Name: _____ Class: _____ Date: _____

Chapter 02: Matter: Properties, Changes and Measurements

1. From what material could evidence be found that might yield a conviction of "Tommy Karate"?
   a. Water samples
   b. Soil
   c. Grass and leaves
   d. Wood samples

ANSWER: b

2. In the "Grave Evidence" case, who was serving as an informant against the Gotti family?
   a. Gianni Gotti
   b. "Tommy Karate" Pitera
   c. "Willie Boy" Johnson
   d. "Willie Boy" Gotti

ANSWER: c

3. What must occur in a physical change?
   a. A new substance must be formed.
   b. The chemical identity of a material must change.
   c. A material must decompose or be formed.
   d. The state of matter must be altered.

ANSWER: d

4. What is a characteristic of a chemical change?
   a. A substance melts or freezes.
   b. A material evaporates.
   c. Both of the above.
   d. None of the above.

ANSWER: c

5. Which of the following measures how much matter is contained in a sample?
   a. Mass
   b. Volume
   c. Density
   d. Weight

ANSWER: a

6. Which of the following units measures volume?
   a. Kilograms
   b. Pounds
   c. Liters
   d. Seconds

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ANSWER: c

7. What does the prefix "milli-" mean on a unit?
   a. One one-thousandth of the unit
   b. One thousand of the unit
   c. One one-millionth of the unit
   d. One million of the unit

ANSWER: a

8. Which of the following does the scientific method utilize?
   a. Collecting relevant data
   b. Forming a hypothesis
   c. Testing the hypothesis
   d. All of the above

ANSWER: d

9. The scientific method tries to determine the nature of the problem.
   a. True
   b. False

ANSWER: a

10. How many meters are in 830 mm?
   a. 0.083 m
   b. 0.830 m
   c. 8.30 m
   d. 83.0 m

ANSWER: b

11. What is the conversion factor between centimeters and inches?
   a. 1 m / 2.54 cm
   b. 1 cm / 2.54 in
   c. 2.54 in / 1 cm
   d. 2.54 cm / 1 in

ANSWER: d

12. How many meters are in 0.645 km?
   a. 645 m
   b. 64.5 m
   c. 6450 m
   d. 6.45 m

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ANSWER: a

13. The length 3.0 ft contains how many centimeters?
    a. 300.0 cm
    b. 30.0 cm
    c. 9.14 cm
    d. 91.4 cm

ANSWER: d

14. What is the difference between mass and weight?
    a. All matter has weight, but not all matter has mass.
    b. Weight is a measure of the pull of matter to a scale or measuring device, while mass is a measure of how much matter weighs.
    c. All matter has mass, but only limited amounts have weight.
    d. Weight is a measure of the pull of matter to the earth, while mass is a measure of how much matter is in a sample.

ANSWER: d

15. Burning is an example of a physical change.
    a. True
    b. False

ANSWER: b

16. What is 3.83 m in cm?
    a. 383 cm
    b. 38.3 cm
    c. 3830 cm
    d. 0.00383 cm

ANSWER: a

17. How many millimeters are in a centimeter?
    a. 0.01
    b. 1000
    c. 100
    d. 10

ANSWER: d

18. How is weight commonly measured?
    a. With a thermometer
    b. In milligrams
    c. With a scale

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d. In metric units

ANSWER: c

19. What is the abbreviation for liters, a unit of volume?

a. L
b. Lt
c. Ls
d. lt

ANSWER: a

20. Mass is always measured in grams.

a. True
b. False

ANSWER: b

21. A gram is a smaller unit of mass than a kilogram.

a. True
b. False

ANSWER: a

22. There are 10,000 meters in a kilometer.

a. True
b. False

ANSWER: b

23. How many numbers in a scientific measurement are always an estimate?

a. 1
b. 2
c. 3
d. At least 2

ANSWER: a

24. What does the term "significant figure" mean?

a. All digits in a number that are known exactly.
b. The first digit in a number that is known exactly, plus one that is an estimate.
c. All digits in a number that are known exactly, plus one that is an estimate.
d. None of the above.

