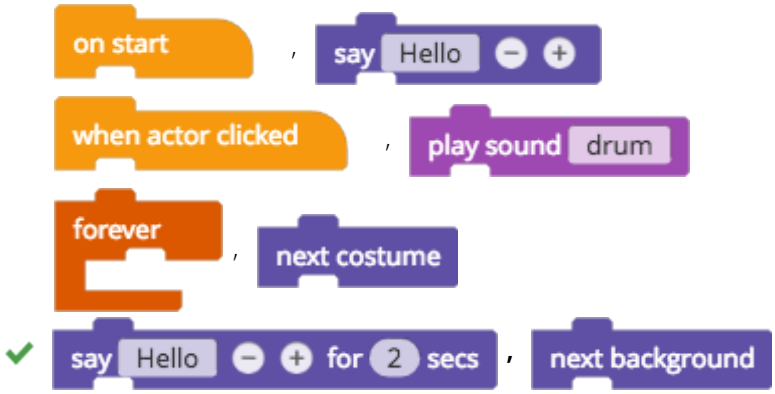
7. Which code blocks would you use to make an Actor talk when clicked?

8. Which code block would you use to make an Actor say something that stays on screen?

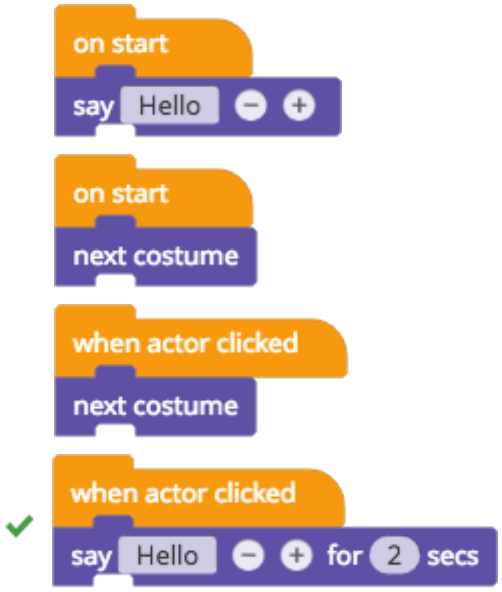


9. Which code blocks would you use to make two Actors have a back-and-forth conversation?

10. Which code blocks would you use to make a slideshow with captions?



11. Which code blocks would you use to make an Actor talk when tapped?



Lesson 4

Farmer

Lesson Objective

Learn how to think like a programmer and make life on the farm even more fun!

Lesson Plan

Lesson: Farmer

Time: 40+ mins

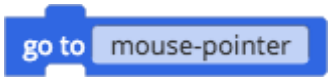
Introduction

In this lesson, students will learn how to think like a programmer and make life on the farm even more fun!

New Code Blocks

- 

: Move the Actor a specified number of units.
- 

: Keep the Actor pointing at the mouse-pointer. Note: This block uses "touch location" instead of "mouse-pointer" for mobile version.
- 

: Move the Actor to the mouse-pointer. Note: This block uses "touch location" instead of
"mouse-pointer" for mobile version.

Vocabulary

- **Bug:** An error in your code that causes your program to fail or show unexpected results
- **Debugging:** The process of identifying and removing errors in your code
- **Crops:** Plants that can be grown and harvested, such as fruit, vegetables, or grains
- **Chicken coop:** A house for chickens, often wooden, where they are kept safe

Objectives

Students will...

- Apply new coding concepts such as Move, Point Towards, and Go To
- Use “point towards” and “go to” commands to move the animal Actors into their houses
- Use “move” and “point towards” commands to program a tractor Actor
- Create a tour of the farm by programming animal Actors to follow the tractor Actor

Materials

- Computers or iPads (1 per student) with student account access to Tynker.com
- Headphones (1 per student)

Warm-Up (*5 minutes*)

1. Say, “Today, we are going on a farm programming adventure!””
2. Ask, “Who can name some farm animals?”
3. Write the students’ answers on the classroom board--for example: pigs, chicken, horse, cow, sheep.
4. Ask, “How do farmers help their farm animals?” (keep them safe, feed them, provide shelter)
5. Write the students’ answers on the classroom board and address misconceptions.
6. Ask, “Why are farmers important?”
7. Write the students’ answers on the classroom board. Discuss.

Getting Started (*5 minutes*)

1. Use your projector to display “Module 3: Concepts.”
2. Play each concept and make sure the volume is loud enough for students to hear Barbie™, or read each caption.

Activities (*30 minutes*)

Hand each student a pair of headphones and instruct students to work individually or in pairs on Farmer modules, starting with Module 1:

1. Choose a Farmer (Video)

- For web: Tell students to click the left and right arrows to see different Actors then click to select the Actor.
- For mobile: Tell students to tap the left and right arrows to see different Actors then tap to select the Actor.

2. Intro to Farmer (Video)

- This short video introduces Farmer as a career.

3. Concepts (Introduction)

- This video introduces three basic coding concepts: Move, Point Towards, and Go To.
- Remind students that there are two different ways to move an Actor: with the “move” block or with the “go to” block.

4. Lead the Animals Home (Puzzle)

- In this puzzle module, students need to use the “point towards” **and** “go to” commands to help lead the animals to their houses.
- If students are experiencing unexpected results, encourage them to debug their code. Give a hint: Tell students to use a “point towards” and “go to” command.
- Remind students to use the drop-down menu to select “Barn,” “Pigpen,” or “Coop.”
- Optional: For younger students (grades K-1)...
  - Say, “First, we need to tell the farm animals to face their house.”
  - Ask, “Which code block tells the Actor which way to face on the Stage?” (point towards)
  - Say, “Great job! Next, we need to tell the farm animals which house to go to.”
  - Ask, “Which code block tells the Actor to go to a specified location?” (go to)
  - Ask, “Where do the cows sleep?” (in the red barn)
  - Ask, “Where do the chickens sleep?” (in the wooden coop)
  - Ask, “Where do the pigs sleep?” (in the grey pigpen)
  - Solve the puzzle as a class.

5. Intro to the DIY (Video)

- This short video introduces the DIY (do it yourself) activity.

6. Tour of the Farm (DIY)

- In this DIY, students will program a tractor to drive around and give a tour of the farm!
- Tell students to follow the step-by-step instructions and drag blocks from the tutorial tab to the center coding area.
- In "Step 2," check that students scroll down to the bottom of the tutorial tab and use the “point towards” block.

