

# NTTI Media-Rich Lesson

Andrea Smith

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## NAME

“Peek-A-Boo” I See You!

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## LESSON TITLE

Fourth Grade

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## GRADE LEVEL

Three 45-minute Class Periods

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## TIME ALLOTMENT

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## OVERVIEW

As students look around them they will discover that circles are everywhere. Circles can be eaten, they are sewn on our clothes, and circles make the shape of a beautiful flower. Have you noticed circles on the wheels of the bus and the shape of the compact disk that plays our favorite songs? The circle is as indispensable to man as it is in nature. Every wheel that moves, every gear that turns exploits the geometrical properties of the circle.

In this lesson students will read “Sir Cumference and the First Round Table, A Math Adventure” to explore the concept of circumference, diameter, and radius. Students will also take a virtual carousel ride and search for the circles on the carousel as they go round and round. In the final phase of the lesson, students will discover the relationship between the diameter and the circumference as the diameter changes.

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## SUBJECT MATTER

Mathematics



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## LEARNING OBJECTIVES

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Students will be able to...

- Determine the relationship of the radius, diameter, and circumference of a circle
  - Find the circumference of a circle
  - Identify the radius, diameter, and circumference of a circle
  - Utilize appropriate instruments to measure or draw a circle
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## STANDARDS

NCTM Standards 3, 4, and 5: Geometry & Spatial Sense and Measurement –  
[www.standards-e.nctm.org](http://www.standards-e.nctm.org)

State Standards - Georgia Quality Core Curriculum Standards (QCC) –  
[www.glc.k12.ga.us](http://www.glc.k12.ga.us)

Geometry & Spatial Sense: Measurement

### Grade 4

[10] **Topic:** Plane and Solid Figures

**Standard:** Makes models of plane and solid figures, sorts and classifies these models according to distinguishing characteristics such as sides, angles, lines of symmetry, faces, and edges (such as triangles, quadrilaterals, circles, cones, cylinders, and rectangular prisms).

11 **Topic:** Measurement

**Standard:** Selects appropriate customary and metric units of measure. Length, Millimeter, Inch, Centimeter, Foot, Meter, Yard, Kilometer, Mile, Capacity, Milliliter, Ounce, Centiliter, Cup, Liter, Pint(Liquid and Dry), Quart (Liquid and Dry), Gallon, Weight/Mass, Milligram, Ounce, Gram, Pound, Kilogram, Time, Second, Week, Minute, Month, Hour, Year, Day, Decade, Century, Temperature, Degree Fahrenheit, Degree Celsius

12 **Topic:** Measurement

**Standard:** Determines, through concrete experiences, perimeter by adding lengths of sides; area by counting squares; volume by counting cubes; and circumference by measuring with string.

13 **Topic:** Measurement

**Standard:** Uses customary and metric units to measure length, capacity/volume (use liquid and dry units), weight/mass, temperature, and time (including telling time to the minute, elapsed time, time before and after hour.) Length, Millimeter, Inch, Centimeter, Foot, Meter, Yard, Kilometer, Mile, Capacity, Milliliter, Ounce, Centiliter, Cup, Liter, Pint (Liquid and Dry), Quart (Liquid and Dry), Gallon, Weight/Mass, Milligram, Ounce, Gram, Pound, Kilogram, Time, Second, Week, Minute, Month, Hour, Year, Day, Decade, Century, Temperature, Degree Fahrenheit,



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## Degree Celsius

### 15 **Topic:** Measurement

**Standard:** Estimates and measures using appropriate instruments, length, capacity/volume, weight/mass, money, time, and temperature (including measuring to nearest half inch and nearest centimeter). Length, Millimeter, Inch, Centimeter, Foot, Meter, Yard, Kilometer, Mile, Capacity, Milliliter, Ounce, Centiliter, Cup, Liter, Pint (Liquid & Dry), Quart (Liquid & Dry), Gallon, Weight/Mass, Milligram, Ounce, Gram, Pound, Kilogram, Time, Second, Week, Minute, Month, Hour, Year, Day, Decade, Century, Temperature, Degree Fahrenheit, Degree Celsius

## MEDIA COMPONENTS

### *Literature*

Neuschwander, C. **Sir Cumference and the First Round Table, A Math Adventure.** Waterton, MA: Charlesbridge Publishing, 1997.

