Banking Business

STRAND: Measurement and Geometry

STRAND CONCEPT: Area, Perimeter, and Circumference

SOL 5.8ab

Remediation Plan Summary

Students differentiate among perimeter, area, and volume and identify which concept is appropriate for a given situation.

Common Errors and Misconceptions

Students confuse the difference between area, perimeter and volume. Students confuse the units used to measure the area, perimeter and volume.   They have difficulty understanding the difference between a linear, square, and cubic unit.

Materials

- Pattern Blocks or color tiles
- Grid paper
- Several small rectangular prisms- such as small boxes
- Inch cubes and centimeter cubes
- Copies of worksheets:
    - Banking Business,
    - Word Frames,
    - Matching Cards,
    - Perimeter, Area or Volume?
- Card stock
- Scissors
- A projector

Introductory Activity

1. <u>Perimeter</u>: Demonstrate the concept of perimeter by tracing on grid paper the outline of a pattern block or a figure made of color tiles. Describe perimeter as the "distance around a figure," and demonstrate this by tracing around the figure again. Have students sketch the resulting polygon and estimate the perimeter, given the units on the grid paper.
2. <u>Area</u>: Ask students to estimate in square grid-paper units the area of the same figure. Have them share their strategies and estimates. Ask which strategies work and how they can write the area in square units.
3. <u>Volume</u>: Hold up a small rectangular prism and put similar prisms on each table for students to manipulate. Ask students, "How many cubic units fill this solid?" Hand out several inch cubes and centimeter cubes for each prism. Ask "How would you record the volume of this prism in cubic units?"
4. Have students' record definitions of *perimeter*, *area*, and *volume* in their math logs, and post these definitions on a chart or on the board.
5. Distribute copies of the attached "Banking Business" worksheet, and have students complete it. Have a few students share what they wrote.

Plan for Instruction

1. Distribute copies of the attached "Word Frames" worksheet, and have students complete each frame according to the printed directions. Give assistance as necessary.
2. Copy the attached Matching Cards on card stock, and cut them out. Have students use the cards to play a Matching Game by the rules listed below to practice measurement concepts.
3. <u>Rules</u>: Turn all cards face down on the table in two rows—one row of situation cards and one row of word cards. Each player takes a turn simultaneously turning over two cards, one from each row, to see if they match. If they match, the player gets to keep them. If they do not match, they are returned face down to the table. Play continues until all cards are matched. The player with the most matches wins.

Pulling It All Together (Reflection)

Have students complete the "Perimeter, Area, or Volume?" worksheet and/or the "Sketch" worksheet.

Note: The following pages are intended for classroom use for students as a visual aid to learning.
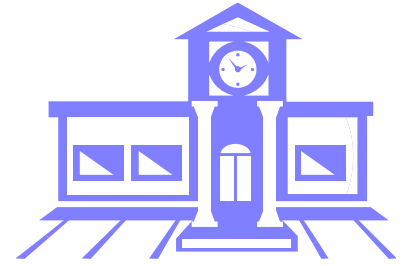
Name: _____

Banking Business

BANK of WORDS					
paint	water	bed	dirt	roof	grass
carpeting	cover	table	boxes	chalk	tile
flower bed	jar	barrel	shingles	fill	string
wallpaper	room	kite	sidewalk	rope	bucket
swimming pool	bowl	wood	cat	tractor	lawn
fish tank	cup	fence	dog	mow	garden

1. Go to the Bank of Words above, and withdraw at least three words to use in a sentence about a perimeter-measurement situation. Scratch the words out of the bank to indicate they have been withdrawn. Write your sentence here:

    _____

    _____

2. Return to the bank for another withdrawal of three or more words to use in a sentence about an area-measurement situation. Scratch the words out of the bank to indicate they have been withdrawn. Write your sentence here:

    _____

    _____

3. Make a final withdrawal of three or more words to use in a sentence about a volume-measurement situation. Scratch the words out of the bank to indicate they have been withdrawn. Write your sentence here:

    _____

    _____

4. Now that you have spent at least nine words out of your bank account, prepare to show how you spent them by sharing your sentences with the class.
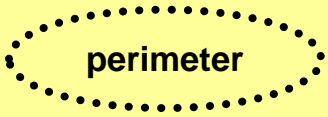
Name: _____

Word Frames

Complete the words frames below for the words *perimeter*, *area*, and *volume*.

1. Write an example of the term in the lower left corner of the frame.
2. Draw a sketch illustrating the term in the upper right corner.
3. Write a definition of the term in the upper left corner.
4. Write a sentence using the term in the lower right corner.

Compare your frames with those of a partner. How are they similar and different? Explain:

_____

_____

Definition	Sketch
	perimeter
Example	Non-example

Definition	Sketch
	area
Example	Non-example

Definition	Sketch
	volume
Example	Non-example

Matching Cards

perimeter	How many yards of fencing will you need to fence your back yard?
perimeter	How many feet of string will you need to make an outline of where your vegetable garden will be planted?
perimeter	How many meters will you walk when you walk around the outside of your school?
perimeter	How many tiles do you need to frame your picture?

perimeter	How many feet of fencing will you need to use to make a dog pen?
perimeter	Old MacDonald has 40 feet of fencing to build a pig pen. What are the dimensions of the pen that will give the pigs the most room?
perimeter	How many gallons of paint will it take to paint your bedroom walls?
perimeter and area	How many square feet of lawn do you have to mow?

area	How much of the floor does the rug cover?
area	How large of a book cover do you need to cover your math book?
area	How many square feet of tile will you need to cover the new bathroom floor?
area	How much water does the swimming pool hold?

area	Will that shipping crate hold the birthday present you bought to send to Grandma?
area	What is the distance of the dirt bike path around the park?
area	Will that tablecloth fit the table?
volume	How much trash will the trash can hold?

volume	How much water will you need to fill your fish tank?
volume	How much room do you need on the sidewalk to play hopscotch or 4-square?
volume	Will you be able to pack all of your school books in that box?
volume	How far is it to run twice around my block?

Name: _____

Perimeter, Area, or Volume?

Draw a line from each unit of measurement listed below to the name of the item it can measure.

    1 inch   1 square inch   1 cubic inch

    rug   water in a fish tank   border of a picture frame

The questions below ask for a measurement of *perimeter* (P), *area* (A), or *volume* (V). Fill in the blank by each question with a letter (P, A, or V) to identify what kind of measurement it is asking for.

1. How much fencing is needed to enclose a garden? _____

2. How much air will fill your bike tire? _____

3. How much wallpaper do you need to cover one bedroom wall? _____

4. How much rainwater can be collected in the barrel? _____

5. How long is the yellow police tape around the crime scene? _____

6. How much material do you need to make a quilt? _____

7. What is the length around the track? _____

8. Which jewelry box will hold the most? _____

9. How much wrapping paper do you need to cover the present? _____

10. How long is the border around that bulletin board? _____

Name: _____

Sketch

Draw a picture of a real-life scene that includes three examples each of perimeter, area, and volume. Record these objects or situations in the chart below your sketch. Add details and color to your sketch, and be prepared to share your examples of perimeter, area, and volume with a partner.

Title: _____

Object in My Picture	Perimeter, Area, or Volume?

Explain how perimeter, area, and volume are different.