Armstrong_Chapter_01

Student: _____

1. An appropriate unit to measure the length of a football field would be the meter.
True False

2. Using a unit of mg to measure the mass of a premature infant would not be appropriate because the mass of the infant would be a very large number.
True False

3. The memory capacity of a flash drive is measured in **giga**bytes so that the capacity can be expressed using simple integers.
True False

4. If the following represents a syringe that measures in cc's (cm^3), the volume indicated by the end of the plunger would be correctly recorded as 5.2 cc.

True False

5. The average of the following volume measurements is 15.5 mL.

Volume Measurements
15.7 mL
15.2 mL
15.9 mL
15.6 mL
15.3 mL

.
True False

6. To convert feet to inches, you should multiply by the factor shown below.

$$\frac{12\text{ in}}{1\text{ ft}}$$

True False

7. To convert micrograms to grams, you should multiply by 1,000,000 g/microgram.
True False

8. A patient weights 220 lbs. A medication for this patient is supposed to be taken using a dosage of 3 mg per kg per day. The correct dose for this patient is 3000 mg per day.
True False

9. A pharmaceutical solution of penicillin contains 125 mg of penicillin in 3 mL. The two conversion factors that express this relationship are:

$$\frac{125\text{ mg penicillin}}{3\text{ mL}} \quad \text{and} \quad \frac{3\text{ mg penicillin}}{125\text{ mL}}$$

True False

10. A 20.00 mL urine sample of a patient has a mass of 20.70 g. This patient is most likely drinking very large amounts of water.
True False

11. A Celsius degree is the same size as a Kelvin degree.
True False

12. One advantage of the Kelvin system is that it is impossible to have temperatures below zero.
True False

13. The lowest temperature ever recorded on earth was -128.6°F. The temperature is equivalent to -89.2 K.
True False

14. The normal range (adult) for specific gravity of urine is 1.020-1.028 g/mL
True False

15. If a patient stands 6 feet tall, their height can also be expressed as 1828.8 cm.
True False

16. If an order read: NS (normal saline solution) 1000 mL to be given intravenously over 8 hrs. 125 mL of NS should be administered every hour.
True False

17. The normal range (adult) for specific gravity of urine is 1.010 - 1.048 g/mL.
True False

18. If the specific gravity of a sample of urine tested higher than normal, this would indicate dilution.
True False

19. The base unit of length in the metric system is the
A. mil
B. millimeter
C. foot
D. meter

20. Which of the following is **not** a base unit of the metric system?
A. g
B. g/L
C. L
D. all are base units

21. The prefix centi- denotes what fraction of a base unit?
A. 1/10
B. 1/100
C. 1/1000
D. 100

22. The mass of an object is
A. the force between the object and the earth
B. a measure of the amount of matter in the object
C. the amount of space the object occupies
D. depends on the location of the object on the earth

23. In which of the following are the masses given in the correct order?
A. cg > mg > g >kg
B. cg > g > kg > mg
C. kg > g > cg > mg
D. mg > cg > g > kg

24. Which of the following is the smallest number?
A. 5×10^{3}
B. 3×10^{4}
C. 2×10^{-5}
D. 7×10^{-6}

25. The land surface area of the earth is approximately 1.49×10^{8} km^2. Which of the following is the correct way to write this in conventional notation?
A. 0.00000000149 km^2
B. 149,000,000 km^2
C. 14,900,000,000 km^2
D. none of these

26. Which of the following set-ups will allow you to calculate the cost of fruit in dollars per gram, if the price is given as 0.79 dollars per pound?

A. $\frac{0.79 \text{ dollars}}{1\text{b}} \times \frac{2.20 \text{ lb}}{1000 \text{ g}}$

B. $\frac{0.79 \text{ dollars}}{1\text{b}} \times \frac{457 \text{ g}}{1 \text{ dollar}}$

C. $\frac{1\text{b}}{0.79 \text{ dollars}} \times \frac{1 \text{ lb}}{457 \text{ g}}$

D. $\frac{1\text{b}}{0.79 \text{ dollars}} \times \frac{1 \text{ kg}}{2.20 \text{ lb}}$

27. How many minutes are in a 30 day month? [Assume exactly 24 hours in a day]
A. 7.20×10^{2}
B. 4.32×10^{4}
C. 2.59×10^{6}
D. 3.11×10^{7}

