

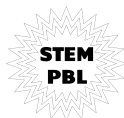
Moley

CHALK ART

A STOICHIOMETRY ACTIVITY



FREE
DOWNLOAD



TEACHER GUIDE



Are you looking for an engaging way to introduce or review stoichiometry? Do you need your students to practice gram to mole and gram to atom calculations? Are you limited on lab supplies? If so, you and your students will love this activity!

This resource is designed to reinforce **gram to mole** and **gram to atom** calculations in an engaging way that also brings some color to your campus! In addition, this activity introduces students to subtractive lab techniques that can later be applied to more advanced labs. This activity is designed for a 45 minute class period and requires a 10 minute prep. The lesson cycle for this activity can follow a traditional lab format or an inquiry-based format.

SUPPLIES REQUIRED

- ★ Sidewalk chalk (at least three colors)
- ★ A laboratory scale
- ★ Periodic Table
- ★ Calculators (as needed)

PREREQUISITE KNOWLEDGE NEEDED

- ★ Converting grams to moles
- ★ Converting moles to atoms
- ★ Chemical nomenclature
- ★ Chemical formulas
- ★ Writing lab procedure

LESSON CYCLE

BEFORE BEGINNING THIS ACTIVITY: Check with school officials about any rules or regulations for students using sidewalk chalk on campus. If you are unable to use chalk outside, you may roll out butcher paper for students to draw on or you may simply pass out construction paper for students to use.

(5 min) When beginning this activity, divide students into groups of 2-3. Discuss the competition rules and any additional parameters you may have for students when creating their chalk masterpieces. Discuss what lab supplies are available for students to use to complete

(10 min) Have students complete the pre-lab and show you this as a checkpoint for understanding. Pay close attention to the lab procedures written. You will want to make sure that students indicate that they will weigh the chalk before and after they use it. Once groups show a completed pre-lab, I allow them to choose their chalk colors and begin their masterpieces. (Yes, chalk today is primarily gypsum, however, have students use calcium carbonate for the activity!)

(15 min) Allow students to create their chalk drawings and fill in data tables. You may want to have students take pictures of their art when complete to submit for the contest! It's even more fun if you involve the whole school in voting!

(10 min) Have students answer the Data Analysis section of the report.

(5 min) Closing: Have students individually answer the extension question as an exit ticket or as homework.

A "spicy" version of this lab for advanced students can be found in my TpT STEM PBL store!



Group Members:

1. _____
2. _____
3. _____

Period: _____

Grade: _____

MOLE-Y ART CONTEST

Today we will apply our understanding of stoichiometry to determine how “mole-y” our art is. As a group, you will draw a picture using chalk to be entered into a classroom chalk-art contest. You will then calculate how many moles and atoms of chalk were used to create your drawing.

CONTEST RULES

- Your drawing must be school appropriate.
- You must use at least 3 colors of chalk.
- You must provide the number of moles of chalk used from each color, the total number of moles of chalk used to create your drawing and the total number of atoms used (you must show calculations).

PRE-LAB QUESTIONS:

You must have this section initialed before you will receive your chalk.

1. What is chalk made from and where does it come from?
4. Calculate the *molecular weight* of chalk . SHOW YOUR WORK.

2. What is the chemical nomenclature for chalk?

Molecular weight of chalk: _____

3. What is the chemical formula for chalk?

5. What is the *molar mass* of chalk?

Molar mass of chalk: _____

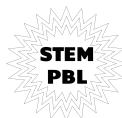


6. Write a brief procedure in the space below for how you will collect your data. In your procedure, be sure to include the following:
- a. Scientific Vocabulary: proper equipment names, types of measurement, etc.
 - b. What data you will collect?
 - c. How will you collect this data?

Teacher Stamp: _____

DATA TABLE

Color of Chalk	Initial Weight (g)	Weight after drawing (g)	Mass of Chalk Used (g)



DATA ANALYSIS

1. Calculate the number of **moles** used of each color of chalk in your art. SHOW YOUR WORK.

Color 1:

Color 2:

Color 3:

2. Calculate the number of **atoms** used of each color of chalk in your art. SHOW YOUR WORK.

Color 1:

Color 2:

Color 3:

3. What is the total number of moles used to create your art? SHOW YOUR WORK.

4. What is the total number of atoms used to create your art? SHOW YOUR WORK.

EXTENSION

Butane (C_4H_{10}) is commonly found in liquefied petroleum gas (LPG) as part of the blend of gases sold to the public. If someone has a sample of 50g of butane gas, burns the gas and is left with 35g of butane gas, how many moles of butane gas were burned? How many atoms of gas were burned? SHOW YOUR WORK