
Reading Different Text Forms: Following Instructions

MATHEMATICS

Students are expected to read and follow instructions in every subject area. This strategy asks students to examine different types of instructions, their features, and elements, and how the features, language and organizational patterns can be used to help the reader understand and complete a task.

Purpose

- Provide students with strategies for reading, interpreting and following instructions to complete a specific task.
- Learn how instructions are organized.

Payoff

Students will:

- identify purposes for reading instructions.
- develop a process for reading and following instructions.

Tips and Resources

- Instructions give detailed step-by-step information about a process or procedure.
- When learning mathematics, students read instructions in a variety of contexts such as playing a math game, reading the sequence in a sample solution, or instructions for using Geometers' Sketchpad to complete a task. It is helpful for students to compare and analyse the organizational patterns, language, and features e.g., What is the difference between using bullets for instructions and instructions that are numbered? (Numbers imply a prescribed sequence.)
- Students are more successful with reading instructions when they have had opportunities to develop sequencing skills orally and then pictorially (e.g., "barrier games" in which pairs of students use a textbook to create a visual "barrier" and then take turns giving and following instructions for completing math tasks such as completing a drawing on a grid or using tangrams to make a shape).
- Graphic organizers such as flow charts and story boards can be used to sequence the instructions through pictures (e.g., the sequence in building a tangram shape) or words (e.g., the explanation for solving a problem) or symbols (e.g., the solution to a sample problem).
- Ensuring that students have previous experience with the content will improve their comprehension when reading instructions (e.g., students will be able to follow instructions for using algebra tiles if they have previous experience in using the manipulative).
- Student/Teacher Resources provide sample materials for grade 7, 8 and 9 for using the Following Instructions strategy.
- **See Student/Teacher Resource, *Following Instructions – Sample*.**

Further Support

- When students become overly concerned about accurately following instructions they may lose their focus on the math skills and concepts that they are learning in the task. Students can work in groups and take turns reading the instructions.
- Provide students with a list of typical signal words and task prompts and suggestions/strategies for responding to them (e.g., explain, list, compare, give reasons, select, choose, show your work, solve, simplify, graph, illustrate, show, evaluate, substitute).
- Provide students with opportunities to follow oral instructions, and discuss how they were able to complete the instructions and what was challenging, confusing or frustrating.

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MATHEMATICS

What teachers do	What students do
<p>Before</p> <p>Asking Questions</p> <ul style="list-style-type: none"> Provide each student with a photocopy of the instructions. Model the strategy for asking questions. Orally identify a question and record it on an overhead copy of the instructions e.g., The name of the game is “Green is Go”, I wonder if the other traffic light colours of red and orange will be used in this game? Ask students to continue reading the instructions and recording their questions. <p>Revising for Clarity</p> <ul style="list-style-type: none"> Model the technique of revising for clarity on an overhead copy of the instructions. Cross out and simplify the vocabulary. Rewrite longer sentences by using shorter sentences with fewer clauses and phrases. Have the students select a problem or a set of task instructions and then direct students to revise it for clarity. <p>Sequencing</p> <ul style="list-style-type: none"> Make copies of game instructions or samples of student responses from a text book or exemplar. Cut them into steps. Ask students to order them in a sequence. Identify strategies used to make decisions about the order (e.g., the use of signal words such as first, next, then or numbers). 	<ul style="list-style-type: none"> Students work in pairs. One student has a copy of the instructions and reads them to his/her partner. The second student asks questions for clarification. In this strategy students learn to refer to the text while they are reading in order to answer questions. Choose a problem or instructions for a task from TIPS or a textbook. Revise the text and record the revised version in a notebook. Compare the two versions for clarity of communication. Put instructions for a game, or samples of students responses, in sequence. Compare sequences with other students, pairs of students, or groups of students. Identify text features that support sequencing and ordering such as signal words and numbering.
<p>During</p> <ul style="list-style-type: none"> When students ask questions, model returning to the text to find answers to their questions. While circulating around the room, ask students questions about the instructions and observe the strategies used to answer the questions (e.g., referring to the text). 	<ul style="list-style-type: none"> Refer to the text to check for answers to questions about “what to do next”.
<p>After</p> <ul style="list-style-type: none"> Ask students to identify which instructions were most helpful and which were most confusing. Identify the strategies that students used to make sense of the instructions e.g., “I had to slow down and read the instructions again.” Summarize the strategies that were used. 	<ul style="list-style-type: none"> Compare personal choice of reading strategies with the strategies used by classmates. Reflect on reading strategies used to make sense of instructions.

Notes



Following Instructions – Sample (Grade 7)

Adapted from: GSP V4 Instructions from the TIPS Section 3: Grade 7 Summative Task: The Gazebo
<http://www.curriculum.org/occ/tips/index.shtml>

Constructing a Hexagon by Rotating Diagonals

Set Distance Units

- Under the Edit menu choose Preferences.
- Set distance units to cm.
- Set precision to hundredths.

Saving Files

- Establish classroom procedures.

Printing Sketches

- Use the text tool to create a text box with your name and date.
- Under the File menu choose Print Preview – then select Scale to Fit Page – then choose Print.

