

Ring Around the Playground

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Overview: Have you ever tried to figure out how much fence you would need to buy to fence in your ranch or how many railroad ties you need to block around your garden? By understanding and learning to calculate perimeter, you can answer these questions and more. In this lesson, students will learn the definition of perimeter, how to calculate perimeter and use perimeter in real life situations.

Grade Levels: 3rd – 5th

Time Allotment: Two 45-minute lessons

Subject Matter: Math, Writing, Language Arts

Learning Objectives:

Students will be able to:

- Define perimeter
- Measure perimeter on a small scale
- Relate the use of perimeter to real life situations

State Standards:

Math

- 3.14 The student will estimate and then use actual measuring devices with metric and U.S. Customary units to measure:
- a) length—_inches, feet, yards, centimeters, and meters;
 - b) liquid volume—cups, pints, quarts, gallons, and liters; and
 - c) weight/mass—ounces, pounds, grams, and kilograms.
- 4.11 The student will:
- a) estimate and measure length, using actual measuring devices, and describe the results in both metric and U.S. Customary units, including part of an inch ($\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$), inches, feet, yards, millimeters, centimeters, and meters;
- 4.13 The student will:
- a) identify and describe situations representing the use of perimeter and area; and
 - b) use measuring devices to find perimeter in both standard and nonstandard units of measure.
- 5.8 The student will describe and determine the perimeter of a polygon and the area of a square, rectangle, and right triangle, given the appropriate measures.

- 5.11 The student will choose an appropriate measuring device and unit of measure to solve problems involving measurement of:
- length—part of an inch ($\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers;

Media Components

Streaming Video - *Area and Volume*, Clip 2 entitled, *Defining Perimeter*, from United Learning: www.unitedstreaming.com

Web Sites:

United Streaming Video

www.unitedstreaming.com - this web site is available to most Virginia schools and is an excellent site for videos on demand. Videos can be downloaded for use at any time.

Perimeter

<http://pittsford.monroe.edu/jefferson/califieri/geometry/perimeter.html> - this site is a good summary of perimeter and includes a quiz that can be printed out and turned in for an assessment.

Home Depot, Lowe's, Fence-it

www.homedepot.com - these are online sites where students can look for fence prices
www.lowes.com
www.fence-it.com

Materials

For Introductory Activity

- Memo from Principal (See attached sample of a memo)

For Culminating Activity

For Individual or Whole Group Work

- A computer for each student for individual work or a computer connected to a television in the classroom for whole group instruction.

For Group Work

- A yardstick
- A ball of string or yarn about 15 yards long
- Pencil and paper
- Computer for each group and a list of web sites
- Calculator

Prep for Teachers

Prior to teaching this unit, bookmark all sites mentioned above. Take the time to review and cue your videotape to the first viewing segment. Photocopy all student handouts for distribution as needed during the lesson.

When using media, provide students with a Focus for Media Interaction, a specific task to complete and/or information to identify during or after viewing of video segments, web sites, or other multimedia elements.

Introductory Activities

Read the memo from the principal asking the class to help him with the fence project around the playground. (See Attached Sample) Read the memo and explain to the students what the principal is asking them to do. Go outside and look at the playground area. Discuss with students different ideas on how to accomplish the project-discuss how they can find out how much fence they are going to need and how much it will cost.

Take students back inside and write on the board the objectives of the project. Include the following:

1. Find out how much fence will be needed
2. Find out how much it will cost
3. Reply to principal with summary information

Learning Activities

Step 1: **Focus for Media Interaction**, Say, “The first thing we will have to do is figure out how we are going to find out how much fence we will need. Let’s watch this segment of downloaded streaming video to see if we can find out how we will might work on our playground project.” **START** video at the beginning (cue 4:30) and **PAUSE** when the lady finishes running around the bases and throws her hands out wide (cue 4:56). (Discuss the answer-the distance all the way around.)

Step 2: **Focus for Media Interaction**, Say, “Now let’s find out what the distance all the way around is called.” **RESUME** video and **PAUSE** as the children start around the table and the narrator says, “The distance all the way around is called the perimeter.” (cue 5:14) (Ask students what that distance is called – perimeter.)

Step 3: **Focus for Media Interaction**, Say, “Now let’s find out how to find perimeter.” **RESUME** video and **PAUSE** when the children finish measuring the table and the narrator says, “...by adding the length of all the edges.” (cue 5:22) (Discuss the answer with the students – add the length of all the edges.)