7. Quiz (Multiple-Choice)

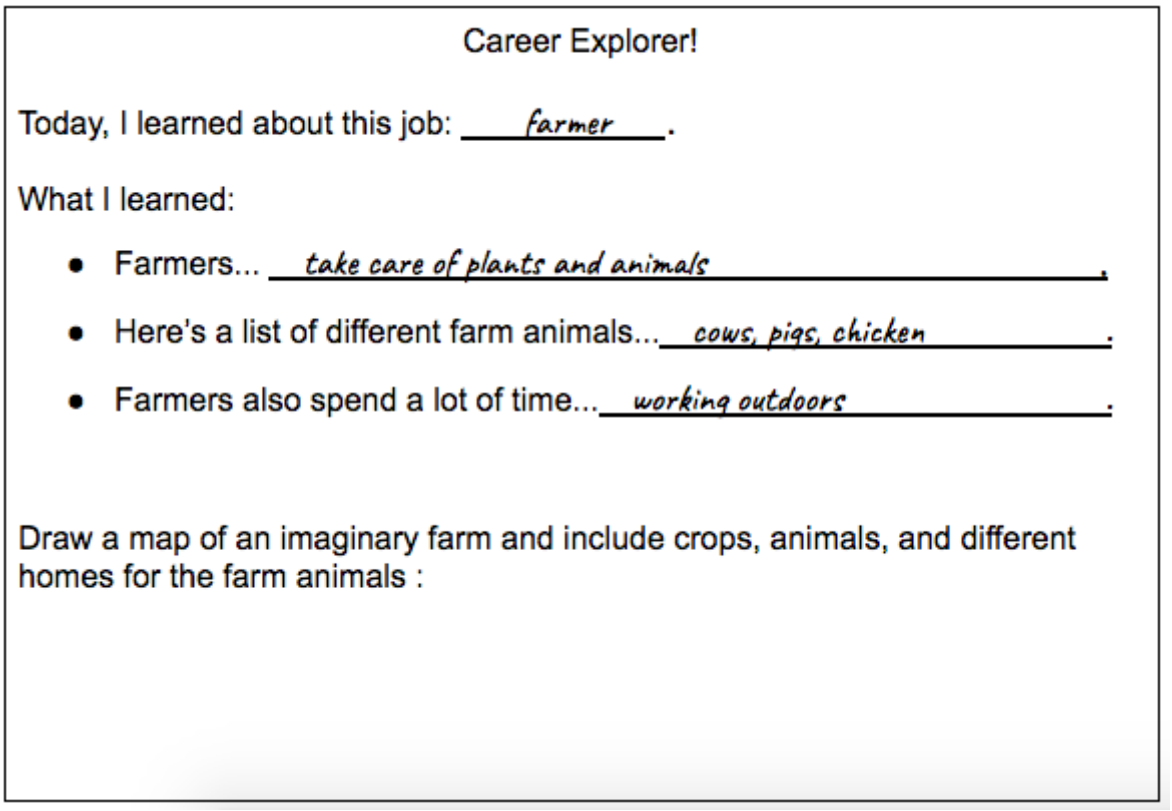
- Students will be asked 5 questions to review concepts from this lesson.

Optional Activities (*20 minutes x 2*)

Career Explorer

1. Play “Module 2: Intro to Farmer” for your students.

2. Tell your students to complete a Career Explorer worksheet. Below is an example:



Career Explorer!

Today, I learned about this job: farmer.

What I learned:

- Farmers... take care of plants and animals.
- Here's a list of different farm animals... cows, pigs, chicken.
- Farmers also spend a lot of time... working outdoors.

Draw a map of an imaginary farm and include crops, animals, and different homes for the farm animals :

Review Questions

Discuss the following with students:

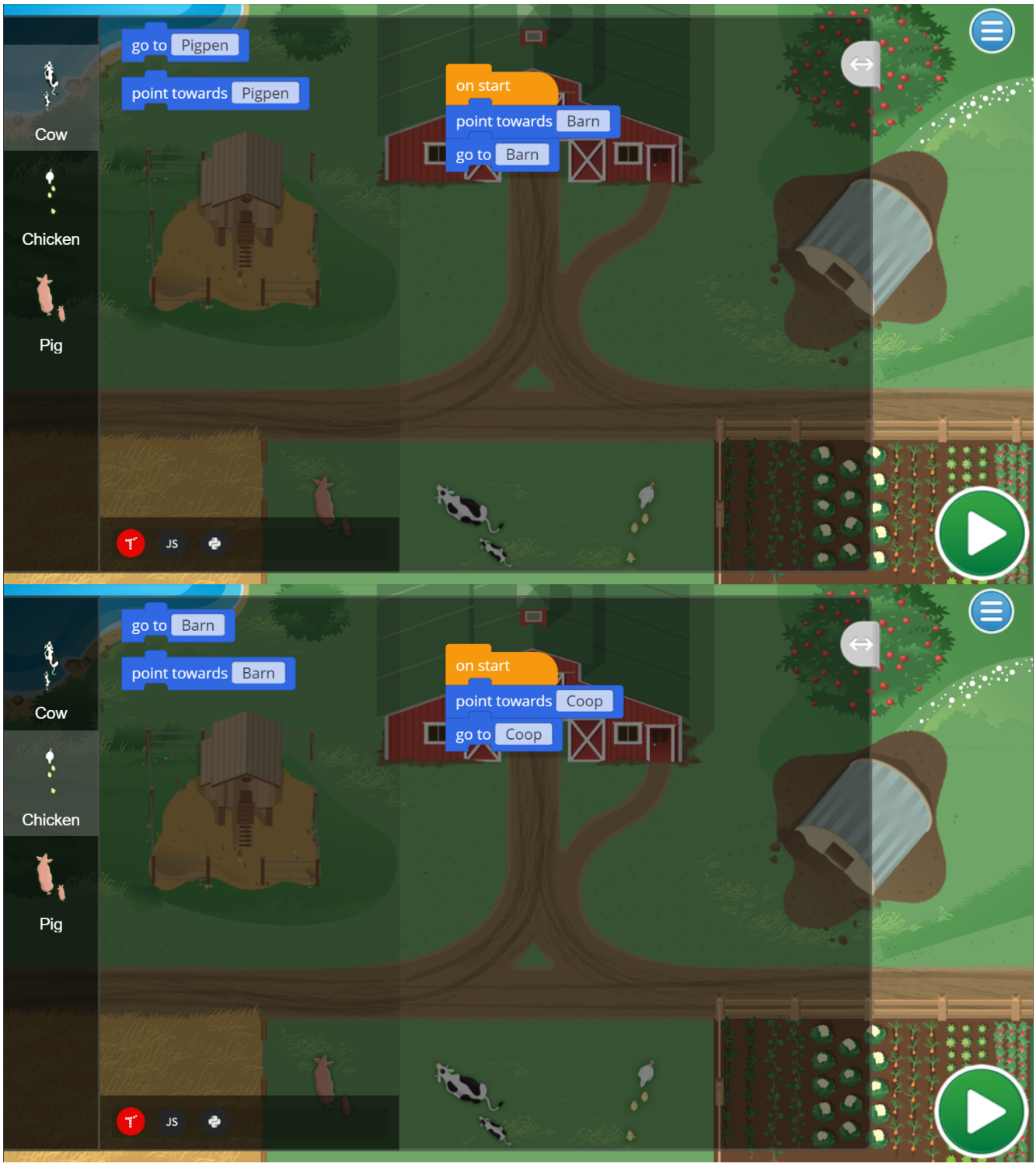
- If using a web device, how do you make an Actor follow the mouse cursor? (use a "go to mouse-pointer" block)
- If using a mobile device, how do you make an Actor go to a specified location you're touching? (use a "go to touch location" block)
- True or false: Your screen is made up of tiny squares called pixels? (true)
- How do you move an Actor a certain number of pixels? (use a “move” command)
- How do you change the direction that an Actor is facing? (use a “point towards” command)

