The Mole Activity

The following picture represents a part of a farm built by a person through FARM VILLE on Facebook.

A) Relation of Moles to Number of Atoms

1) Based on the figure, the farmer has _____ cabbage blocks.

2) Given that **1Dozen → 12**, how many dozens of cabbage blocks does this farmer have?

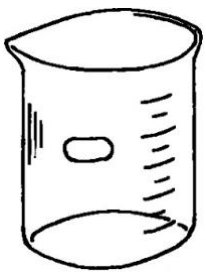
3) Based on the given figure, help the farmer fill the following table:

Duck's Count		
Number of Ducks	**Number of Dozens of Ducks**	**Proposed Formula for Calculation**

4) If a beaker contains 36 carbon atoms, how many dozens of carbon atoms do we have in this beaker? (Show your work).

5) The following figure shows a beaker containing 36 carbon atoms:

Oh my God, the beaker is empty!!!!!
Where are the 36 carbon atoms?



a) Based on the above figure, do you think it is a good idea for chemists to use the term **Dozen** to count the number of atoms present in a beaker? Justify your answer.

For chemists, **One Mole** is similar to a **Dozen** and **Avogadro's number** is similar to **12.**

As you say **One dozen → 12**; **One Mole → Avogadro's Number (N_A)**

Avogadro's Number = N_A = 602300000000000000000000 = 6.023 x 10^{23} atoms.mol^{-1}

One Mole of cabbage blocks will cover the whole American continent!!!!!

6) The following beaker contains **12 x 10^{23} atoms** of carbon atoms:

a) How many moles of carbon atoms are in this beaker?

B) <u>Relation of Moles to Mass</u>

If you are in the chemistry laboratory, you will never be able to count the number of atoms of a certain element. For example, if your experiment requires the **2.5 moles of Carbon atoms**, you will not be able to count 2.5 x 6.023 x 10^{23} = 1.5 x 10^{24} atoms of Carbon. You need to use the metric balance to weigh the mass of such atoms. ***You need a relation between the number of moles and the mass of the carbon atoms.***

1) Referring to the figure of the farm, the farmer has _____ horses.

2) If each horse has a mass of 100Kg, what is the mass of a Dozen of horses?

3) The farmer is willing to achieve 4500Kg as a total mass of horses by the end of the year. How many Dozens of horses does he need? (Show your work).

4) In the laboratory, your experimental procedure is showing that you need 2.5moles of Carbon atoms. Propose a method that will allow you to find the mass of these carbon atoms.