National Coding Symposium
Code Quest Lesson Plan

Audience:	
	## Grade level: K – 8 Each lesson includes an unplugged component and a plugged component. The unplugged part of the lesson is done without the use of any electronic devices and is meant to be completed first. The plugged part of the lesson uses an iPad device and the free CodeQuest app to do the coding. Braille readers: Documents are in contracted braille. Beginning tactile skills will be helpful for the unplugged activities. Basic Voiceover skills are necessary. ## Prerequisites iPad skills - Tapping, swiping, scanning, selecting - Voiceover skills for the above for screen reader users - Voiceover practice is built into iOS devices Go to settings→accessibility, turn on voiceover, tap on "VoiceOver Practice"

Expanded Core areas & components targeted in this lesson:

ECC Area	ECC Component
Assistive Technology	

Learning targets (what do I want the students to learn?)

There should be at least 2 learning objectives for one lesson. Learning objectives should be written with actionable verbs. Click here for more support on writing effective, rigorous learning objectives

Objective #1	
Objective #2	
Objective #3	

Lesson procedure: (how am I going to teach this lesson?)

See teaching tips below for this section. Quick tip: check the rigor of your content. Click here for a quick read on developing rigorous content for students.

Write your lesson procedure here:

Vocabulary terms for this lesson:

Share with students key vocabulary terms that you will discuss in this lesson. This also helps our transcription service better prepare for your lesson.

Materials needed (What I need to teach the lesson?)

- American Printing House CodeQuest app (free app that runs on iPad)
- Downloads to accompany CodeQuest app
  - (For braille readers) Tactical Maps of levels are very helpful while using the app
  - (Optional) 3D print files for Alien, Arrows, Astronaut and Rocket Ship
- 10x10 grids for unplugged activities
  - Printable grids
  - Tactile grids: Unplugged Grids (TIGER) or Unplugged grids (PIAF). Be sure you have the Tiger29 or Swell Braille font on your computer if using these files.
  - See accessible directions for creating your own grid, if preferred.

- Writing device for creating code
  Accommodations for students with limited keyboarding or braille skills
    - APH Feel 'n Peel arrow stickers to indicate path with arrows on a sheet of paper
    - Use additional tactile stickers for picking up aliens or blasting walls
    - Draw arrows and symbols with marker or pencil
    - Keyboard or braille only the first letter of each direction

ECC High School Readiness Checklist sections referenced for this lesson:

- Use the ECC High School Readiness Checklist as your ECC assessment. Get your free copy [here](#).

Grade band:	
ECC area:	
Level: (Required, Novice, Accomplished or Proficient)	

Lesson 1 – Movement

Unplugged

- Using Grid 1, challenge students to create "code" to move the astronaut to the rocket ship using the following commands. They must use each command at least once!
    - left
    - up
    - down
    - right
- Consider using a small, 3D object for the students to move around the grid for trial and error.
- Any combination that results with the arrival of the astronaut to the rocket ship is acceptable.
- Next, have the student write down the commands (in order) that would be used to tell the astronaut how to follow a path to get to the rocket ship.
- If time, students can check their work by reading code out loud and having someone else follow commands to be sure that the code does not have any "bugs." Edit as necessary.
- See [Solutions](#) for one option.

Plugged

- Task – Complete the levels for the Kratos and Helios planets in the CodeQuest app.
- Buttons – Left, Up, Down, Right, Erase, Erase All, Read Commands, Help, Play
- Tactile Maps – Kratos (levels 1-6), Helios (levels 1-6)
    - Key Components on Tactile Maps for Kratos

- - - ■ Unbreakable wall
      - ■ ast = Astronaut
      - ■ rsh = Rocket ship
    - ○ Key Components on Tactile Maps for Helios
      - ■ Unbreakable wall
      - ■ al = Alien (NEW)
      - ■ ast = Astronaut
      - ■ rsh = Rocket ship
- ● Kratos Directions
  - ○ Introduce the student to the symbols used for the maps, either on the screen or using the tactile maps. If using the tactile maps, be sure the student takes time to look at both the key and the map.
  - ○ Have the student share how they think the astronaut will have to move to get to the rocket ship. If the student has difficulty keeping track of the steps, it may help to have the student write down the steps first.
  - ○ Introduce the student to the buttons at the bottom of the screen.
  - ○ Have the student select the correct steps and then select the Play button to have the astronaut perform the steps.
  - ○ Encourage the student to use the least number of steps possible while still getting the astronaut to the rocket ship.
  - ○ Once the student gets the astronaut to the rocket ship, they can select Next Level to go to the next map.
  - ○ After the student has completed all 6 levels, they can select Planet Helios to go to the next Planet.
- ● Helios Directions
  - ○ Ask the student what symbol on the map is new to them. The alien is new in this planet.
  - ○ Let the student know that they only have to land on the square with the alien to pick it up, but they must go to each square with an alien before arriving at the rocket ship.
  - ○ Challenge the student to use the least number of steps possible while still getting the astronaut to the rocket ship.
  - ○ Once the student gets the astronaut to the rocket ship, they can select Next Level to go to the next map.
  - ○ After the student has completed all 6 levels, they are finished with the lesson.