Standards

CCSS-ELA: W.K.2, SL.K.1, SL.K.3, RF.K.4, W.1.2, SL.1.1, SL.1.3, RF.1.4.A, W.2.1, SL.2.1, SL.2.3, RF.2.4.A, SL.3.1, SL.3.3, RF.3.4.A, SL.4.1, SL.4.1.C, RF.4.4.A
CCSS-Math: MP.1, K.CC.A.2
CSTA: 1A-AP-09, 1A-AP-10, 1A-AP-11, 1A-AP-14, 1A-AP-15, 1B-AP-10, 1B-AP-12, 1B-AP-15
CS CA: K-2.AP.10, K-2.AP.12, K-2.AP.13, 3-5.AP.10, 3-5.AP.12, 3-5.AP.13, 3-5.AP.14, 3-5.AP.17
ISTE: 1.c, 1.d, 5.d, 6.b, 7.c

Puzzle Answer Keys

Lead the Animals Home

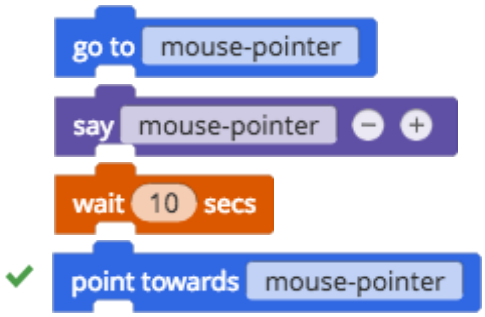

go to Pigpen
point towards Pigpen
on start
point towards Barn
go to Barn
Cow
Chicken
Pig
JS
go to Barn
point towards Barn
on start
point towards Coop
go to Coop
Cow
Chicken
Pig
JS

Quiz Questions

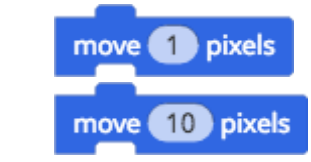
Quiz

1. Which code block moves an Actor forward by 10 pixels?

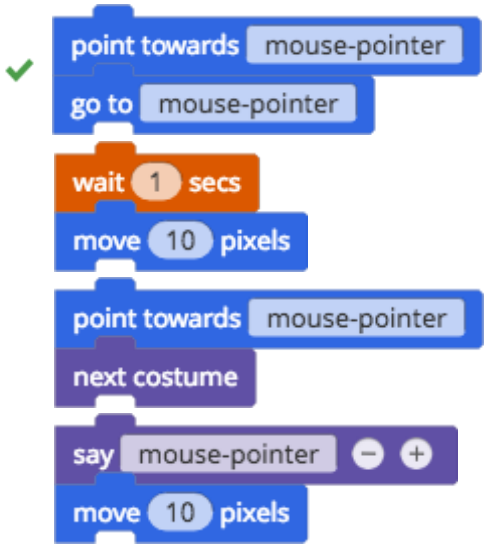
2. To make an Actor face the mouse-pointer, which code block would you use?



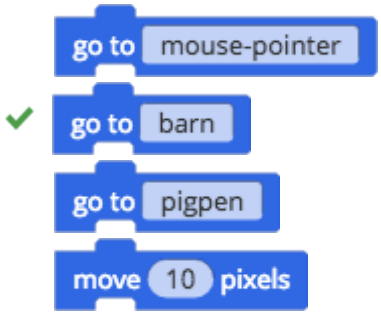
3. Which of these code blocks will move an Actor the farthest?



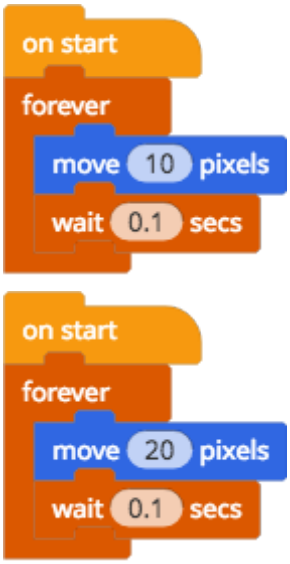
4. Which of the following would you use to make an Actor follow the mouse-pointer?

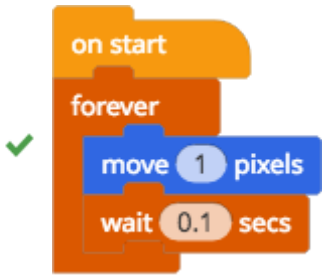


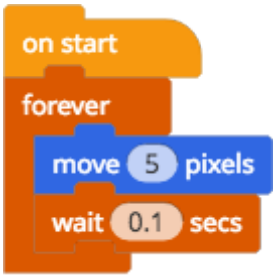
5. To move an Actor to the barn, which code block would you use?



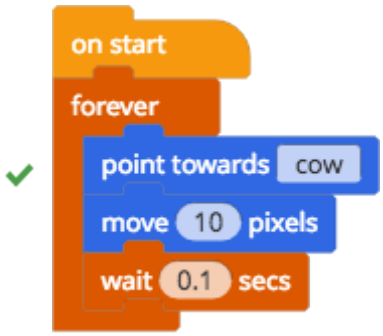
6. Which of these will make an Actor move the slowest?

