



Science Objectives

- In this activity, students will use the periodic table to determine atomic mass and calculate the formula weight for molecules.

Vocabulary

- Atomic mass
- Mole

About the Lesson

- The goal of this activity is for students to explore the concepts of atomic mass and formula weight. Students will use the periodic table to determine the atomic mass of elements and then use that information to calculate the molecular weight for various molecules.
- Students should be familiar with the structure of the periodic table and how to locate elements on it. This will help students calculate atomic mass and molecular weight. They should also be familiar with moles. A periodic table is included in the .TNS file.
- The following questions will guide student exploration during this activity:
 - What is a mole?
 - Which units are used for the mass of atoms, and which units are used for the mass of moles of atoms?
 - How do you determine the number of atoms of each element in a molecule?




TI-Nspire™ Navigator™ System

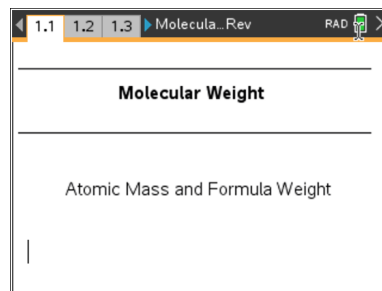
- Use Class Capture and Live Presenter to share students' explorations with the entire class during the formative lesson or as a review.
- Quick Polls may be used to assess students' progress and understanding of the concepts.
- Use Teacher Software to review student documents.

Activity Materials

Compatible TI Technologies :  TI-Nspire™ CX Handhelds,



TI-Nspire™ Apps for iPad®,  TI-Nspire™ Software



Tech Tips:

- This activity includes screen captures from the TI-Nspire CX II handheld. It is also appropriate for use with the TI-Nspire family of products including TI-Nspire software and TI-Nspire Apps. Slight variations to these directions may be required if using other technologies besides the handheld.
- Watch for additional Tech Tips throughout the activity for the specific technology you are using.
- Access free tutorials at <http://education.ti.com/calculators/pd/US/Online-Learning/Tutorials>

Lesson Materials:

Student Activity

- MolecularWeight_Student.pdf
- MolecularWeight_Student.doc

TI-Nspire document

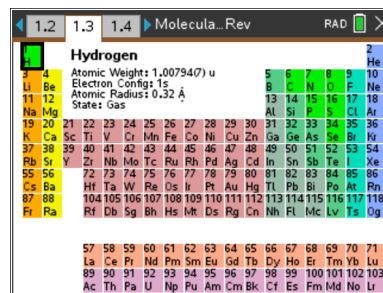
- Molecular Weight.tns



Discussion Points and Possible Answers

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A periodic table has been included for students' reference. Note that the data can be viewed for each element by selecting the box. Students should answer questions on 1.4-1.7.



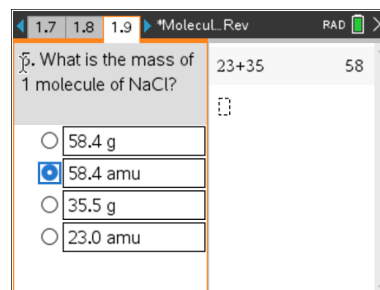
- Q1.** What is the mass of 1 atom of C?
 - A.** 12.01 amu
- Q2.** What is the mass of 1.00 mole of C?
 - A.** 12.0 g
- Q3.** What is the mass of 2 atoms of O?
 - A.** 32.0 amu
- Q4.** What is the mass of 2 moles of O?
 - A.** 32.0 g

Move to page 1.8 -1.11

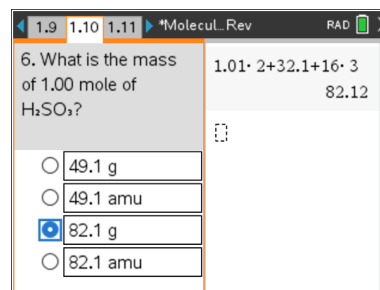
Students will calculate the molecular weight for different molecules using the Calculator application.

- Q5.** What is the mass of 1 molecule of NaCl?
 - A.** 58.4 amu

By looking at the Periodic Table, we know Na is 22.9 + 35.4 (Cl) = 58.4



- Q6.** What is the mass of 1.00 mole of H_2SO_3 ?
 - A.** 82.1 g





Q7. What is the mass of 4.00 moles of CaCl_2 ?

A. 444.0 g

7. What is the mass of 4.00 moles of CaCl_2 ?

111.0 g

111.0 amu

444.0 g

444.0 amu

Q8. What is the mass of 1 mole of MgCO_3 ?

A. 84.3 g

8. What is the mass of 1 mole of MgCO_3 ?

Q9. How many atoms are contained in Na_2O ?

A. There are 2 Na atoms and 1 oxygen atom for a total of 3.

Q10. The compound Li_2S contains

A. 2 lithium and 1 sulfur

Q11. What is the mass of 5 molecules of NaCl ?

A. 292.5 amu

11. What is the mass of 5 molecules of NaCl ?

292.5 amu

Q12. What is the mass of 0.25 mole of MgCl_2 ?

A. 23.8 g

12. What is the mass of 0.25 moles of MgCl_2 ?

23.8 g



Molecular Weight

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Q13. How many moles of LiBr are in 50.0 g of LiBr?

A. 0.58

The screenshot shows a TI-84 Plus calculator window titled '*MolecuL_Rev'. The problem displayed is '13. How many moles of LiBr are in 50.0 g of LiBr?'. Below the problem is a text entry field with the prompt 'Student: Type response here.'. The solution is shown as a calculation:
$$\frac{50 \cdot 1}{86.81} = 0.575971$$