ANSWER: c

25. The number 3.26×10^{-4} is represented in scientific notation. How many significant figures does it have?

a. 4

b. 3
c. 2
d. 1

ANSWER: b

26. How many milligrams are there in 0.002 g?

a. 0.2
b. 2
c. 20
d. 200

ANSWER: b

27. Convert 830 mL to L:

a. 83.0
b. 0.083
c. 0.83
d. 8.30

ANSWER: c

28. How many milliliters are in 0.468 L?

a. 468
b. 46.8
c. 4.68
d. 0.0468

ANSWER: a

29. 23.9 mg is the same as 0.239 g.

a. True
b. False

ANSWER: b

30. How many centimeters are there in 2.54 in.?

a. 6.45
b. 1.00
c. 5.08
d. 15.48

ANSWER: a

31. How many yards are in 153 ft.?

a. 12.75

b. 1836
c. 51
d. 459

ANSWER: c

32. Convert 3.5 ft. to cm.

a. 0.75
b. 1.4
c. 8.9
d. 107

ANSWER: d

33. There are 3 yards in a foot.

a. True
b. False

ANSWER: b

34. How many grams are there in a sample of salt weighing 1908 mg?

a. 190.8
b. 19.08
c. 1.908
d. 0.1908

ANSWER: c

35. How many yards are there in 342 cm?

a. 0.374
b. 4104
c. 869
d. 3.74

ANSWER: d

36. Twenty yards is the same as how many meters?

a. 60
b. 20
c. 183
d. 18.3

ANSWER: d

37. How many milliliters are there in 13.500 L?

a. 1350.0

b. 13,500
c. 135.00
d. 0.13500

ANSWER: b

38. The average of two numbers is 1.983. How is this best expressed to three significant figures?

a. 2.00
b. 1.90
c. 1.99
d. 1.98

ANSWER: d

39. What is the answer, to the correct number of significant figures, to the following: 10.34 + 9.4 = ____?

a. 19.74
b. 19.7
c. 19.0
d. 19.8

ANSWER: b

40. How many significant figures are in the number 1.0043?

a. 5
b. 3
c. 2
d. 1

ANSWER: a

41. When two length measurements were summed, the answer came to 3.416 m. What is this when represented to three significant figures?

a. 3.415 m
b. 3.41 m
c. 3.42 m
d. 3.40 m

ANSWER: c

42. How many significant figures are there in the number 0.00204?

a. 3
b. 2
c. 4
d. 5

ANSWER: a

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43. The number 13.0 has how many significant figures?

a. 2
b. 3
c. 1
d. 4

ANSWER: b

44. How many significant figures are there in the number 1027?

a. 4
b. 3
c. 2
d. 1

ANSWER: a

45. How many significant figures does the number 23.120 have?

a. 3
b. 4
c. 5
d. 6

ANSWER: c

46. How many significant figures are there in the number 12,100?

a. 3
b. 5
c. Both of the above are possible.
d. Neither of the above is possible.

ANSWER: c

47. The number 8.03 contains how many significant figures?

a. 3
b. 2
c. 1
d. 4

ANSWER: a

48. How many significant figures are there in the number 100,000?

a. 1
b. 2
c. 6
d. A or C, depending on how the number was obtained

ANSWER: d

49. Good accuracy and good precision in three measurements means that all three have what in common?
    a. Values close to each other and close to the true value
    b. Values close to each other
    c. Values close to the true value
    d. Values close to the true value, but not necessarily close to each other

ANSWER: a

50. If a true value is 1.76 m, how are the following measurements of it best defined: 1.92 m, 1.91 m, and 1.94 m?
    a. Neither accurate nor precise
    b. Accurate, but not precise
    c. Precise, but not accurate
    d. Both accurate and precise

ANSWER: c

51. Which is the best definition of accuracy?
    a. How close theoretical results are to a true or real value
    b. How close experimental results are to a theoretical or real value
    c. How close experimental results are to a true or real value
    d. How often results can be obtained in repeated measurements

ANSWER: c

52. How many significant figures should the answer to the following equation have?
$2.3 \times 13.669 =$ ____
    a. 1
    b. 2
    c. 3
    d. 4

ANSWER: b

53. The answer to the following calculation should have how many significant figures?
$12.0112 \times 32.3 =$ ____
    a. 2
    b. 3
    c. 4
    d. 5