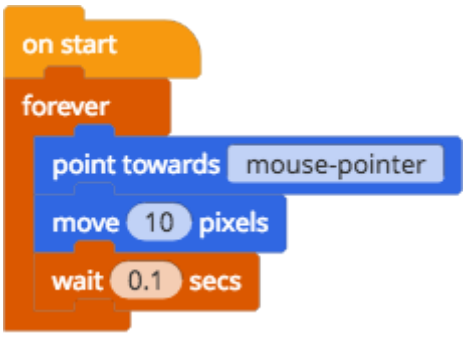


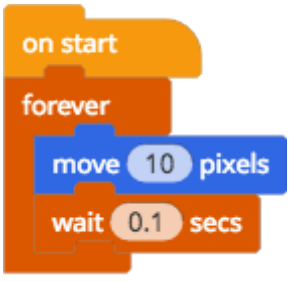


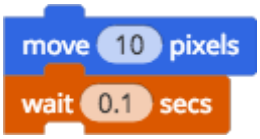


7. Which set of code blocks will make an Actor follow the cow Actor?

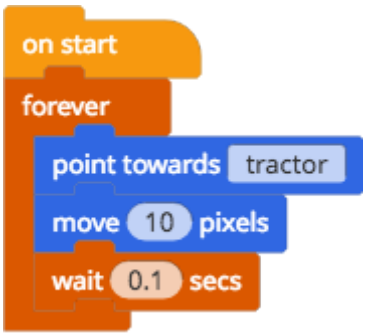


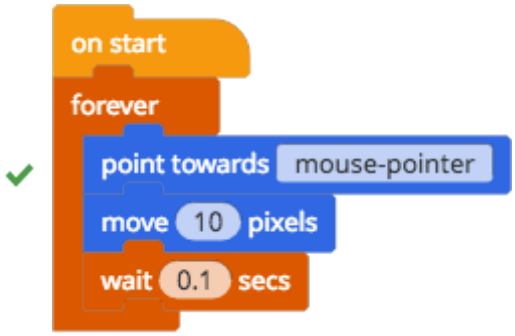


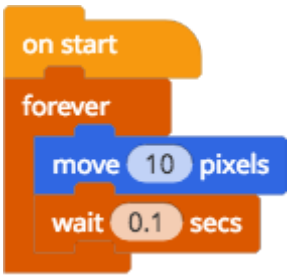


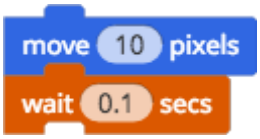


8. How would you constantly move an Actor towards the mouse-pointer?

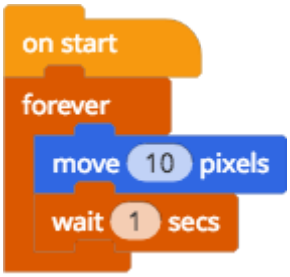


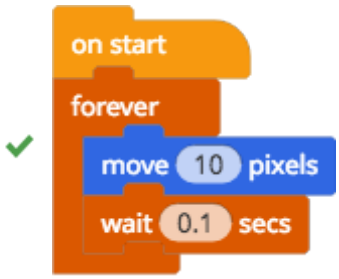


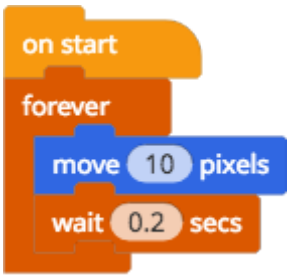


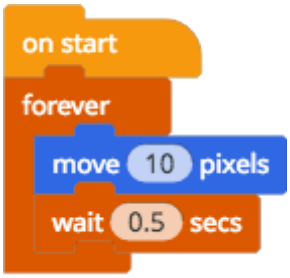


9. Which of these will make an Actor move the fastest?

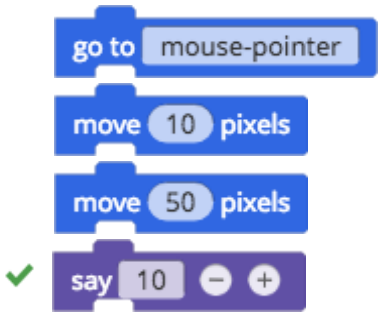




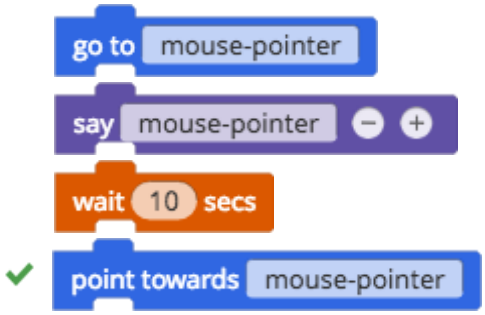




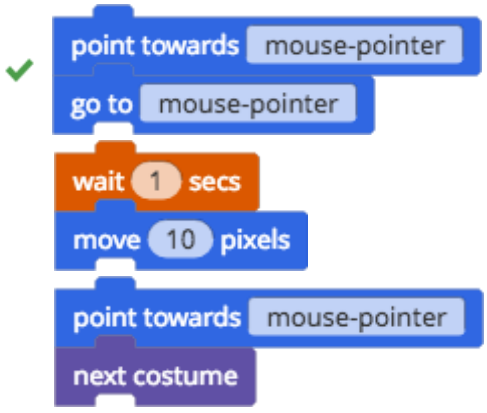
10. Which of these code blocks is NOT a way to make an Actor move?

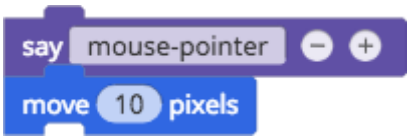


11. To make an Actor face your touch location, which code block would you use?

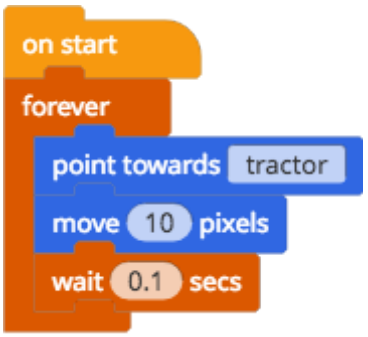


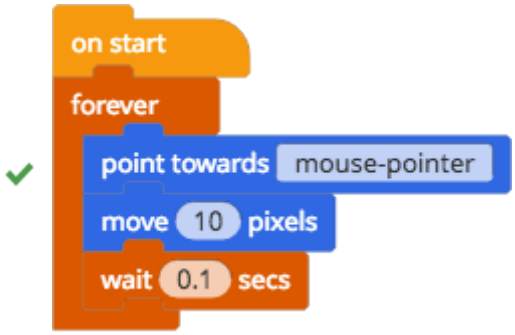
12. Which of the following would you use to make an Actor follow your finger on the screen?

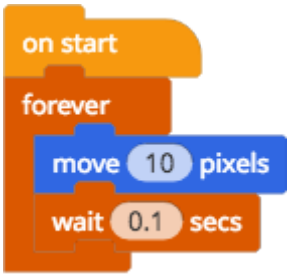


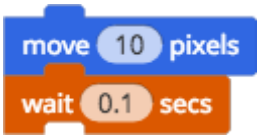


13. How would you constantly move an Actor towards your touch location on the screen?









Lesson 5

Beekeeper

Lesson Objective

Use coding concepts to design a video game about bees!

Lesson Plan

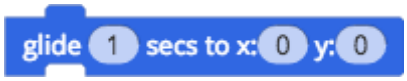
Lesson: Beekeeper

Time: 45+ mins

Introduction

Have you heard the buzz? In this lesson, students will use coding concepts to design a game about bees! Prepare to “bee” amazed.

New Code Blocks

- 

: Glide the Actor to the specified x- and y-coordinates over a specified length of time.
- 

: Send a message or instruction to other Actors while continuing to run the script.
- 

: Listen for a message or broadcast from other scripts before activating.

Vocabulary

- **Variable:** A stored value that can change over time, commonly used to store the score in computer games
- **Coordinates:** A set of x- and y- values that show the exact position of an object
- **Pollination:** The transfer of pollen from one plant to another plant
- **Nectar:** A sweet liquid produced by some plants

Objectives

Students will...

