NEE
Network for Educator Effectiveness
College of Education
University of Missouri

Unit of Instruction Organizer

Teacher: Mary Measures **School Year:** 2013-2014 **Years of Experience:** 6

School: Soggy Bottoms **Subject Area:** Mathematics **Grade:** 5

Unit of Study: Measurement

1. List the Board of Education-approved content standard(s) and curriculum addressed in this Unit of Instruction. Align the unit objectives with the standard(s). (Indicator 3.1)

Core Standard/GLE/NGSS – Write out the standard(s) your instruction will support.	*Unit Objectives – Write out the specific unit objectives that will address the Board of Education-approved standard(s).*
GLE M2E5 – Convert from one unit to another within a system of linear measurement (customary and metric). **GLE M2E6 –** Convert from one unit to another with a system of measurement (mass and weight). **GLE M2E7 –** Convert from one unit to another within a system of measurement (capacity) and convert square or cubic units within the system of measurement. *(NOTE: Square and cubic units will be covered during a later unit.)* **Standard –** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	1. The student will convert linear measurement within the customary system. 2. The student will convert linear measurement within the metric system. 3. The student will convert mass within the metric system. 4. The student will convert weight within the customary system. 5. The student will convert capacity within the customary system using square or cubic units. 6. The student will convert capacity within the metric system using square or cubic units.

2. Provide essential and guiding questions that are aligned with unit objectives (i.e., questions that focus student attention on meaningful activities leading to desired learning). (Indicator 1.2)
3. Indicate whether essential and guiding questions require higher-level thinking according to Depth of Knowledge (DOK) level or Bloom's Taxonomy. (Indicator 4.1)

Essential Question(s):	*DOK or Bloom's Taxonomy:*
How can I use measurement conversion to solve real world problems?	4 (Connect, analyze, prove; apply concepts)
Guiding Questions:	***DOK or Bloom's Taxonomy:***
How is the process of converting measurement in the metric system similar to the process of converting measurement in the customary system? (compare)	3
How is the process of converting measurement in the metric system different from the process of converting measurement in the customary system? (contrast)	3
If you were to critique each system, would you choose the customary or metric system to use in your daily life? (analyze and justify)	4
What is the connection between the metric system and the powers of ten?	4

4. Indicate how the Unit of Instruction elements link directly to the unit objectives. (Indicator 3.1)	
What will students be asked to do? (e.g., learner activities, student work samples, and assessments)	***Which unit objective does this support?***
Students will use a variety of conversion problems placed throughout the room that students have to answer and then check with the instructor. Cards are color coded by difficulty. Students cannot progress to the next color without mastering the previous color.	2, 3, 6
Students will go out to the football field so they can understand how big a yard is, and they can also see that three feet actually fit in a yard. They will measure and see how many feet and inches are in a yard. After the football field activity, students will convert the entire football field from yards into feet and then inches.	1
Students will roll dice to earn beans. Beans will represent ounces. Every eight ounces, they may trade in their beans for a cup. When they get two cups, they may trade those in for a pint. They continue to roll dice and convert capacity until they reach a gallon. The first student to reach a gallon wins.	5
We use the pneumonic device: King Henry Died By Drinking Chocolate Milk.	2, 3, 6
Organize the conversion problem to state the known measurement to the unknown measurement. Determine the larger and smaller units. Apply the appropriate operation. Complete the conversion.	1, 2, 3, 4, 5, 6
Students will be given animal cards with an animal and the weight. Students will then give the animal's weight in a different unit than what is shown.	4
Modeling the correct process for conversions.	1, 2, 3, 4, 5, 6
NOTE: Place documentation in Appendices A, B, and C.	

5. Describe the process of formative assessment to inform change in instruction to meet student needs and summative assessment to evaluate student learning. (Indicator 7.2)

What formative assessment(s) will you use?

- Metric Mania (see box 4)
- Written Check for Understanding Strategy (using whiteboards)
- Questions and answers during teaching
- Homework sections from text book
  - p. 811/812 Customary length
  - p.829/830 Customary weight
  - p. 843/844 Customary capacity
  - p. 861/862 Metric length
  - p. 875/876 Metric mass
  - p. 881/882 Metric capacity
- Check my progress pages in textbook
- Rating 1-5 for understanding and confidence with eyes closed

Describe how results of formative assessment(s) inform changes in instruction to meet student needs.

- In Metric Mania, students are not allowed to move on to the next color until they master the color prior.
- In general, formative assessment will determine which groups have mastered the objective and are able to move on to higher level thinking, while other groups will meet with the teacher for one-on-one and intensive reteaching.
- Homework will be checked and corrected if necessary.

What summative assessment(s) will you use?

The chapter will be split into two formal tests: one test covers the customary system and the other covers the metric system.

Describe how results of summative assessment(s) will be used to evaluate student learning. (How will you know the students met the learning objectives? Why are you giving that particular assessment? What will it tell you?)

