

Lesson 6

Orientation

Overview

In this lesson, students will first review the concept of sequencing and the application of sequential algorithms in programming scripts. Building on this previous practical experience, students will be introduced to the use of Motion blocks. Students will then use the Motion blocks to develop a short animation about the stars.

Objectives

By the end of class, students will be able to...

- Demonstrate the understanding of the sequence that well-defined sequential algorithms affect the execution of programs;
- Utilize appropriate programming scripts to generate interactive effects for the star sprites built on a well-defined algorithm of visual display.

Materials

- mBlock
- Lesson 6 Activity Sheet
- Lesson 6 Slideshow

Content Standards

Type	Indicator	Standard
ISTE	1d	Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
	5a	Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
	6a, 6d	Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
CSTA	1B-DA-07	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
	1B-AP-08	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
	1B-AP-10	Create programs that include sequences, events, loops, and conditionals.
	1B-AP-11	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
	1B-AP-16	Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.

Vocabulary

Term	Definition
Looks Blocks*	This set of blocks is used to control a sprite's look.
Motion Blocks*	This set of blocks is used to control and display a sprite's movement.
Sequencing	A set of ordered steps for accomplishing a task.

* New term

Pre-lesson Checklist

- Print out and/or digitally distribute the Lesson 6 Activity Sheet.
 - If students will use paper versions of activity sheets, make sure the resources are easily available for students. This can be done by providing the links on your LMS, etc., or printing the resources out for each group to utilize during the class.
- Make sure any necessary computer equipment is ready to go.
- Familiarize yourself with key points and notes detailed within this lesson plan and Lesson 6 slideshow as well as the demo programs shown below:

```

when clicked
go to x: 205 y: 20
glide 0.2 secs to x: 185 y: 35
glide 0.2 secs to x: 165 y: 50
glide 0.2 secs to x: 145 y: 65
glide 0.2 secs to x: 125 y: 80
glide 0.2 secs to x: 105 y: 95
glide 0.2 secs to x: 85 y: 110
glide 0.2 secs to x: 65 y: 125
glide 0.2 secs to x: 45 y: 140
glide 0.2 secs to x: 25 y: 155
    
```

```

when clicked
point in direction 90
forever
turn 15 degrees
    
```

Demo Program used in Phase 2

```

when clicked
switch costume to Star1
go to x: 205 y: 20
next costume
glide 0.2 secs to x: 185 y: 35
next costume
glide 0.2 secs to x: 165 y: 50
next costume
glide 0.2 secs to x: 145 y: 65
next costume
glide 0.2 secs to x: 125 y: 80
next costume
glide 0.2 secs to x: 105 y: 95
next costume
glide 0.2 secs to x: 85 y: 110
next costume
glide 0.2 secs to x: 65 y: 125
next costume
glide 0.2 secs to x: 45 y: 140
next costume
glide 0.2 secs to x: 25 y: 155
    
```

```

when clicked
point in direction 90
forever
turn 15 degrees
change color effect by 25
    
```

Demo Program used in Practice Section

**Agenda (60 minutes)**

Time Interval	Content
5 minutes	Warm Up This phase aims to help review what has been learned in the previous lesson quickly. Pay attention to the sequence of programming scripts.
15 minutes	Phase 1 - This phase aims to facilitate students' learning experience on sequential algorithms associated with Looks and Motion blocks. - The teacher will play the role of a passer-by who is struggling to find her/his way, while students need to give step-by-step directions on getting from one side of the room to the other. The step-by-step instructions should be detailed.
15 minutes	Phase 2 In this phase, students will create a simple animation about the stars. Students need to combine Motion and Looks blocks to program the star sprites.
15 minutes	Practice Students will combine Look blocks with Motion blocks to design and generate more interactive effects to enrich their "Star" project.
5 minutes	Wrap Up
5 minutes	Clean Up

 Activities

Warm Up: Slides 2-4 [5 minutes]

Objectives:

- This phase aims to help review what has been learned in the previous lesson quickly. Pay attention to the sequence of programming scripts.

