

# PHYSICAL SCIENCE 2012.13

## Unit 1: WAVES

### A. Wave Mechanics

1. Types of waves,
2. Characteristics
3. Interactions
  - a. Slinky Lab
  - b. Making Waves Lab

### B. Sound Waves

1. Doppler Effect
  - c. Speed of Sound Lab
  - d. Doppler Lab

### C. Light Waves

1. Electromagnetic Spectrum
  - Atomic Structure
  - Using spectra to identify elements
  - Origin of Universe : Red Shift
    - e. Bright Line Spectra Lab
    - f. Evidence for Expanding Universe Lab

## Unit 2: Motion

### A. Motion, Acceleration, Forces Ch 3

1. Describing Motion
2. Simple Vector Problems
3. Acceleration
4. Motion and Forces
5. Friction
  - a. Measuring Speed Lab
  - b. Bowling Ball Lab
  - c. Match the Graph
  - d. Need for Speed
  - e. Force and Acceleration
  - f. Comparing Motion from Different Forces

## Unit 3: Forces

### A. Newton's Laws of Motion

- g. First Law Activities
- h. You Dropped the Ball

### B. Gravity and Air Resistance, Free Fall

- i. Hang Time Lab
- j. Nerf Gun Science Lab
- k. Egg Drop Challenge

### C. Momentum and Collisions

- l. Momentum of Colliding Object Lab

## Unit 4: Energy

- A. What is energy?
- B. Types of energy and phases
  - a. What materials are the coldest?
  - b. Heat vs Temp Lab
  - c. Graphing a Phase Change Lab
- C. Specific Heat
  - d. Boiling Water in a Paper Cup

## Unit 5: Energy and Climate

### A. Energy Transfer and Seasons

- a. Absorption Lab
- b. Globe Lab
- c. Angle of Isolation Lab

### B. 6 Factors of Climate

- d. Build Your Own Barometer Activity
- e. Land and Water Lab
- f. Weather Water Tanks Lab \*
- g. Gas Laws Lab
- h. Climatogram Activity \*
- i. Upwelling Activity

## Unit 6: Global Climate

### A. Earth's Energy

1. Greenhouse Effect
2. Global Warming

### A. Affects of Global Changes on Climate

- a. Carbon and Water Footprint Activity
- b. Research Global Trends (Upwelling)
- c. Research emissions, agriculture and economics
- d. Build Solar Cookers and WAPIs for Community Service Learning Project

## Unit 7: Plate Tectonics and Earth's Energy

### A. Evidence for Structure of the Earth

- a. Scale Model of Earth
- b. Determining the Rate of Ocean Floor Spreading \*
- c. Polar Wandering \*
- d. Tonga Trench

### B. Seismograph Lab: Finding the Epicenter

## Unit 8: Geology

### A. Rock Cycle and Rock Types

- a. Rock Lab

### B. Interpreting Geologic Formations

- b. What's Up Lab: Profiles
- c. Rock Clock

### C. Minerals

- d. Mineral Density Lab
- e. Mineral Identification

## Unit 9: Seismic Engineering

### A. How Faults effect structures

- a. Resonance Activity

### B. How to build or retrofit structures

- b. Structural Reinforcement Lab
- c. Building Challenge

### Community Service Learning Project

Please understand this syllabus is a working document as labs constantly improve and new ideas are developed integrating parental involvement and community learning opportunities.