Sphero Code Mat & Game Cards

Ahoy Adventurers! In the following cards you will find some Pirate Challenges to promote collaboration, problem solving and fun!

- Have students work in groups of 2-3 to solve the challenges.

- Encourage students to discuss problems they had and how they solved them.

- Have students present their solutions to the rest of the group.

- Challenge students to design their own scenarios to solve.

This activity was inspired by the Sphero Code mat and Activity Cards.

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Designed for the Oklahoma Imagine Science grant partnership as part of the Seven Seas STEM day camp curriculum.

7 Seas of STEM

OSU EXTENSION
4-H YOUTH DEVELOPMENT

Set Sail

The crew has appointed you as the next captain for its round trip voyage.

⚓ Place your Sphero on Buccaneer Bay.

⚓ Open the Draw Program.

⚓ Aim your robot.

⚓ Draw your voyage from Buccaneer Bay to Pirate cove and back, try to avoid any ships and obstacles along the way.

Treasure Island

The map pieces to treasure island have been scattered across the sea in floating bottles. Program your Sphero to touch all the pieces, then move to treasure Island without getting caught by a rival ship.

⚓ Start your journey on the compass (1A).

⚓ Aim your robot.

⚓ Using roll blocks and delay blocks, program your Sphero robot to each floating bottle on the map.

Note: There are only four floating bottles.

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OSU

4-H

OSU EXTENSION
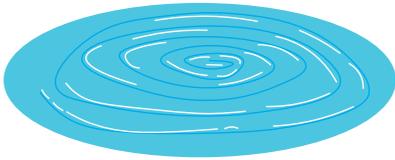4-H YOUTH DEVELOPMENT

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OSU

4-H

OSU EXTENSION
4-H YOUTH DEVELOPMENT

Whirlpool Whirl

Crossing the sea your ship gets caught in a whirlpool and thrown off course. Where will it send you?

⚓ Place Robot on the compass (1A).

⚓ Program Sphero to navigate to whirlpool using roll blocks and delay blocks.

⚓ Add code to end of program to see where whirlpool sends the Sphero.

```
stabilization   off

roll   70°   at   75   speed for   2s

raw motor left   255   right   -255   for   1.5s

stabilization   off

reset aim

roll   0°   at   75   speed for   1s
```

EXTENSIONS- To play this as a game, get two robots and devices. Press start at the same time and the irst to land on a desired location wins.

Flag Flying

Using your robot, program a voyage to visit all the named ships on the map and fly their flag.

⚓ Program your robot to visit each ship using roll blocks and delay blocks.

```
roll   0°   at   0   speed for   0s        delay for   0s
```

⚓ Once arrived use the matrix animation block to match the ships flag.

```
matrix animation   [■■]   loop
```

⚓ After using the matrix animation block, navigate to the next ship and repeat.

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OSU EXTENSION
4-H YOUTH DEVELOPMENT

Island Hopping

There are many islands scattered across the 7 seas. Can your Sphero successfully navigate to all the island or be lost to the sea?

⚓ Place Robot on the compass (1A).

⚓ Aim your robot.

⚓ Use the roll blocks and delay blocks to navigate from island to island.

roll 0° at 0 speed for 0s   delay for 0s

⚓ At each island use a speak block to tell a fact about pirates or sailing you have learned.

speak [ ] and wait

Naval Navigator

Not everybody can steer a boat. Can you successfully navigate the Sphero around the obstacles from one side to the other?

⚓ Set obstacles on the code mat that you can find in the classroom (whiteboard erasers, water bottles, staples, etc.)

⚓ Place Robot on the compass (1A).
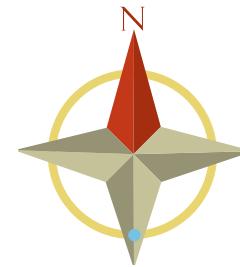
⚓ Try to get your Sphero from one side to the other without hitting a object using the Draw or Block programs.

EXTENSIONS- Have another individual or team set up in the opposing corner (10). Have both teams start their program and see who can navigate to the other side faster.

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I Spy

It is easy to get lost at sea. Find a partner and play a game of "I Spy" to find what your partner sees at sea.

⚓ Place Robot on the compass (1A).

⚓ One person in your group decides on one of the objects on the mat and gives the an "I Spy" clue.

Example: I spy something with a parrot.

⚓ Using a roll and delay blocks, program your robot to roll to the secret object.