28. A common piece of laboratory glassware is a 125 mL beaker. What is the volume of this piece of glassware in the English system of units? [1 quart = 0.946 liter = 32 fl oz]
A. 0.423 fl oz
B. 0.423 quarts
C. 4.23 fl oz
D. 4.23 quarts

29. A particular model of hybrid car can travel 53.0 miles/gallon of gas. What is this fuel efficiency expressed in the metric system? [1 quart = 0.946 liter; 1 mile = 1.609 km]
A. 8.71 km/liter
B. 20.2 km/liter
C. 22.5 km/liter
D. 90 km/liter

30. A tablet contains 250 mg of penicillin while the solution form of the same antibiotic contains 250 mg of penicillin/5 mL. If a doctor was to prescribe that one-half of a scored tablet be taken four times a day, how many mL of the solution would be equivalent to this daily dosage?
A. 5 mL
B. 20 mL
C. 2.5 mL
D. 10 mL

31. An intern made an error and gave a patient a dose of 500 mg rather than 500 mg of a drug. Which of the following is true?
A. The patient received an overdose by a factor of 1000.
B. The patient received an overdose by a factor of 100.
C. The patient received an underdose by a factor of 1000.
D. The patient received an underdose by a factor of 100.

32. A penicillin derivative is used to treat infections with an adult 24-hour dosage of 35 mg/kg of body mass. This is to be given in three injections daily. This antibiotic is prepared by the pharmacy in solution form with a concentration of 130 mg/5mL. What volume in milliliters should be given in each injection to an adult with a mass of 12.5kg?
A. 5.6 mL
B. 17 mL
C. 50 mL
D. 0.32 mL

33. Which of the following is true of the relationship between density and specific gravity?
A. They have different numerical values and different units.
B. They have nearly the same numerical value and the same units.
C. They have nearly the same numerical value but specific gravity is dimensionless.
D. They have the nearly same units but different numerical values.

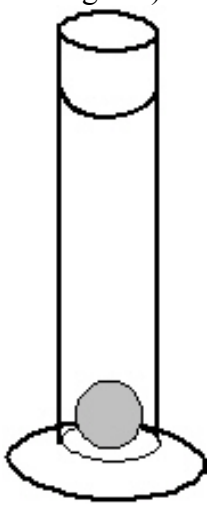
34. The densities of the coinage metals (copper, silver and gold) are as follows:

copper = 8.95 g/mL
silver = 12.59 g/mL
gold = 19.32 g/mL

A sample of material is found to weigh 15.03 grams, and have a volume of 1.20 mL. This is a sample of which of the coinage metals?
A. copper
B. silver
C. gold
D. it is not one of the coinage metals

35. Aluminum has a density of 2.70 g/ mL. What volume is occupied by a block of aluminum that weighs 4.32 kg?
A. 0.000625 mL
B. 0.625 mL
C. 1.60 mL
D. 1.60 L

36. In an experiment a solid sphere is placed in a cylinder containing the organic solvent cyclohexane (density = 0.778 g/mL).



Based on this picture, the sphere has a density:

A. greater than 0.778 g/mL
B. less than 0.778 g/mL
C. about the same as 0.778 g/mL
D. The image does not provide enough information to answer.

37. If urine has a density of 1.08 g/mL, what would be the mass of a 125 mL urine sample?
A. 135 g
B. 0.00864 g
C. 116 g
D. 125 g

38. What temperature on the Celsius is the same as normal body temperature 98.6°F?
A. 34.3°C
B. 37.0°C
C. 119.9°C
D. none of these

39. At what temperature do the temperatures on the Celsius and Kelvin scales have the same numerical value?
A. - 40
B. 0
C. 32
D. There is no value where the two scales are the same.

