Tennessee Tech University

LESSON PLAN TEMPLATE

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Lesson Title: Estimating Measurement Grade/Level: 1st Grade

Curriculum Standards	Focus Question/Big Idea/Goal	Rationale/Theoretical Reasoning
CCSS.MATH.CONTENT.1.MD.A.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.	Essential Question: How can you estimate and measure length with nonstandard units? Big Idea: Measurement is a process of comparing a unit to the object being measured. The length of any object can be used as a measurement unit for length. Goal: For students to become aware of and familiar with the objects in their everyday life.	Rationale: It is important for children to explore measuring lengths with nonstandard units because it prepares them for an introduction to both customary and metric units. Measuring is something that happens in everyday life. If students understand how to make good estimates, then he or she can use that knowledge to check the accuracy of their measurements. Theoretical Reasoning: **Multiple Intelligences-** This lesson was created to reach a number of multiple intelligences present in Howard Gardner's Theory of Multiple Intelligences. The lesson specifically addresses verbal/linguistic, logical/mathematical, bodily/kinesthetic, intrapersonal, interpersonal, and visual/spatial learning styles in order to help students with varied learning styles grasp how to estimate and measure objects using nonstandard units. (see Adaptations section) Gardner, H. (2000). Intelligence reframed: Multiple Intelligences for the 21st century. New York: Basic Books. **Vygotsky-** Vygotsky's theories explain the importance of social interaction in learning. This lesson incorporates Lev Vygotsky's Sociocultural Theory by having the students work in a small group during the center rotations. Also, the students will be in a whole group setting while answering

Lesson Objective(s)

1. The student will accurately estimate lengths of objects by using nonstandard units.
2. The student will accurately measure lengths of objects by using nonstandard units.
3. The student will recognize and define vocabulary words associated with estimating measurement.

Vocabulary/ Academic Language

Vocabulary:
Estimate- An educated or good guess
Measure- To find the size of something

Academic Language:
Length
Rounding Up
Rounding Down
Nonstandard Unit

* Students will discuss the vocabulary terms during the online mini lesson and the measurement anchor chart, and the students will have a chance to work with the vocabulary terms during the center rotations.

Assessment/Evaluation

Formative:
Throughout the lesson, the teacher will monitor the students' understanding in a variety of ways. The teacher will use the problem of the day as a pre-assessment to see if the students are able to make good estimations. During the online mini lesson, the teacher will ask the students a variety of probing questions to assess their current understanding about estimating and measuring objects with nonstandard units. (see Questions section) During the measurement anchor chart activity, the teacher will call on students to define each term to asses what students know about the vocabulary definitions. This assessment requires students to think about what they already know, which brings their knowledge about estimation and measurement to the surface. The teacher will give the students feedback on their definitions, depending on if their definition was correct or incorrect. If a student's response is correct, the teacher will tell the student why his or her response is correct, and if a student's response is incorrect or needs more detail, the teacher will provide clarification as needed and ask probing questions to guide the student in the right direction to improve his or her response. During the workbook packet center, the teacher will use the packet and the

discussion as an assessment of what the students currently understand. If the students' responses are incorrect, the teacher will provide clarification and guide the students to improve their responses.

Summative:
The teacher will check for mastery by collecting the exit ticket. The teacher will look at the exit ticket to check for mastery of the lesson objectives. It is considered mastery, if a student provides a good estimate and an accurate measurement of his or her given object. For those students who do not achieve mastery, I will work with them to complete the Reteaching 14-2 worksheet in a small group before I begin the math lesson the next day. For those students who achieved mastery, I will have them complete the problem of the day while the other students are working on the Reteaching 14-2.