Procedures:**Slide 2**

- Show Slide 2 to inform the class about the agenda and tasks in this lesson.

Slide 4

- Pose questions for discussion:
 - *"What is sequencing?"*
 - *"Why code should be logically ordered?"*

Phase 1: Slides 5-11 [20 minutes]

Objectives:

- This phase aims to facilitate students' learning experience on sequential algorithms associated with Looks and Motion blocks.
- The teacher will play the role of a passer-by who is struggling to find her/his way, while students need to give step-by-step directions on getting from one side of the room to the other. The step-by-step instructions should be detailed.

Procedures:**Slides 6-7**

- Explain the rule of this activity:
 - The teacher pretends to be a passer-by who got lost in a place. Students need to navigate the teacher to get from one point to another.
 - Introduce the scenario:
 - *"Help! I need to get from Point A to Point B but my phone died and I don't know where to go. Could you please help me?"*
 - Tell students to be as specific as possible, and to give you directions on what to do to get to your destination.
 - Make sure that you only do exactly as the students say during this game.
 - For instance, if a student says "walk forward," continue walking forward until they catch on and say "stop." Stay there until they give a new direction.
 - Students will eventually catch on that their directions need to be specific. Allow time for a minimum of two rounds for this game.
 - Repeat multiple rounds depending on time.
 - Be sure to leave time for the debrief.

Slide 8

- Introduce the use of Motion blocks to the class:
 - *"Similar to how you direct a passer-by to arrive at the destination, Motion blocks are used to control a sprite's movements and make it do something."*

Slides 9-10

- Instruct students to complete Task 6-2 to explore the Motion blocks listed in the activity sheet.
 - Students can choose to either run a single block or create a simple script to see the effect.

Slide 11

- Ask students to test and compare the “go to X/Y” and “glide (...) secs to X/Y” blocks, report the difference between the two blocks.

Phase 2: Slides 12-16

[20 minutes]

Objectives:

- In this phase, students will create a simple animation about the stars. Students need to combine Motion and Looks blocks to program the star sprites.

Procedures:

Slides 13-14

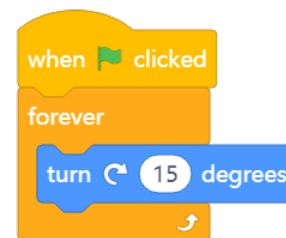
- Instruct students to complete Task 6-3 by creating animated stars.
 - Briefly contextualize the project by introducing a navigation method used in a hostile environment – people can observe the position of the stars to direct the way.

Slides 15-16

- Show some examples to inspire students, for example, they can use the “glide (...) secs to X/Y” block to make the star rise from one side to another; they can program the sprite of a group of stars to rotate themselves.



Example 1: Rising the star (1)



Example 2: Rotating the star (1)

- Students may need to use some new Control blocks.
- Encourage students to explore whether they are the constructs they need in this project.
- Also, encourage students to try different kinds of Motion blocks to animate the star sprite.
- Remind students that they may need to add the “wait” control blocks to facilitate the moving effects.

Practice: Slides 17-24 [15 minutes]

Objectives:

- Students will combine Look blocks with Motion blocks to design and generate more interactive effects to enrich their “Star” project.

Procedures:

Slide 18

- Give a challenging task to the class:
 - Ask students to try to make the stars change color while moving.
 - Have students discuss with their partners to brainstorm the solution. Remind them that there is more than one way to make a star sprite change its color.
 - Have students recall what has been learned in the previous learning activities, and transfer your experience to this task.

Slides 19-20

- Suggest some possible solutions:
 - Switch the costumes of the sprite; if the sprite only has one costume, make some copies and tailor the color of the figure in the “Costume” panel.
 - Use the “change color effect” blocks to change the sprite’s color.

Slide 21

- Have students upload their projects onto the mBlock community after the animation is completed. Invite partners to give some comments.

Slide 23

- Instruct students to reflect on how the key concepts are embodied in the project.

Wrap Up & Clean Up [10 minutes]