Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Science and Technology Education	Course:	SCI/TE PLTW Gateway to Technology (DSF)	Unit 3 Title:	Design and Modeling Measurement	Grade Level(s):	7-8
Assessed Trimester:	Trimester 1	Pacing:	3 Days	Date Created:	6/17/2014	Last Revision Date:	

Course Understandings: *Students will understand that:*
- Students will understand that in the United States, we use both standard and metric systems of measurement

DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

Established Goals

Math
- **Standard: 6.1.3:** Multiply and divide decimals, fractions and mixed numbers; solve real-world and mathematical problems using arithmetic with positive rational numbers.
  Benchmark:
  6.1.3.2: Use the meanings of fractions, multiplication, division and the inverse relationship between multiplication and division to make sense of procedures for multiplying and dividing fractions.
  6.1.3.4: Solve real-world and mathematical problems requiring arithmetic with decimals, fractions and mixed numbers.

Technological Literacy
- **Standard:** Students will develop an understanding of the influence of technology on history.
  Benchmark:
  E. The design and construction of structures for service or convenience have evolved from the development of techniques for measurement, controlling systems, and the understanding of spatial relationships. (7.6-8-E)

Transfer

Students will be able to independently use their learning to: (product, high order reasoning)
- Students can use standard or metric measurements to create a product accurately with in tolerances.

Meaning

Unit Understanding(s):	Essential Question(s):
Students will understand that: ● In the United States, we use both Standard and Metric systems of measurement. ● Being able to measure accurately is important at school and at home, at work and when pursuing hobbies. ● Quality workmanship and accurate measurements with precise instruments are necessary to successfully solve problems.	**Students will keep considering:** ● Do you think the U.S. should convert to all metric measuring, or should the U.S. stay with using both the Standard and Metric systems? Why? ● Why don't we use such measurement forms as the hand span, cubit, and pace very often today?

Acquisition

Knowledge - Students will:	Skills - Students will:
It is expected that students will: ● Select the appropriate value from a conversion chart to convert between standard and metric units.	● Demonstrate the ability to measure accurately with different devices and scales using both the standard and metric systems. ● Convert between standard and metric measurements including inches, feet, yards, millimeters, centimeters, and meters.

Reasoning - Students will: ● Measurement with standard system accurately ● Measurement with metric system accurately	

Common Misunderstandings	**Essential new vocabulary**
● Often students will combine standard measuring with decimal measuring. i.e. They will measure one section of a plan in 8th's or 16th's and another in 10th's using the same standard ruler. ● When students multiply and divide fractions, they get rules of denominators and numerators mixed up. ● When students multiply and divide mixed metric system numbers, they get the rules of conversion mixed up. ● Students sometimes think it is not necessary to study both measurement systems. ● Students may believe that multiplication always results in a larger number, while division always results in a smaller number. ● When using the standard algorithm for division, students may ignore 0s in problems involving multi-digit dividends where the 0 is in the middle. For example, students may treat 40.2 ÷ 6 as 42 ÷ 6. ● When placing the decimal point using the standard algorithm, students may begin counting from the left side of the product instead of the right. For example, students may understand that four decimal places are needed, but believe that 7.91 x 0.72 = 5695.2. ● When using the standard algorithm for multiplying decimals, students may determine the number of decimal places in the answer by counting the decimal places to the left of the decimal point instead of the right. For example, students may believe that 18.6 x 5.9 = 10.974, thinking that 3 decimal places are needed rather than 2.	● Precision ● Lowest Common Denominator ● standard system ● metric system ● unit ● numerator ● denominator