Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ UGA myID \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**How large is a mole?**

You may have heard that a mole is the chemist’s dozen. Because particles are so small, there are A LOT of them in any given sample of a substance. It’s much easier to have a unit that stands in for a certain number of particles. Just like a dozen is 12 items, a mole is 6.022 x 1023 items. It doesn’t matter if we are discussing atoms or compounds, a mole is always the same number of particles. It makes sense to use the mole when we are discussing items so small that we can’t see them.

It can be difficult to visualize what a mole may look like for items that we can see. In today’s activity, your group will calculate the number of moles of Nerds in a standard-sized jar using two different methods. Then, we will discuss which method is most accurate by investigating the difference between the two methods. You will type your answers in this document for upload to eLC.

**Predict:** Guess how many moles of Nerds you think are in the jar before doing any calculations, then post your group’s answer on the whiteboard near your table.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ moles

**Experiment 1:** The volume of the jar is 450 mL, and the volume of one Nerd is 0.050 mL. How many moles of Nerds are in the jar? Post your group’s answer on the whiteboard, labelled as experiment 1.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_moles

**Experiment 2:** The mass of the jar is 224 g. The mass of the jar full of Nerds is 640. g, and the mass of one Nerd is 0.0714 g. How many moles of Nerds are in the jar? Post your group’s answer on the whiteboard, labelled as experiment 2.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ moles

**Discussion Break:** Which number is most accurate? Why is your choice the most accurate way to determine the moles of Nerds in the jar?

**Extend:** What is the percent error in the calculation? Report your answer as the absolute value.

Percent error =

­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_ %

**Compare:** How accurate was your initial guess for the moles of Nerds?

**Review:** What is the density of Nerds?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g/cm3

**Extend:** The density of table sugar is 1.59 g/cm3. Does your density make sense given the density of table sugar? What other factors could contribute to calculating a different density for the Nerds?