

Course Outline for Mr. Mathot's
8th Grade Science Class

Physics

Motion (Chapter 1)

1. Measuring and Calculating Motion-
 - a. Speed vs. Velocity
 - b. Acceleration
 - c. Momentum

FORCES (Chapter 2)

1. Types of Forces-
 - a. Balanced vs. Unbalanced
 - b. Normal Force
 - c. Friction
 - d. Gravity & Weight
2. Newton's 3 Laws of Motion-
 - a. First Law (Inertia)
 - b. Second Law ($F=MA$) or ($A=F/M$)
 - c. Third Law (action/reaction)
3. Roller Coaster Physics
 - a. Centrifugal
 - b. Centripetal
 - c. Freefall
 - d. Free- Body diagram

ENERGY (Chapter 5)

1. Types-
 - a. Potential (stored)
 - b. Kinetic (motion)
2. Forms of Energy-
 - a. Mechanical
 - b. Electromagnetic
 - c. Chemical
 - d. Heat
3. Work & Power-
 - a. $Work=(Force)(Distance)$
 - b. $Power=Force/Time$

Pressure Density & Buoyancy (Chapter 3 & 14)

1. Pressure -
 - a. $PV=nRT$
 - b. Gas laws
 - i. Charles's
 - ii. Boyle's
2. Bernoulli's Principle
 - a. Faster air = lower pressure
 - b. Slower moving air = higher pressure
3. Density
 - a. $D=M/V$
4. Buoyancy
 - a. Surface area
 - b. Buoyant force
 - c. Academies Principle

Heat Transfer (Chapter 6)

1. Three ways Heat is transferred (moves)-
 - a. Conduction
 - b. Convection
 - c. Radiation

Chemistry

Structure of Matter (Chapter 14, 15, & 16)

1. Properties of Matter-
 - a. Solid
 - b. Liquid
 - c. Gas
2. Measuring Matter-
 - a. Mass
 - b. Volume
 - c. Using the Metric System
3. Periodic Table
 - a. Metals
 - b. Non Metals
 - c. Element Families

Atoms and Bonding (Chapter 18 & 20)

1. Parts of the Atom-
 - a. Protons, electrons, & neutrons
2. Bonding-
 - a. Covalent
 - b. Ionic
3. Polymers
 - a. Characteristics
 - b. Uses

Chemical Reactions (Chapter 17)

1. Parts-
 - a. Reactants
 - b. Products
2. Types-
 - a. Exothermic
 - b. Endothermic
 - c. Decomposition
 - d. Synthesis
3. Changing Reaction Rates-
 - a. Surface Area, Temperature, Concentration, and Catalyst

Solution Chemistry and Acids & Bases (Chapter 19)

1. Solutions-
 - a. Solvent
 - b. Solute
2. Forming Solutions-
 - a. Surface area
 - b. Temperature
 - c. Mixing
3. Describing Solutions-
 - a. Soluble vs. Insoluble
 - b. Concentrated vs. Dilute
 - c. Saturated vs. Unsaturated
4. pH of a Solution-
 - a. Acid
 - b. Base

Chemistry of Living Systems (Chapter 21)

1. Carbon
 - a. Bonding
 - b. Organic compounds
 - c. Element of life

Earth Science

EARTH IN SPACE (Chapter 22, 23, & 24)

1. The Solar System
 - a. The sun
 - b. The planets
2. The Earth and Moon
 - a. Seasons
 - b. Phases of the moon
3. The universe
 - a. Stars
 - b. Galaxies