ANSWER: b

54. How many significant figures should the answer to the following calculation have?

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18.03 / 9.2 = _____

a. 1
b. 2
c. 3
d. 4

ANSWER: b

55. How many significant figures should the answer to this question have?
14 + 3.078 = ____

a. 2
b. 3
c. 4
d. 5

ANSWER: a

56. When a material floats, what is its density?

a. Above 0.5 g/ml
b. Above 1.0 g/ml
c. At or above 1.0 g/ml
d. Less than 1.0 g/ml

ANSWER: d

57. What two measurements determine density, and in what relationship to each other?

a. Volume multiplied by mass
b. Mass multiplied by volume
c. Mass divided by volume
d. Volume divided by mass

ANSWER: c

58. Which of the following represent three measurements that are the most precise?

a. 1.35, 1.20, and 1.28
b. 1.02, 0.82, and 1.87
c. 1.11, 1.93, and 1.90
d. 1.20, 1.22, and 1.19

ANSWER: d

59. Which of the following represent three measurements that are the least precise?

a. 2.34, 2.40, and 2.37
b. 14.2, 14.1, and 14.3
c. 3.45, 45.3, and 13.1

d. 35.2, 35.5, and 35.4

ANSWER: c

60. Accuracy is several measurements compared against a true, known value.

a. True
b. False

ANSWER: a

61. If a true value for the mass of a sample is 0.100 g, which of the following is the most accurate?

a. 0.105 g
b. 0.099 g
c. 0.104 g
d. 0.093 g

ANSWER: b

62. If a sample has a mass of 2.370 g, which of the following other readings is the most accurate?

a. 2.330 g
b. 2.368 g
c. 2.450 g
d. 2.373 g

ANSWER: b

63. A sample has a mass of 0.002 g. Which of the following is the most accurate comparison measurement of it?

a. 0.001 g
b. 0.004 g
c. 0.005 g
d. 0.006 g

ANSWER: a

64. If a true value for the mass of a sample is 1300 g, which of the following is the most accurate?

a. 1200 g
b. 1295 g
c. 1350 g
d. 1310 g

ANSWER: b

65. What is the density of a material with a mass of 23.9 g and a volume of 27.5 mL?

a. 51.4 g/mL
b. 1.15 g/mL
c. 3.60 g/mL

d. 0.869 g/mL

ANSWER: d

66. What is the density of a material with a mass of 1.20 g and a volume of 13.5 mL?

a. 12.3 g/mL
b. 16.2 g/mL
c. 0.0889 g/mL
d. 14.7 g/mL

ANSWER: c

67. What is the density of a sample with a volume of 10.0 mL and a mass of 13.9 g?

a. 1.39 g/mL
b. 3.90 g/mL
c. 139.0 g/mL
d. 0.719 g/mL

ANSWER: a

68. How dense is a powdered material with a mass of 9.8 g and a volume of 1.2 mL?

a. 11.0 g/mL
b. 0.122 g/mL
c. 8.2 g/mL
d. 7.7 g/mL

ANSWER: c

69. What is the density of a liquid sample with a mass of 22.0 g and a volume of 10.9 mL?

a. 32.9 g/mL
b. 11.1 g/mL
c. 2.02 g/mL
d. 22.0 g/mL

ANSWER: c

70. A chemical with a mass of 3.2 g and a volume of 4.1 mL has what density?

a. 0.9 g/mL
b. 7.3 g/mL
c. 13.1 g/mL
d. 0.78 g/mL

ANSWER: d

71. The density of a sample with a mass of 3.9 g and a volume of 2.8 mL is 0.72 g/mL.

a. True

b. False

ANSWER: b

72. Liquids are not always less dense than solids.

a. True
b. False

ANSWER: a

73. What is the mass of a material with a density of 2.22 g/mL and a volume of 5.11 mL?

a. 2.30 g
b. 11.3 g
c. 0.434 g
d. 2.89 g

ANSWER: b

74. A sample with a density of 6.01 g/mL and a volume of 1.97 mL has what mass?

a. 0.328 g
b. 3.05 g
c. 11.8 g
d. 4.04 g

ANSWER: c

75. What is the mass of a metal with a density of 10.98 g/mL and a volume of 0.900 mL?

a. 9.88 g
b. 10.08 g
c. 0.082 g
d. 11.88 g

ANSWER: a

76. A chemical sample with a mass of 10.0 g and a volume of 5.00 mL has to have a density of 3.00 g/mL.

a. True
b. False

ANSWER: b

77. How much mass does a sample with a density of 1.23 g/mL and a volume of 6.14 mL have?

a. 4.99 g
b. 4.91 g
c. 7.55 g
d. 7.37 g

ANSWER: c

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78. What is the mass of a material with a density of 12.42 g/mL and a volume of 1.33 mL?