Instruction
Total Lesson Time: 75 minutes

Set/Motivator:
"I Can" Statement- (Approx. 3 min.)
The teacher will begin the lesson by having the students come and sit in font of the whiteboard. The teacher will then go over the lesson standards, objectives, and "I can" statement, and he or she will have the students repeat the "I can" statement. Next, the teacher will display the lesson schedule and explain that there will be a mini lesson, review, centers, and an exit ticket to recess.
Problem of the Day- (Approx. 3 min.)
After the teacher has gone over the lesson schedule, he or she will pose the problem of the day to the students: How many steps do you think it will take for me to walk across the room? The teacher will take one step to show the students what one of his or her steps looks like. Then, the teacher will call on a few students to share their answers, and he or she will write the students' answers on the board. Next, the teacher will start at one end of the classroom and walk straight to the other, while having the students count the steps aloud. Then, the teacher will write the number of steps in a box on the board and go over the guesses to see if any were close. Finally, the teacher will explain that when the students guessed how many of steps it would take for the teacher to walk across the room, they made an estimate, and when they counted how many steps it really took, they measured the length of the room in steps. (see objectives 1, 2, and 3 and formative assessment)

Instructional Procedures/Learning Tasks:
Online Mini lesson- (Approx. 10 min.)
Next, the teacher will start the online slideshow. On slide 2, the teacher will ask the students if he or she should use his or her steps to measure the crayon, and have the students explain why not. Then, the teacher will ask the students to give some suggestions of what they can use to measure the crayon, give the suggestion of using connecting cube, and ask why those will work. Next, the teacher will ask the students to turn to their turn-and-talk partner and discuss how many connecting cubes long he or she thinks the crayon is. The teacher will move on in the slideshow and stop at slide 9. After the teacher plays slide 9, he or she will have the students close their eyes and form a mental picture to figure out their estimate of how many cubes it will take to measure the length of the crayon. Then, the teacher will call on a student to share his or her estimate and reasoning for the estimate. The teacher will move on in the slideshow and stop at slide 13 to point out how the cubes are all connected, that there are no gaps between the cubes, and that the cubes start at one end of the crayon and go all the way to the other end. Next, the teacher will explain that when you are accurately measuring an object you have to make sure there are no gaps between the cubes and that you start at one end and go all the way to the other. Finally, the teacher will play the rest of the slideshow. (see objectives 1, 2, and 3, questions, and formative assessment)
Measurement Anchor Chart- (Approx. 5 min.)
After the mini lesson, the teacher will explain to the students that they, as a class, are going to make a chart of tips for measurement. The teacher will write "estimate" on the

questions during the instruction. Also, Vygotsky talks about the zone of proximal development (ZDP), which is the zone between what a student can do without help and what he/she can do with help. This lesson incorporates Lev Vygotsky's ZDP by having the students work with the teacher during the workbook packet 14-2 center. Vygotsky, L.S. (1978). Mind in society. The development of higher psychological processes. Cambridge, MA: Harvard University Press.
Bloom's Taxonomy- The teacher is using Benjamin Bloom's Taxonomy by asking higher-order thinking questions, rather than yes or no questions. These types of questions allow students to use their critical thinking skills, which help the students to understand how estimate and measure using nonstandard units. (see Questions section) Bloom's Taxonomy. (n.d.). Retrieved from http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm
Marzano's Nine Essential Instructional Strategies- Reinforcing Effort and Providing Recognition- If a student is struggling, the teacher should pause to discuss the problem, then prompt with suggestions. If the student's performance improves, offer praise. In this lesson, the teacher will observe each student's answers to questions during the whole group instruction and the workbook packet 14-2 center, provide any clarification that is needed

chart, ask the students what he or she should write for it, and write the students' responses. Next, the teacher will do the same thing for "measure." Finally, the teacher will go over the class anchor chart and explain to the students that they can use the chart when they are working at centers. (see objective 3 and formative assessment)

Centers- (Approx. 45 min.)

Next, the teacher will give the directions for each center and release the students to begin their first center rotation. Each center rotation will be 15 minutes long.