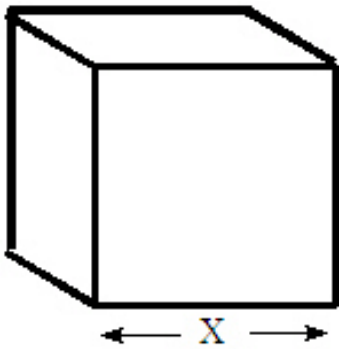
40. The boiling point of liquid nitrogen is 77K. What is this temperature on the Celsius scale?
A. 350°C
B. 171°C
C. 25°C
D. -196°C

41. If a patient weighs 202 pounds (lbs), how many kilograms (kg) does he weigh?

A. 444 kg
B. 918 kg
C. 10.9 kg
D. 91.8 kg

42. In the health sciences, learning and understanding how to accurately convert chemical quantities is of utmost importance, as it keeps your patients and your practice safe. At home medicines are sometimes dispensed by the teaspoon (tsp) or tablespoon (tbsp). If there are 3 tsp in 1 tbsp and 1 tbsp is equal to 15 mL, how many milliliters are 2 tsp?
A. 45 mL
B. 5 mL
C. 10 mL
D. 2.5 mL

43. The following questions refer to the plastic box shown below.

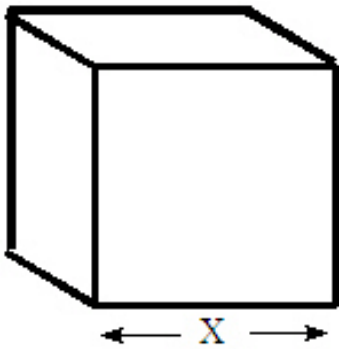


Fill in the blanks in the questions from the following list. All units in the list will not be used and a unit maybe used more than once.

dm
L
mL
g/mL
kg
mm
km

If a measurement were made of the quantity represented by X in the figure, an appropriate unit to use would be_____ if X = 18 in.
_____

44. The following questions refer to the plastic box shown below.



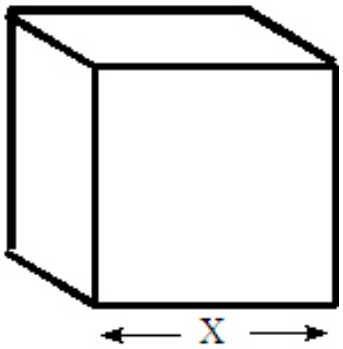
Fill in the blanks in the questions from the following list. All units in the list will not be used and a unit maybe used more than once.

dm
L
mL
g/mL
kg
mm
km

If the box were placed on a balance, a unit that might appear on the balance read-out would be _____.

_____

45. The following questions refer to the plastic box shown below.



Fill in the blanks in the questions from the following list. All units in the list will not be used and a unit maybe used more than once.

dm
L
mL
g/mL
kg
mm
km

The box is filled with water to the very top from a graduated cylinder. A unit that could be used to measure this quantity would be _____.
_____

46. Fill in the first blank with the appropriate number (1, 2, 3 etc.) and the second blank with the direction (right or left).

In order to convert from milliliters to liters, the decimal is moved _____ places to the_____.
_____

47. Fill in the first blank with the appropriate number (1, 2, 3, etc.) and the second blank with the direction (right or left).

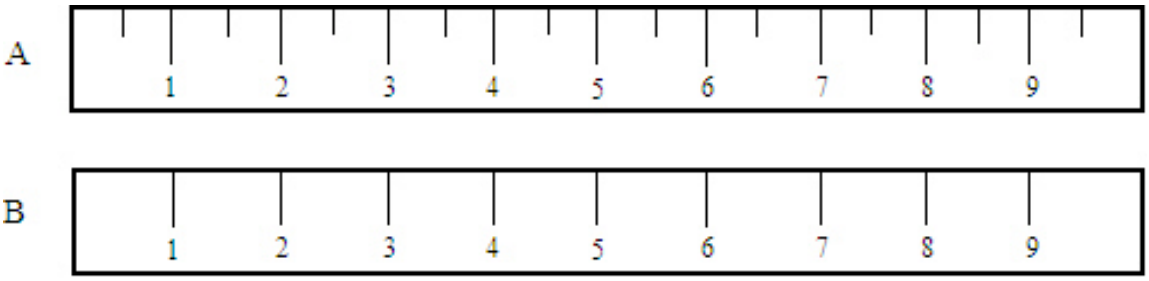
In order to convert from kilogram to milligrams, the decimal is moved _____ places to the_____.
_____

48. Fill in the blanks with top or bottom as appropriate.

In order to convert from kilograms to grams, the conversion factor should have 1 kg on the _____ and 1000 g on the _____.