a. 16.5 g
b. 11.09 g
c. 0.107 g
d. 13.75 g

ANSWER: a

79. What is the mass of a sample with a volume of 2.45 mL and a density of 3.42 g/mL?

a. 1.40 g
b. 0.716 g
c. 8.38 g
d. 0.970 g

ANSWER: c

80. A chemical sample with a density of 7.25 g/mL and a volume of 1.99 mL has what mass?

a. 3.64 g
b. 5.26 g
c. 0.274 g
d. 14.4 g

ANSWER: d

81. What is the volume of a material with a density of 2.22 g/mL and a mass of 5.11 g?

a. 2.89 mL
b. 11.3 mL
c. 0.434 mL
d. 2.30 mL

ANSWER: d

82. A liquid sample with a density of 5.25 g/mL and a mass of 1.11 g has what volume?

a. 5.83 mL
b. 0.211 mL
c. 4.73 mL
d. 4.14 mL

ANSWER: b

83. What is the volume of a material with a density of 1.72 g/mL and a mass of 5.55 g?

a. 9.55 mL
b. 0.310 mL
c. 3.23 mL
d. 3.83 mL

ANSWER: c

84. A sample with a density of 4.28 g/mL and a mass of 1.71 g has what volume?

a. 0.400 mL
b. 7.32 mL
c. 2.50 mL
d. 2.57 mL

ANSWER: a

85. What is the volume of a substance with a density of 1.29 g/mL and a mass of 3.11 g?

a. 2.41 mL
b. 4.01 mL
c. 1.82 mL
d. 0.415 mL

ANSWER: a

86. What is the volume of a liquid, chemical sample with a density of 2.11 g/mL and a mass of 4.80 g?

a. 10.13 mL
b. 0.440 mL
c. 2.69 mL
d. 2.27 mL

ANSWER: d

87. A material with a density of 3.22 g/mL and a mass of 1.31 g has what volume?

a. 4.22 mL
b. 0.407 mL
c. 1.91 mL
d. 4.53 mL

ANSWER: b

88. What is the volume of a chemical sample with a density of 0.982 g/mL and a mass of 6.14 g?

a. 5.16 mL
b. 0.160 mL
c. 6.25 mL
d. 6.03 mL

ANSWER: c

89. What is the volume of a material with a density of 6.02 g/mL and a mass of 7.89 g?

a. 1.87 mL
b. 0.763 mL

c. 1.31 mL
d. 13.9 mL

ANSWER: c

90. What is the volume of a material with a density of 4.42 g/mL and a mass of 0.0051 kg?
a. 1.2 mL
b. 866.7 mL
c. 0.0012 mL
d. 4.41 mL

ANSWER: a

91. What is the volume of a sample with a density of 1.23 g/mL and a mass of 0.023 kg?
a. 19 mL
b. 0.0187 mL
c. 1.21 mL
d. 283 mL

ANSWER: a

92. What is the density of a material with a mass of 32.3 g and a volume of 22.8 mL?
a. 736 g/mL
b. 55.1 g/mL
c. 9.50 g/mL
d. 1.42 g/mL

ANSWER: d

93. What is the density of a substance that has a mass of 112.1 g and a volume of 9.8 mL?
a. 102.3 g/mL
b. 11 g/mL
c. 0.087 g/mL
d. 10.23 g/mL

ANSWER: b

94. How dense is a material with a volume of 13.0 mL and a mass of 14.2 g?
a. 1.09 g/mL
b. 1.20 g/mL
c. 0.92 g/mL
d. 27.2 g/mL

