Physics Vocabulary List

1. Measurements will be integrated into labs

- Students will be able to identify SI units and use them to calculate derived units.
- Students will be able to convert units using dimension analysis.
- Students will be able to use dimensional analysis in their calculations.

Vocabulary: units, dimensions, length

2. Describing Motion

- Students will be able to describe what average speed is and differentiate this from instantaneous speed.
- Students will be able to calculate speed from distance and time.
- Students will be able to explain that velocity is speed with direction and displacement is distance with direction.
- Students will be able to draw and interpret displacement vs time graphs.
- Students will recognize that the slope of a displacement vs time graph is velocity.
- Students will recognize that the area under a velocity vs time graph is the displacement traveled.
- Students will recognize that the slope of a velocity vs time graph is acceleration.
- Students will be able to differentiate between vector and scalar quantities.

Vocabulary: distance, speed, time, with respect to, units, calculations, dimensions, constant, velocity, rest, displacement, graph, slope, steep, gentle, acceleration, vector, scalar

3. Forces and motion

- Students will recognize that forces cause an acceleration or change in velocity.
- Students will recognize that an acceleration changes velocity but may not change speed.
- Students will be able to add forces in the same axis.
- Students will recognize that weight is a force and will be able to distinguish it from mass.

- Students will recognize that acceleration of free fall, g, is approximately 10m/s^2.
- Students will be able to explain that F=ma.
- Students will be able to explain that the unit Newton, N=kg*m/s^2.
- Students will be able to indicate the direction of force and velocity of an object that goes through circular motion.
- Students will be able to explain why objects in free fall reach terminal velocity.
- Students will be able to explain the relationship between momentum and motion of an object.
- Students will be able to explain that impulse is a change in momentum.
- Students will recognize that momentum is always conserved (Law of conservation of momentum).
- Students will be able to add vectors in 2d.

Vocabulary: force, balanced, net force, resultant, weight, mass, free fall, Newton, kilogram, SI units, atmosphere, terminal velocity, circular motion, momentum, impulse, magnitude

4. Rotational Motion (Turning effects of forces)

- Students can explain that a torque causes angular acceleration and is given by the equation
- Students will be able to differentiate translational motion and angular/rotational motion.
- Students will be able to explain what static equilibrium means in rotational motion.
- Students will recognize that the center of mass of an object goes through translational motion as a point mass would.
- Students will be able to explain how to find the center of mass of an object.
- Students will be able to explain applications or phenomena related to center of mass.
- Students will be able to explain that the height of the center of mass and the width of the base affects stability.

Vocabulary: translational motion, rotational motion, balance, static equilibrium, dynamic equilibrium, center of mass, stability

5. Forces and matter

- Students will recognize that forces can cause deformations on objects and some are reversible while others are not.
- Students will recognize that the displacement of a spring from normal length follows Hooke's law, F=kx, where k is the spring constant.
- Students will recognize that if a spring is stretched too much (goes beyond its elastic limit), it is inelastically deformed and not reversible.
- Students will recognize that not all objects follow Hooke's law, e.g. rubber does not.
- Students will recognize that we live in an environment with constant pressure, most of the time under air pressure.
- Students will recognize that pressure, P=F/A, is a force over an area.
- Students will be able to explain how a manometer and barometer measures pressure.

Students will recognize that pressure in a liquid can also be calculated as $P=h\rho g$, where h is the depth and ρ is density.

Vocabulary: deformation, reversible, stretch, compress, elastic limit, load, pressure, area, density, depth

After midterm

6. Energy transformations and energy transfers

- Students will recognize that there are many forms of energy such as chemical energy, light and thermal energy.
- Students will recognize that energy can be changed from one form into another.
- Students will recognize that the total energy in a closed system does not change – the law of conservation of energy.
- Students will recognize that energy conversions often involve waste (unwanted) energy such as heat or sound.
- Students will be able to calculate and describe what energy conversion efficiency is.
- Students will be able to calculate gravitational potential energy,PEg=mgh , where h is from the ground.
- Students will be able to calculate kinetic energy, $KE=1/2mv^2$, where v is speed.
- Students will be able to apply conservation of energy on objects that convert between gPE and KE.