_____

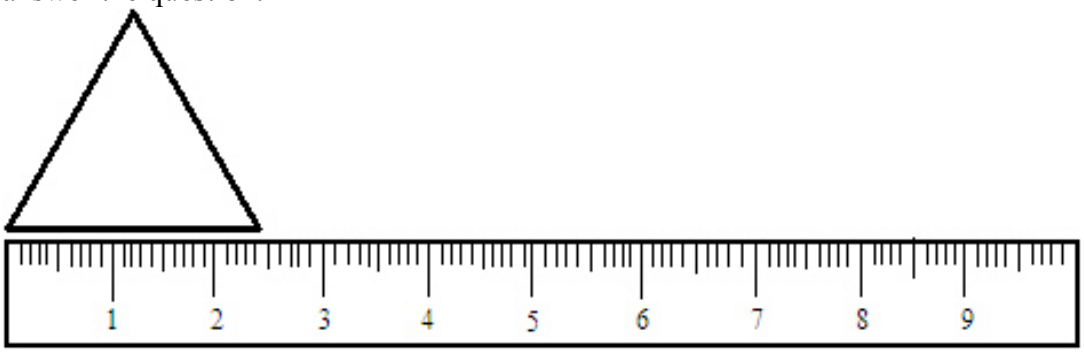
49. Compare the following two metric rulers. Fill in the blanks, respectively, with the identity of the ruler (A or B) and the terms more or less as appropriate.



A measurement made with ruler_____would be _____accurate.

_____

50. Based on the ruler represented in the picture. Use the appropriate integer (0, 1, 2, 3, etc.) in the blank to answer the question.



The length of the side of the triangle should be recorded to _____decimal places.

_____

51. Fill in the blanks, respectively, with a letter (A or B) to represent the balance and more or less to describe the precision.

The density of a metal block was determined based on mass measurements using two different balances. The results are shown below.

Density (g/mL) Balance A	Density (g/mL) Balance B
9.76	9.89
9.59	9.78
9.89	9.99

The density determined using balance _____ is _____precise.

_____

52. Fill in the blanks, respectively, with a letter (A or B) to represent the balance and more or less to describe the precision.

Two students measured the density of a metal block was determined based on mass measurements using the same balance. The results are shown below.

Density (g/mL) Student A	Density (g/mL) Student B
21.7	21.0
21.6	21.3
21.9	21.5
22.0	21.8

If the metal block is gold (density = 21.45 g/mL), student _____'s data is _____accurate.

_____

53. Enter the number (0, 1, 2, 3, etc.) in the blank provided.

Consider the measurement shown below.

780 mg

The first uncertain digit is the _____.

_____

54. Enter the number (0, 1 ,2, 3, etc.) in the blank provided.

Consider the measurement shown below.

23.5410 g

The first uncertain digit is the _____.

_____

55. Fill in the blank with the appropriate number (0, 1 ,2 ,3 etc.).

Consider the following calculation:

$$\begin{array}{r} 143.321\ \text{g} \\ 17.89\ \text{g} \\ +\ 100.1\ \text{g} \\ \hline 261.311\ \text{g} \end{array}$$

The answer should be round to _____decimal places.

_____

56. Fill in the blank with the appropriate number (0, 1, 2, 3 etc.).

The following calculation was carried out to determine the volume of a rectangular solid.

$15.55\ \text{cm} \times 12.0\ \text{cm} \times 0.557\ \text{cm} = 105.80233350\ \text{cm}^3$

The answer should be round to _____significant figures..

_____

57. Fill in the blanks, respectively, with higher or lower and adequate or inadequate.

A drop of a potential donor's blood is placed in water and floats on the surface. This indicates that specific gravity of the blood is _____than water and that the iron concentration is_____.

_____

Armstrong_Chapter_01 Key

1. An appropriate unit to measure the length of a football field would be the meter.
TRUE

2. Using a unit of mg to measure the mass of a premature infant would not be appropriate because the mass of the infant would be a very large number.
TRUE

3. The memory capacity of a flash drive is measured in **giga**bytes so that the capacity can be expressed using simple integers.
TRUE

4. If the following represents a syringe that measures in cc's (cm^3), the volume indicated by the end of the plunger would be correctly recorded as 5.2 cc.

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5. The average of the following volume measurements is 15.5 mL.

