

MEASUREMENT MANIA

GRADES 3-4

LATRENDIA KNIGHTEN

TIME ALLOTMENT: Three 50-minute class periods

OVERVIEW:

This lesson allows elementary primary students to make observations about the uses of measurement in their everyday lives. Students will work with a group to conduct an investigation using standard and non-standard units of measurement and a classmate to demonstrate basic measurement concepts.

SUBJECT MATTER: Mathematics and Science

LEARNING OBJECTIVES:

Students will be able to:

- Identify measurement tools.
- Identify uses and purposes for measurement.
- List vocabulary words and/or terms used to describe measurement.
- Describe the everyday uses for measurement.
- Explain the role measurement plays in designing a television set.
- Identify a variety of ways to use measurement.
- Use standard and non-standard units of measurement to record vital measurement statistics about a classmate.
- Work cooperatively with the members of a group to complete an assigned task.
- Use Microsoft PowerPoint to prepare a group presentation that demonstrates the group findings.

STANDARDS:

National Council of Teachers of Mathematics Standards

<http://www.nctm.org/standards/standards.htm>
Measurement

Louisiana Mathematics Framework Bulletin

<http://www.lcet.doe.state.la.us/doe/assessment/standards/MATH.pdf>

- M-1-E:** Applying (measure or solve measurement problem) the concepts of length (inches, feet, yards, miles, millimeters, centimeters, decimeters, meters, kilometers), area, volume, capacity (cups, liquid pints and quarts, gallons, milliliters, liters), weight
- M-2-E:** Selecting and using appropriate standard and non-standard units of measure (e.g., paper clips and Cuisenaire rods) and tools for measuring length, area, capacity, weight/mass, and time for a given situation by considering the purpose and precision require
- D-1-E:** Collecting, organizing, and describing data based on real-life situations

National Science Education Standards

<http://bob.nap.edu/html/nses/html>

Science as Inquiry: Employ simple equipment and tools to gather data and extend the senses

Louisiana Science Frameworks:

State Standards for Curriculum Development

<http://www.lcet.doe.state.la.us/doe/assessment/standards/SCIENCE.pdf>

- PS-E-A2:** Measuring properties of objects using appropriate materials, tools, and technology.
- SI-E-A5:** Using data, including numbers and graphs, to explain observations and experiments.
- SI-E-A6:** Communicating observations and experiments in oral and written formats

MEDIA COMPONENT:

Video:

The Eddie Files with Kay Toliver, Length and Area: *Sleep Like A Dog*



Corporation for Public Broadcasting



GE Fund



Web site:

<http://www.funbrain.com/measure/index.html>

Students will use the Measure It activity. This activity allows students to select a difficulty level (easy, hard, etc.) and students can choose to measure with inches or centimeters. Students will measure a red line using the virtual ruler. Students receive feedback on their responses to let them know the number of correct and incorrect responses. The student directions are as follows: *FunBrain will show you a ruler with a red bar above it. Click on the length of the red bar. You can play with centimeters or inches.*

MATERIALS:

Per Group (4-6 students per group)

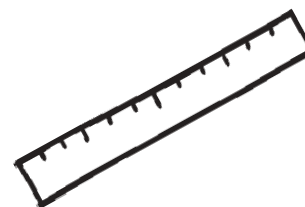
- 1 **Measurement Mania** recording sheet
- An assortment of non-standard objects for measurement (dog biscuits, unifix cubes®, paper clips, unsharpened pencils, crayons, etc.)
- An assortment of standard units of measure (rulers, tape measures, yard sticks, meter sticks, scales, stopwatches, etc.)
- 1 diskette
- Copy of the PowerPoint® Checklist

Per Student

- **Measurement in My World Activity Sheet**
- **Measurement in My World Homework Sheet**
- Child's Checklist
- Group Checklist

Per Teacher

- Book: **Measuring Penny** by Loreen Leedy
- Transparency: **Measurement Mania**
- Transparency: **Directions for Groups**
- Cooperative Group Checklist for each group
- PowerPoint Checklist for each group
- Chart Paper
- Markers



General

- Computer with Internet Access or Computer with PC/TV adapter or projector
- Digital Cameras (*NOTE: Students can use regular cameras and scanners if digital cameras aren't available.*)
- Television with VCR
- VCR Tape of **The Eddie Files with Kay Toliver, Length and Area: Sleep Like A Dog**
- Paper
- Pencils

PREP FOR TEACHERS:

Prior to teaching this lesson, view the video and teach your students how to use Microsoft PowerPoint®.