Construct a Hexagon

1. Construct a line segment.
2. Under Construct choose Point at Midpoint.
3. Under Transform choose Mark Center.
4. Select the line segment and its endpoints.
5. Under Transform choose Rotate.
6. Enter 60o for the angle of rotation.
7. Under Transform choose Rotate.
8. Deselect, then choose the segment tool to construct the sides of the hexagon.
9. Do a drag test.

Take Measurements

1. Select the two endpoints of one side of the hexagon.
2. Under Measure choose Distance. (The measurement appears in the sketch.)
3. Select the two endpoints of one diagonal of the hexagon.
4. Under Measure choose Distance.

Make Calculations

Calculate the Perimeter

1. Under Measure choose Calculate.
2. Select 6, select *, select the measurement of the side length, then press OK.

Calculate the Ratio of Perimeter to Diagonal

1. Under Measure choose Calculate.
2. Select the Perimeter measurement, select ÷, select the measurement of the side length, then press OK.
3. Do a drag test and watch the measurements change.

Create a Table

1. Select all of the following measurements and calculations: side length, diagonal length, perimeter, ratio.
2. Under Graph choose Tabulate.

New Table Entry

1. Change the side length of your hexagon by dragging a point in the diagram.
2. Place the arrow on one of the table entries.
3. Double click and a new entry will be added.

Repeat steps 1-3 to add more entries.



Student/Teacher Resource

Following Instructions – Sample (Grade 8)

Adapted from: TIPS Section 3: Grade 8 Lessons 17 –23, Task: Green is a Go
<http://www.curriculum.org/occ/tips/index.shtml>

20.1: Green is a Go

Names:

Date:

With a partner, play a simple game involving six tiles in a bag, e.g., three red and three green tiles. Take two tiles from the bag during your “turn.”

Rules

You may not look in the bag. Draw one tile from the bag and place it on the table. Draw a second tile from the bag and place it on the table. Return the tiles to the bag. You win if the two tiles drawn during your turn are both green.

Predict the number of wins if you play the game 40 times. Record and explain your prediction.

Play the Game

1. Take turns drawing two tiles from the bag, following the rules above. Record your wins and losses on the tally chart. Continue this until you have played a total of 40 times.

	Green, Green (win)	Red, Red (loss)	Red, Green (loss)
Totals			

2. After you have played 40 times, use your results to find the experimental probability of winning. (Remember that probability is the number of wins divided by the total number of times the game was played.)
3. How does this compare with your predictions? Explain.
4. Find the theoretical probability of winning. (Hint: Use a tree diagram to show all possible draws).
5. Write a paragraph to compare the theoretical probability you just calculated to the experimental probability you found earlier. Are these results different or the same? Why do you think they are the same/different?

Following Instructions – Sample (Grade 9)

Adapted from: TIPS Section 3: Grade 9 Introductory Unit: Task: Grid Walking Game
<http://www.curriculum.org/occ/tips/index.shtml>

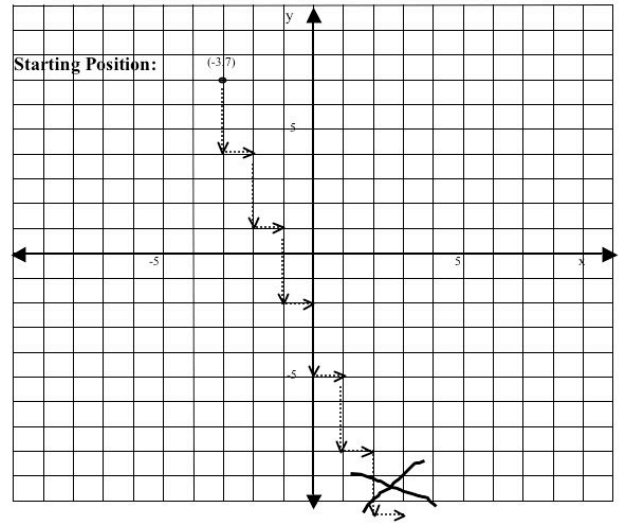
1.2: Grid Walking

1. You and your partner need a Grid Walking game board and a score sheet.
2. Each of you chooses one 'Starting Position' and one pair of Grid Walk directions. Record these on the score sheet.
3. On the grid, mark your starting position and move across the grid following the Grid Walk directions.
4. Keep moving following the Grid Walk directions until you get to an edge or a corner of the grid.
5. Collect 1 point for each complete "step." No points are given for partial steps!
6. The next player chooses a new starting position and new Grid Walk directions.
7. Use a different colour to mark each turn on the grid.

Example:

The starting position is $(-3, 7)$.
 The Grid Walk directions are: Down 3, Right 1.

This play has 5 complete "steps" and earns 5 points.



Starting Position Choices		Grid Walk Choices			
$(2, -4)$	$(-4, -1)$	Up 0	Down 0	Right 0	Left 0
$(-2, 0)$	$(1, 1)$	Up 1	Down 1	Right 1	Left 1
$(-3, 7)$	$(0, 0)$	Up 2	Down 2	Right 2	Left 2
$(5, -4)$	$(-6, 1)$	Up 3	Down 3	Right 3	Left 3
$(0, 2)$	$(4, -3)$	Up 4	Down 4	Right 4	Left 4
$(4, 2)$	$(-2, -3)$	Up 5	Down 5	Right 5	Left 5