Vocabulary: Chemical energy, kinetic energy, potential energy, gravitational potential energy, electrical energy, nuclear energy, elastic energy, internal energy, thermal energy, light energy, sound energy

7. Energy resources

a) Students will be able to explain various sources of energy and how energy is converted in those cases.

b) Students will be able to explain whether an energy source is renewable or non-renewable.

c) Students will be able to compare energy sources based on initial/running costs, reliability, scale and environmental impact.

d) Students will be able to trace the origin of energy resources.

Vocabulary: Source, solar panel, solar cell/photo cell, solar power, wind power, wave power, biomass fuel, fossil fuel, nuclear fuel, nuclear fission, nuclear fusion, water/hydroelectric power, geothermal energy

8. Work and Power

a) Students will recognize that when work is done on an object is related to the change in energy of the object.

b) Students will recognize that when work done on an object is positive, the energy of the object increases and vice versa.

c) Students will be able to calculate work using the formula, W=Fx, where F is force and x is displacement in the same direction.

d) Students will be able to link work with the change in KE and gPE.

e) Students will recognize power as p= w/t. The units for power are Watts.

Vocabulary: Work, Power, Watt, work done on an object

Elementary and Intermediate Algebra

Important Vocabulary

Variable	Constant	Operation
Grouping Symbol	Expression	Substitute
Value	Model	In terms of
Commutative Law	Associative Law	Distributive Law
Factor	Product	Natural Number
Prime Number	Composite Number	Factorization
Set	Integer	Rational Number
Real Number	Absolute Value	Exponent
Coefficient	Like Terms	Common Denominator
Contradiction	Identity	Linear Equation
Solution Set	Empty Set	Formula
Circumference	Percent	Decimal
Consecutive	Solution	Graph
Inequality	Interval	Closed Interval
Open Interval	Average	Ordered Pair
Coordinate Plane	Origin	Quadrant
Graph	Intercept	Horizontal
Vertical	Rate	Slope
Parallel	Perpendicular	Function
Domain	Range	System of Equations
Consistent System	Dependent System	Substitution Method
Elimination Method	Intersection	Exponent
Power	Scientific Notation	Significant Digits
Polynomial	Term	Degree
Monomial	Binomial	Trinomial
Grouping	Perfect Square	Pythagorean Theorem

Chemistry Vocabulary List

Ch. 1, 2 and 3 Vocabulary

chemistry	organic chemistry	inorganic chemistry
theory	observations	hypothesis
scientific method	experiment	scientific law
macroscopic	technology	independent variable
dependent variable	microscopic	matter
chemical change	chemical property	chemical reaction
chemical symbol	compound	distillation
element	extensive property	filtration
gas	heterogeneous mixture	homogeneous mixture
intensive property	liquid	law of conservation of mass
mass	mixture	phase
physical change	physical property	precipitate
product	reactant	solid
solution	vapor	volume
absolute zero	accepted value	accuracy
calorie	Celsius scale	conversion factor
density	energy	dimensional analysis
experimental value	gram	SI Unit
joule	Kelvin scale	kilogram
liter	measurement	meter
percent error	precision	scientific notation
significant figures	temperature	weight

Ch. 4 and 5 Vocabulary

atom	atomic mass	atomic mass unit
atomic number	cathode ray	electron
group	isotopes	mass number
neutron	nucleus	Dalton's atomic theory
period	periodic table	proton
amplitude	atomic orbital	aufbau principle
energy levels	frequency	ground state
hertz	Hund's rule	photons
quantum	spectrum	wavelength
electromagnetic radiation	atomic emission spectra	electron configurations
Heisenberg's uncertainty principle	Pauli's exclusion principle	quantum mechanical model

alpha particle
band of stability
beta particle
fission
fusion
gamma rays
Geiger counter
half-life
ionizing radiation
neutron absorption
neutron moderation
nuclear force
positron
radiation
radioactivity
radioisotopes
scintillation counter
transmutation
transuranium elements

Ch. 6 Vocabulary

alkali metals
anion
alkaline earth metals
atomic radius
cation
electronegativity
halogens
ion
inner transition metal
ionization energy
metalloids
metals
noble gases
nonmetals
periodic law
transition metal
representative elements