King Arthur and his knights have a royal tangle of problems. Their rectangular table is too long and their triangular table is too pointy, but they somehow must sit down and discuss the shape of the future. Join a knight named Sir Cumference, his wife, Lady Di of Ameter, and their son Radius as they use different strategies to solve this quandary.

### *Web Sites*

#### **Harcourt School Publishers**

[www.hbschool.com/activity/elab2002/grade\\_4/023.html](http://www.hbschool.com/activity/elab2002/grade_4/023.html)

Electronic learning activities for exploring math concepts: This site contains a series of 25+ multimedia learning activities per grade (3-6) that enables students to explore and extend key skills and concepts.

[www.hbschool.com/glossary/math2/index.html](http://www.hbschool.com/glossary/math2/index.html)

A great reference for math terms and definitions!

<http://puzzlemaker.school.discovery>

Puzzlemaker is a puzzle generation tool for teachers, students and parents. Create and print customized word search, crossword and math puzzles using your word lists.

### *Video*

<http://peachstar.unitedstreaming.com/index.cfm>

Keyword: circles

Title: **Videomath: Circles** – Examining circles in art, nature, and machinery, the viewer sees circles everywhere, illustrating the structure of circles, concentric circles and



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circular motion, this program explores the definition of a circle. Appropriate for Grade Level K-6

Run Time: 15:59. (*password needed*)

<http://www.unitedstreaming.com> – go to this site to purchase video listed above; video: **Circles – Videomath Series, #4751**, English, VHS(NTSC)

## MATERIALS

### Per Class

Sir Cumference and the First Round Table, A Math Adventure

### Per Group of Students

Calculator

12in. strips of Yarn

Ruler or meter stick

Recording sheet

Collection of circular objects (buttons, coins, cheerios®, lifesavers®, Oreo cookies®, cups, roll of tissue or paper towel w/out paper, paper plates)

### Per student

Focus For Media Interaction Journal Sheet

## PREP FOR TEACHERS

Before teaching this lesson, make certain that all of your Web sites are bookmarked on all of the computers in your classroom, and that all of the necessary links are still valid and running. CUE your videotape to the first segment you are going to use in the Learning Activity.

Make sure that each lab station or table has all of the necessary components and handouts already in place for the start of the lesson.

*Sir Cumference and the First Round Table, A Math Adventure*, can be purchased online at [www.barnesandnoble.com](http://www.barnesandnoble.com) in paperback for \$6.95 or checked at your public library.

## INTRODUCTORY ACTIVITY: SETTING THE STAGE (Engage)

### Step 1

Students will be posed with a riddle. (*Allow students 2 minutes of wait time to raise their hand to answer the question*). What Am I? I'm all around you; on buildings, cars, and even door knobs. Look around the room you might notice me on the wall, on your friend's button up shirt, or perhaps in your pocket. (Answer: circles)

Tell the students; at the end of the lesson the class will publish a book of riddles based on the concepts learned about circles.

### Step 2



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Say, “Circles are all around”, then ask students to name other objects that are circular or made of circles. (Answers will vary)

### Step 3

Provide your students with a **FOCUS FOR MEDIA INTERACTION**, asking your students if they been on a carousel ride before. (Answers will vary) Tell the students that they are going on a virtual carousel ride and as they are going around find and point out the circles they see. **PLAY** the video tape on **MUTE** at the cue of the carousel (3:00-4:16). As you **CHECK FOR COMPREHENSION, REWIND** the tape for students to identify the circles on the carousel. Briefly allow students to discuss the circles they identified on the carousel (*the circles could be identified in the shape of the carousel and the gears just to name a few*).