Prior to teaching this lesson:

1. View the video: **The Eddie Files with Kay Toliver, Length and Area: Sleep Like a Dog. CUE** the tape to the beginning.
2. Bookmark the Web site: <http://www.funbrain.com/measure/index.html>. Select the **Measure It** activity.
3. Teach your students how to use Microsoft® PowerPoint®.

Preparation for the hands-on component of the lesson:

1. Make copies of the student activity sheets: **Measurement in My World Activity** and homework sheets, **Group Checklist**, **Child's Checklist**, **Measurement Mania** recording sheet, and the **PowerPoint® Checklist**. See materials list for quantities.
2. Collect a large quantity of standard and non-standard units of measure.

INTRODUCTORY ACTIVITY:

Day One: 50 minutes

Step 1. The teacher will introduce the lesson topic to the students through a group discussion. The teacher will lead students in a discussion about measurement to assess prior knowledge and student preconception about measurement. Lead the class in a brainstorming session about measurement. Suggested questions to spark student thinking: "How would you describe measurement?" "What does it mean when we say we measured something?" "What type of materials or tools do you use to measure objects or people?" "What are some of the reasons you would measure something or someone?" Record all of the students' responses on the chart paper. Read the students' comments to the class.

Step 2. Insert **The Eddie Files with Kay Toliver, Length and Area: *Sleep Like A Dog*** into your VCR. Tell students that many people use measurement as part of their jobs. *Provide students with a **FOCUS FOR MEDIA INTERACTION**: Tell students that they will view a video clip that shows people at work on a Paramount Studios television set.* (You may need to tell students that Paramount Studios films television shows and movies.) *Distribute blank paper and pencils to students and tell them, "Watch the video segment carefully, list the measurement tools used in the video, list the items measured, and tell the reasons the engineers used measurement."* **START** the tape at the beginning of the segment featuring the Paramount Studios engineer. Allow students to view the entire segment on Paramount Studios. **STOP** the tape when the segment ends. Check for comprehension. Allow students to share their observations and written notes.

Step 3: Tell students that measurement is an important part of our everyday lives. Tell students that in today's lesson they will make observations about how they use measurement in their daily lives. Tell students to think about all of the activities they've done from the time they woke up to the present time. Ask, "Did you use measurement to complete any of these activities?" Distribute **Measurement in My World** Activity Sheet. Discuss the directions for the assignment with the students. Students are to make a schedule of the day's activities and list the ways they used measurement. Remind students to list the tools used for each activity listed. Allow students to complete the assignment and share their findings with the class.

Step 4: Review the day's activities with the students. Ask students if they can think of a person who uses measurement every day. Distribute the **Measurement in My World** Homework Sheet. Tell students that their assignment is to interview someone at home and record the ways he/she uses measurement.

LEARNING ACTIVITIES:

Day Two: 50 minutes

Step 1. Review the comments and activities from the previous day's lesson. Allow students to share their experiences from the interview assignment.

Step 2. Ask a student volunteer to stand up or come forward. Ask students "How can I use measurement to describe _____?" Students will probably suggest taking linear measurements such as height initially. Continue the discussion with students and ask questions that lead students to think of other types of measurement such as time, money, weight, etc. Suggestions to spark student thinking: "How would I describe this person using time? i.e., How old is _____?" "_____ lives 10 minutes from our school." "_____ can walk from our classroom to the library in 7 minutes." "_____ weighs 60 pounds." Point out to students that all measurements have a number and a unit.

Step 3. Provide your students with a **FOCUS FOR MEDIA INTERACTION**. Tell students that you want them to practice their measurement skills by using the virtual ruler to measure the red bar. Ask students to keep track of their progress. Use the class computer with PC/TV adapter, a projector, or allow students to work in small groups to log on to <http://www.funbrain.com/measure/index.html>. Students will use the virtual ruler to measure the objects on the page. The students receive feedback that tells them whether or not their answers are correct.

