**Module One Assessment: Size and Scale**

**Teachers Guide and Rubric**

INTRODUCTION: This is assignment is designed to be a quick assessment of the students’ concepts of size and scale in relation to Nano- mainly, just how small is Nano?

OBJECTIVES:

Students will-

* Explain the term “Nano” in everyday language
* Compare the relative sizes of Nano-objects with larger objects

TIME: 20 min or homework

MATERIALS:

* “Module One Assessment” Student Sheet

PROCEDURES:

1. Explain to students that this assignment will demonstrate their knowledge of how small “Nano” really is.
2. Emphasize that they need to use common, everyday language to explain the term “Nano” to a 3rd grader. They should be accurate, but understandable.
3. Explain the grading to the students: Each question is worth 6 points- 3 possible for accuracy and 3 possible for clarity. (See the Scoring Rubric below.) Also remind students that they should treat this like a quiz- no talking to other students.

ANSWER KEY:

1. In the space below, explain the term “Nano” to a 3rd grader in 3-5 sentences. Use your own language, but be scientifically accurate.

Students should explain that Nano means very small. They may include facts like a nanometer is one billionth of a meter or examples of things that are one-billionth the size of common objects. Strong answers should include these.

1. If a nanoparticle is the size of an orange, draw a sketch demonstrating the size of an actual orange, relative to the super-sized nanoparticle.

If a nanoparticle were the size of an orange, and orange would be the size of the earth. Students do not need to provide this specific answer, but should come up with a similarly sized object.

SCORING RUBRIC:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **0** | **1** | **2** | **3** |
| **1. Accuracy** | Student provides no accurate information. | Student provides accurate information, but with major inaccuracies or misconceptions | Student provides mostly accurate information, but no examples. | All information is accurate- no mistakes or misconceptions. Provides examples to help explain. |
| **1.**  **Clarity** | Student writing is incomprehensible. | Students writing is mostly clear, but may contain 1 large problem in either organization or clarity. | Student writing is clear and organized, with few minor problems in clarity or organization. | Student writing is clear and organized with no problems. |
| **2. Accuracy** | Student provides no answer | Student provides an answer, but the scale is extremely inappropriate | Student provides an answer that is significantly larger than a normal orange, but not large enough. | Student provides an appropriately scaled answer, such as “the Earth” or other planet |
| **2.**  **Clarity** | Student answer is incomprehensible | Students writing is mostly clear, but may contain 1 large problem in either organization or clarity. | Student writing is clear and organized, with few minor problems in clarity or organization. | Student writing is clear and organized with no problems. |