

NTTI Media-Rich Lesson

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NAME

The Magical World of Measurement: "Using Centimeters and Meters"

LESSON TITLE

Fourth Grade

GRADE LEVELS

One Hour (60 minutes) - Class Period

TIME ALLOTMENT

OVERVIEW

According to the National Council of Teachers of Mathematics (2003) all students should be able to understand measurable attributes of objects and the units, systems, and processes and processes of measurement. In this unit lesson students will be involved in investigative inquiry to formulate knowledge and skills for measuring and using centimeters and meters.

TOPIC/SUBJECT MATTER

Mathematics: Measurement

LEARNING OBJECTIVES

Students will be able to:

- Select appropriate metric units of measures (i.e. length: centimeters and meters)
 - Estimate and use appropriate metric units to measure (i.e. length: centimeters and meters)
-



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STANDARDS

National Standards:

- Understand measurable attributes of objects and the units, systems, and processes of measurement
- Apply appropriate techniques, tools, and formulas to determine measurements

State Standards:

- Select appropriate metric units of measures (i.e. length: centimeters and meters)
- Estimate and use appropriate metric units to measure (i.e. length: centimeters and meters)

MEDIA COMPONENTS

National Council of Teachers of Mathematics: <http://www.nctm.org>

Georgia Learning Connection: <http://www.glc.k12.ga.us>

United Streaming: <http://www.unitedstreaming.com/index.cfm>

Harcourt Brace: <http://www.hbachool.com>

NASA Kids Science News Network: <http://www.ksnn.larc.nasa.gov/meter/meter.html>

Brainpop: <http://brainpop.com>

Funbrain: <http://funbrain.com>

Kazaa Media: Amazon Rainforest-Relaxing Instrumental Music/Anton Hughes

MATERIALS

Student Materials:

Bag and spinner Activity: Ocelot Madness

- (5) sets of gallon size plastic bag with the following contents:
 - Colored pencils
 - Markers
 - Laminated rainforest animal squares (20 each-ocelot)
 - Laminated rainforest animal squares (40 each-emerald tree boa, sloth, harpy eagle, morpho butterfly and giant anteater)
 - Color chips



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- Color popsicle sticks
- Spinner board (poster board)
- The Rainforest World of Statistics” data collection journal
- Post-it chart paper (1)
- Rainforest gift bag (1)
- Mini display board with rainforest boarder and number poster

Teacher Materials:

- Laminated state and national standards
- Video Tape: Eddie Files: Statistics: “The Lucky Batting Glove”
- VCR/Monitor
- Laptop
- Screen
- 5x7” index card (multi-color)
- Copier paper

Teacher Materials:

- Pocket folders (100)
- Question cards
- Statistics word wall cards
- Statistics word wall poster
- Rubber cement
- Laminated neon color poster board for teacher-made spinner
- spinners

PREP FOR TEACHERS

Steps for the teacher:

- 1.) Read over the unit lesson “The Magical World of Measurement: Using Centimeters and Meters.”
- 2.) Preview each media component and practice the video utilization strategies.
- 3.) Double check state and national standards at websites listed for any revisions.
- 4.) Gather all materials and supplies needed two weeks prior to implementing the lesson.
- 5.) Create a physical environment that includes, measuring instruments, mathematics word-wall and reading books). Do a practice run utilizing all resources

INTRODUCTORY ACTIVITY: SETTING THE STAGE

Steps for the teacher: (Engagement) Play rainforest music download from Kazaa media as students prepare for the lesson:

- 1.) Pose a problem to students: “The science fair committee review team provided us with constructive criticism on our science fair project.” “They advised us to calculate the length of our rainforest plant using the Metric System (i.e. centimeters and



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meters) instead of the Customary System (i.e. inches, feet and yards). “ “The measurements must be turned in no later than tomorrow.”

- 2.) Teacher asks: Does everyone understand why measurement is important? What is the meaning of measurement?

Instruct students to view a movie on Brainpop.com <http://brainpop.com> (i.e. The Mysteries of Life) in order to find the answers to: Why measurement is important? The meaning of measurement? and the Metric System units of measurement. (centimeters and meters)?.

