

Measurement and Lab Equipment Basics

Assignment – Teacher Edition

I. Multiple Choice: Select the correct answer for each question

- 1 inch is equivalent to _____ cm.
 - a) 1.54
 - b) 2.54
 - c) 1.45
 - d) 2.45

2. _____ is measured in grams.
 - a) Energy
 - b) Pressure
 - c) Mass
 - d) Volume

3. Which of the following instruments is used to measure the mass of an object?
 - a) Digital balance
 - b) pH meter
 - c) Microscope
 - d) Incubator

4. Identify the lab equipment seen below:

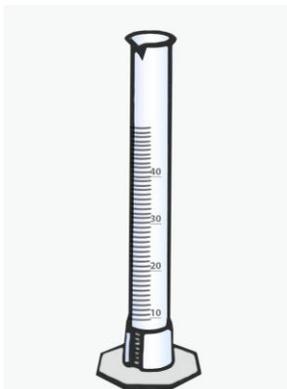


- a) Physical Balance
- b) Digital Balance
- c) Microscope
- d) pH meter

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5. Identify the piece of glassware below:



- a) Conical flask
- b) Measuring cylinder
- c) Beaker
- d) Volumetric flask

6. Identify the objects below:



- a) Wire gauze
- b) Test tube racks
- c) Dropper
- d) Measuring cylinder

7. Which of the following is the smallest unit of length?

- a) Centimeter
- b) Decimeter
- c) Millimeter
- d) Micrometer

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8. The ounce is used as a unit of _____.
- a) Length
 - b) Distance
 - c) Pressure
 - d) Weight
9. _____ is used to measure the volume of any liquid.
- a) Graduated cylinder
 - b) Beaker
 - c) Flask
 - d) Test tube
10. _____ is used to hold test tube.
- a) Test tube rack
 - b) Wire gauge
 - c) Beaker
 - d) Cylinder

II. Convert the following:

1. 5 ml to μl

2. 20 degree C to degree F

3. 30 mm to cm

4. 1 gallon to liter

5. 10 kg to pound

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III. While measuring the mass of an object using a digital balance, certain steps are followed to get an accurate weight. Write a number from 1 through 4 beside each step, to indicate the order in which these steps take place.

- a) Press “Tare” so that the weight comes to “0” reading.
- b) Switch on the balance and place the weight boat on the digital balance.
- c) Record the weight of the object.
- d) Place the object on the weight boat.

IV. Decide if the following statements are true or false. Correct any false statements.

1. One kilogram is more than one decigram.

2. While measuring the volume of liquid using a graduated cylinder, the upper meniscus is used.

3. Pressing “tare” resets the digital balance to “0” reading.

4. One centimeter is smaller than one millimeter.

5. A spatula is used to pick up a small amount of a solid substance.

V. Take a ruler and measure the following things in millimeter (mm).

- a) Length of a paper

Paper No.	Length of Paper (mm)
1.	
2.	
3.	
4.	
5.	

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b) Width of a paper

Paper No.	Width of Paper (mm)
1.	
2.	
3.	
4.	
5.	

VI. Why is it important to press tare before weighing an object?

VII. What is the principle behind a pH meter?

VIII. Describe the two lenses used in a compound microscope.

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ANSWERS

I. Multiple Choice: Select the correct answer for each question

1. 1 inch is equivalent to _____ cm.

a) 1.54

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2. _____ is measured in grams.

a) Energy

b) Pressure

c) Mass

d) Volume

3. Which of the following instruments is used to measure the mass of an object?

a) Digital balance

b) pH meter

c) Microscope

d) Incubator

4. Identify the lab equipment seen below:



a) Physical Balance

b) Digital Balance

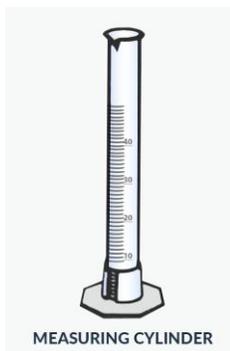
c) Microscope

d) pH meter

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- a) Wire gauze
- b) Test tube racks
- c) Dropper**
- d) Measuring cylinder

7. Which of the following is the smallest unit of length?

- a) Centimeter
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 - d) Test tube
10. _____ is used to hold test tube.
- a) Test tube rack
 - b) Wire gauge
 - c) Beaker
 - d) Cylinder

