iMath Readers

Finding the Treasure:
Coordinate Grids

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Math Objective

Children understand how grids can help pinpoint a location. They learn about coordinate grids, ordered number pairs, and x-coordinates and y-coordinates. Children learn about graphing math data by plotting points on a grid. And they make predictions from patterns they observe on a grid.

iMath Discover Activity

In this activity, children use their grid and graph skills to make a map or model of a space inside or outside their homes.

➤ Objectives

Children will:
• use measurement tools to measure a real-world space.
• choose a unit scale for their graph-paper drawing of that space.
• measure to plot the location of objects in the space.
• use a math compass and ruler to plot points.
• learn the median.

Materials

- measuring tape
- graph paper
- pencil
- masking tape or pieces of string
- math compass

Lesson Plan

Before Reading

Investigation	Math Concepts
Ask children to look at the picture on pp. 4–5. Read the text. Ask: *Have you heard of geocaching? Do you know how it works?* Provide children with Internet time to do research on geocaching and GPS satellite-mapping technology. Have children share what they find.	Connecting to what they know helps children engage in the topic. They gain confidence in using the Internet as a research tool.
Ask: *Does your car or a friend's car have a satellite-operated map system in it? How is it similar to the technology used in geocaching?* Record children's answers on the board.	Accessing prior knowledge gets children to think about and engage with the topic.

Children join a high-tech treasure hunt using their coordinate-reading skills. They solve real-world problems and find the answers by understanding how to use ordered pairs of coordinate points to find hidden treasure.

During Reading

Investigation	Math Concepts
pp. 6–9: Display a map of the world with lines of latitude and longitude. Invite a volunteer to read p. 6. Ask: *How are lines of latitude and longitude on a map like a coordinate grid?* Record children's answers. Distribute graph paper. Invite a volunteer to read p. 7. Have children draw the grid on p. 7 while you draw it on the board. Have children label the unknown points. Invite volunteers to fill in the unknowns on the graph on the board. Read p. 8 aloud and draw the graph on p. 8 on the board while you have children draw it on graph paper. Ask: *Do you see the pattern in these coordinate pairs? What will the next pair of numbers be?* Read p. 9 aloud. Ask: *What are the coordinates for each of the symbols on this page?* Have children check each other's work.	Children understand x- and y-coordinates on a grid. They understand ordered pairs and know how to plot points on a coordinate grid. Children deduce and identify two numerical patterns using two given rules. They find apparent relationships between corresponding terms. Children read and form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

During Reading (continued)

Investigation	Math Concepts
pp. 12–13: Read pp. 12–13 aloud. Ask: *Do you remember how to use ordered pairs? Which is the x-coordinate and which is the y-coordinate?* Have children use the coordinates to find the giraffe on the map. Ask: *What is a memory device or a poem we can make up to remember which coordinate is which*? (X says with a frown, "I'm always first and I like to go across." Y says, "Why, that's your loss, because I like to go up and down!")	Children understand x- and y-coordinates on a grid. They understand ordered pairs and know how to plot points on a coordinate grid. Children create a mnemonic to help them remember x and y coordinates and their features.
pp. 14–17: Invite a volunteer to read pp. 14–15 aloud. Ask: *What is the answer to the question on this page?* Children do mental math to find the answer. Read pp. 16–17 aloud. Have children answer the questions as you read.	Children deduce and identify two numerical patterns using two given rules. They find apparent relationships between corresponding terms. Children read and form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.
pp. 18–19: Invite a volunteer read pp. 18–19 aloud. Ask: *What is the rule for both x and y? What operation do you use?* Have children make their own data tables with rules of their own creation for x and y coordinates. Have children trade tables with their neighbors and find the unknown rules.	Children deduce and identify two numerical patterns using two given rules. They find apparent relationships between corresponding terms. Children find unknown coordinates using the rules they have identified. Children read and form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.
pp. 20–24: Invite children to work in pairs and read pp. 20–23 silently. Let them work together to find the answers to the challenges on these pages. Have pairs share their answers with the larger group. Read p. 24 aloud. Pass around sample copies of maps with grids. Invite discussion with prompts. Ask: *Have you read a map before? When did you do that? What helped you read the map?* Have children find a location on the maps you distributed.	Children read and form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. Children relate their experience with maps to careers using map-reading and math.

During Reading (continued)

Investigation	Math Concepts
pp. 25–27: Invite children to continue to work in pairs and read pp. 25–27 silently. Let them work together to find the answers to the challenges on these pages. Have pairs share their answers with the larger group.	Children deduce and identify two numerical patterns using two given rules. They find apparent relationships between corresponding terms. Children find unknown coordinates using the rules they have identified. Children read and form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane or map.
pp. 28–29: Invite children to continue to work in pairs and read pp. 28–29 silently. Let them work together to find the answers to the challenges on these pages. Have pairs share their answers with the larger group.	Children deduce and identify two numerical patterns using two given rules. They find apparent relationships between corresponding terms. Children find unknown coordinates using the rules they have identified. Children read and form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane or map.
pp. 30–31: Read pp. 30–31 aloud. Show children a globe with lines of latitude and longitude. Provide children with library or Internet time to research how sailors and pilots use latitude and longitude.	Children relate latitude and longitude on a globe and map to a grid and infer real-world relationships and uses. They use the Internet and become comfortable with it as a research tool.
pp. 32–33: Invite a volunteer to read these pages aloud. Children work alone to find the answer to the question posed on p. 33. Have children whisper the answer to you when they figure it out.	Children read and form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane or map. They use the coordinates to find a location.
pp. 34–36: Read pp. 34–35 aloud. When children answer the questions on those pages correctly, continue on to p. 36, inviting a volunteer to read it aloud. Ask: *If you were drawing an imaginative map, what would your map show*? Record children's answers on the board.	Children read and form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane or map. They use the coordinates to find a location.

During Reading (continued)

Investigation	Math Concept
pp. 37–41: Gather children into small groups. Have them read pp. 37–41 quietly. Children work together to answer the questions on those pages correctly. Walk around and check children's understanding.	Children identify coordinates on a grid. They deduce and identify two numerical patterns using two given rules. They find apparent relationships between corresponding terms. Children find unknown coordinates using the rules they have identified. Children read and form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane or map.
pp. 42–44: Children remain in small groups. Distribute graph paper. Read pp. 42–44 aloud. Children work together, draw the grids on each page, and answer the questions on those pages, filling in missing coordinates and naming coordinates. Visit each group and check children's understanding.	Children identify coordinates on several different grids. They deduce and identify two numerical patterns using two given rules and fill in missing coordinates in a data table. Children weigh the value of different strategies.
p. 45: Read p. 45 aloud together. Provide Internet time for children to research geocaching.	Children use hands-on skills to learn about geocaching and reading maps and coordinate grids. They plan and design their geocaching activity.

After Reading

Ask children to restate the key ideas in the book.

Investigation	Understanding Math
Children create an imaginative map with coordinates. They write a brief story about the map and what it represents. Children should include coordinates in their story that provide clues to the ultimate treasure.	Children use math and map-making skills to draw a map with grid. They write clues that use operations and coordinate-reading.
Borrow a GPS unit. Hide different caches around the school. Provide children with coordinates and clues. Let children test their coordinate-reading skills.	Children use a real-world situation to learn how to use ordered pairs of coordinates.