Step 4: **Focus for Media Interaction**, Say, “Now, let’s look at how we can take this outside and use it in a real life situation.” **RESUME** video and **PAUSE** when the

narrator says, ...every piece of land in the world is defined by its boundary or perimeter.” (cue 5:50) (Discuss the answer – a farm must have border/perimeters to keep animals in, all land is defined by perimeters.)

Culminating Activity

(To the Teacher: The computer activity should be done in a lab setting where each student can have a computer. However, it can be done as a whole group with one computer attached to a large screen television)

Step 1: <http://pittsford.monroe.edu/jefferson/califieri/geometry/perimeter.html>

Have students go to the bookmarked website listed above. **Focus for Media Interaction,** Say, “Review what perimeter is and discuss the best ways to find the perimeter of an object or area. Once you have finished reviewing the information, click on the Perimeter Quiz and take the quiz. When you are finished, print out a copy of the quiz and turn it in.” After all students have completed the quiz and turned in a copy, go over the questions and answers together to make sure students have a good understanding of perimeter. Reinforce any areas where students are still having problems.

Step 2: **Focus for Media Interaction,** Say, “Before we are ready to go outside and tackle the job of the playground, let’s start small and try a few objects in the classroom first.” First we will measure to find the perimeter of objects in the classroom to make sure we have a good understanding of measuring perimeter. Then we will look at other ways to measure perimeter on a larger scale. Divide students into groups of three. Give each group a yardstick and ask them to measure to find the perimeter of a table, a door, and the chalkboard. Have a recorder in the group write down the answers. Compare answers to see if the groups came close to the correct answer.

Step 3: Now give each group a ball of yarn or string. Ask student to think of a way they could use the ball of string to measure these larger items that would be easier than using the yardstick. Help students come to the conclusion that they could use the string to go all the way around the object and then measure the string. Try this on one or two of the objects they just measured. (ex. Chalkboard, door)

Step 4: Say, “Now, do you think we are ready to try the playground? What do you think is going to be the best way to do that job?” Lead students to decide to use the string. Have all groups take their balls of string outside. Have one group stretch their string out as far around the playground as it will go. Then have a second group tie on their string and so on until the students have gone all the way around the playground. Take the long string back inside and measure it using the yardstick to find out how many yards it is around the playground. You can write the answer on the board next to the first question.

Step 5: Divide students into groups and assign one of the following web sites to each group. Have each group look at the web site and find out how much the fence costs per yard and write down that information.

www.homedepot.com

www.lowes.com

www.fence-it.com

Step 6: Have students use the price information they found on the web site and multiply that price by the number of yards around the playground to come up with a final cost for the fence project.

Step 7: With the teacher doing the typing, have students sum up the information they have come up with and dictate a memo back to the principal with their findings. (See sample memo)

Cross-Curricular Activities

Logical Thinking Skills and Art: Show the remainder of the video that demonstrates students using a card to cut a perimeter large enough to pass over their body. Then have students try to complete the task. This is an excellent final activity for the end of the unit or week.

Science and Art: Have students design a farm with measured borders/perimeters for the animals and gardens they will have on the farm. Include the perimeter and the type of animal or crop in each sectioned area.

Math: Convert information from yards to meters.

Social Studies: Research the types of fencing used through the ages.

Technology and Math: Design some objects to be measured using the computer and a word processing or drawing program. Using the drawing tools, draw several objects that can be measured with a ruler. (Students should already have some knowledge of word processing to be able to complete this activity. If they do not, have them draw objects with a ruler.) Once students have finished drawing objects, have them print out the page and exchange papers with another student. Hand out rulers and have students try to measure the sides of the objects and add them together to come up with the perimeter. Have students check each other's work.

Community Connections

1. Have a builder come in and talk to students about house plans, blueprints, building a house and show some of the tools they use for measuring.

Sample Memo From Principal (Put on school letterhead)

Date

To: Ms. Jones' Class

From: Mr. Johnson

Subject: Playground Fence Project

The school is looking into the possibility of building a fence around the playground behind the school. I would like for your class to take on the responsibility of finding out how much fence we will have to purchase and how much the fence will cost.

Please let me know what your findings are in a summary report so that I can make a final decision on the project.

Sample Memo to the Principal (maybe make classroom letterhead)

Date

To: Mr. Johnson

From: Ms. Jones' Class

Subject: Summary for Playground Fence

We have completed a study of the playground and come up with the following information to help you make a decision about the fence project.

We found that you will need to purchase _____ yards of fence.

The best price for the fence was found at _____.

The cost for the fence will be _____.

Thank you for letting us help with this project. We hope our findings will help you with your final decision. Please feel free to contact us if you have any questions.