

RICE – O – RAMA INTRODUCTION TO THE MOLE LAB

Introduction: This lab introduces the mole and suggests why the concept of the mole is needed in chemistry.

Purpose: Students are to figure out two ways in which to assess as accurately and consistently as possible the number of bean seeds in one container and rice grains in another container. The purpose behind the lab is to see how the need for counting very small things accurately evolved into the concept of the mole, which is defined as the amount of a substance (referring to chemical elements).

Setup: Students may work together with a partner, but they cannot consult any other groups. There are four materials available to students to figure out the number of bean seeds and rice grains: a pan balance, a ruler, graph paper, and a graduated cylinder.

****NOTE – IF STUDENTS DECIDE TO USE THE GRADUATED CYLINDER, THEY MAY NOT USE WATER IN ANY WAY!!**** The water will do nothing but ruin the seeds and rice. Counting the individual beans is possible, but not the most efficient; counting the rice is possible, but the margin of error is huge! Counting is not recommended.

Special notes: If students happen to accidentally drop a bean, they need to find it again! All materials must be returned to the original containers when finished with the lab. If a bean is dropped – the lab group must yell “BEAN!” Everyone in the room must stop what they are doing to help find the missing material and continue doing so until it is found. Retaining all of the materials is vital.

Wrapup: Students do have questions to answer when they are done with the lab and they have returned the beans and rice to their original containers (beakers). When everyone is done with their counting and has cleaned up, have each group go up to the board and write down their estimates. Take about 5 minutes to discuss first of all the reason for the similarities in the numbers. Then take about 5 minutes to discuss the differences in the numbers (there is almost always one group that is completely off). When the groups are finished with their questions, have them turn the lab in.