

How Long is a Hot Dog? Weight, Weight! Don't tell me!

Grade levels: K-3

Math, Science

2003 NTTI Master Teacher

Susan Hunt Apteker, Fisher Hill School, Orange, MA

Overview:

Measurement is used all over the world. Children often learn at an early age to consider measurement as they consider whether or not to take the biggest piece. (My mother told me, "Always let your friend choose the piece when sharing or you give your friend the larger piece." Or the ever-popular questions, How long? How far? How much? How wide? And "Mom are we almost THERE?") This lesson features an assortment of measurement activities. Most are interactive and filled with hands on movement as the children have fun they will not realize they are learning life-long skills

Time Allotment:

Two weeks

Learning Activities:

Students will be able to:

- estimate weight
- compare and contrast weights
- create a working scale
- design their own small scale
- Utilize their design for measurement study
- Explore what fruit would be the best fruit for the class to share
- Investigate measurement labels
- Examine where measurement is used in a kitchen
- Compare and contrast measurement
- Measure different parts of the school

Standards:

National Standards:

NCTM (National Council for Teachers of Mathematics)



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standards.nctm.org/

Apply appropriate techniques, tools, and formulas to determine measurements.

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Develop and evaluate inferences and predictions that are based on data.

State Standards:

K.M1 Recognize and compare the attributes of length, volume/capacity, weight, area, and time using appropriate language, e.g., longer, taller, shorter, same length; heavier, lighter, same weight; holds more, holds less, holds the same amount.

2.M.5 Select and correctly use the appropriate measurement tools, e.g., ruler, balance scale, thermometer.

2.M.6 Make and use estimates of measurement, including time, volume, weight, and area.

K.M.2 Make and use estimates of measurements from everyday experiences.

K.M.3 Use nonstandard units to measure length, area, weight, and capacity.

Media Components:

NCTM Interactive Scale

www.mhschool.com/student/math/mhmath/popup.html

Match the measurement tool with the item to be measured.

Grade 1 Macmillian McGraw-Hill Online Activity

Place weights on each pan of the balance by dragging the shapes and releasing the mouse button.

Learning Geometry and Measurement Concepts by Creating Paths and Navigating Mazes: Hiding Ladybug NCTM

standards.nctm.org/document/eexamples/chap4/4.3/index.htm#apple

Plan a path that will take the ladybug to a hiding place under the leaf.

Estimate how many steps and in what direction you should move. Plan your route then test it out.

Learn Online: Count Us In: Capacity Activity

www.abc.net.au/countusin/games/game15.htm



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Once the water is poured into the container, choose the one that is holding the most liquid.

FunBrain: Measure It Ruler Activity
funbrain.com/measure/index.html
Use the virtual ruler to measure the line.

Learn Online: Count Us In: Smallest to Tallest
www.abc.net.au/countusin/games/game14.htm
Race to put the people in line from tallest to shortest.

Videos:

Madeline at Cooking School (Golden Book Video) (1993)
When Mrs. Murphy the cook becomes ill, Madeline and friends attempt to take matters into their own hands.

My First Cooking Video: A Kid's Guide to Making Fun Things to Eat (Sony Music Video) New York (1992)

Materials:

- 3-4 digital bathroom scales
- magnifying glasses
- thermometer for measuring water temperature
- Number charts
- 1 package of hot dogs
- 20-30 recycled boxes or cans without food in them.
- two 1-2 pound weights
- other assorted hand weights
- writing tools for each child
- data recording sheets for each child
- chart paper
- five-pound bag of sugar
- assorted fruit

One of the following for each students:

- newspaper flyers from a grocery store
- worksheets to gather names of fruit and how much they cost.
- pencils



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- rulers

Ingredients for recipe: 1/2 cup of confectioners' sugar, 1/4 cup of cocoa powder, 1/4 cup of cream cheese, 1/4 cup of chopped nuts, chocolate sprinkles.

Literature Connections:

Eating Fractions by Bruce McMillan

This tantalizing book demonstrates with food the fractions of 1/2, 1/3 and 1/4.

Prep for Teachers:

Arrange details of field trip to kitchen with the manager of the cafeteria. Gather materials on materials list.

Create or access number chart.

Create/copy a data sheet for recording length of hotdogs

Introductory Activity: Setting the Stage

Week One Preliminary Activities:

Let the students choose if they would like to be weighed. In a large group, invite the class to estimate how much each weigh. Discuss reasonable and unreasonable estimations. Chart the children's weight on a 1-100 a number chart. Use the chart as a reference tool to find patterns in the data. Pass around a five-pound bag of sugar as an example of what five pounds feels like. Share with the children how much a baby might weigh.

Provide the Web site: Learn Online: Count Us In: Smallest to Tallest www.abc.net.au/countusin/games/game14.htm. This site asks children to sort from smallest to tallest; practicing compare and contrast. Send the students in groups of two to the web sites. Invite the students to put the people in order from smallest to tallest. Ask them to be sure that both of the partners agree before they complete the line-up.