Volume Measurements
15.7 mL
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15.3 mL

.
TRUE

6. To convert feet to inches, you should multiply by the factor shown below.

$$\frac{12\text{ in}}{1\text{ ft}}$$

TRUE

7. To convert micrograms to grams, you should multiply by 1,000,000 g/microgram.
FALSE

8. A patient weights 220 lbs. A medication for this patient is supposed to be taken using a dosage of 3 mg per kg per day. The correct dose for this patient is 3000 mg per day.
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9. A pharmaceutical solution of penicillin contains 125 mg of penicillin in 3 mL. The two conversion factors that express this relationship are:

$$\frac{125\text{ mg penicillin}}{3\text{ mL}} \quad \text{and} \quad \frac{3\text{ mg penicillin}}{125\text{ mL}}$$

FALSE

10. A 20.00 mL urine sample of a patient has a mass of 20.70 g. This patient is most likely drinking very large amounts of water.
FALSE

11. A Celsius degree is the same size as a Kelvin degree.
TRUE

12. One advantage of the Kelvin system is that it is impossible to have temperatures below zero.
TRUE

13. The lowest temperature ever recorded on earth was -128.6°F. The temperature is equivalent to -89.2 K.
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18. If the specific gravity of a sample of urine tested higher than normal, this would indicate dilution.
FALSE

19. The base unit of length in the metric system is the
A. mil
B. millimeter
C. foot
D. meter

20. Which of the following is **not** a base unit of the metric system?
A. g
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21. The prefix centi- denotes what fraction of a base unit?
A. 1/10
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A. the force between the object and the earth
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A. cg > mg > g >kg
B. cg > g > kg > mg
C. kg > g > cg > mg
D. mg > cg > g > kg

24. Which of the following is the smallest number?
A. 5×10^{3}
B. 3×10^{4}
C. 2×10^{-5}
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25. The land surface area of the earth is approximately 1.49×10^{8} km^2. Which of the following is the correct way to write this in conventional notation?
A. 0.00000000149 km^2
B. 149,000,000 km^2
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26. Which of the following set-ups will allow you to calculate the cost of fruit in dollars per gram, if the price is given as 0.79 dollars per pound?

A. $\frac{0.79 \text{ dollars}}{1\text{b}} \times \frac{2.20 \text{ lb}}{1000 \text{ g}}$

B. $\frac{0.79 \text{ dollars}}{1\text{b}} \times \frac{457 \text{ g}}{1 \text{ dollar}}$

C. $\frac{1\text{b}}{0.79 \text{ dollars}} \times \frac{1 \text{ lb}}{457 \text{ g}}$

D. $\frac{1\text{b}}{0.79 \text{ dollars}} \times \frac{1 \text{ kg}}{2.20 \text{ lb}}$

27. How many minutes are in a 30 day month? [Assume exactly 24 hours in a day]
A. 7.20×10^{2}
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28. A common piece of laboratory glassware is a 125 mL beaker. What is the volume of this piece of glassware in the English system of units? [1 quart = 0.946 liter = 32 fl oz]
A. 0.423 fl oz
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C. 4.23 fl oz
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copper = 8.95 g/mL
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A sample of material is found to weigh 15.03 grams, and have a volume of 1.20 mL. This is a sample of which of the coinage metals?

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B. silver
C. gold
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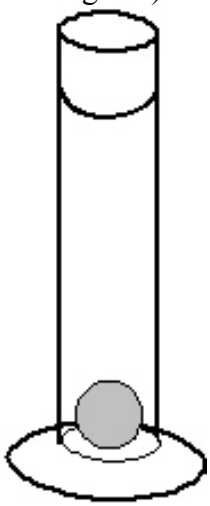
35. Aluminum has a density of 2.70 g/ mL. What volume is occupied by a block of aluminum that weighs 4.32 kg?

A. 0.000625 mL
B. 0.625 mL
C. 1.60 mL
D. 1.60 L

36. In an experiment a solid sphere is placed in a cylinder containing the organic solvent cyclohexane (density = 0.778 g/mL).



Based on this picture, the sphere has a density:

A. greater than 0.778 g/mL
B. less than 0.778 g/mL
C. about the same as 0.778 g/mL
D. The image does not provide enough information to answer.

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C. 119.9°C
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39. At what temperature do the temperatures on the Celsius and Kelvin scales have the same numerical value?
A. - 40
B. 0
C. 32
D. There is no value where the two scales are the same.