Step 4. Read the story or share excerpts from the book, *Measuring Penny* by Loreen Leedy with students. In this story the teacher gives his students a measurement assignment. The main character uses her dog as the subject of her homework assignment.

Step 5. Tell students that they are going to work in small groups to complete a measurement assignment. Each group will choose one person to serve as its subject. Tell students that each group is going to measure their subject in as many ways as possible. Show students the assortment of measurement tools and provide one example. Tell students that they will use digital cameras to take pictures as they work and that they will use the pictures to make a PowerPoint® slide show to show the results of their group work. SEE NOTE IN THE MATERIALS SECTION CONCERNING THE USE OF DIGITAL CAMERAS.

Step 6. Divide students into small groups of 4 – 6 students per group.

Step 7. Provide each group with one copy of the *Measurement Mania* recording sheet and go over the directions for the assignment. Use an overhead transparency to go over and clarify directions for the assignment. *NOTE: You may want to make a transparency of the group directions and use this as you explain directions to the group.*

- DIRECTIONS TO STUDENTS
- Each group should choose one “lucky” person to serve as its subject.
- Write that person’s name in the blank space at the top of the recording sheet.
- Record the names of the group members on the recording sheet.
- Your group is to measure your classmate in as many ways as you can.
- You must use standard and non-standard units of measure.
- Include at least one comparison. (Mary is taller than ...)
- Each member of the group must participate in the group work.
- Your group must take pictures to document your work. Use your digital camera.
- Each member of the group will use the group checklist and individual checklist to evaluate the group’s ability to work together as a team.
- Be creative!
- Each student should complete the individual checklist and group checklist when the work is complete.

CULMINATING ACTIVITY:

Day 3

Step 1. Allow students to work in groups to create a PowerPoint® presentation that shows their group findings. (Students should place their digital pictures in the PowerPoint® presentations.) *NOTE: Give each group a copy of the PowerPoint® checklist and go over the requirements for the project. Make certain that students know the criteria that will be used to assess each group’s presentation. Students should construct their presentations using the following format. NOTE: The teacher could use Microsoft® PowerPoint® to prepare a template for students on the computer– prepare a template that includes the title placeholders, picture/object placeholders, etc.*

- **Slide One: Title page** – Includes the title *Measuring* (Insert your classmate’s name here) and lists the names of the group members.
Place a picture of your entire group on this page also.
- **Slide Two** – This is (name of classmate). Include a picture of the group’s volunteer.
- **Slide Three** – (Classmate) is ____ tall. Use a standard unit of measurement to measure your classmate. Include a picture of your classmate being measured with this unit.
- **Slide Four** – (Classmate) is __ tall. Use a non-standard unit of measurement to measure your classmate. Include a picture of your classmate being measured with this unit.
- **Slide Five** – (Classmate) is taller than _____. Include a picture.
- **Slide Six** – (Classmate) is shorter than _____. Include a picture.
- **Slide Seven** – (Classmate) is the same height as _____. Include a picture.
- **Slide Eight: Bonus slide** – Include any other measurement information about your classmate. Remember to include pictures.
- You can add additional slides to your presentation.

Step 2. Allow each group to share its findings with the class.

Step 3. The teacher will use the PowerPoint® checklist to assess each group's presentation.

Step 4. Assessment Procedures:

- Teacher Observation
 - Class Participation
 - Student performance on the group task (*Measurement Mania*) and the PowerPoint® presentation.
- Student work will be evaluated using the cooperative group rubric, the PowerPoint® checklist, and based on the successful completion of the assigned task.

CROSS-CURRICULUM EXTENSIONS:

Language Arts:

- *Measurement in My World* Book: Using the *Measurement in My World* Activity Sheet, students write a story that illustrates their daily activities.
- Using the model from the *Measuring Penny* book, students write a measurement story about someone at home.

Social Studies/History:

- Our history includes many references to non-standard units of measurement such as cubits, arm-spans, googol, etc. Allow students to conduct research to find out the meaning of these unfamiliar units of measure and their origins. Research should address the following issues: When were standard units of measure (inches, feet, yard, etc.) introduced to our society? What is the origin of the names for these units of measurement?

