

Name: \_\_\_\_\_

Mr. Willis

Conceptual Physics: \_\_\_\_\_

Date: \_\_\_\_\_

Unit I

Introduction to Conceptual Physics

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I

## Video: The Scientific Method and Metric Measurement

**Objective:** Develop an understanding of the foundations of scientific exploration and the value of standards in scientific measurement.

**Directions:** Answer the following questions as you watch the video.

1. Most scientists today work in \_\_\_\_\_ because teamwork accomplishes more than working \_\_\_\_\_.
2. At Fermilab, scientists are working to explore the basic building blocks of all \_\_\_\_\_.
3. Thousands of years ago, the search for knowledge was called \_\_\_\_\_, the love of wisdom.
4. One of the most famous philosophers was \_\_\_\_\_, but he wasn't a scientist because he never \_\_\_\_\_ his ideas.
5. A scientist doesn't make statements of fact unless he has backed them up with \_\_\_\_\_.
6. Galileo dropped \_\_\_\_\_ to test Aristotle's theory. Apollo astronauts dropped a \_\_\_\_\_ and a \_\_\_\_\_. In both cases both items fell at the same rate.
7. Galileo and Francis Bacon are considered the founders of the \_\_\_\_\_.
8. First Step \_\_\_\_\_
9. Next, \_\_\_\_\_. Then make predictions about the outcome.
10. Next, design a \_\_\_\_\_ to test the hypothesis.
11. Gather \_\_\_\_\_ and \_\_\_\_\_ results.
12. Make a \_\_\_\_\_ about the data.
13. Following this process, new knowledge will lead to the creation of new \_\_\_\_\_.
14. If a hypothesis stands up to many experiments it becomes a \_\_\_\_\_.
15. Theories that seem to be correct in every case are called \_\_\_\_\_.
16. \_\_\_\_\_ and \_\_\_\_\_ are sometimes used instead of the Scientific Method to make discoveries. Some discoveries are even made by \_\_\_\_\_.
17. \_\_\_\_\_ is important in all phases of the Scientific Method.

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18. In order to study pepper, Anton von Leeuwenhoek developed the \_\_\_\_\_.
19. He also studied one-celled animals in \_\_\_\_\_.
20. Anything in an experiment that may change in appearance or form is called a \_\_\_\_\_.
21. In the experiment the dome that received no ozone was the \_\_\_\_\_.
22. Scientists must test only one \_\_\_\_\_ at a time.
23. \_\_\_\_\_ is the use of science in a practical way.
24. Most early measuring systems were based on \_\_\_\_\_.
25. This system worked as long as \_\_\_\_\_ did the measuring.
26. Units of measurements need to be \_\_\_\_\_ in order for all people to use them.
27. The French invented the \_\_\_\_\_ based on the distance from the North Pole to the Equator.
28. One \_\_\_\_\_ was equal to 1/10,000,000 the distance.
29. The \_\_\_\_\_ is the only major country that still uses a measuring system that is based on body parts.
30. The \_\_\_\_\_ is based on powers of 10 (ten).
31. Base units in the metric system are:
  - a. Length = \_\_\_\_\_
  - b. Volume = \_\_\_\_\_
  - c. Mass = \_\_\_\_\_
32. Prefixes used in the metric system are:
  - a. \_\_\_\_\_ = 10 times
  - b. \_\_\_\_\_ = 100 times
  - c. \_\_\_\_\_ = 1000 times
  - d. \_\_\_\_\_ = 1/10<sup>th</sup>
  - e. \_\_\_\_\_ = 1/100<sup>th</sup>
  - f. \_\_\_\_\_ = 1/1000<sup>th</sup>
33. Graduated cylinders are used to measure \_\_\_\_\_.
34. The \_\_\_\_\_ is the bottom of the curve of a liquid that is being measured.

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35. \_\_\_\_\_ is measured on a balance.
36. \_\_\_\_\_ and \_\_\_\_\_ are not the same.
37. \_\_\_\_\_ measures the amount of gravitational pull on an object.
38. The moon has \_\_\_\_\_ the gravity of the earth.
39. \_\_\_\_\_ is the measure of matter in an object.
40. \_\_\_\_\_ does not change on the moon.
41. When using the metric system, changing units does not change the \_\_\_\_\_.
42. The metric system does not use \_\_\_\_\_ but does use decimals.
43. The three different temperature systems used today are:
- a. \_\_\_\_\_
  - b. \_\_\_\_\_ also called the Centigrade scale.
  - c. \_\_\_\_\_ which is based on Absolute Zero.
44. Absolute zero is the point at which all \_\_\_\_\_ stops.
45. Thermometer rules:
- a. Never \_\_\_\_\_ a thermometer.
  - b. Don't put the thermometer in your \_\_\_\_\_. You never know where it's been.
  - c. Don't \_\_\_\_\_ things with a thermometer.
  - d. Be careful where you \_\_\_\_\_ the thermometer so that it doesn't roll off and break.
46. \_\_\_\_\_ is the mass of a substance versus its volume.
47. Density = \_\_\_\_\_  $\div$  \_\_\_\_\_
48. 1 mL of water = 1 cubic \_\_\_\_\_
49. The density of water = \_\_\_\_\_
50. Objects with densities less than water \_\_\_\_\_ while objects with densities greater than water \_\_\_\_\_.