

Unit 1 Test Review: Scientific Processes

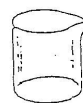
Answer the following safety questions:

1. What are the first two steps when performing any experiment?
Listen to teacher instructions, and completely read all directions.
2. What should you do if glassware is broken during a lab? *Tell the teacher so he/she can clean it up.*
3. What type of footwear should you wear in the lab? *Closed-toe shoes.*
4. How should you smell vapors from a container? *Carefully waft the vapors towards your nose.*
5. What should you do at the end of an experiment? *Wash & air-dry glassware, wipe down counter.*
6. What is the most important piece of safety equipment? *Eye goggles.*
7. What should you do if a chemical gets in your eye? *Wash it out with water immediately.*

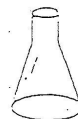
Label each tool, write the SI unit for that tool, and describe its function:

8. *Beaker; milliliters; for mixing and heating chemicals.*

8.



9. *Erlenmeyer flask; milliliters; mixing / heating chemicals, catching gasses.*



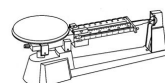
10. *Graduated cylinder; milliliters; for measuring liquids.*

10.



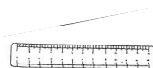
11. *Triple-beam balance; grams; for measuring mass.*

11.



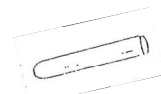
12. *Ruler; millimeters, centimeters; for measuring length.*

12.



13. *Test Tube; milliliters; heating small volumes of chemicals.*

13.



14. *Thermometer; degrees Celsius; for measuring temperature.*

14.



Answer the following questions regarding the SI (metric) system of measurement:

15. What is the base unit for measuring length in the SI system? **Meters (m).**
16. What is the base unit for measuring mass in the SI system? **Grams (g).**
17. What is the base unit for measuring liquid volume in the SI system? **Liters (L).**
18. What is the base unit for measuring solid volume in the SI system? **Cubic meters (m³).**
19. What is the base unit for temperature in the SI system? **Degrees Celsius (°C).**
20. At what temperatures does water freeze and boil in the SI scale? **Freezing: 0°C; Boiling 100°C .**

Answer the following questions about the Scientific Method:

Put the steps of the scientific method in order:

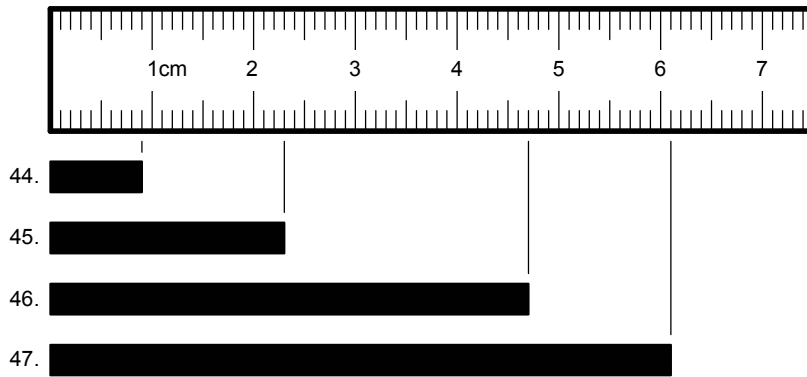
21. ***Problem Identification***;
 22. ***Research (also called literature review)***;
 23. ***Hypothesis***;
 24. ***Experimental Design***, which includes ***Materials*** and ***Procedures***;
 25. ***Data Collection*** (also called ***performing the experiment***);
 26. ***Data Analysis***; and
 27. ***Conclusions***.
28. Which step makes a prediction about what will happen and why? ***Hypothesis***.
29. Which step is stated in the form of a question? ***Problem Identification***.
30. In which step is the data averaged and graphs of the data prepared? ***Data Analysis***.
31. In what step will your hypothesis accepted, restated, or rejected and your opinion about the experiment stated? ***Conclusions***.
32. Which group stays the same in your experiment? ***Control group (independent variable not changed)***.
33. Which group changes in your experiment? ***Experimental Group (independent variable is changed)***.
34. What change relies on another change to occur? ***Dependent or Responding Variable***.
35. Quantitative data is based on what? ***Measurements stated in numeric terms***.
36. Give examples of quantitative data: ***5.2 meters; 10.9 seconds; 423 grams***.
37. Qualitative data is based on what? ***Qualities or value judgments, stated in non-numeric terms***.
38. Give examples of qualitative data: ***Blue; tall; smart; heavy; slow***.
39. In what form should you state a hypothesis? ***In a third-person prediction: "It is predicted that . . ."***