- Apply new coding concepts such as Gliding, Messaging, and Keeping Score
- Use the “glide to” command to move an Actor to a point on the Stage
- Use "broadcast" messages and "when I receive" events between Actors
- Create a game with a score

Materials

- Computers or iPads (1 per student) with student account access to Tynker.com
- Headphones (1 per student)

Warm-Up (*5 minutes*)

1. Ask students what they think of when they hear the word “bees.”
2. Write their answers on the classroom board. Discuss.
3. Explain that bees are important for plants, including the fruit and vegetables we eat. Emphasize that a lot of flowers, fruits, and vegetables can not pollinate on their own, so they rely on bees to spread pollen for them.

Getting Started (*5 minutes*)

1. Use your projector to display “Module 3: Concepts.”
2. Play each concept and make sure the volume is loud enough for students to hear Barbie™, or read each caption.

Activities (*35 minutes*)

Hand each student a pair of headphones and instruct students to work individually or in pairs on the Beekeeper modules, starting with Module 1:

1. Choose a Beekeeper (Video)

- For web: Tell students to click the left and right arrows to see different Actors then click to select the Actor.
- For mobile: Tell students to tap the left and right arrows to see different Actors then tap to select the Actor.

2. Intro to Beekeeper (Video)

- This short video introduces Beekeeper as a career.

3. Concepts (Introduction)

- This video introduces three basic coding concepts: Gliding, Messaging, and Keeping Score.
- Tell older students that x- and y-coordinates define points on the Stage.

4. Collect the Nectar (Puzzle)

- In this puzzle module, students need to use the “glide to” command to help a bee collect nectar from flowers and return home to the hive.
- Remind students that the order of flowers does not matter.
- Optional: For younger students (grades K-1)...

- Say, “In this puzzle module, we need to use the ‘glide to’ command to help a bee collect nectar from flowers and return home to the hive.”
- Identify which glide code block matches which flower. Say, “Match the numbers in the code block to the numbers on the flowers.”
- Ask, “Which code block has numbers that match the numbers on the yellow flower?”
- Ask, “Which code block has numbers that match the numbers on the beehive?”
- Ask, “Does it matter which flower the bee goes to first?” (no)
- Solve the puzzle module as a class: on start - glide 1.5 secs to (-290,-110), glide 1.5 secs to (335,-140), glide 1.5 secs to (-60, 225), glide 1.5 secs to (290, 150).

5. Intro to the DIY (Video)

- This short video introduces the DIY (do it yourself) activity.

6. Bee Game (DIY)

- In this DIY, students will create a scorekeeping game of bees visiting flowers.
- Tell students to follow the step-by-step instructions and drag blocks from the tutorial tab to the center coding area.
- To program the other flowers, students need to choose a different flower Actor on the right, then repeat “Step 2” in the tutorial tab.

7. Quiz (Multiple-Choice)

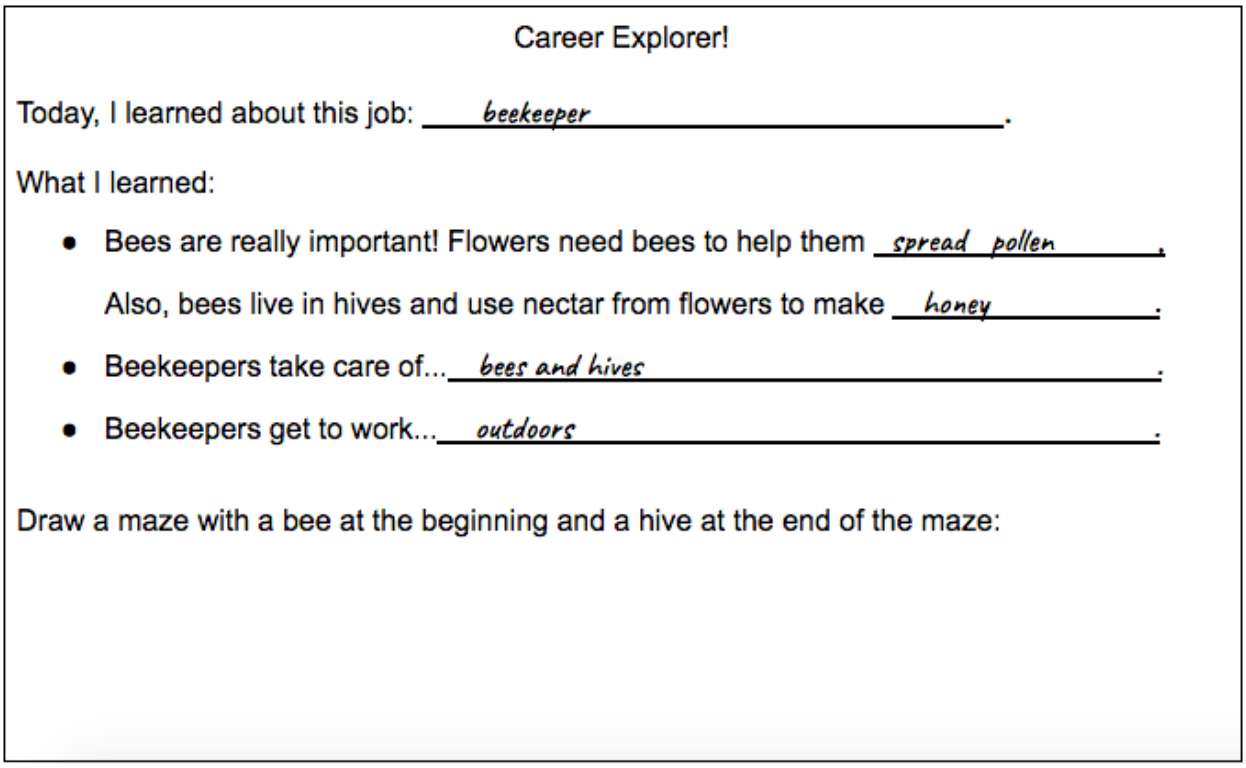
- Students will be asked 5 questions to review concepts from this lesson.

Optional Activities (*20 minutes x 2*)

Career Explorer

1. Play “Module 2: Intro to Beekeeper” for your students.

2. Tell your students to complete a Career Explorer worksheet. Below is an example:



Career Explorer!

Today, I learned about this job: beekeeper.

What I learned:

- Bees are really important! Flowers need bees to help them spread pollen.

  Also, bees live in hives and use nectar from flowers to make honey.
- Beekeepers take care of... bees and hives.
- Beekeepers get to work... outdoors.