Brainpop.com Directions:

- 1) Log on to Internet Explorer
- 2) Type <http://brainpop.com> to enter site. be prepared to enter your school's username and password (a subscription is needed)
- 3) Once at the site, **Select** a movie: **select** science as the subject and **scroll down** and <http://brainpop.com> measurement.
- 4) The movie will load in (1) minute). **select play** movie.
- 5) **Pause and check for comprehension** after an explanation is given for students to write down answers on the data collection journal sheet during the movie to and ask again why do we measure things-what tools are used to measure length. Let student volunteers share written responses.

LEARNING ACTIVITIES

Learning Activity 1: (*Exploration*)

Step 1

Explain to student that they will be placed into cooperative groups of (3) by counting off 1, 2, 3,..... and that 1=yellow, 2=green and 3=orange. provide students with a colored popsicle sticks to remind them of which group they are in. Students will move to designated student centers according to a color coded rotation chart.

Step 2

Students are instructed to sit near their group members. Tell student groups you want them to share what they know about “Measuring using centimeters and meters” by completing a KWL chart.

Step 3

Provide each group with (1) sheet of post-it chart paper with KWL written at the top of the paper forming (3) columns for each letter and markers. ask each group to discuss what they know and want to know about “Measuring using centimeters and meters” and be ready to share in (5) minutes by recording information on the KWL chart. monitor students and provide feedback to students while they are recording ideas under the letter K and W section of the KWL chart. Let groups share information on their KWL



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chart. Provide a **FOCUS FOR MEDIA INTERACTION** for media interaction by instructing students to watch the next video clip to understand how to measure using centimeters and meters:

United Streaming Video Directions:

- 1) Log on to Internet Explorer
- 2) Type <http://www.unitedstreaming.com/index.cfm>: to enter site. be prepared to enter your school's username and password (a subscription is needed).
- 3) Once at the site, select grade level.
- 4) Search by keyword: measurement.
- 5) Select subject: mathematics and primary subject: measurement.
- 6) Click go.

CHECK FOR COMPREHENSION: Instruct students to jot down data in their journals so they can add to what they learn about measuring using centimeters and meters using the KWL chart under the L section (i.e. what I learned).

Provide a **FOCUS FOR MEDIA INTERACTION** for media interaction by instructing students to view a clip from **NASA Kids Science** to find the length of a meter and explain the measurement process used to determine the length of various objects.

- 1) **NASA Kids Science Network Directions:**
<http://www.ksnn.larc.nasa.gov/meter/meter.html>
 - a. Log onto the website above and click view movie (How long is a meter?)
- 2) **CHECK FOR COMPEHENSION:** Instruct each group to dialogue about whether or not the data about "Measuring using centimeters and meters" written on their KWL chart needs to be needs to be reconstructed and share revisions. **Rewind video** back to the beginning if more clarity is needed.

Steps for the teacher:(Elaboration)

- 1) Instruct student groups that they will explore Metric Measurement Project Labs geared to assist in their comprehension of the meaning of measuring using centimeters and meters.
- 2) Students will follow a rotation chart posted near every project lab.
- 3) Briefly provide students with a description of each project lab's expectation.
- 4) Student materials will be located near each project lab in a bag.
- 5) Have students read and follow instructions attached to the measurement project labs.
- 6) Teacher monitors by asking group member questions and providing meaningful feedback.

Project Lab 1: Magical Bunny in the Hat

Directions:

- 1) Estimate the height (length) of each magical item pulled out of the magical hat (see items on the table).



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- 2) Measure and record the actual height (length) of magical items pulled out of the magical hat.
- 3) Write about your findings.

Project Lab 2: Magical Spinner

Directions:

- 1) Estimate the height (length) of each magical item the spinner lands on (see items on the table).
- 2) Measure and record the actual height (length) of magical items the spinner lands on.
- 3) Write about your findings.

Project Lab 3:Magical Cards

Directions:

- 1) See how high your team can stack the magical cards.
- 2) Measure and chart your results.
- 3) Document your magical exploration on your metric journal page.

Project Lab 4:Magical Seeds

Directions:

- 1) Measure out (6) centimeters of seeds.
- 2) Drop the seeds into the magical pot.
- 3) Close your eyes and turn around twice.
- 4) Lift the green tab and watch the plant grow.
- 5) Estimate the plant's height (length).
- 6) Measure and chart its actual height (length).
- 7) Document your exploration on your metric journal page.