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## LEARNING ACTIVITIES

### Step 4

Provide your students with a **FOCUS FOR MEDIA INTERACTION**, ask the students, “Did you know that a circle has some very special and important parts?”, “Can you name them?” (*diameter, radius, circumference*). Tell them, “We are going to read a story to explore the parts of the circle as I am reading the story, think about the following questions: (*post a set of focus questions for the story on chart paper*) Ask the students to read the focus questions silently as you read them aloud. 1. How does the author use vocabulary to explain the concept of circles? Give two examples. (*The main character is name Sir Cumference, his wife is Lady Di from Ameter, and his son’s name is Radius*) 2. How does the author use diagrams to explain the circle? Show your examples by drawing the diagrams. (*On pages 29, 30, and 31, the author shows the characters who are named for their parts of a circle*) 3. What did you learn about circles in the story? (*answers may vary, samples are: diameter goes through the center of the circle – Lady Di from Ameter, the outside of the circle is the circumference – Sir Cumference, the radius of a circle is half the diameter – the son is half as tall as his mother.*)

### Step 5

Read the story. After reading the story, ask the students to refer back to the questions and share their answers with a partner (*think-pair-share*). **Provide a Focus for Media Interaction Worksheet** with the questions for each pair of students for recording their response. Ask students to share their answers.

### Step 6

Review with your students what they have already learned. Then tell them, “We are now going to investigate some ideas about circles. You will need to get from the materials table, a string of yarn, a calculator, a recording sheet, a ruler and four circular



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objects – paper plate, cup, an Oreo cookie and a quarter.” (*students are to follow instructions and answer questions on the recording sheet, handout provided in appendix*) To CHECK FOR COMPREHENSION, students will be asked to model an activity to explain the relationship between the circumference and the diameter.

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## CULMINATING ACTIVITY

Provide your students with a **FOCUS FOR MEDIA INTERACTION**, ask each pair of students to go to a computer and click on the “favorites” button, then click on E-Lab, Finding Circumferences ([http://www.hbschool.com/activity/elab2002/grade\\_4/023.html](http://www.hbschool.com/activity/elab2002/grade_4/023.html)). Tell them to take the quiz on the Finding Circumference Worksheet before beginning the interactive activity. (*handout provided in appendix*)

Students should note what happens to the circumference as they increase or decrease the diameter. Ask the students to follow the directions on the computer screen to increase and decrease the diameter of the circle. As the diameter changes, students should record the circumference. The students should observe that the circumference is approximately three times the diameter.

Provide your students with a **FOCUS FOR MEDIA INTERACTION**, go on a scavenger hunt just for fun to find the mathematical term used to define the relationship between the circumference and diameter. Click on favorites and go to Harcourt Math Glossary (<http://www.hbschool.com/glossary/math2/index.html>) (*hint: you can eat it!*)



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## HANDOUT 1

## FOCUS FOR MEDIA INTERACTION WORKSHEET

LESSON TITLE: "PEEK-A-BOO" I SEE YOU!

## APPENDIX – ACTIVITY FOR STEP 6

Name(s) \_\_\_\_\_

In this activity you will investigate some ideas about circles. You will need a string of yarn, a calculator, four circular objects, and a ruler.

Measure the distance around the circular object (circumference) and the diameter. Record your measurements on the table below. After you have made your measurements, use your calculator to divide the circumference by the diameter ( $C \div d$ ). Record your answers.

Object	Circumference (C) In inches	Diameter (d) In inches	$C \div d$
quarter			
Paper plate			

1. What do you about the numbers in column ( $C \div d$ ), the quotient?
2. Describe the relationship between the circumference and the diameter.
3. When the diameter is 12cm, what is the radius? Explain your answer.