Draw a maze with a bee at the beginning and a hive at the end of the maze:

Review Questions

Discuss the following with students:

- How do you make an Actor move slowly to a point on the Stage? (set the seconds inside a "glide" block to a larger number)
- If you broadcast a message, what block must you use for the Actor receiving the message? (the "when I receive" block)
- What Actor do you need to use to keep track of the score? (the "Score" Actor)

Standards

CCSS-ELA: W.K.2, SL.K.1, SL.K.3, RF.K.4, W.1.2, SL.1.1, SL.1.3, RF.1.4.A, W.2.1, SL.2.1, SL.2.3, RF.2.4.A, SL.3.1, SL.3.3, RF.3.4.A, SL.4.1, SL.4.1.C, RF.4.4.A
CCSS-Math: MP.1
CSTA: 1A-AP-09, 1A-AP-10, 1A-AP-11, 1A-AP-14, 1A-AP-15, 1B-AP-10, 1B-AP-12, 1B-AP-15
CS CA: K-2.AP.10, K-2.AP.12, K-2.AP.13, 3-5.AP.10, 3-5.AP.12, 3-5.AP.13, 3-5.AP.14, 3-5.AP.17
ISTE: 1.c, 1.d, 5.d, 6.b, 7.c

Puzzle Answer Keys

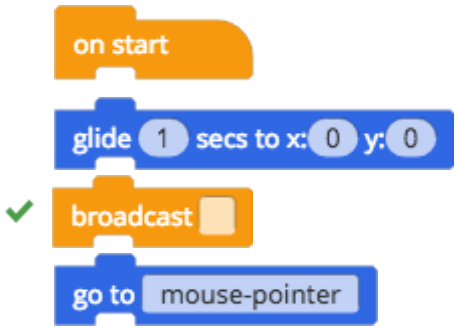
Collect the Nectar

Quiz Questions

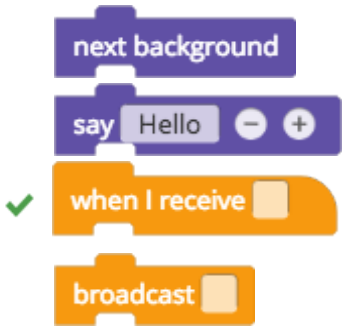
Quiz

1. Which code block can be used to move an Actor to a specific point on the Stage?

2. Which code block can be used to send a message?

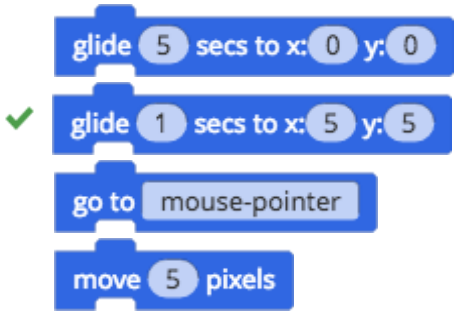


3. Which code block would you use to make an Actor respond to a message?

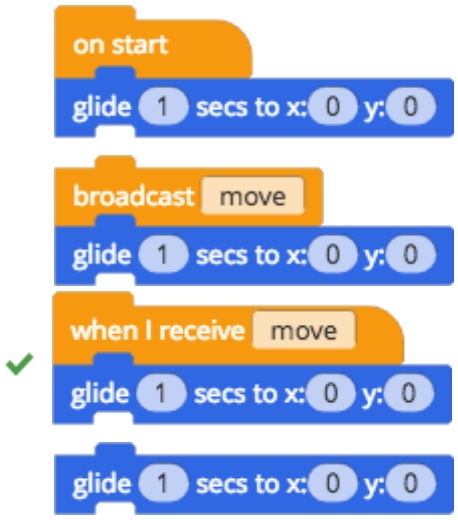


4. Which code block would you use to make an Actor glide to a location in two seconds?

5. Which code block would move an Actor to where (5, 5) is on the Stage?

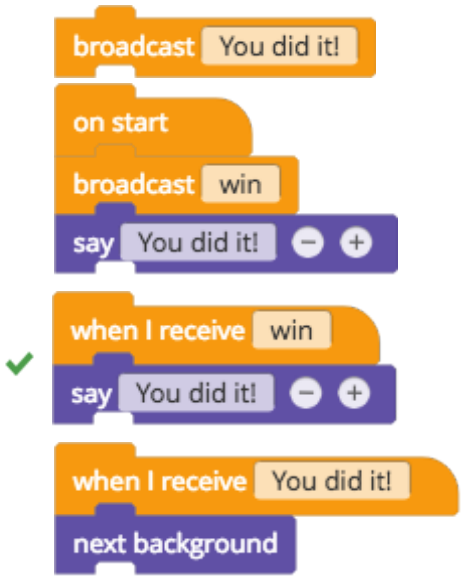


6. Which code blocks would make an Actor glide when it receives the "move" message?



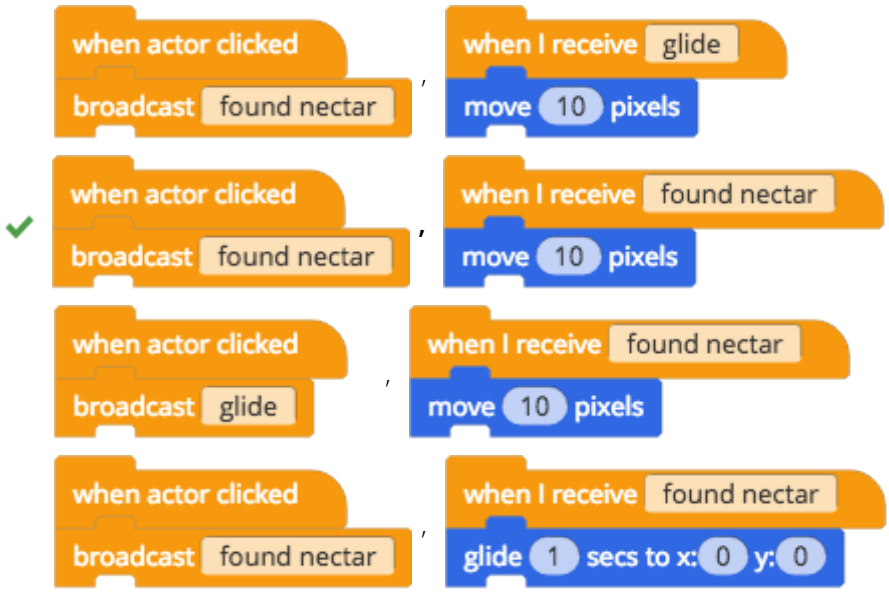
7. Which code block would you use to send a "dance" message to an Actor?

8. Which code blocks would you use to make an Actor say, "You did it!" when it receives the "win" message?



9. Which set of code blocks will cause a chime sound to play?

10. Which set of code blocks will move an Actor 10 pixels?



Lesson 6

Pastry Chef

Lesson Objective

Coding and cupcakes? Yum! Discover how delicious programming can be!

Lesson Plan

Lesson: Pastry Chef

Time: 50+ mins

Introduction

Coding and cupcakes? Yum! In this lesson, students will use coding concepts to frost cupcakes and decorate a cake! Who knew coding could be so delicious?!

New Code Blocks

- 

: Rotate the Actor to the right (clockwise) by a specified amount.
- 

: Rotate the Actor to the left (counter-clockwise) by a specified amount.
- 

: Change the Actor's costume to the specified one.
- 

: Stamp an image of the Actor on the Stage.
- 

: Clear stamped images of Actors from the Stage.

Vocabulary

- **Pastry:** A baked good that is often sweet

Objectives

Students will...