COMMUNITY CONNECTIONS:

- Invite a tailor or seamstress to visit your class and tell the students how he/she uses measurement to perform his/her job duties. Encourage the guest to share and describe the detailed measurements he/she must take in order to design or alter clothing for customers.

STUDENT MATERIALS:

See attached, Student Materials include:

- *Measurement in My World* Activity Sheet
- *Measurement in My World* Homework Sheet
- *Measurement Mania* Activity Sheet
- *Child's Checklist*
- *Group Checklist*

Teacher Transparency: Student Directions

DIRECTIONS TO STUDENTS

- Each group should choose one “lucky” person to serve as their subject.
- Write that person’s name in the blank space at the top of the recording sheet.
- Record the names of the group members on the recording sheet.
- Your group is to measure your classmate in as many ways as you can.
- You must use standard and non-standard units of measure.
- Include at least one comparison. (Mary is taller than ...)
- Each member of the group must participate in the group work.
- Your group must take pictures to document your work. Use your digital camera.
- Each member of the group will use the group checklist and individual checklist to evaluate the group’s ability to work together as a team.
- Be creative!

Measurement Mania Recording Sheet

Measuring _____

Group Members:

_____	_____
_____	_____
_____	_____

Choose someone to measure.

Measure your classmate in as many ways (height, width, length, and weight if possible) as you can.

Use a variety of units to measure your classmate. (Suggestions: inches, feet, centimeters, paper clips, pencils, crayons, dog biscuits, unifix cubes®, etc.)

Record your results. Include one comparison:

_____ is _____ tall.

_____ is taller than _____.

_____ is the same height as _____.

_____ is shorter than _____.

Measure your classmate's height with a different unit and record the results.

_____ is _____ tall.

Child's Checklist

Answer each question by placing a check in the appropriate box.	Always	Sometimes	I need to work on this.
I followed directions.			
I helped my group and worked well with others in my group.			
I did my share of the work.			
I was a good listener.			
I asked questions.			

Group Checklist

Answer each question by placing a check in the appropriate box.	Always	Sometimes	We need to work on this.
We listened to each other.			
We worked cooperatively.			
Each group member did a share of the work.			
We helped each other.			
We followed all of the directions to complete the assignment.			

Measurement Mania PowerPoint® Checklist

Group Members: _____

Category	Responsibilities
Appearance	<input type="checkbox"/> The words on our slides are easy to read.
	<input type="checkbox"/> The words on our slides are spelled correctly.
	<input type="checkbox"/> The titles and headings are easy to read.
	<input type="checkbox"/> The pictures are related to the information on the slide.
	<input type="checkbox"/> The pictures on each slide are easy to see.
Media	<input type="checkbox"/> We used photographs.
Organization	<input type="checkbox"/> We included the names of the people in the group on the title slide.
	<input type="checkbox"/> Our presentation clearly explained our group work.
	<input type="checkbox"/> We included interesting and exciting information.
Preparation	<input type="checkbox"/> We used our time wisely.
	<input type="checkbox"/> We went over the directions and gathered all of the necessary materials before we started the project.

Name: _____

Date: _____

Measurement in My World Activity Sheet

In mathematics class we have been learning about measurement. We use many tools on a daily basis to obtain measurement information. Today you will take a closer look at your daily activities and make note of the ways you use measurement on a regular basis.

1. Make a schedule of your daily activities.
2. List the ways you used measurement to complete those activities. Why was measurement important to complete these activities?
3. Did you use any tools? List the tools used.

My Daily Schedule		
<i>Time</i>	<i>I used measurement to ...</i>	<i>I used these tools ...</i>

Name: _____ Date: _____

Measurement in My World Homework Assignment

In mathematics class we have been learning about measurement. We use many tools on a daily basis to obtain measurement information. In class today, you made a schedule of your day and listed the ways you use measurement. Interview someone at home and make a list of the ways he/she uses measurement on a regular basis. Remember some of the items we discussed in class. Make certain to include the following information on your recording sheet.

1. List or name the activities.
2. How was measurement used to complete each activity? Why was measurement important to complete these activities?
3. List the tools used.

My Measurement Interview with _____	
<i>How do you use measurement each day?</i>	<i>What tools do you use?</i>