Project Lab 5: Magic with Technology

Directions:

- 1) Explore technology at a glance.
- 2) Log on to <http://www.funbrain.com> and explore measurement math games – select your choice.
- 3) Log onto <http://www.hbschool.com> and define the following words in the multimedia glossary (i.e. metric system, meter, centimeter).
- 4) Log onto <http://ksnn.larc.nasa.gov/meter/meter.html> investigate the activity (“Let’s go Metric-ing!).
- 5) Document your explorations in your journal.

Check for comprehension:

- 1) Students will read the poem called the “Marrog,” and design the alien on chart paper according to its metric dimensions.
- 2) Let students share their creations by posting them around the room.



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Step for the teacher: (Evaluation)

- 1) Instruct students to record what they learned about “Measuring using centimeters and meters” on the KWL chart under the L (learn) category and share.
- 2) Let student write in their journal what they learn about “Measuring using centimeters and meters,” concerning selecting appropriate metric units of measures (i.e. length: centimeters and meters), estimating and using appropriate metric units to measure (i.e. length: centimeters and meters)

Check for comprehension:

- a. Log onto Funbrain: <http://funbrain.com>
- b. Select Title: Baseball.
- c. Keyword selection: measurement
- d. Click game level: centimeters to nearest whole no.. half of centimeter. (see other math games for meters, etc.).

CULMINATING ACTIVITY

Student share knowledge about measurement by sponsoring a “World of Magical Measurement Carnival” for parents, student and community members. Participants engaged in metric measurement activities:

Project Lab 1: Magical Bunny in the Hat

Directions:

- 1) Estimate the height (length) of each magical item pulled out of the magical hat (see items on the table).
- 2) Measure and record the actual height (length) of magical items pulled out of the magical hat.
- 3) Write about your findings.

Project Lab 2: Magical Spinner

Directions:

- 1) Estimate the height (length) of each magical item the spinner lands on (see items on the table).
- 2) Measure and record the actual height (length) of magical items the spinner lands on.
- 3) Write about your findings.

Project Lab 3:Magical Cards

Directions:

- 1) See how high your team can stack the magical cards.
- 2) Measure and chart your results.
- 3) Document your magical exploration on your metric journal page.



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Project Lab 4:Magical Seeds

- 1) Directions:
- 2) Measure out (6) centimeters of seeds.
- 3) Drop the seeds into the magical pot.
- 4) Close your eyes and turn around twice.
- 5) Lift the green tab and watch the plant grow.
- 6) Estimate the plant's height (length).
- 7) Measure and chart its actual height (length).
- 8) Document your exploration on your metric journal page.

Project Lab 5: Magic with Technology

Directions:

- 3) Explore technology at a glance:
 - 1) Log on to [Http://www.funbrain.com](http://www.funbrain.com) and explore measurement math games – select your choice
 - 2) Log onto [Http://www.hbschool.com](http://www.hbschool.com) and define the following words in the multimedia glossary (i.e. metric system, meter, centimeter
 - 3) Log onto [Http://ksnn.larc.nasa.gov/meter/meter.html](http://ksnn.larc.nasa.gov/meter/meter.html) investigate the activity (“Let’s go Metric-ing!”)
 - 4) Document your explorations in your journal.

CROSS-CURRICULAR EXTENSIONS

Science/Mathematics/Reading:

Read books about metric measurement.

Obtain a newspaper and collect statistics on the weather, baseball player’s stats and specific stocks.

Invite people whose careers depend on collecting statistics in as a speaker. ,
Macmillan/McGraw-Hill’s Math Anthology: Stories and Poems – “The Marrog.”

COMMUNITY CONNECTIONS

Have students collect statistics on a community issue (i.e. pollution, acid rain fall, animals endangered in the rainforest, etc.) and inform students to design their own data collection sheet listing topic of choice. Let students write letters to specific government officials addressing their findings.



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The Magical World of Metric Measurement

HANDOUT 1

Part I

Name _____
Class: _____

Date _____
Grade: _____

1. Why is measurement important? _____

2. What is measurement? _____

3. Define the Metric System: _____

4. What are centimeters? _____

5. What are meters? _____

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HANDOUT 2

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 What we know....	 What we want to know....	 What we learned....



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The Magical World of Metric Measurement

Handout 3

Part II

Name _____

Date _____

Class: _____

Grade: _____

1. Would you measure the length of a door using meters or centimeters? Why? _____

2. Would you measure the length of the chalk board in meters or centimeters? Why? _____

3. Give examples of objects you would measure by using these units:



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