Pirate Treasure Hunt
Grades 3-5

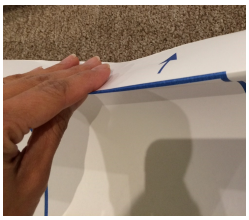
The Big Idea
To find hidden treasure, you need a good map. Today you'll be pirates who map the seas, and then you'll use coordinates to find the treasure before anyone else!

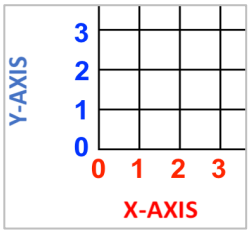
Supplies
In your kit:
- ★ Large grid paper: 2 packs with 4 sheets each
- ★ Dice: 8
- ★ Ruler bracelets: 16

To print:
- ★ Treasure Hunt Coordinates: 2 copies
  See last page of these directions
  Also posted on the Splash of Math website

You provide:
- ★ Bag, hat or bucket to draw numbers: 2
- ★ Crayons: 2 red, 2 blue, 2 yellow, 2 green
- ★ Markers: 2 - one red, one blue
- ★ Pencils: 1 per kid
- ★ Scissors: 1 pair
- ★ Scotch tape
- ★ Scrap paper: half sheet per kid

Key Prep
- ★ Print two copies of the Treasure Hunt Coordinates. Cut the first sheet along the dotted lines to make 30 coordinate pairs. Place all 30 slips into a bag, hat or bucket. Repeat for second sheet and place slips in their own bag, hat or bucket.
- ★ Assemble your giant grid maps:
  1. Lay out 4 grid sheets to form a rectangle with 2 sheets on top and 2 on the bottom. Make sure all edges without a line are facing to the right.
  2. Starting with the bottom left sheet, fold back the top margin by making a crease along the top line.
  3. Slide that sheet to the bottom line of the sheet above it to create 1 continuous line. Tape these sheets together using Scotch tape.
  4. Repeat steps 2 and 3 with the next pair of sheets.
  5. Slide the two pairs together in the center to cover the white margin, forming a complete grid. Use Scotch tape to tape together.
  6. Number the axes: Using the RED marker, number every line from left to right along the bottom of the grid starting with 0 at the left edge. Label this line: X-AXIS. Using the BLUE marker, number every line from bottom to top along the left-hand side of the grid starting with 0 at the bottom edge then. Label this line: Y-AXIS.
  7. Make a second grid by following steps 1-6.





Room Set-up
- ★ Clear floor space to lay out both grids with enough room for kids to sit around each grid.
- ★ Place 1 marker, 4 crayons (one of each color), 4 different colored dice and 1 bag of Treasure Hunt Coordinates on each grid.

What's the Math?

★ Plotting coordinates
★ Bonus: probability

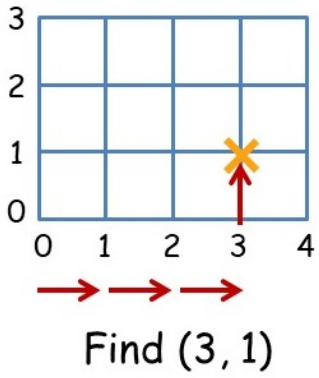
Kickoff

"How many of you have used a map?" **Discuss**. "Today we'll be pirates searching for buried treasure! To find it, we'll need to read the **coordinates** on our map. Coordinates are numbers on a grid that tell you which direction to travel. Let's get started!"

Getting to the Point (10 minutes)

"First, let's find out how coordinates work."

1. Gather the kids together at a grid. Ask them to stand below the x-axis (line along the bottom) and face the grid.
   ★ "Coordinates are a set of 2 numbers. The first number is the **x-coordinate**. That number tells you how many spaces to move across the **x-axis**, which is the bottom line of this grid."
   ★ "To find the x-coordinate, start at the bottom left corner and count across. Make sure you don't count your starting position: It's the number zero!"
   ★ "The second number is the **y-coordinate**, which shows how many spaces to move up the grid along the **y-axis**. Once you move across to your first coordinate on the x-axis, you turn and move up the grid the number of spaces in the y-coordinate. Again, remember that your starting position is zero!"
   ★ "To remember that the first number is the x-coordinate and the second number is the y-coordinate, remind yourself that x comes before y in the alphabet, just like the 'a' in 'across' comes before the 'u' in 'up.'"



Make Your Map (10-15 minutes)

"Let's draw our treasure maps! On your turn, I'll read a pair of coordinates, and you'll connect the coordinates on the grid, in order. Once all the dots are connected, we'll reveal the location of the secret treasure."