40. The boiling point of liquid nitrogen is 77K. What is this temperature on the Celsius scale?
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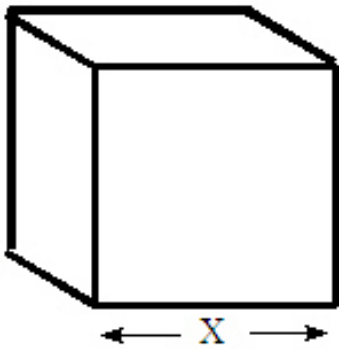
C. 25°C
D. -196°C

41. If a patient weighs 202 pounds (lbs), how many kilograms (kg) does he weigh?

A. 444 kg
B. 918 kg
C. 10.9 kg
D. 91.8 kg

42. In the health sciences, learning and understanding how to accurately convert chemical quantities is of utmost importance, as it keeps your patients and your practice safe. At home medicines are sometimes dispensed by the teaspoon (tsp) or tablespoon (tbsp). If there are 3 tsp in 1 tbsp and 1 tbsp is equal to 15 mL, how many milliliters are 2 tsp?
A. 45 mL
B. 5 mL
C. 10 mL
D. 2.5 mL

43. The following questions refer to the plastic box shown below.

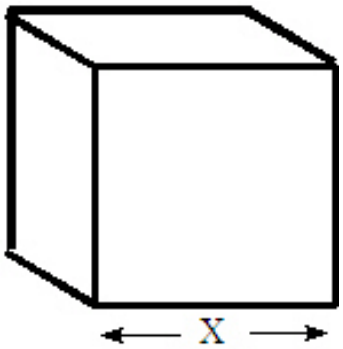


Fill in the blanks in the questions from the following list. All units in the list will not be used and a unit maybe used more than once.

dm
L
mL
g/mL
kg
mm
km

If a measurement were made of the quantity represented by X in the figure, an appropriate unit to use would be_____ if X = 18 in.
dm

44. The following questions refer to the plastic box shown below.



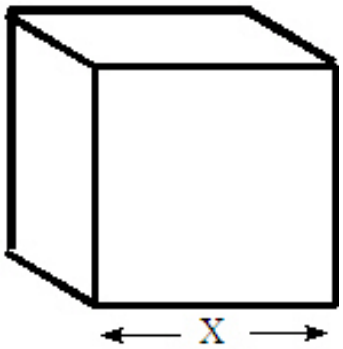
Fill in the blanks in the questions from the following list. All units in the list will not be used and a unit maybe used more than once.

dm
L
mL
g/mL
kg
mm
km

If the box were placed on a balance, a unit that might appear on the balance read-out would be _____.

kg

45. The following questions refer to the plastic box shown below.



Fill in the blanks in the questions from the following list. All units in the list will not be used and a unit maybe used more than once.

dm
L
mL
g/mL
kg
mm
km

The box is filled with water to the very top from a graduated cylinder. A unit that could be used to measure this quantity would be _____.
L

46. Fill in the first blank with the appropriate number (1, 2, 3 etc.) and the second blank with the direction (right or left).

In order to convert from milliliters to liters, the decimal is moved _____ places to the_____.
3, left *or*
three, left

47. Fill in the first blank with the appropriate number (1, 2, 3, etc.) and the second blank with the direction (right or left).

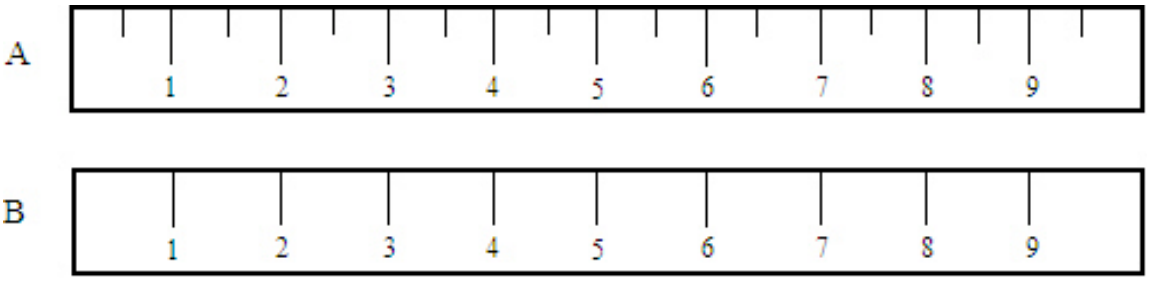
In order to convert from kilogram to milligrams, the decimal is moved _____ places to the_____.
6, right *or*
six, right

