Lesson Plan: Molar Marks

FOR THE TEACHER

Summary
In this lesson, students will better understand the mole concept by using chalk to write their name on a sidewalk and finding out the composition of chalk through research.

Resource Type | Grade Level
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Lesson plan | High school

Objectives
By the end of this lesson, students should be able to
• Better understand molar quantities with the help of chalk.

Chemistry Topics
This lesson supports students’ understanding of
• Mole concept

Time
Teacher Preparation: 5 minutes
Lesson: 25 minutes

Materials
• Sidewalk chalk
• Balance
• 3x5 note card for each student

Safety
No safety precautions of note.

Teacher Notes
• I leave this activity open ended so students think their way through this exercise.
• They like everything about this activity: writing their names on the sidewalk, figuring out what chalk is, finding its molar mass, and finding out the huge number of molecules used just to spell out their name.

FOR THE STUDENT

Lesson
After students have been introduced to molar mass and the mole concept, I have them complete the following exercise called “Molar Marks”

I start the exercise by asking the class if I drank a glass of water, what would they need to know to calculate the number of moles of water I drank. Once I am convinced that they understand the need to find the mass of the water, I ask them if I gave them some chalk and they used it to
write, could they determine the moles of chalk that was used. I do not give them the molecular formula for chalk \((\text{CaCO}_3)\) but I do allow them to use their smartphones or laptops to do the research.

Next, I hand out 3x5 cards for students to record their mass data and their calculation of moles and molecules of chalk used to write their name.

I set out a tub of sidewalk chalk and have students go outside to write their name on the sidewalk. They then calculate how many moles of chalk were used and how many molecules of chalk were used to write their name.