Learning Activities:

Week Two, Day One:

Assemble the children in groups of four or five and ask them to choose one person to retrieve their backpack for the group to use. Instruct them



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to fill their backpack with unbreakable items from the classroom. Put on the five-minute timer. After five minutes has passed, say, "Time is up." Allow groups of children to work together to make predictions about how much their group's backpack weighs. Take a moment to review the lesson of what five pounds feels like. Ask the groups to predict if their backpack is more or less than five pounds. Discuss as a group, then proceed to estimate the actual weight of each backpack. Each group will share how much they predicted and compare the prediction to the actual weight of the backpack using a bathroom scale.

Provide the students with a balancing scale. Allow the students to investigate ways to use small items that will balance the scale. Once the students have practiced making the scale work, invite them to try this same type of measurement on the computer.

Send groups of two to the computers to attempt to balance the virtual scales found at the NCTM interactive scale Web site:
illuminations.nctm.org/imath/across/balance/equiv1.htm

As **the focus for media interaction**, once the students are at the Web site, explain that the scale on the screen is like the scale that they have used in the classroom. Explain that they will need to click and drag the shapes to the pan of the scale and try to make the scale balance. Once the students have used the virtual scale, provide them with the following activity: Provide two identical digital bathroom scales. Supply the students with items that they can place on each scale to make the scales register the same weight. Ask the students to record what they put on each scale in order to make it weigh the same. As a class, discuss what the small groups discovered.

Week Two, Day Two:

Explore the school's kitchen to find as many measuring numbers as they can. How are these numbers used? How does math help the people who work in the kitchen preparing food for the school? Keep a tally of how many numbers you find. Discuss different tools for measurement. Rulers are used for inches, measuring cups for liquid, thermometers for temperature. Invite the children to measure the length of hot dogs before and after they are cooked. Show how a measuring cup measures the amount of liquid and how a thermometer measures the temperature of



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the water. Fill one saucepan with two cups of water and the second saucepan with four cups of water. Which one will boil first? Compare and contrast the differences. Students should record this data in their journals.

Have students go to the Count Us In: Capacity Activity Web site: www.abc.net.au/countusin/games/game15.htm .

They will see in this the activity that once the water is poured into the container that it is holding the most liquid. As a **focus for media interaction** invite the students to try the measuring game. During the game they will try to figure out which container holds the most liquid. Remind them that just because a container is long and tall, it does not mean that it holds more liquid than a shorter, wider container. Encourage the students to be sure that they and their partner agree on an answer before they choose the container with the most liquid.

Introduce the *Madeline at Cooking School*/video. As the **focus for media interaction** explain to the students that this is a story about Madeleine and her friends. Madeline and her friends live at their school. When Mrs. Murphy the school's cook becomes ill, Madeline and her friends try to help by cooking. Tell the students that you will be stopping the tape at certain points and they will be asked questions.

Start the video and **play** until you see the girls in the kitchen making several additions to the buttered toast. **Pause** the tape when you hear the narrator announce, "And so for the esteemed trustee the children made as specialty, a feast of creativity." Ask the children, "What is happening?" "What are the children making?" "Have you ever eaten a meal like this one?" **Resume** the video until you see Madeline and her friend drop their sandwiches on the floor. **Pause** the tape. Ask the students, "Why would the girls drop their sandwiches on the floor?" "What is going on?" "Why do you think the food tasted so awful?" (**Note:** It will be likely that a student will mention that the girls did not follow a recipe). Ask the students to think about how a recipe may have helped the food taste better. **Resume** the tape until you hear the narrator say, "So they set off to learn France's finest cuisine, to prevent Lord Cuckoo Face from turning green." **Pause** the tape, ask the students if they know what the word cuisine means. Explain that it is another word for meal or food. **Resume** the tape until you see the



hungry children being turned away and Madeline's memory of the girl in the park who was hungry. **Pause** the tape; ask the students, "Who are these children and what do they want?" **Resume** the tape until you hear the narrator say, " They listened so well it was a surprise, chef Frombe could scarcely believe his eyes." **Pause** the tape. Ask the students, "Why would listening help when you are cooking in a kitchen?" **Resume** the tape until you hear the narrator say, " If chef Frombe was contented a diploma was presented." **Pause** and ask the students, "What is a diploma, what does the word contented mean?" **Resume** the tape until you hear the narrator say, "And that is all there is, there isn't any more." **Stop** tape and ask the students, what did the children learn at cooking school?

Have the students go to the Web site:

www.mhschool.com/student/math/mhmath/popup.html and as the **focus for media interaction** tell them "This Web site provides you with pictures of different tools that you use to measure different things. You need to think about which tool would work best to measure the weather, water, fruit and more. Send small groups to the Web site to match the measurement tool with the item needing to be measured.

