Text: Unit 3 Cord Applied Mathematics

Unit number and title: 3--Measuring in English and Metric Units

  Short Description: Use items purchased at a store to develop and compare unit conversions between the US Customary System of Measurement and the Metric System of Measurement.

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Lab Title
Creating Conversion Ratios

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

    To create unit conversion ratios using two congruent measurements given in Metric and Customary notation.

    Unit conversion ratio -- A fraction, or ratio, that equals one, having a quantity with a certain unit of measure in the numerator, and a quantity with a different unit of measure in the denominator. This ratio is used to convert between units. For example, a unit ratio for converting inches to centimeters is

$$\frac{inch}{centimeters} \; or \; \frac{0.3937}{centimeter}$$

- **Materials List**
    - A soda can
    - Box of macaroni
    - Can of soup
    - Eggo waffles
    - TV Dinner
    - Packages of candy
    - Bag of chips
    - Etc (anything that has measurements in customary and metric units(ex.--12 fl oz is 355 ml)
- **GLEs (State Standards) addressed**

    Math:

    EALR 1: The student understands and applies the concepts and procedures of mathematics.

    COMPONENT 1.1: Understand and apply the concepts and procedures of number sense

    1.1.1   Understand the concept and symbolic representation of real numbers, including rational exponents. (aligns with College Readiness Standards (CRS) 4.1)

    1.1.6   Complete multi step computations with combinations of rational numbers using order of operations and addition, subtraction, multiplication, division, powers, and square roots.

1.2.3   Apply unit conversions within measurement systems, U.S. or metric, to maintain an appropriate level of precision. W

EALR 2: The student uses mathematics to define and solve problems.

COMPONENT 2.2: Construct solutions

2.2.1   Select and use relevant information to construct solutions.

EALR 3.1: Analyze information

3.1.1   Analyze, compare, and integrate mathematical information from multiple sources.

- **Leadership Skills**

- **SCAN Skills/Workplace Skills**
  Writing
  A. Communicates thoughts, ideas, information and messages in writing.
  B. Records information completely and accurately.
  Math
  A. Performs basic computations.
  B. Uses basic numerical concepts such as whole numbers and percentages in practical situations

- **Set-up information**
  Lab organization – Students can work on their own, in pairs, trios, etc.

- **Teacher Assessment of student learning**
  Students will be assessed, on a percentage basis, on the accuracy of their calculations and their persuasive conclusion that must include a minimum of two statements of supporting data and meets the WASL standard for writing.

- **Summary of learning**
  o   Each team will share their conclusion and supporting data with the class.
  o   The teachers should ask for possible career applications and discuss them. Examples are given below.

- **Optional activities**
  Accelerated students will use the Class M & M data to calculate the mean, median, and mode of the data.

  Students with learning disabilities may be paired with an existing team of two students. Students would then be assigned the roles of recorder, calculator and grapher.

- **Career Applications**
  o   Consumer advocates check the validity of manufacturers' statements.
  o   Assembly lines need to ensure that their process is creating a standard product.
  o   Ordering departments need to know how much material to order for each item produced.
  o   Our state determines how much money each city receives based on the percentage of residents living in the city.
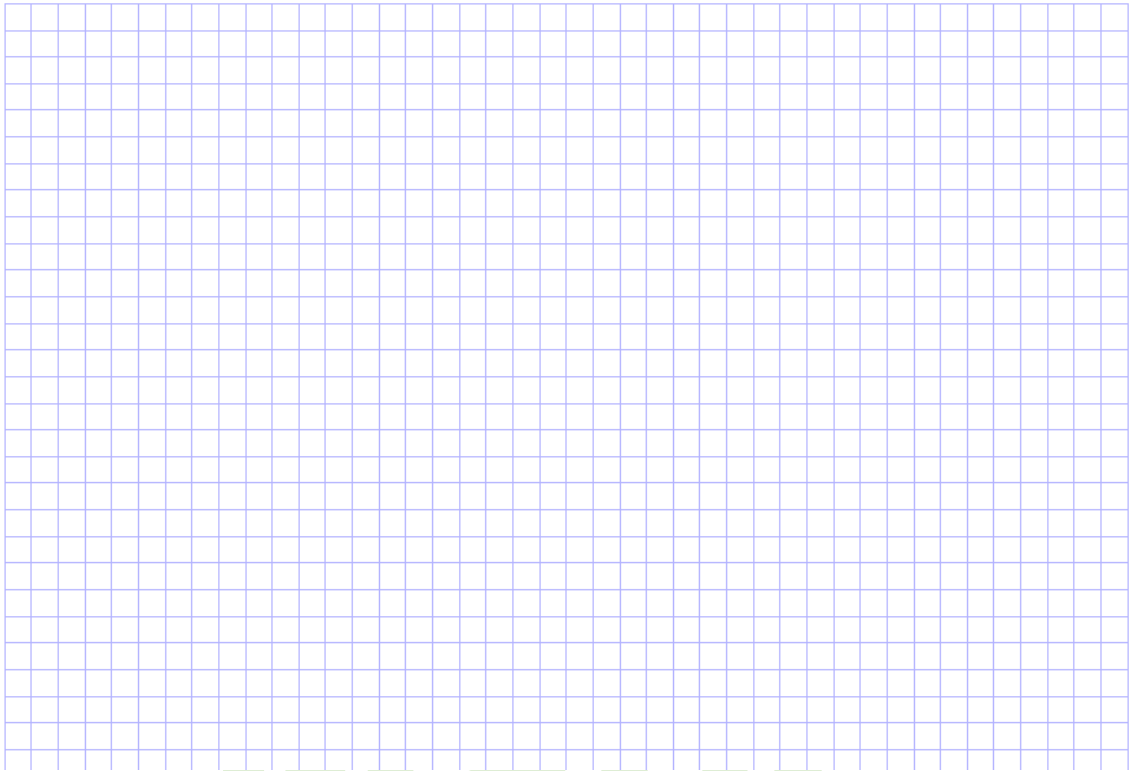
LAB TITLE: What Colors Come in Your Bag?
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
  (Almost) All groceries sold in the United States are sold with weights labeled in the metric system along with the United States customary system.

- **Grouping instructions and roles**
  Students may work by themselves, in pairs, trio, etc.

- **Procedures** – steps to follow/instructions
  1. Have a member from the group collect (at least) three different grocery items.

  2. Once items are collected, begin making calculations of
     $$\frac{\text{US Customary measurement}}{\text{metric measurement}} \text{ and } \frac{\text{metric measurement}}{\text{US Customary measurement}}$$

  3. Record the calculations on a sheet of paper.

  4. Are your ounces to grams unit conversions the same for every item you calculated? If not, why do you think they are not the same?

  5. Write the ounce measurement in the first column and the gram measurement in the second column on the board for each of your items.

  6. Once all students have written their values on the board, write them in the table below.

Measurement in ounces	Measurement in grams

7. Plot the data in the graph, placing ounces on the x-axis and grams on the y-axis

8. Be prepared to present your findings to the class.

- **Assessment instructions** (peer-teacher)
  Students will be assessed on the accuracy of their calculations and their conclusion to the lab. The conclusion should include supporting data from their lab as well as a persuasive answer.