

Name: KEY

period: _____

Unit 1: Nature of Science Study Guide

1. What is the SI unit for measuring volume? liters

2. What is the SI unit for measuring mass? grams

3. What is the SI unit for measuring length? meters

4. How many milligrams are there in 1 gram? 1000

5. If 1 marble has a mass of 1 gram, then
100 marbles would have a mass of 1 Hg

1000 marbles would have a mass of 1 Kg

6. Which prefix means one hundredth? centi one thousandth? milli

What is the value of each prefix below?

K H da u d c m

7. Kilo (K) 1000

10. deci (d) 0.1 or $\frac{1}{10}$

8. Hecto (H) 100

11. centi (c) 0.01 or $\frac{1}{100}$

9. Deca (da) 10

12. milli (m) 0.001 or $\frac{1}{1000}$

13. Which direction do you move the decimal to convert from centigrams (cg) to the basic unit for mass, grams (g)? left

14. Which direction do you move the decimal to convert from Kiloliters (kL) to centiliters (cL)? right

15. Which direction do you move the decimal to convert from millimeters (mm) to basic unit for length, meters (m)? left

K H D u d c m

Convert each quantity below.

Scratch Paper Area

5) 50.2 cm = 0.502 m

17) 89 m = 0.089 Km

Knowledge check

18) 2.16 L = 2160. mL

19) 0.000827 Kg = 827 mg

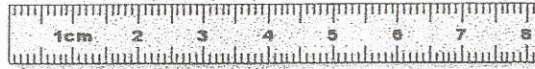
Tell what each tool below is used to measure.

20.



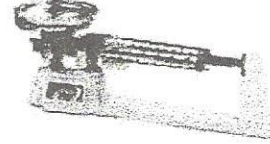
Volume

21.



length

22.



Mass

Name an object that you would measure with each tool above.

Water

book, line, hand

sugar, sand, Soap, rock

23. What is the difference between Qualitative data and Quantitative data?

Qualitative data is words, Quantitative data is numbers.

Tell whether the data below is an example of Qualitative (QL) or Quantitative (QN) data.

24. The light is yellow. QL

25. The length of the desk is 1.2 meters. QN

26. The ice is cold. QL

Tell whether the hypothesis is Testable (T) or Not testable (N).

T 27. Motorcycles get more miles per gallon of gas than trucks do.

T 28. GE light bulbs last longer than generic light bulbs.

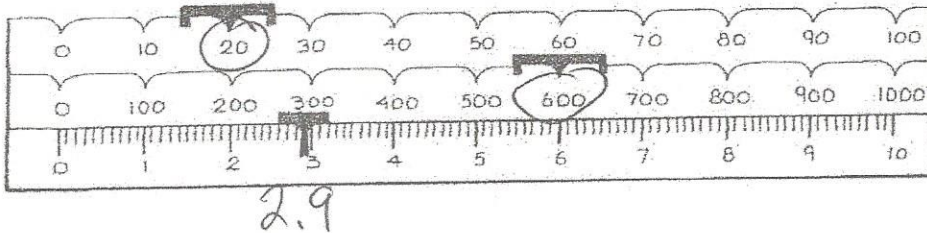
N 29. Blueberry muffins taste the best.

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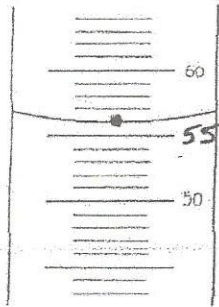
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30. What mass does the triple beam balance measure to the nearest tenth (0.1) g?



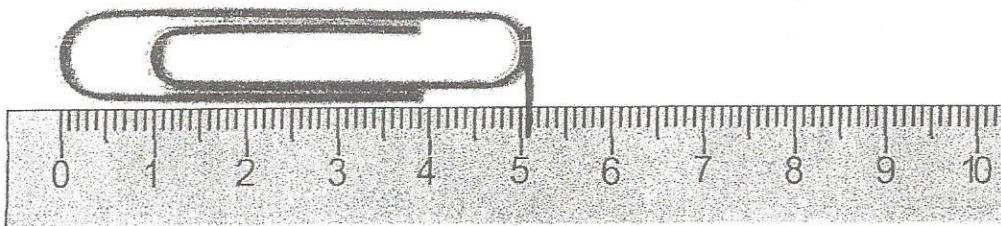
622.9 g

31. What volume does the graduated cylinder measure?



56 ml

32. What length does the ruler measure the paperclip to the nearest tenth (0.1) cm?



K h d a a d c m

5.1 cm

What length does the ruler measure the paperclip to the nearest mm?