Students who scored above an 80% have mastered the information. All students will be given the opportunity to make test corrections to earn back half of the points for each question missed. If students are struggling with the information, reteaching will take place during Bearcat time.

NOTE: Place documentation in Appendix D.

6. Identify effective research-based instructional strategies to be used in the unit. (Indicator 2.3)

Explain why you are using specific instructional strategies. You do not need to discuss all the instructional strategies. Provide a description of key instructional strategies you will use and which lessons you will use them in. Provide evidence of their effectiveness. Cited evidence should be from credible sources, such as publications or presentations that have been reviewed by peers. Other examples include credible textbooks, trade books, journals, the What Works Clearinghouse review, and publications and papers produced by nationally-recognized research or higher-education institutions.

- Thematic Instruction (used when teaching the process of conversions) (links prefixes from CA, multiplying powers of ten from an earlier unit): "Themes are a way of understanding new concepts. They provide mental organizing schemes for students to approach new ideas" (Caine & Caine, 1997; Kovalik, 1994). http://www.netc.org/focus/strategies/them.php
- Identifying Similarities and Differences (between metric unit and customary unit): "Results of employing these strategies can help to boost student achievement from 31 to 46 percentile points" (Strone, 1983; Stahl & Fairbanks, 1986; Ross, 1988) http://www.netc.org/focus/strategies/idea.php
- Reinforcing Effort (used during test corrections):" Student achievement can increase when teachers show the relationship between an increase in effort to an increase in success" (Craske, 1985; Van Overwalle & De Metsenaere, 1990) http://www.netcorg/focus/strategies/rein.php
- Homework and Practice (used with textbook sections): "Homework assignments provide the time and experience students need to develop study habits that support learning. They experience the results of their effort as well as the ability to cope with mistakes and difficulty (Bempechat, 2004) http://www.netc.org/focus/strategies/home.php
- Cooperative Grouping (pair students with differing abilities during Metric Mania and beans game): "Low ability students perform worse when grouped in homogenous ability groups (Kulik & Kulik, 1991, 1997; Lou et al, 1996) http://www.netc.org/focus/strategies/coop.php
- Providing Feedback (tests are given at the end of the unit after instruction and review; tests and homework will be graded and returned promptly) "Effective feedback is timely. Delay in providing students feedback diminished its value for learning (Banger-Drown, Kulik, Kulik, & Morgan, 1991) AND "Administer tests to optimize learning. Giving tests a day after a learning experience is better than testing immediately after a learning experience (Banger-Drown, Kulik, Kulik, & Morgan, 1991) http://www.netc.org/focus/strategies/prov.php
- Simulation and Games (metric mania and Cup 'O Beans game) "Gaming teaches competition strategies, cooperation and teamwork, and conflict resolution (Neubecker, 2003) AND Games have been found to serve a range of functions in education including tutoring, exploring and practicing skills, and attitude change (Dempsey et al., 1994) http://www.netc.org/focus/strategies/simu.php

7. Describe the instructional strategies you will use to differentiate instruction for diverse learners present in the classroom. Mark diverse learner categories that do not apply as "N/A" (Not Applicable). (Indicator 3.2)

Enrichment for accelerated learners: • Higher level enrichment worksheet • Problem solving/higher order thinking	***Remediation for struggling learners (Tier 2/Tier 3):*** • One-on-one instruction (reteaching) • Lower-level reteach worksheet (modified) • Manipulatives – gallon jugs, quart containers, yardstick, rulers, etc. • Visuals – gallon diagram, gallon man, leveled staircase
ELL: Not applicable.	***Other:*** RedCat microphone for heading-impaired students

8. Describe how you lead students to self-reflect about their personal goals regarding the unit objectives. (Indicator 2.2)

Provide description with evidence.

- Raise your hand and rate your mastery of the objective from one to five
- Reflect page at the end of the chapter
- Test Reflection questions (study habits, success, etc.)

NOTE: Place documentation in Appendix C.

9. Provide supporting resources used in the Unit of Instruction to guide both teacher and students. (Indicator 4.2)

How are you getting your end results? Provide description of supporting resources. Include samples, such as comparative student work samples/anchor papers, schedules/pacing guides, task outlines, scoring guides/rubrics, assessments, or other appropriate resources for instruction and learning.

To be included in the Appendix E at a later date:

- Student work
- Tentative schedule (about three weeks)
- Tentative pacing guide (2 days per skill, plus 3 days review/basics)
- Customary test/key
- Metric test/key
- Task outline – See Element 5.

NOTE: Place documentation in Appendix E.

10. Indicate how you will use available and appropriate technology to promote student engagement and learning. (Indicator 4.2)

Describe how each use of technology promotes engagement and/or deepens understanding.

- PowerPoint – How to make their own ruler (to understand ruler).
- The interactive white board engages students in visual and hands-on learning to convert measurement.
- Ruler/yardstick/meter stick – Apply conversions with hands on methods.
- Visual capacity graduated cylinders
- Metric magnetic prefix staircase poster
- Magnetic customary capacity visuals