Lesson 2 – Actions

Unplugged

- Create, print or emboss the 10x10 grid for lesson 2. If creating your own, see accessible directions for adding to the grid.
- Using Grid 2, challenge the student to create "code" to move the astronaut to the rocket ship by adding the commands below. They cannot move through a "crumble wall" until they blast it. Aliens can be picked up after a move to the square that the alien occupies.
  - Pick up alien
  - Blast crumble wall
- Students should add to their earlier written commands (in order) so that aliens are picked up and crumble walls blasted on the path to the rocket ship. (All aliens must be "picked up").
- If time, students can check their work by reading code out loud and having someone else follow commands to be sure that the code does not have any "bugs." Edit as necessary.
- Solutions

Plugged

- Task – Complete the levels for the Attis and Castor planets in the CodeQuest app.
- Buttons – Left, Up, Down, Right, Blaster (NEW), Erase, Erase All, Read Commands, Help, Play
- Tactile Maps – Attis (levels 1-6), Castor (levels 1-6)
  - Key Components on Tactile Maps for Attis
    - Unbreakable wall
    - Breakable wall (has a number inside the block that tells the number of blasts needed to break it) NEW
    - al = Alien
    - ast = Astronaut
    - rsh = Rocket ship
  - Key Components on Tactile Maps for Castor
    - Unbreakable wall
    - Stronger breakable wall (has a number inside the block that tells the number of blasts needed to break it) NEW
    - ast = Astronaut
    - rsh = Rocket ship
- Attis Directions
  - Ask the student what symbol on the map is new to them. The breakable wall is new in this planet.
  - Let the student know that they cannot move to the square with the breakable wall until they go to a square next to the breakable wall and then use the blaster to remove it.
  - Have the student find the new Blaster button at the bottom.
  - Challenge the student to use the least number of steps possible while still getting the astronaut to the rocket ship.
  - Once the student gets the astronaut to the rocket ship, they can select Next Level to go to the next map.
  - After the student has completed all 6 levels, they can select Planet Castor to go to the next Planet.

- Castor Directions
  - Ask the student what symbol on the map is new to them. The stronger breakable wall is new in this planet.
  - Let the student know that they will need to look for the number on the stronger breakable wall to find out how many times they will need to use the blaster to remove it.
  - Challenge the student to use the least number of steps possible while still getting the astronaut to the rocket ship.
  - Once the student gets the astronaut to the rocket ship, they can select Next Level to go to the next map.
  - After the student has completed all 6 levels, they are finished with the lesson.

Lesson 3 – Loops

Unplugged

- Introduce the concept of a "loop" as a repetition of commands.
  For instance: up, up, up, up, can be written as:
  up (loop 4 times)
- Using Grid 2, challenge students to find places within their written code where commands repeat.
- If the code is printed out, students can circle groups of commands that repeat. Braille students can use wiki stix or tactile tape to mark commands that repeat.
- Edit the written code one more time to include at least one string of code that can be written as a loop such as "left (loop 3 times)."
- Challenge students to shorten the program by looping as many commands as possible.
- If time, students can check their work by reading code out loud and having someone else follow commands to be sure that the code does not have any "bugs." Edit as necessary.
- Possible solutions

Plugged

- Task – Complete the levels for the Pollux planet in the CodeQuest app.
- Buttons – Left, Up, Down, Right, Blaster, Loop (NEW), Erase, Erase All, Read Commands, Help, Play
- Tactile Maps – Pollux (levels 1-6)
  - Key Components on Tactile Maps for Pollux
    - Unbreakable wall
    - Stronger breakable wall (has a number inside the block that tells the number of blasts needed to break it)
    - al = Alien
    - ast = Astronaut
    - rsh = Rocket ship
- Directions
  - Have the student find the new Loop button at the bottom.

- ○ Show the student how they can select the Loop button and then swipe up or down to change the number of times to loop the command.
- ○ Placing this Loop command after another command makes that command repeat for the designated number of times.
- ○ Challenge the student to use the least number of steps possible while still getting the astronaut to the rocket ship. The Loop will help decrease the number of steps.
- ○ Once the student gets the astronaut to the rocket ship, they can select Next Level to go to the next map.
- ○ After the student has completed all 6 levels, they are finished with the lesson.

Creating grid 1 for Lesson 1

- Refer to images [Printable grids](#) document or use descriptions below to create a 10x10 grid.
- Use tactile graph paper or an APH Hundreds Boards or something similar for your grid.
- The following can be used for marking grids:
  - Colors or markers
  - Tactile stickers
    - APH Feel 'n Peel Stickers
    - Tactile dots from Exceptional Teaching http://exceptionalteaching.com/compare/281/237/139
    - Tactile dots from Maxi-Aids https://www.maxiaids.com/braille-tactile-voice-markers
    - Shapes cut from textured paper (self sticking will be easier)
    - Foam shape stickers
- Create one marker in 2nd row, 8th column to represent the "rocket ship" goal
- Create one marker in 9th row, 3rd column to represent the "astronaut" beginning position
- Add color, texture, or shape for squares which represent areas that are not accessible
  - Row 1: squares 1-7
  - Row 2: squares 1-7 and 9
  - Row 3: squares 1-9
  - Row 4: square 1 and 9
  - Row 5: squares 1, 3-7, and 9
  - Row 6: squares 1, 6, 7, and 9
  - Row 7: squares 1-4, 6, 7 and 9
  - Row 8: squares 1-4, 6, 7
  - Row 9: squares 1-2, 6-10
  - Row 10: squares 1-10

Additions to the grid for Lessons 2 and 3

- Place an "alien" space in the following locations:
  - 5th column, 6th row
  - 10th column, 2nd row
  - 10th column, 5th row
- Place "crumble wall" space in the following locations:
  - 3rd column, 4th row
  - 5th column, 4th row
  - 7th column, 4th row
  - 5th column, 9th row
  - 10th column, 8th row