48. Fill in the blanks with top or bottom as appropriate.

In order to convert from kilograms to grams, the conversion factor should have 1 kg on the _____ and 1000 g on the _____.

bottom, top

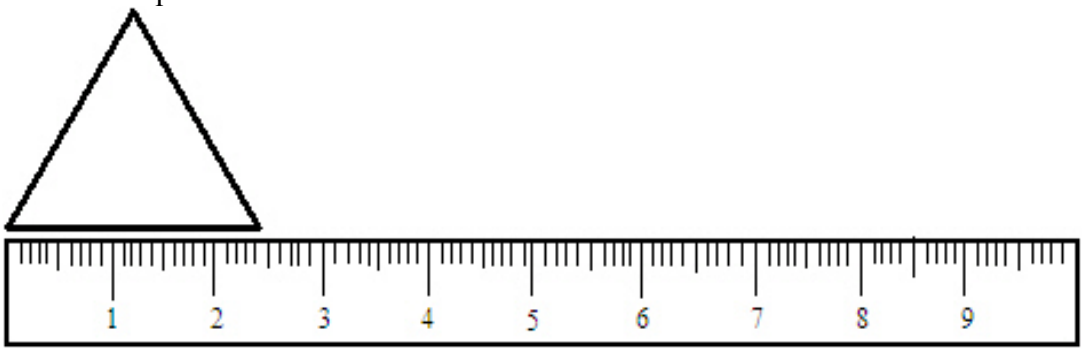
49. Compare the following two metric rulers. Fill in the blanks, respectively, with the identity of the ruler (A or B) and the terms more or less as appropriate.



A measurement made with ruler_____would be _____accurate.

A, more *or*
B, less

50. Based on the ruler represented in the picture. Use the appropriate integer (0, 1, 2, 3, etc.) in the blank to answer the question.



The length of the side of the triangle should be recorded to _____decimal places.

2 *or*
two

51. Fill in the blanks, respectively, with a letter (A or B) to represent the balance and more or less to describe the precision.

The density of a metal block was determined based on mass measurements using two different balances. The results are shown below.

Density (g/mL) Balance A	Density (g/mL) Balance B
9.76	9.89
9.59	9.78
9.89	9.99

The density determined using balance _____ is _____precise.

A, less *or*
B, more

52. Fill in the blanks, respectively, with a letter (A or B) to represent the balance and more or less to describe the precision.

Two students measured the density of a metal block was determined based on mass measurements using the same balance. The results are shown below.

Density (g/mL) Student A	Density (g/mL) Student B
21.7	21.0
21.6	21.3
21.9	21.5
22.0	21.8

If the metal block is gold (density = 21.45 g/mL), student _____'s data is _____accurate.

B, more *or*
A, less

53. Enter the number (0, 1, 2, 3, etc.) in the blank provided.

Consider the measurement shown below.

780 mg

The first uncertain digit is the _____.

8 *or*
eight

54. Enter the number (0, 1 ,2, 3, etc.) in the blank provided.

Consider the measurement shown below.

23.5410 g

The first uncertain digit is the _____.
0 *or*
zero

55. Fill in the blank with the appropriate number (0, 1 ,2 ,3 etc.).

Consider the following calculation:

$$\begin{array}{r} 143.321\ \text{g} \\ 17.89\ \text{g} \\ +\ 100.1\ \text{g} \\ \hline 261.311\ \text{g} \end{array}$$

The answer should be round to _____decimal places.
1 *or*
one

56. Fill in the blank with the appropriate number (0, 1, 2, 3 etc.).

The following calculation was carried out to determine the volume of a rectangular solid.

$$15.55\ \text{cm} \times 12.0\ \text{cm} \times 0.557\ \text{cm} = 105.80233350\ \text{cm}^3$$

The answer should be round to _____significant figures..
3 *or*
three

57. Fill in the blanks, respectively, with higher or lower and adequate or inadequate.

A drop of a potential donor's blood is placed in water and floats on the surface. This indicates that specific gravity of the blood is _____than water and that the iron concentration is_____.
lower, inadequate