1. Divide the kids into 8 teams of 1-2 kids each. Then send 4 teams to each grid.
2. Each grid should have 1 marker and 4 crayons - at least 1 red, 1 blue, 1 yellow, 1 green.
3. Read aloud the first pair of coordinates in the 1st Object column (on the next page).
4. Player 1 on each map finds that first coordinate pair, makes a dot with the marker at that intersection, then hands the marker to the next player.

5. Read the next pair of coordinates. Player 2 finds the corresponding location on the grid, makes a dot and connects it to the previous dot.
6. Repeat steps 4-6 through all the coordinates in the 1st Ocean Object column to create the boat.
7. Next, repeat steps 4-6 for the 2nd Ocean Object column to make the sail.
8. Finally, repeat steps 4-6 for the 3rd Ocean Object column to make the island. IMPORTANT: Tell kids NOT to connect the first dot of the island to the ship or sail! They wait until they make the second dot of the island to begin connecting dots.
9. Occasionally ask the kids what they think the pictures are going to be. Suggest some silly ideas!
10. Don't reveal the picture below – keep the surprise! When the map is complete, point out the island: That's where secret treasure is buried!
11. Have kids color the maps with crayons: blue ocean, green island, red boat and yellow sail. They can quickly shade the objects – just enough to bring the map to life!

Map Drawing Coordinates

1st Object (Boat)	2nd Object (Sail)	3rd Object (Island)
(3, 1)	(5, 3)	(11, 7)
(8, 1)	(5, 9)	(10, 8)
(10, 4)	(8, 4)	(11, 9)
(8, 3)	(5, 4)	(13, 9)
(3, 3)		(12, 8)
(1, 4)		(13, 8)
(3, 1)		(11, 7)

Hunt for Treasure (20-30 minutes)

"Now that we've drawn our map, let's race to the island to find the buried treasure!"

1. Give each team a pencil, a piece of paper, and one of the dice to use as a playing piece. Make sure each team on the board has a different color die than their opponents.
2. Taking turns, each team picks a Treasure Hunt Coordinate pair out of the bag and finds that intersection on the game board.
3. If the coordinates land on any part of the ship or sail, either inside or on the line, the team places its die on that spot.
   ★ "You're on board the ship! Mark your place with your die. Your turn is over."
4. If the coordinates land in the ocean, the player may choose to swim along 2 gridline line segments in any direction to reach the ship or the island OR may choose to remain solo.
   ★ "If you decide to swim to the ship, swim 2 gridline spaces and mark the new location with your die."

- ★ "If you can swim to the island, you're a winner! But be careful: Your fellow pirates will try to steal from you!"
- ★ "If you're too far away to swim to the ship or the island, mark your place with your die and tread water. Your turn is over."

5. After every turn, put the coordinate pair in a discard pile.

SCORING AND WINNING

The buried treasure is worth 4 points.

1. If a pirate on the boat pulls coordinates that land on the island, each pirate on the boat steals 1 point from the winner's 4 points.
   - ★ "Being on the boat means you have to share your treasure.
   - ★ "BUT being on the boat also increases your chances of stealing some treasure from the winner!"
2. If a pirate in the ocean pulls coordinates that land on the island OR swims to the island, ALL other pirates on the boat and in the ocean quickly grab a coordinate pair from the bag. If any of *those* pirates land on the island, they each steal 1 point from the winner's 4 points.
3. Players track everyone's points after each round on scrap paper. The highest cumulative score after 3 rounds wins!
4. Give all the kids a ruler bracelet as a take-home prize for finding the buried treasure!
5. Once kids have played 3 rounds:
   - ? "What made you decide to swim to the boat or stay in the ocean? Which worked out better?" **Discuss.** The risk of not sharing treasure with the crew is weighed against the possible reward of gaining all the treasure for yourself.
   - ? "There are 30 Coordinate Pairs in the bag. If there are 3 coordinate pairs that land on the island, what are your chances of winning on the first turn?" **Discuss.** Your chances of winning on the first turn are 3 out of 30, or 1 in 10. Your chances of winning get better every time another player picks a non-winning coordinate pair out of the bag!

Wrap Up

"It's fun to hunt for pirate treasure. And just like anyone who's navigating by car, boat, or plane, we used math to find our way."

Treasure Hunt Coordinates

→ → 9, 10	→ → 1, 5	→ → 9, 5	→ → 10, 4	→ → 5, 7
→ → 2, 8	→ → 11, 9	→ → 6, 7	→ → 10, 8	→ → 7, 5
→ → 3, 4	→ → 8, 7	→ → 12, 8	→ → 14, 3	→ → 5, 0
→ → 9, 3	→ → 8, 4	→ → 7, 2	→ → 1, 1	→ → 0, 8
→ → 12, 3	→ → 4, 2	→ → 5, 10	→ → 8, 9	→ → 3, 3
→ → 11, 8	→ → 13, 7	→ → 12, 6	→ → 10, 7	→ → 12, 5