Read the following experiment and identify the control, independent variable, dependant variable and state the conclusion:

I wanted to test whether food coloring added to water will cause carnation petals to change color. I thought that it would. I placed one white carnation in a vase of regular water. Next to it, I placed one white carnation in a vase of water with blue food coloring. I observed the flowers for a week, noting the change. At the end of the week, the carnation in the blue colored water had indeed changed to a blue color!

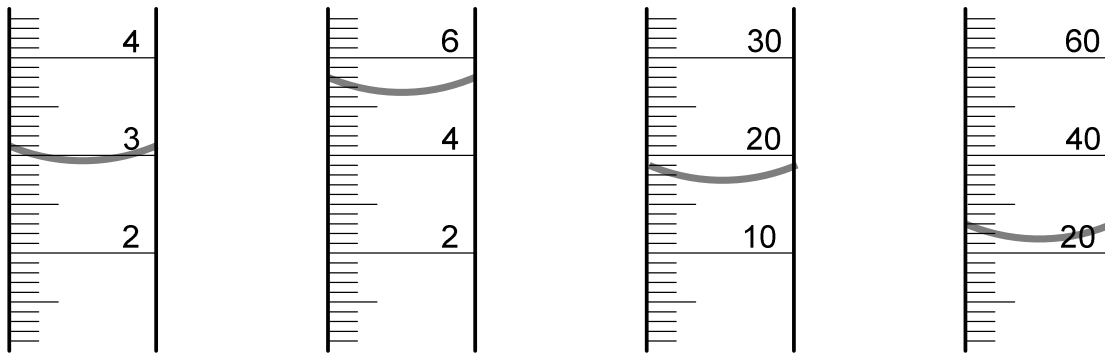
40. Control: ***Flower in clear water***.
41. Dependant (or Responding) Variable: ***Change in flower color***.
42. Independent (or Manipulated) Variable: ***Blue food coloring in water***.
43. Conclusion – ***A white carnation placed in water containing blue food coloring will turn blue as the blue food coloring is drawn up into the flower***.

State the length of the following four bars, in both millimeters and centimeters, reading from the enlarged meter stick.



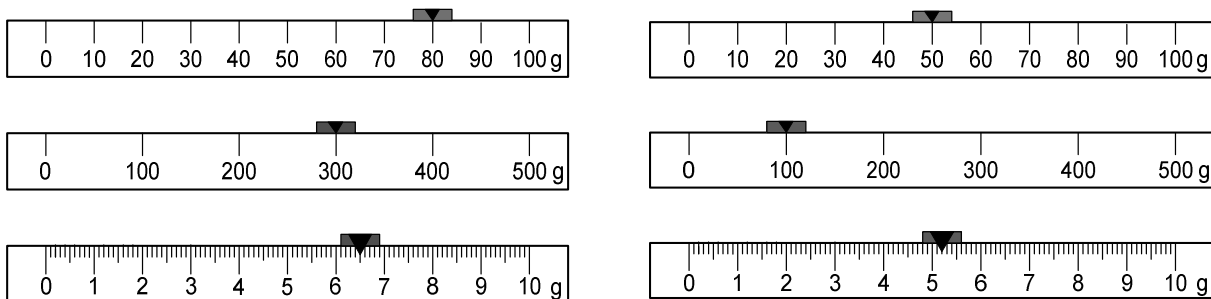
44. *9 mm; 0.9 cm* 45. *23 mm; 2.3 cm*
 46. *47 mm; 4.7 cm* 47. *61 mm; 6.1 cm*

State the liquid volume in milliliters in the following four graduated cylinders.



48. *2.9 mL* 49. *5.2 mL* 50. *17 mL* 51. *22 mL*

State the mass in grams for the following two triple-beam balances.



52. *386.5 g* 53. *155.2 g*