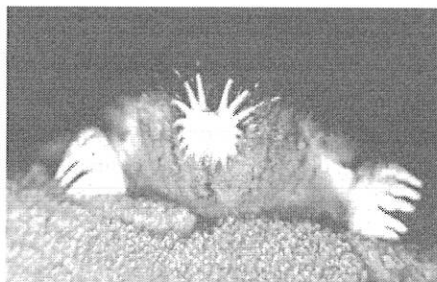
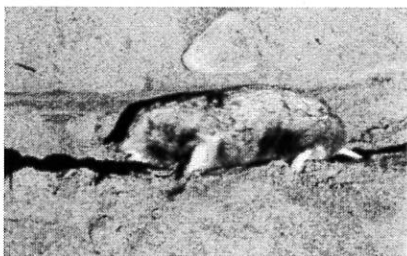


Name:

What is a Mole?



In chemistry it is not an animal that lives in the ground.

A mole is the SI unit that describes the amount of a substance.

One mole = 6.02×10^{23} objects

In chemistry the objects are atoms and molecules.

Let's think how large a mole really is... Let's think of things we see everyday!

◇ A mole of marshmallows would cover the planet Earth 12 miles high.

◇ A mole of seconds would last so long, the universe would die out before it was done!

◇ **1 Mole of marbles would fill the entire Grand Canyon and there would still be enough left over to displace all the water in Lake Michigan and a few other lakes!**

◇ Computers can count at the rate of over 800 million counts per second. *At this rate it would take a computer over 25 million years to count to 6.02×10^{23}*

◇ A mole of hockey pucks would be equal to the mass of the Moon.

◇ Assuming that each human being has 60 trillion body cells (6.0×10^{13}) and the Earth's population is 6 billion (6×10^9), the total number of living human body cells on the Earth at the present time is 3.6×10^{23} or a little over half of a mole.

◇ If one mole of pennies were divided up among the Earth's population, each person would receive 1×10^{14} pennies. Personal spending at the rate of one million dollars a day would use up each person's wealth in about three thousand years. Life would not be comfortable because the surface of the Earth would be covered in copper coins to a depth of at least 400 meters.

Name:

Activity for the mole concept

1 mole is 6.022×10^{23} particles

Particles can be ions, atoms, molecules, etc.

SHOW ALL OF YOUR WORK

Exercise 1

1-If we have a mole of pennies and divide them equally among the 6 billion people on earth how much money would each person receive? Please express answer in terms of dollars.

2-If you spend 1 million dollars a day how long would it be before you ran out of money? Express answers in days and years.

Exercise 2

Obtain 15 pennies from the teacher and stack them one on top of the other. Measure the height of the stack in centimeters. Record measurement below.

A- What is the average height of ONE penny?

B- Using the average height of one penny determine the height of a stack of 6.022×10^{23} pennies in km.

C- How many light years (measured in seconds) is this? (Light travels 3.00×10^8 km per second)

D-How many round trips is this to the moon? (Distance to moon from earth 364,000 km)