⚓ Keep playing until you reach the correct object.

7 Seas Shipwright

The Sphero is the ship, and it has to carry cargo to the different ports.
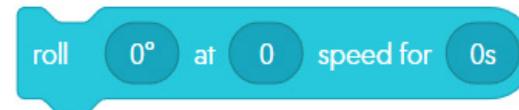
⚓ Create a physical ship from craft supplies for the Sphero to move across the seas. (Craft sticks, straws, pipe cleaners, 18oz cups, etc)

⚓ Place Robot on the compass (1A).

⚓ Using roll and delay blocks, program your robot to roll to the 3 ports.

EXTENSIONS-Run the program again adding additional weight to the ship, as you go from port to port.

- Did the robot complete the mission as designed?

- Adjust your program so that the Sphero can transport its new cargo.

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Location Battleship

In the Battleship style game, you are going to play against three teams to use your Sphero robot to program an "attack" on your enemy's grid. (Divided below)

⚓ Each individual or group will choose a quadrant on the code mat.

⚓ Each team places a sticky note on 3 different grid spaces in their quadrant.

⚓ Groups will play rock-paper-scissors to decide who goes first, and go in a clockwise order.

⚓ Each group will start with their Sphero on the outside corner of their quadrant. From there they will program their robot to hit opposing teams sticky notes. Keep rotating till there is one team left with sticky notes.
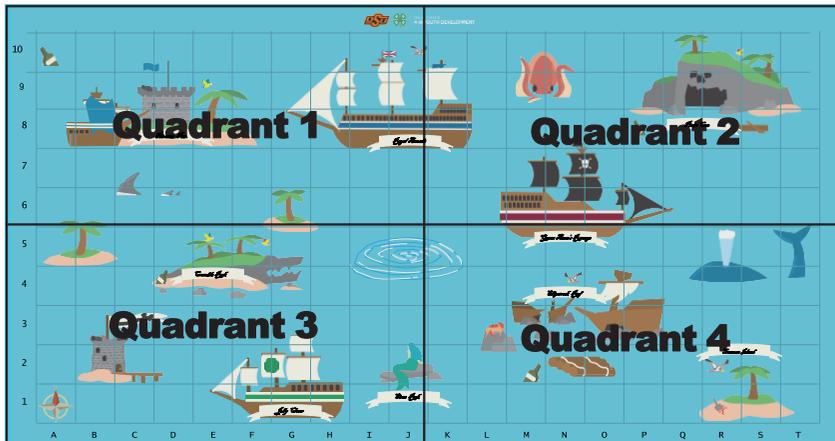
Lost at Sea

Your ship has gotten lost at sea. Use cardinal directions and the compass rose in grid A1 to get from one landmark to another.

⚓ Start by choosing two landmarks on the Code Mat. One for a starting point and the second for the end point.

⚓ Create 4 number variables called North, South, East & West.

North =0°

270°= West

East =90°

South =180°
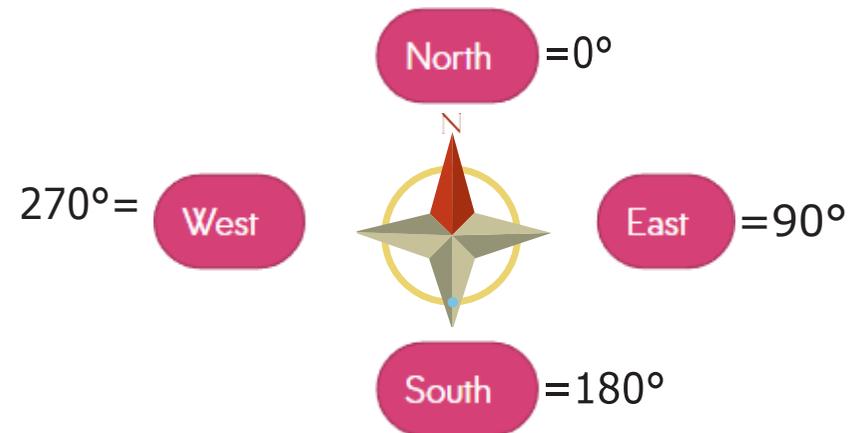
⚓ With your program, use the Variable to establish your heading.

Hint: Drag the Variables you created into the heading of the Roll Command.

⚓ Write your program using these direction variables to get from your starting point to your chosen end point.

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