Ch. 7 and 8 Vocabulary

alloys
chemical formula
coordination number
electron dot structure
formula unit
halide ion
ionic bonds
ionic compounds
metallic bonds
octet rule
valence electron
bond dissociation energy
bonding orbital
coordinate covalent bond
diatomic molecule
dipole
dipole interactions
dispersion forces
double covalent bond
hybridization
hydrogen bonds
molecular compound
molecular formula
molecular orbital
molecule
network solids
nonpolar covalent bond
pi bond
polar bond
polar covalent bond
polar molecule
polyatomic ion
resonance structure
sigma bond
single covalent bond
structural formula
tetrahedral molecule
triple covalent bond
unshared pair
VSEPR theory
van der Waals forces
acid
base
binary compound
law of definite proportions
monoatomic ion
polyatomic ion
law of multiple proportions

Ch. 9 and 10 Vocabulary

Avagadro's hypothesis	Avagadro's number	Empirical formula
Molar mass	Molar volume	Mole
Percent composition	Representative particle	Standard temp & pressure (STP)
Activity series	Balanced equation	Catalyst
Chemical equation	Coefficients	Combination reaction
Combustion reaction	Complete ionic equation	Decomposition reaction
Double-replacement reaction	Net ionic equation	Single-replacement reaction
Skeleton equation	Spectator ion	

Ch. 11 Vocabulary

actual yield	excess reagent	limiting reagent
mole ration	percent yield	stoichiometry
theoretical yield		

Ch. 12 and 13 Vocabulary

allotrope	amorphous solid	atmospheric pressure
barometer	boiling point	crystal
evaporation	gas pressure	glass
kinetic energy	melting point	normal boiling point
pascal	phase diagram	standard atmosphere (atm)
sublimation	triple point	unit cell
vacuum	vaporization	vapor pressure
Boyle's law	Charles' law	combined gas law
compressibility	diffusion	Dalton's law of partial pressure
effusion	Gay-Lussac's law	Graham's law of effusion
ideal gas constant	ideal gas law	partial pressure

Ch. 14 and 15 Vocabulary

Calorimeter	calorimetry	chemical potential energy
Endothermic process	enthalpy	exothermic process
Heat	heat capacity	heat of combustion
Heat of reaction	Hess's law	law of conservation of energy
Molar heat of condensation	molar heat of fusion	molar heat of solution
Molar heat of vaporization	specific heat	standard heat of formation
system	thermochemistry	thermochemical equation
aqueous solution	Brownian motion	colloid
electrolyte	emulsion	hydrate
nonelectrolyte	solute	salvation
solvent	strong electrolyte	surfactant
suspension	surface tension	Tyndall effect
weak electrolyte	boiling point elevation	concentrated solution
concentration	colligative property	dilute solution
freezing-point depression	Henry's law	immiscible
miscible	molality	molarity
mole fraction	saturated solution	solubility
supersaturated solution	unsaturated solution	

molal freezing-point depression constant (k_f) molal boiling-point elevation constant (k_b)

Ch. 16, 17 and 18 Vocabulary

rate	collision theory	activation energy
transition state	catalyst	inhibitor
reversible reaction	chemical equilibrium	concentration
equilibrium position	Le Chatelier's principle	equilibrium constant
acid	base	electrolyte
aqueous solution	monoprotic acids	triprotic acids
hydrogen-ion donor	hydrogen-ion acceptor	conjugate base
conjugate acid	amphoteric	Lewis acid
Lewis base	strong acid	weak acid
strong base	self-ionization	hydronium ion (H_3O^+)
neutral solution	acidic solution	basic solution
salt hydrolysis	common ion effect	neutralization reaction
buffer	titration	equivalence point

hydroxide ion (OH^-) base dissociation constant (K_b)

acid dissociation constant (K_a) ion-product constant for water (K_w)

Organic Chemistry Vocabulary

aliphatic hydrocarbons
alkanes
alkenes
alkynes
aromatic compound
asymmetric carbon
branched-chain alkane
cis configuration
condensed structural formula
hydrocarbons
cyclic hydrocarbons
isomers
geometric isomers
structural isomers
saturated compounds
unsaturated compounds
trans configurations
substituent group
straight-chain alkane