1. Measure a Friend- Students will get with a partner and take turns measuring each other with a nonstandard unit of measure. First, the students will write the name of their partner on the "Measure a Friend" activity page (Attachment A) and list the tool they are going to use to measure. The students will get to choose a tool from the basket of tools that the teacher places at the center. Next, the students will write their estimate for the tool. Then, one partner will lay flat on the floor with his or her arms to his or her side, and the other partner will begin to measure his or her partner will the tool. Finally, the partners will switch roles, and each student will write a sentence explaining what they have learned about measurement. (see objectives 1 and 2)
2. Workbook Packet- Students will complete workbook packet 14-2. The teacher will work with the students at this center. The teacher will do problems 1-3 with the students, as a group, making sure each student understands the concepts. Then, the teacher will let the students complete the Do you understand? and problems 4-7 independently. After the students finish working, the teacher will lead the students in a discussion about the Do you understand?, having each student explain their reasoning. Finally, the teacher will have the students complete problems 8-10. If there is time left, the teacher will ask the students if they needed to estimate to solve problem 8 and to explain why or why not. (see objectives 1 and 2 and formative assessment)
3. Classworks- For this center, students will get on the computer and work on their classworks account.

Questions and/or activities for higher order thinking:

What word tells you to estimate?
When you estimate will you find the exact length? Why or Why not?
How can looking at one connecting cube help you estimate how many connecting cubes it will take to measure the crayon?
How is measuring the length different from estimating the length?
Explain why your estimate was a good or bad estimate?
What do you have to remember when you are measuring an object?
What happens when the connecting cubes don't align exactly with the object?

Closure:

Lesson Review- (Approx. 3 min.)

After all the center rotations, the teacher will have the students cleanup the center that they are working at and transition back to their desks. Then, the teacher will go back over the measurement anchor chart, and have a few students share a measurement for their partner from the "Measure a Friend" activity page.

Exit Ticket- (Approx. 4 min.)

To close the lesson, the teacher will pass out an exit ticket (Attachment B) to each student. Each exit ticket will have a different object on it for the students to estimate and measure with connecting cubes. Finally, the students will turn in their exit tickets. (see objectives 1 and 2 and summative assessment)

Material/Resources:

Lesson Outline Anchor Chart
Lesson Schedule Anchor Chart
enVision Math Slideshow: www.pearsonsuccessnet.com
Measurement Anchor Chart
Measure a Friend Activity Page (Attachment A)
Measurement Tools (4 different kinds)

and offer praise when performance improves.

Cooperative Learning- Allowing students to work in groups can have a positive impact on learning, if a teacher is conscious in the way he/she groups the students. For example, the teacher needs to take into account the students' interests, academic level, and personalities. In this lesson, students will work in groups during the center rotations.

Setting Objectives and Providing Feedback- Setting objectives and providing feedback provides students with a sense of direction. The teacher sets objectives for the students when creating this lesson, and provides feedback during the lesson's assessments and other activities.

Information taken from http://www.middleweb.com/MWLresources/marzchat1.html

Technology in the Classroom- Crystal A. Gasell has found in her research that technology integration in the classroom has many benefits. There is an overwhelming amount of evidence that supports that the use of technology in the classroom raises student achievement. In this lesson, the teacher will be using technology during the online mini lesson.

Information taken from http://edtech2.boisestate.edu/gasellic/metportfolio/assignments/Sunthesis%20Paper_Gasell.pdf

Modeling- Heather Coffey has found in her research that modeling in the classroom has many benefits. "Research has shown that modeling is an effective instructional strategy in that it allows students to

enVision Math Workbook Packet 14-2
Connecting Cubes
Exit Ticket (Attachment B)

Adaptations to Meet Individual Needs:

High-Level Learners-

The teacher will adapt the instruction to meet the individual needs of high-level learners by differentiating problem 10 on the workbook packet 14-2. The teacher will challenge the high-level learners by only letting them carry one connecting cube with them when they are trying to find an object that is about 10 connecting cubes long. This will challenge the high-level learns because they will have to form a mental picture of 10 connecting cubes and will have to compare their mental picture to the object they have chosen to get a good estimate.

Struggling Learners-

The teacher will adapt the instruction to meet the individual needs of struggling learners by differentiating problem 10 on the workbook packet 14-2. The teacher will provide the struggling learners with 10 connecting cubes so they can see how long the object will have to be in order to be a good estimate for problem 10. Also, instead of having four math groups, the teacher will have three. The math group that is made up of the struggling learners will be broken up, with each struggling learner joining a higher level group to go through the center rotations.