II. Convert the following:

1. 5 ml to μl

$$1 \text{ ml} = 1000 \mu\text{l}$$

$$\text{Therefore, } 5 \text{ ml will be equal to } 5 \text{ ml} \times 1000 \mu\text{l} = 5000 \mu\text{l}$$

$$\text{Answer: } 5000 \mu\text{l}$$

2. 0 degree C to degree F

$$\text{degree F} = \text{degree C} \times 1.8 + 32$$

$$= 0 \text{ degree C} \times 1.82 + 32$$

$$= 67.6$$

$$\text{Answer: } 67.6 \text{ degree F.}$$

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3. 30 mm to cm

$$1 \text{ m} = 100 \text{ cm}$$

$$1 \text{ m} = 1000 \text{ mm}$$

$$\text{Or } 1000 \text{ mm} = 100 \text{ cm}$$

$$30 \text{ mm} = 100/1000 \times 30 = 0.1 \times 30 = 3 \text{ cm}$$

Answer: 3 cm

4. 1 gallon to liter

$$1 \text{ gallon} = 3.8 \text{ liters}$$

Answer: 3,8 liters

5. 10 kg to pound

$$1 \text{ kg} = 2.21 \text{ pounds}$$

$$\text{Therefore, } 10 \text{ kg} = 10 \times 2.21 \text{ pounds} = 22.1 \text{ pounds}$$

Answer: 22.1 pounds

III. While measuring mass of an object using a digital balance, certain steps are followed to get an accurate weight. Write a number from 1 through 4 beside each step, to indicate the order in which these steps take place.

- a) Press “Tare” so that the weight comes to “0” reading.
- b) Switch on the balance and place the weight boat on the digital balance.
- c) Record the weight of the object.
- d) Place the object on the weight boat.

Answer: 2), Switch on the balance and place the weight boat on the digital balance.

1), Press “Tare” so the weight comes to “0” reading.

4), Place the object on the weight boat.

3), Record the weight of the object.

IV. Decide if the following statements are true or false. Correct any false statements.

1. One kilogram is more than one decigram.

Answer: False, kilogram is greater than decigram. $1\text{Kg} = 1000 \text{ gm}$ while $1\text{dg} = 0.1 \text{ gm}$

2. While measuring the volume of liquid using a graduated cylinder, the upper meniscus is used.

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Answer: False, while measuring the volume of liquid the lower meniscus is considered for getting the accurate reading.

3. Pressing “tare” resets the digital balance to “0” reading.

Answer: True, when “tare” is pressed on a digital balance and the reading come to “0”. This is called resetting the balance. This gives the accurate reading of the object and removes the weight of the weight boat or any other thing placed on the balance just to keep the sample object.

4. One centimeter is smaller than one millimeter.

Answer: False, centimeter is greater than millimeter. $1\text{cm} = 0.01\text{ m}$ and $1\text{mm} = 0.001\text{ m}$

5. A spatula is used to pick up a small amount of a solid substance.

Answer: True, spatula is a small tube-like structure that can hold a pinch of solid on it. It is used to pick materials during weighing.

II. Take a ruler and measure the following things in millimeter (mm).

- a) Length of a paper: Take the average of 5 papers.

Paper No.	Length of Paper (mm)
1.	
2.	
3.	
4.	
5.	

- b) Width of a paper: Take the average of 5 papers.

Paper No.	Width of Paper (mm)
1.	
2.	

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3.	
4.	
5.	

III. Why is it important to press tare before weighing an object?

Pressing tare causes the balance to return to zero, meaning that the container that a substance is being measured into is not part of the final mass.

IV. What is the principle behind a pH meter?

pH meter is used to measure the hydrogen ion concentration of a solution. With the increase in hydrogen ion (H^+) concentration the acidity of a solution increases and a lower pH will be seen on the meter and vice versa. pH meter is used to determine acidity, alkalinity and neutrality of a solution.

V. Describe the two lenses used in a compound microscope.

A compound microscope is also known as student microscope and is commonly seen in the biology laboratory. It consists of two lenses: the eye piece and objective lens. The eye piece is found near the eye while the objective lens is found just above the object being viewed.