ANSWER: a

95. What is the density of a chemical sample with a mass of 0.020 kg and a volume of 11.1 mL?

a. 0.0020 g/mL
b. 0.222 g/mL
c. 0.0018 g/mL
d. 1.8 g/mL

ANSWER: d

96. How dense is a material with a volume of 0.045 L and a mass of 376 g?

a. 16.92 g/mL
b. 8355 g/mL
c. 8.4 g/mL
d. 16,920 g/mL

ANSWER: c

97. A piece of glass has a mass of 6.32 g and displaces 4.21 mL of water. What is its density?

a. 26.6 g/mL
b. 1.50 g/mL
c. 2.11 g/mL
d. 0.666 g/mL

ANSWER: b

98. A shard of glass with a mass of 7.37 g displaces 3.27 mL of water. What is the density of this sample?

a. 2.25 g/mL
b. 4.10 g/mL
c. 24.1 g/mL
d. 10.2 g/mL

ANSWER: a

99. Several glass fragments from the same crash site have a total mass of 26.32 g and displace 12.11 mL of water. What is the density of this material?

a. 2.17 g/mL
b. 14.21 g/mL
c. 0.46 g/mL
d. 4.34 g/mL

ANSWER: a

100. If a glass fragment has a mass of 12.78 g and a volume of 3.29 mL, what is its density?

a. 9.49 g/mL
b. 0.257 g/mL
c. 6.39 g/mL
d. 3.88 g/mL

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ANSWER: d

101. What is the density of a piece of glass that has a volume of 2.34 mL and a total mass of 8.42 g?

a. 6.08 g/mL
b. 0.280 g/mL
c. 3.60 g/mL
d. 4.21 g/mL

ANSWER: c

102. What kind of change is the burning of wood to charcoal?
ANSWER: A chemical change

103. To change a measurement from milliliters to centimeters, what kind of conversion is required?
ANSWER: A decimal multiplier

104. What type of change occurs when a copper penny turns green?
ANSWER: A chemical change, oxidation

105. How many centimeters are in 2.00 inches?
ANSWER: 5.08

106. How many significant figures are in the measurement 3.400 g?
ANSWER: Four

107. When metal rusts, what sort of change has occurred?
ANSWER: Chemical

108. If a material has a density of 2.00 g/mL and a volume of 2.00 mL, should its mass be greater than or less than 2.00 g?
ANSWER: Greater than 2.00

109. How many significant figures are in the mass of 0.0012g?
ANSWER: Two

110. When snow melts, is this a physical or a chemical change?
ANSWER: Physical

111. Assuming two materials have the same volume, but Sample 1 has a mass of 5.23 g and Sample 2 has a mass of 2.33 g, which is the more dense material?
ANSWER: Sample 1

112. What is the density of a steel sample that has a volume of 9.802 mL and a mass of 124.1 g?
ANSWER: 12.66 g/mL

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113. How is precision defined?
ANSWER: Precision is how reproducible a measurement is when the same material is analyzed multiple times.

114. How many significant figures does the number 23.500 have?
ANSWER: Five

115. How many significant figures does the number 0.0023 contain?
ANSWER: Two

116. What is the density of water?
ANSWER: 1.00 g/mL

117. What kind of change is ice melting?
ANSWER: Physical Change

118. What is the density of a material with a mass of 28.04 g and a volume of 3.252 mL?
ANSWER: 8.622 g/mL

119. What is the density of a liquid with a volume of 35.3 mL and a mass of 62.2 g?
ANSWER: 1.76 g/mL

120. What is the density of a white powder with a mass of 12.5 g and a volume of 10.3 mL?
ANSWER: 1.21 g/mL

121. What is the SI unit of time?
ANSWER: The second

122. What is the density of an object with a mass of 13.0 g and a volume of 2.35 mL?
ANSWER: 5.53 g/mL

123. What three physical characteristics of soil samples could have linked Tommy Karate Pitera to the killing?
ANSWER: Color, texture, and composition

124. How did Pitera's shovel provide evidence of his burying bodies?
ANSWER: The shovel still had soil on it specific to the burial site.

125. Why couldn't Pitera claim that soil samples on the shovel were from his yard?
ANSWER: Investigators sent samples of soil from his yard to the lab, which was found not to match the soil on the shovel.

126. What characteristics of Staten Island soil are the same throughout the island?
ANSWER: Nothing really, soil from various areas differ significantly.

127. Why was soil in the loop of a shovel able to link Tommy Karate Pitera to a crime site?

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ANSWER: Because once soil from a site gets into the loop and fills it, no more different soil can replace it.