



SHS LEARNING ACTIVITY

CHEM1-02-01

Name: _____ Score/Mark: _____

Grade and Section: _____ Date: _____

Strand: STEM ABM HUMSS ICT (*TVL Track*)

Type of Activity : Concept Notes Skills: Exercise/Drill Illustration

Laboratory Report Essay/Task Report Other: _____

Activity Title: 02-01.Dividing sugar in half infinitely v05

Learning Target: To discuss whether substances can be divided endlessly

Authors/References: Victor Sojo

Laboratory experience

1. Pour a teaspoonful of sugar onto a flat surface.
2. Divide *roughly* in half and give the other half to a fellow student.
3. Take your half and divide it roughly in two again. Keep one part and push the other part away to create a waste pile.
4. Divide the portion you kept in two once more and put the unwanted sugar into the discard pile. The portion we kept is a half of the half of the initial half of the full spoonful.
5. Quickly keep doing this again and again and again until only one little crystal of sugar is left.
6. It seems we've reached the end. Maybe not: try to squash this last crystal with a spoon or spatula. Can you start the division process again?
7. There will be a point at which you can't divide the sugar in half anymore.

Analysis

We reached the end of the experiment, but maybe we could have kept going if we had a very sharp knife and a magnifying glass, or even a microscope. Perhaps with the sharpest knife and the best microscope in the world we could carry on dividing the sugar forever... Could we?

The answer is not obvious, but it is "no, we cannot", or at least not without destroying the identity of the sugar. Even if we had such a knife, there would be a point at which we would reach the most basic block of the sugar, in this case, the **molecule** of sucrose. If we break it further, which is certainly possible, we would have the **atoms** that compose it (carbon, hydrogen, and oxygen), but no longer sugar.

Note: Make sure to clean up the surface and get rid of all the sugar.

