SCIENCE 1206

UNIT 3: MOTION
WORKSHEET #1: MEASUREMENT

Physics is the study of motion, matter, energy, and force.

Qualitative Descriptions: are descriptions made by observing with the 5 senses, such as the smell of a flower or the colour of someone's eyes. They include observations which cannot be measured.

Quantitative Descriptions : are descriptions that are based on measurements or counting (i.e. they are numerical), such as the number of petals a flower has or how tall a person is. They deal with quantities.

Le Système International d'Unités (SI) refers to a single measurement system (metric system) that has been agreed upon by scientist all over the world. SI has seven base units. Most other units are derived from these seven units

Base unit: refers to units that are defined.

Table 1. SI base units

Base quantity	Name	Symbol
	SI base unit	
length	meter	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
thermodynamic temperature	kelvin	K
amount of substance	mole	mol
luminous intensity	candela	cd

Note:

meter is defined as the distance light travels in a small fraction of a second.

kilogram is the current "base unit" for mass. A kilogram is defined as the mass of a certain lump of platinum and iridium that is kept in Paris under glass to protect it from chemical changes that could alter its mass.

Derived units are ones that we "figure out" by using base units.

Table 2. Examples of SI derived units

Derived quantity	Name	Symbol
	SI derived unit	
area	square meter	m^2
volume	cubic meter	m^3
speed, velocity	meter per second	m/s
acceleration	meter per second squared	m/s^2

PART A: MULTIPLE CHOICE [9]

1. Which of the following involves the study of motion, matter, energy, and force?

   (A) Biology
   (B) Chemistry
   (C) Meterology
   (D) Physics

2. Which of the following is a great physicist?

   (A) Albert Einstein
   (B) Galileo Galilei
   (C) Isaac Newton
   (D) All are correct

3. Which of the following is used to make a qualitative description?

   (A) Your bath scales
   (B) Your Eyes
   (C) A measuring Tape
   (D) A rain gauge

4. Which of the following is a quantitative description?

   (A) The glass is half full
   (B) It is warm in the physics lab
   (C) The lemon tastes sour
   (D) The mass the cat is 2.0 kg

5. Which organization is responsible for creating a system of base units to be followed by the scientific community?

   (A) International Union of Pure and Applied Chemisrty (IUPAC)
   (B) Le Système International d'Unités (SI)
   (C) French Academy of Sciences (FAS)
   (D) International Space Agency (ISA)

6. What is the bass unit for measuring time?

   (A) kilograms
   (B) meter
   (C) second
   (D) meter/second

7. What is the bass unit for measuring mass?

   (A) kilogram
   (B) meter
   (C) second
   (D) meter/second

8. Which of the following is a derived unit?

   (A) kilograms
   (B) meter
   (C) second
   (D) meter/second

9. The SI units for length, time and mass are respectively

(A) metre , second and gram
(B) metre , second and kilogram
(C) centimetre, minute and gram
(D) centimetre, hour and kilogram

10. Which one of the following lists consists of three derived units?

(A) speed, volume and area
(B) mass, time and volume
(C) distance, time and volume
(D) length, temperature and mass

PART B: WRITTEN RESPONSE

11. Complete the chart below. [10]

Step 1. Tell if each of the following is a quantitative or qualitative description.

Step 2. If it is a quantitative description, tell if the unit is a derived unit or a base(standard) unit.

Measurement	Quantitative/ Qualitative	Derived Unit/ Base Unit
a speed of 25 m/s		
a foul odour		
mass is 75.1 kg		
a long trip		
salty taste		
a time of 200.0 seconds		
a density of 200 g/m^3		
an area of 20.1 m^2		