Gardner's Learning Styles-

Verbal/Linguistic- The students will have to write a sentence or two to explain their answer on the Do you understand? problem on the workbook packet 14-2. Also, the students will have to write a sentence or two to tell what they have learned about measurement on the "Measure a Friend" activity page. (see Attachment A)

Bodily/Kinesthetic- The students will participate in hands-on learning when they are using connecting cubes and other nonstandard units to measure different objects throughout the lesson.

Visual/Spatial- The students will have to use their visual/spatial skills when they are estimating the lengths of different objects because they have to form mental pictures in their heads.

Logical/Mathematical- This lesson is a mathematics lesson, so students will be using their mathematics skills to complete the activities throughout the lesson.

Intrapersonal- The students will be working independently for some parts of the workbook packet 14-2, while he or she is on classworks, and to complete the exit ticket.

Interpersonal- The students will be working with each other during the measure a friend activity and for some parts of the workbook packet 14-2. Also, the students will be discussing with their turn-and-talk partners during the online mini lesson.

Management/Safety Issues:

To insure that the teacher and the students will be able to hear each other and the correct student will have the opportunity to answer a question during discussions, the teacher will remind the students to raise their hands and to stay quite unless they are called on by the teacher. Before the students begin their center rotations, the teacher will remind the students that they will be working in small groups, and that they only need to talk loud enough so there group members, who are working right next to them, can hear them. The teacher will also remind the students that before they leave a center, they need to clean up and make it look like the way the found it.

To avoid safety issues, the teacher will remind students that they need to walk when they are rotating between centers, and that they need to be careful and use care when they are working on the computers

Reflections/Future Modifications:

observe the teacher's thought processes. Using this type of instruction, teachers engage students in imitation of particular behaviors that encourage learning." Information taken from http://www.learnnc.org/lp/pages/4697

_____ _____

Student Teacher Signature/Date Supervisor/Date

Name: _____ Date: _____

Measure a Friend

Directions- Pick two nonstandard measurement tools to use to measure your friend. Make sure to make an estimate before you measure and show your work below.

My friend's name is _____.

The tool I'm using to measure my friend is

_____ .

Measurement Tool	Estimate	Actual Measurement

What did you learn about measurement today?

a.brantley

CCSS.MATH.CONTENT.1.MD.A.2

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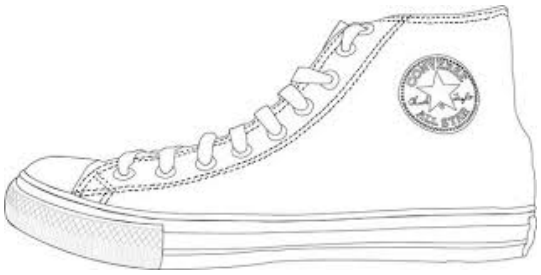
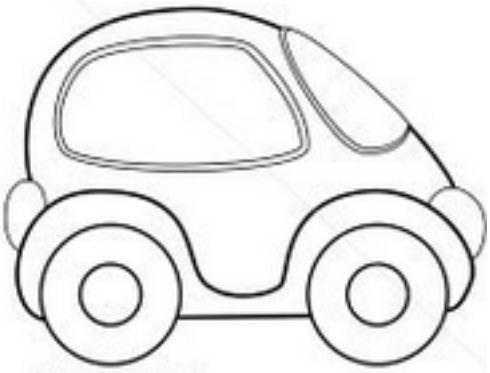
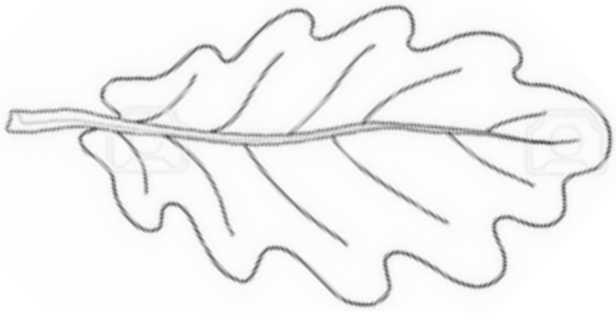


Estimate: _____ Measure: _____



Estimate: _____ Measure: _____



Estimate: _____ Measure: _____

Estimate: _____ Measure: _____

Attachment B