Week Two, Day Three:

Provide the students with newspaper flyers from a grocery store. Explain to students how fruit is sold by the pound. Compare and contrast different types of fruit and how much they cost per pound. Would one pound of bananas feed the entire class? How many pounds would you need to feed the whole class? Are bananas more expensive, less expensive or do they cost the same as the apples do per pound? Use the fruit as a manipulative for exploring what would be the best fruit at the best price for the class to share?

Culminating Activity:

Week Two, Day Four

(for grades 1-3)

- **SAFETY NOTE:** Be sure to check for food allergies before you begin this lesson. As written, the recipe contains nuts.



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As a class, brainstorm ways a scale could be made with the following materials: a soft drink can or bottle, a shoebox lid, some tape, a ruler and Popsicle sticks and other miscellaneous junk.

Next, Provide groups of two with a soft drink can or bottle as well as a shoe box lid and some tape. Ask them to design a scale that will allow them to balance small objects. Provide them time to design the scale in ways they think will work best. Invite them to use their scale to compare and contrast the weight of small objects. Ask the students to record their results in words and pictures.

Culminating Activity

(for all grades):

Invent a recipe for a meal using all the types of measurements the class has experienced. Record the recipe and send it home for families to try.

Step One:

Explain to the students that you bought the ingredients from the grocery store. You heard that if you mix all of these ingredients together you can make a tasty treat. So you are going to do that now. Take the ingredients and mix it together haphazardly. Then spoon out portions on plates and offer it to children. The ingredients are confectioners' sugar, cocoa powder, cream cheese, nuts and sprinkles. (Make a small portion of the mix and make it as unappetizing as possible.)

Ask the students if they think the treat is tasty enough to give as presents to people. Most likely they will say no. Ask the students for suggestions as to how you might begin to make treats that are tasty. Most likely they will offer the suggestion to follow a recipe.

Step Two:

Cue the video *My First Cooking Video, A Kid's Guide to Making Fun Things to Eat* and as the **focus for media interaction** tell the students that the video will show them step-by-step directions for following a recipe. Tell them they must listen, measure and mix carefully in order for our cooking to taste and look good. Measurement is always important when you are cooking. Tell them that if they add too much or too little of an ingredient they may end up with food no one will want to eat.

Start the tape at the Chocolate Truffles Recipe. **Play** the tape until you hear the list of the ingredients that you will need. **Pause** the tape after



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each one of the ingredients. On large chart paper write in words and pictures the ingredients and the amounts of ingredients (**Note:** see **Materials**) that you will need in order to make the Chocolate Truffles. Once you have created the list, read through it as a class and gather the materials together. Be sure that the children have washed their hands and are at the workstation ready to help with the recipe. As the **focus for media interaction** tell the children they are going to follow the step-by-step directions in the video. They are going to work together to create the Chocolate Truffles. **Resume** and **play** the entire set of directions once through to allow the children to see the recipe as a whole. Then **rewind** the tape and **start** the video again. Listen to the first step and then **pause** the tape after each individual step of the directions.

The instructions will work as follows.
Put the chopped nuts into a mixing bowl.

Pause

Add the cream cheese

Pause

Confectioners' sugar

Pause

And cocoa powder

Pause

Mix it all together.

Pause

Now roll the mixture into little balls in the palm of your hand.

Pause

Then roll it carefully over the chocolate sprinkles.

Pause

And then put the truffles into the paper candy cups.

Stop

Now serve the truffles on fancy napkins and plates. Discuss how following the recipe made the food taste and look better. Compare the end product of the dessert that was not created from a recipe and the dessert created from a recipe and chart the differences on a large piece of paper.

Cross-Curricular Connections

Language Arts:



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Study famous quotations that involve measurement. What do they mean? Some examples include: “A stitch in time saves nine”. “A penny saved is a penny earned”. “Measure twice, cut once”. “Measure once, cut twice.” “Time flies when you’re having fun.”

Study compound words such as backpack and snowman. Measure the compound words. For example, take an actual lipstick case and measure how long the lipstick is.

Community Connections:

Take a walking tour of your town or city. Investigate the types of measurements that people use in their workplace. Request that the student and their family work together to measure the length and width of the student's snack or lunch. Ask the family to label the snack's length and width using tape or a sticky label adding the corresponding number of Inches on the tape/label.

Ask families to measure the distance between their home and the school. Request that they time how long the trip takes on a bus vs. a car. Invite a bus driver to assist in helping you measure the length of a bus. Compare the length of the bus to the length of a car.

Student Materials:

Data Recording sheet



Name:

Tally how many numbers you find in the kitchen.

Length of the hot dog before cooking.

B _____

Length of the hot dog after cooking.

A _____

Temperature of water

Circle the pot that boiled first.



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