- Apply new coding concepts such as Stamping, Turning, and Switching Costumes

- Use the “turn” command to rotate an Actor clockwise and counter-clockwise
- Use “stamp,” “clear,” and “switch to costume” commands to decorate a cake

Materials

- Computers or iPads (1 per student) with student account access to Tynker.com
- Headphones (1 per student)

Warm-Up (*5 minutes*)

1. Ask, “What are some careers that use math skills?”
2. Say, “Did you know pastry chefs use math in their career? For example, math is used to measure ingredients and calculate the size of baked goods.”
3. Ask, “What do you think will happen if a pastry chef does not know basic math (e.g., fractions)?"

Getting Started (*5 minutes*)

1. Use your projector to display “Module 3: Concepts.”
2. Play each concept and make sure the volume is loud enough for students to hear Barbie™, or read each caption.

Activities (*30 minutes*)

Hand each student a pair of headphones and instruct students to work individually or in pairs on the Pastry Chef modules, starting with Module 1:

1. Choose a Pastry Chef (Video)
- For web: Tell students to click the left and right arrows to see different Actors then click to select the Actor.
- For mobile: Tell students to tap the left and right arrows to see different Actors then tap to select the Actor.

2. Intro to Pastry Chef (Video)
- This short video introduces Pastry Chef as a career.

3. Concepts (Introduction)
- This video introduces three basic coding concepts: Stamping, Turning, and Switching Costumes.
- Remind students there are two turn commands, and the arrows on the “turn” block point in the direction the Actor will turn.

4. Frost the Cupcakes (Puzzle)
- In this puzzle module, students need to use the “repeat” and “rotate” commands to frost cupcakes. Each time the plate rotates, a cupcake gets frosted.
- Give a hint: Ask, "How many times does Barbie need to turn the plate so she can frost all the cupcakes?"
- Optional: For younger students (grades K-1)...
  - Say, “The ‘turn’ block turns [rotates] the plate.”
  - Ask, “How many cupcakes do we need to frost?” (six)

- Ask, “If we do not use a ‘repeat’ block, how many ‘turn’ blocks should we use?” (six, because there are six cupcakes)
- Tell students that the value on the “repeat” block is incorrect.
- Ask, “What do we need to change the value to?” (six)
- Ask, “Which block goes inside the ‘repeat’ block?” (rotate)
- Solve the puzzle module as a class, and make sure to change the repeat value to “6.”

5. Intro to the DIY (Video)

- This short video introduces the DIY (do it yourself) activity.

6. Cake Decorator (DIY)

- In this DIY, students will use the “stamp,” “clear,” and “switch costume” commands to decorate a cake!
- Tell students to follow the step-by-step instructions and drag blocks from the tutorial tab to the center coding area.
- To add more decorations, students need to choose a different Actor on the right, repeat “Step 6” in the tutorial tab, and manually type in the name of the Actor (e.g., candy heart) in the “broadcast” code block. Next, use the drop-down menu in the “when I receive” and “switch to costume” code blocks to match the name of the Actor you typed in the “broadcast” code block (e.g., candy heart).

7. Quiz (Multiple-Choice)

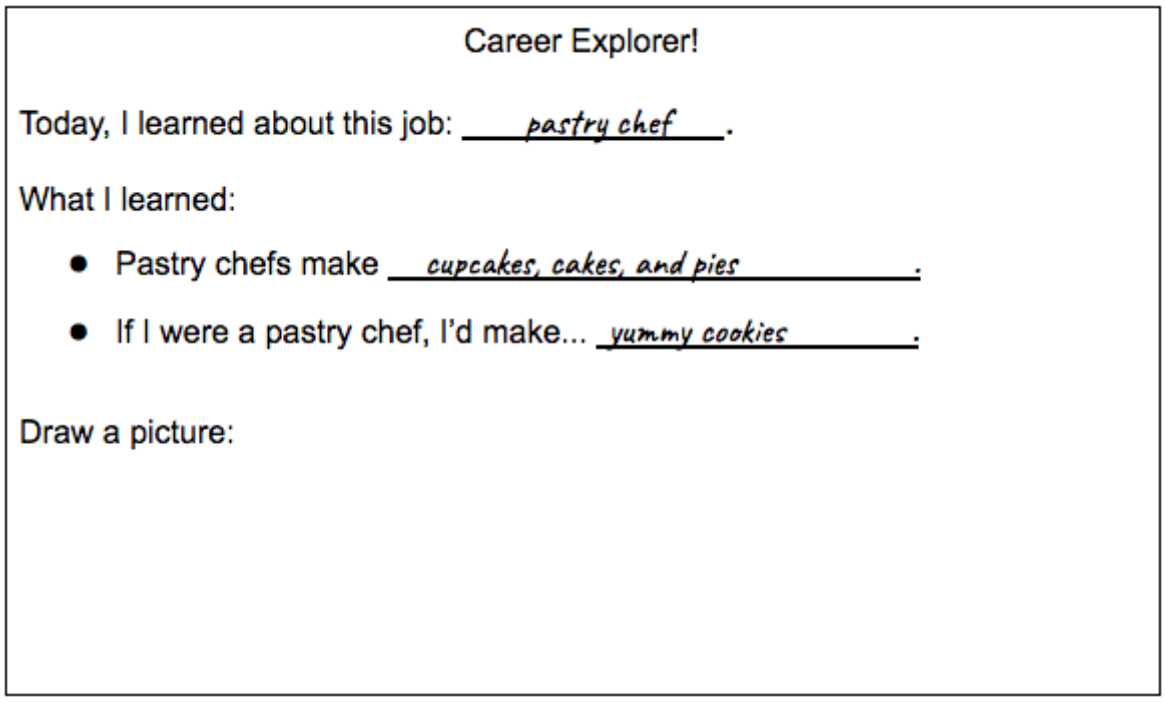
- Students will be asked 5 questions to review concepts from this lesson.

Optional Activities (*20 minutes x 2*)

Career Explorer

1. Play “Module 2: Intro to Pastry Chef” for your students.

2. Tell your students to complete a Career Explorer worksheet. Below is an example:



Review Questions

Discuss the following with students:

- Which code block can you use to leave a copy of an Actor on the Stage? (stamp)

- Which code block can you use to rotate an Actor? (turn)
- What does the “clear” code block do? (clears stamped Actors from the Stage)

Standards

CCSS-ELA: W.K.2, SL.K.1, SL.K.3, RF.K.4, W.1.2, SL.1.1, SL.1.3, RF.1.4.A, W.2.1, SL.2.1, SL.2.3, RF.2.4.A, SL.3.1, SL.3.3, RF.3.4.A, SL.4.1, SL.4.1.C, RF.4.4.A
CCSS-Math: MP.1, K.CC.A.2, K.CC.B.4
CSTA: 1A-AP-09, 1A-AP-10, 1A-AP-11, 1A-AP-14, 1A-AP-15, 1B-AP-10, 1B-AP-12, 1B-AP-15
CS CA: K-2.AP.10, K-2.AP.12, K-2.AP.13, 3-5.AP.10, 3-5.AP.12, 3-5.AP.13, 3-5.AP.14, 3-5.AP.17
ISTE: 1.c, 1.d, 5.d, 6.b, 7.c