51 mm

33. Below is a hypothesis for an experiment. What is the *dependent* variable and the *independent* variable for this experiment?

Hypothesis: The GE light bulbs last longer than generic light bulbs.

Independent Variable (IV) Light bulb

Dependent Variable (DV) time (long it lasts)

A scientist wants to know if the paper towels from home are more absorbent than the paper towels from work. What is each step of the scientific method of this experiment?

34. Make a guess that the paper towels from home are more absorbent. Hypothesis
Step 1
35. Design an experiment to use both types of paper towels to soak up water. Experiment
Step 2
36. Measure the volume of water each type of paper towel held. Data
Step 3
37. From the data, decide which paper towel was more absorbent. Analyze
Step 4
38. Compare the results to their hypothesis to see if they were right. Conclusion
Step 5

39. The length of the line below would best be measured in which unit? cm



40. The volume of the drink below would best be measured in which unit? L



41. The mass of a marble would best be measured in which unit? g



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Convert these using your metric conversion chart.

42) 756 m = .756 Km

43) .000235 Kg = 235 mg

44) 2.45 L = 2,450 mL

45) 755.2 cm = 7.55 m

46) 987 Dg = 98,700 dg

47) .0265 HL = 26.5 dm

48) 59 m = 59,000 mm

Use dimensional analysis convert numbers 8-15. (Circle your answer and use the correct unit)

49) 5.9 Gallons to Liters (1 gal = 3.79 L)

$$\frac{5.9 \cancel{\text{gal}}}{1} \times \frac{3.79 \text{ L}}{1 \cancel{\text{gal}}} = \frac{22.361 \text{ L}}{1} = \textcircled{22.4 \text{ L}}$$

50) 33 inches to centimeters (2.54 cm = 1 in)

$$\frac{33 \cancel{\text{in}}}{1} \times \frac{2.54 \text{ cm}}{1 \cancel{\text{in}}} = \frac{83.82 \text{ cm}}{1} = \textcircled{83.8 \text{ cm}}$$

51) 9.2 hours to minutes (1 hr = 60 min)

$$\frac{9.2 \cancel{\text{hr}}}{1} \times \frac{60 \text{ min}}{1 \cancel{\text{hr}}} = \frac{552 \text{ min}}{1} = \textcircled{552 \text{ min}}$$

52) 4 pounds to kilograms (1 Kg = 2.2 lbs)

$$\frac{4 \text{ lbs.}}{1} \times \frac{1 \text{ Kg}}{2.2 \text{ lbs}} = \frac{4 \text{ Kg}}{2.2} = 1.81 \text{ Kg}$$

53) 55 minutes to seconds (1 min. = 60 sec)

$$\frac{55 \text{ min}}{1} \times \frac{60 \text{ s}}{1 \text{ min}} = \frac{3,300 \text{ s}}{1} = 3,300 \text{ s}$$

54) 2.3 miles to feet (1 mile = 5,280 ft)

$$\frac{2.3 \text{ mile}}{1} \times \frac{5,280 \text{ ft}}{1 \text{ mile}} = \frac{12,144}{1} = 12,144 \text{ Feet}$$

55) 5.5 miles to yards (1 mile = 1760 yds)

$$\frac{5.5 \text{ miles}}{1} \times \frac{1760 \text{ yds}}{1 \text{ mile}} = \frac{9,680}{1} = 9,680 \text{ yds}$$

56) 3.6 hours to seconds (1 hr = 60 min; 1 min = 60 sec)

$$\frac{3.6 \text{ hrs}}{1} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{60 \text{ sec}}{1 \text{ min}} = \frac{12,960 \text{ sec}}{1} = 12,960 \text{ sec}$$