**Quantities**

N-Q.1 “Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.”

Example homework for 13-4:

1. Mercury weighs 13.69 g/cm3. If a vial contains 3.6 mL of mercury, what is its weight?

7. Rubbing alcohol weighs 0.79 g/cm3. One liter of rubbing alcohol is how many grams lighter than 1 L of water?

Example homework for 13-7:

Consider the data in the chart:

|  |
| --- |
| Years of Employment |
| 2 | 13 | 25 |
| 14 | 8 | 10 |
| 3 | 14 | 23 |
| 30 | 30 | 22 |
| 24 | 5 | 16 |
| 16 | 23 | 17 |
| 1 | 14 | 20 |
| 18 | 25 | 19 |

The cluster *Reason quantitatively and use unites to solve problems* falls under the domain **Quantities.** The textbook used is titled “Algebra 2” written by Siegfried Haenisch and published by AGS Publishing. This learning progression is written for an 11th grade Algebra 2 class.

N-Q.1To address the units/multi-step problems portion of this standard, I will incorporate volume and mass to teach it effectively. Chapter 13 section 4 of the aligned textbook provides effective story problems that require students to problem solve. Initially, I will introduce the learning target associated with using units to solve multi-step problems. I will explain to students that the problems deal with familiar material because students have had exposure to volume. However, I will emphasize that the main point is that units are handled correctly. To ensure students are aware of the unit conversion and properties, I will require them to take notes and check these notes before the assignment will be handed out. After notes have been checked, I will assign problems 1-10 odds on page 450 of the textbook. This assignment will be due the next day of class, and corrections will be allowed for any missing points.

On the next day of class, I will address the interpreting data and graphs portion of the standard. For this, I will use section 7 of chapter 13 of the textbook. This section covers representing data in frequency tables, stem-and-leaf plots, histograms, pie graphs. Most likely, students have seen this material before in middle school or prior, but I will present each method on the whiteboard regardless. To check if students understand each method of representing data, I will have them draw examples data representations on mini-whiteboards. This will provide effective formative assessment information. After I believe students understand each method I will assign homework problems 1-10 from the book on page 459. The assignment will be due the following day of class, and students will be allowed to make corrections. Both of these two homework assignments, after corrections have been made are not will serve as benchmark assessments.

1. Display the data in a stem-and-leaf plot.

2. Display the data in a frequency table.

N-Q.2 “Define appropriate quantities for the purpose of descriptive modeling.”

N-Q.3 “Choose a level of accuracy appropriate to limitation on measurement when reporting quantities”

Excerpt from activity worksheet:

**Measure a Pencil:**

**Centimeters: Error:**

**Inches: Error:**

**Feet: Error:**

**Yards: Error:**

Best Unit/Conclusion:

N-Q.2

N-Q.3, For both of these standards, I will use an engaging activity to teach students. N-Q.2 and 3 are closely related and the activity can apply to both standards. The activity used to teach these standards requires students to measure various objects of various sizes in the classroom. Then, students calculate their possible error while measuring, and make a decision about the most appropriate units for each object. I will begin this activity by first introducing the units used in the assignment. I included centimeters, inches, feet and yards. Students will be shown how to measure each unit using a yardstick. Then, I will explain how to calculate possible error which is explained in section 1 of chapter 13 in the textbook. Students will do examples problems on their mini whiteboards to express whether or not they understand possible error. After I believe students are ready for the activity based on this formative assessment, I will group students and pass out the worksheet. Then, students will complete the activity while I walk around and ensure participation. Students will be graded on this worksheet based on a rubric.

The activity serves as a benchmark assessment.