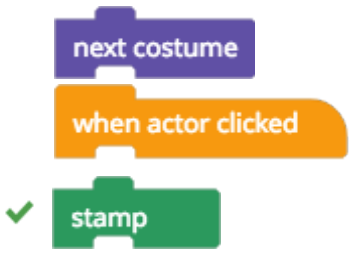
Puzzle Answer Keys

Frost the Cupcakes

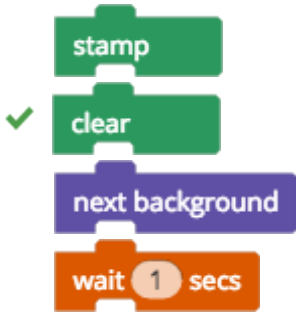
Quiz Questions

Quiz

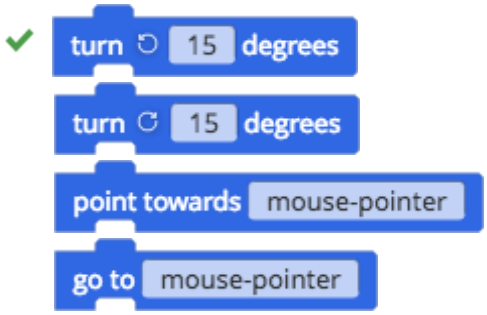
1. Which code block would you use to copy an Actor's image onto the Stage?



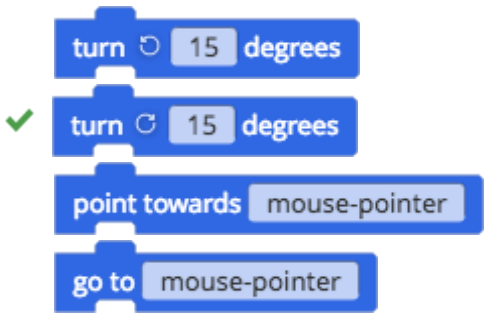
2. Which code block would you use to erase all of the stamps on the Stage?



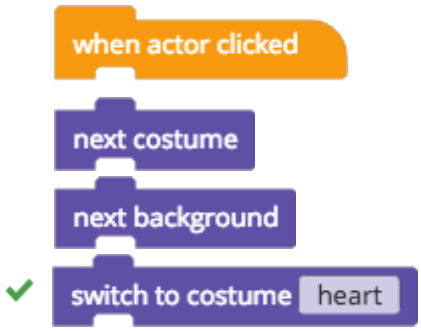
3. Which of these code blocks turns an Actor to the left?



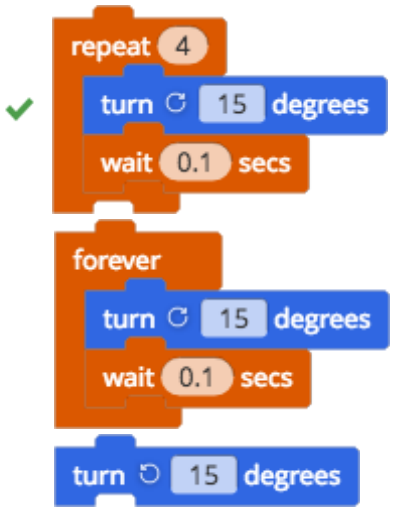
4. Which of these code blocks turns an Actor to the right?



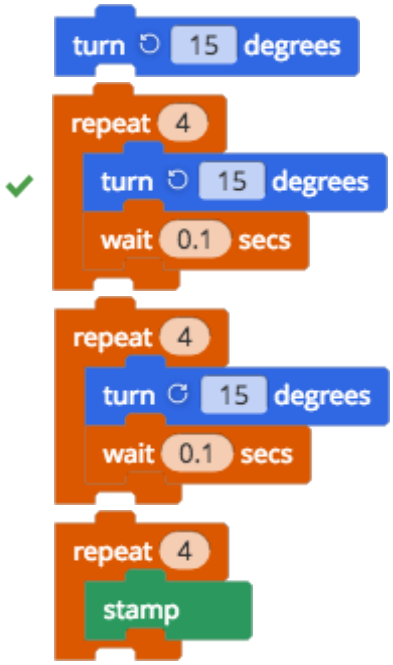
5. Which code block would you use to switch an Actor to its "heart" Costume?



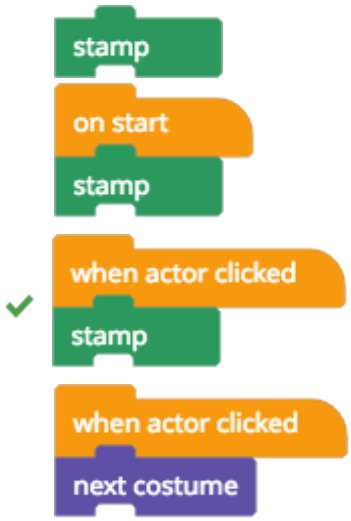
6. Which of these sets of code blocks will turn an Actor to the right four times?



7. Which of these sets of code blocks will turn an Actor to the left four times?

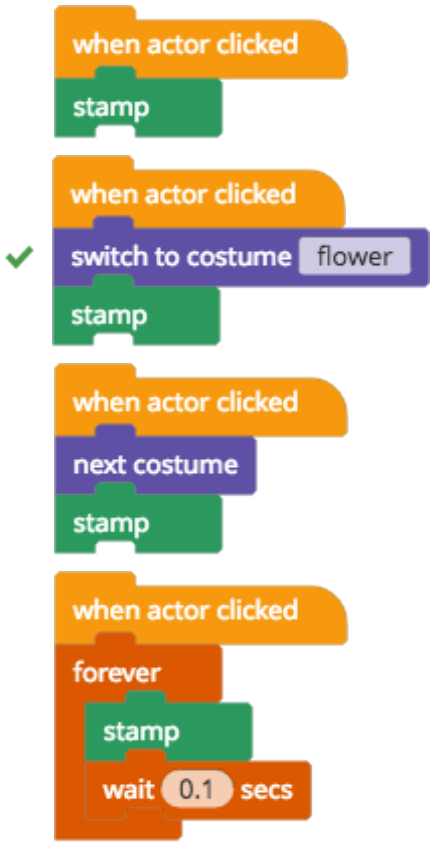


8. How would you make an Actor stamp when you click on it?

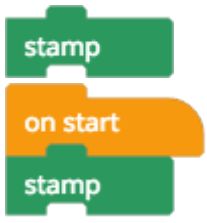


9. What code would you add to a button Actor to make it clear the Stage when clicked?

10. How would you make an Actor only stamp the "flower" Costume when clicked?



11. How would you make an Actor stamp when you tap it?



12. What code would you add to a button Actor to make it clear the Stage when tapped?

13. How would you make an Actor only stamp the "flower" Costume when tapped?