

# Freetown Lakeville Public Schools

Grade 8 Unit Guide  
Science and Technology Engineering

June 19, 2003

## Grade 8 Curriculum Guideline

**Purpose of this Curriculum Guide:**

**Grade 8 Science and Technology Engineering  
Mission:**

**Grade 8 Science and Technology Engineering  
Philosophy:**

**This curriculum was written by:**

## Grade 8 Curriculum Guideline

### Unit: Atoms

#### Topic:

#### Student Learning Outcomes

- 50335** Differentiate between an atom (the smallest unit of an element that maintains the characteristics of that element) and a molecule (the smallest unit of a compound that maintains the characteristics of that compound).

#### Textbook References, Resources and Materials

Holt Online Resource Keyword HSTATS  
Scilinks NSTA # HSTP255  
Demonstrations p. 54  
Review p. 285-286  
Math Break, Atomic Mass, p. 292

#### Suggested Instructional Strategies

#### Assessment

Quiz: p. 293 Forces in the Atom  
Concept Map  
Critical Thinking Worksheet II

## Grade 8 Curriculum Guideline

### Unit: Chemical Reactions

#### Topic:

#### Student Learning Outcomes

**50333** Recognize that mass is conserved in a closed system (e.g. chemical reactions).

#### Textbook References, Resources and Materials

Holt on-line HSTREA  
Sci Link #HSTP330, #HSTP335, #HSTP340  
Math Break p. 352  
Math and More p. 352  
Quick Lab "I'm Crushed"

#### Suggested Instructional Strategies

#### Assessment

List Balancing Rules  
Exothermic and Endothermic graph interpretation

## Grade 8 Curriculum Guideline

### Unit: Compounds

#### Topic:

#### Student Learning Outcomes

- 50337** Differentiate between mixtures and pure substances.
- 50335** Differentiate between an atom (the smallest unit of an element that maintains the characteristics of that element) and a molecule (the smallest unit of a compound that maintains the characteristics of that compound).
- 50336** Give basic examples of elements and compounds.

#### Textbook References, Resources and Materials

Datasheet #14 Making Butter  
Ecolab: Ozone News  
Review Sheet #4  
Sci Links #HSTP095, HSTP090  
Perfume: Fragrant Solutions

#### Suggested Instructional Strategies

#### Assessment

Concept Mapping  
Rules for Naming Compounds : Identify different types of compounds  
Identifying/Naming Compounds

## Grade 8 Curriculum Guideline

### Unit: Elements

#### Topic:

#### Student Learning Outcomes

**50334** Recognize that there are more than 100 elements that combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter.

**50336** Give basic examples of elements and compounds.

#### Textbook References, Resources and Materials

Study Guide #4  
Labs You Can Eat: Iron

#### Suggested Instructional Strategies

Activity: I am Not a Metalloid  
Chapter 4 vocabulary

#### Assessment

Performance-based Chapter Test  
Concept Mapping  
Research an element and create a powerpoint presentation.

## Grade 8 Curriculum Guideline

### Unit: Energy

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

- 50342** Differentiate between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa. [www.scilinks.org](http://www.scilinks.org) # HSTP205, # HSTP210

#### Suggested Instructional Strategies

Demonstrate various items that need energy (windup toy, windup toy timer)  
Using above, discuss which are potential and kinetic: Explain difference).  
Forms of Energy: Relate the forms of energy to everyday examples  
Discuss energy conversions in producing electricity.  
Discuss renewable and unrenowable sources of energy  
Transparecies on transfer of energy.

#### **Assessment**

## Grade 8 Curriculum Guideline

### Unit: Force

#### Topic:

#### Student Learning Outcomes

- 50308** Recognize that gravity is a force that pulls all things on and near the earth toward the center of the earth.
- 50340** Explain and give examples of how the motion of an object can be described by its position, direction of motion, speed, and change in speed.
- 50341** Graph and interpret distance vs. time graphs for constant speed.

#### Textbook References, Resources and Materials

#### Suggested Instructional Strategies

Give and/or ask for different kinds of forces  
Identify the relationship between motion, force, and the need for a reference point  
Factors that determine speed  
Using an incline discuss acceleration  
Compare balanced and unbalanced forces  
Demonstrate the nature of friction  
- using treads on sneakers, the benefits of friction  
- reducing friction  
Define gravity using same shaped objects of different masses.

#### Assessment

Chapter Review  
Vocabulary and Notes  
Chapter tests with performance based activities

## Grade 8 Curriculum Guideline

### Unit: Heat

#### Topic:

#### Student Learning Outcomes

- 50303** Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through the earth's system. Give examples of each.
- 50343** Recognize that heat is a form of energy and that temperature change results from adding or taking away heat from a system.
- 50345** Give examples of how heat moves in predictable ways, moving from warmer objects to cooler ones until they reach equilibrium.

#### Textbook References, Resources and Materials

[www.sciencelink.org](http://www.sciencelink.org)

#### Suggested Instructional Strategies

Using two volumes of water how even though they are the same temperature that they have different amounts of heat.  
Explain the two main temperature scales (Celcius and Farenheit). Conversion of temperatures  
Introduce Kelvin Conversion  
Heat transfer using metal nails  
Describe three types of transfer  
Using water demonstarte the effect heat on a metal ring and a metal ball.  
Discuss heating systems  
Heat - work via heat engines  
Using various materials (wood, metal, plastic, rock) demonstrate the heat absorbing ability

#### Assessment

Chapter review study guide  
Chapter tests  
Performance-based assessments

## Grade 8 Curriculum Guideline

### Unit: Matter

#### Topic:

#### Student Learning Outcomes

- 50330** Differentiate between weight and mass, recognizing that weight is the amount of gravitational pull on an object and mass is an absolute amount of matter.
- 50331** Differentiate between volume and mass.
- 50338** Recognize that a substance (element or compound) has a melting point and a boiling point, both of which are independent of the amount of the sample.
- 50339** Differentiate between physical changes and chemical changes.
- 50344** Explain the effect of heat on particle motion through a description of what happens to particles during a change in phase.

#### Textbook References, Resources and Materials

SciLinks #HSTP060/#HSTP065  
Holt On-line resource HSTSTA  
Lab: Full of Hot Air  
Demo: Can Crusher (Lab Book Data Sheet 10)

#### Suggested Instructional Strategies

#### Assessment

Make models of solids, liquids and gases  
Gas Law graphs

## Grade 8 Curriculum Guideline

### Unit: Measurement

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

- 50332** Precision vs. Accuracy. Recognize that the measurement of volume and mass requires understanding of the sensitivity of measurement tools (e.g., rulers, graduated cylinders, balances) and knowledge and appropriate use of significant digits (figures).

#### Suggested Instructional Strategies

Distribute measurement tools (rulers, cylinders balances, thermometers) with various objects and substances to measure.

Lab activity - Measureing Liquid volume

Math Skills Worksheets

- What is SI System

- Finding volume

#### Assessment

Homework p. 26

Quiz

Chapter Test with performance-based assessment.

## Grade 8 Curriculum Guideline

### Recommended Resources for Grade 8 Science and Technology Engineering: