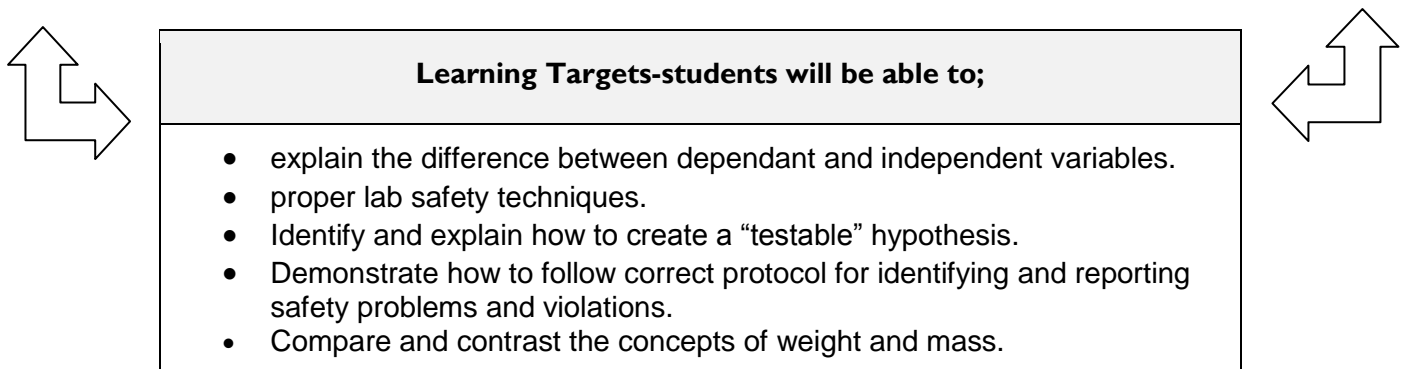
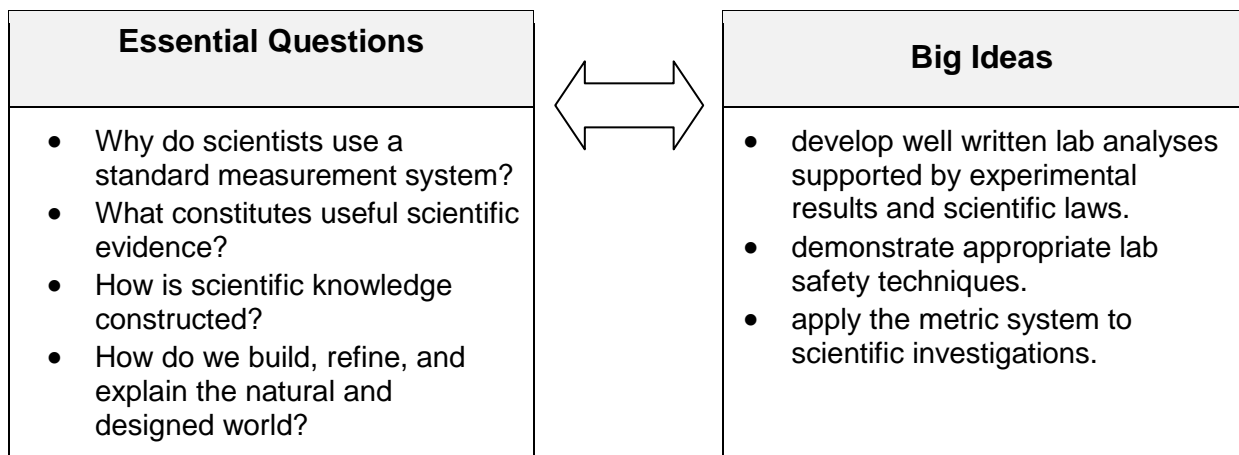


Unit Title	8.1 Introduction to the World of Physical Science and the Metric System
Time frame	2-3 Weeks
21 st Century Themes	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility
Interdisciplinary focus and technology integration	Technology Math



Assessment	
Rubrics	Teacher-created Assessment
Lab Reports	Classroom Participation
Homework completion	Group Participation
Differentiation	
Hands-on Activities	

Diagnostic Assessment
 Kinaesthetic
 Re-teaching
 Enrichment Activities
 Cooperative Learning
 Peer Tutoring
 Tiered Instruction
 Alternative Assessment

Content Standards

What state content standards are to be addressed?

5.2.8.A
 5.2.8.B
 5.1A-D

Approaches to Learning

Observation skills- observing and communicating data in a lab report
Analyzing skills – recognizing relationships
Evaluation skills- developing criteria for judging their own work
Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments
Inquiry skills – formulate questions, hypothesize and conduct experiments

Learning Experiences

- “Review lab safety procedures and lab equipment.
- Review Scientific Method.
- Introduce unit conversions in the metric system and practice metric to metric conversions.
- Metric Measurement Labs (Practice measuring mass, length, volume, temperature) and create appropriate graphs.
- Students design and develop a class lab with a “testable hypothesis”.
- Develop well written lab report.

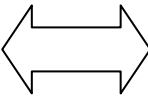
Teaching Strategies

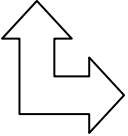
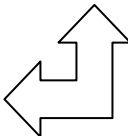
- Evaluation of lab reports, rubrics to assess writing, written assessment
- Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology
- Utilization of key terms

Resources

Prentice Hall Science Explorer: Physical Science, 2009

Unit Title	8.2 Properties of Liquids
Time frame	3 Weeks
21 st Century Themes	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility
Interdisciplinary focus and technology integration	Technology Math

Essential Questions		Big Ideas
<ul style="list-style-type: none"> • How can density determine if an object floats or sinks? • How do the properties of materials determine their use? 		<ul style="list-style-type: none"> • the relationship between different objects and their ability to float. • complete labs investigating adhesion, cohesion and surface tension as properties of liquids

	Learning Targets-students will be able to;	
	<ul style="list-style-type: none"> • calculate how to find the density of solids and liquids. • Explain that density allows us to layer liquids on top of each other. • Explain the relationship between molecular attraction, adhesion, cohesion capillary action and surface tension. 	

Assessment	
Rubrics	Teacher-created Assessment
Lab Reports	Classroom Participation
Homework completion	Group Participation
Differentiation	
Hands-on Activities Diagnostic Assessment Kinaesthetic Re-teaching Enrichment Activities Cooperative Learning Peer Tutoring	

Tiered Instruction
Alternative Assessment

Content Standards

What state content standards are to be addressed?

5.2.8.A
5.2.8.B
5.1A-D

Approaches to Learning

Observation skills- observing and communicating data in a lab report

Analyzing skills – recognizing relationships

Evaluation skills- developing criteria for judging their own work

Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments

Inquiry skills – formulate questions, hypothesize and conduct experiments

Learning Experiences

- Sink or Swim? Lab: Conduct inquiry lab in which the students determine which types of objects sink or float. (Is there a relationship between mass, volume and floating/sinking?) Write a well written lab report.
- Introduce the relationship between mass, volume and density.
- Build a Boat Lab: Conduct a lab in which students design a boat out of given materials to hold as many pennies as possible. Write a well written lab report.
- Introduce molecular attraction, adhesion, cohesion capillary action and surface tension.
- Properties of Water Lab: Students will conduct a station lab in which students test the properties of water. Write a well written lab report.

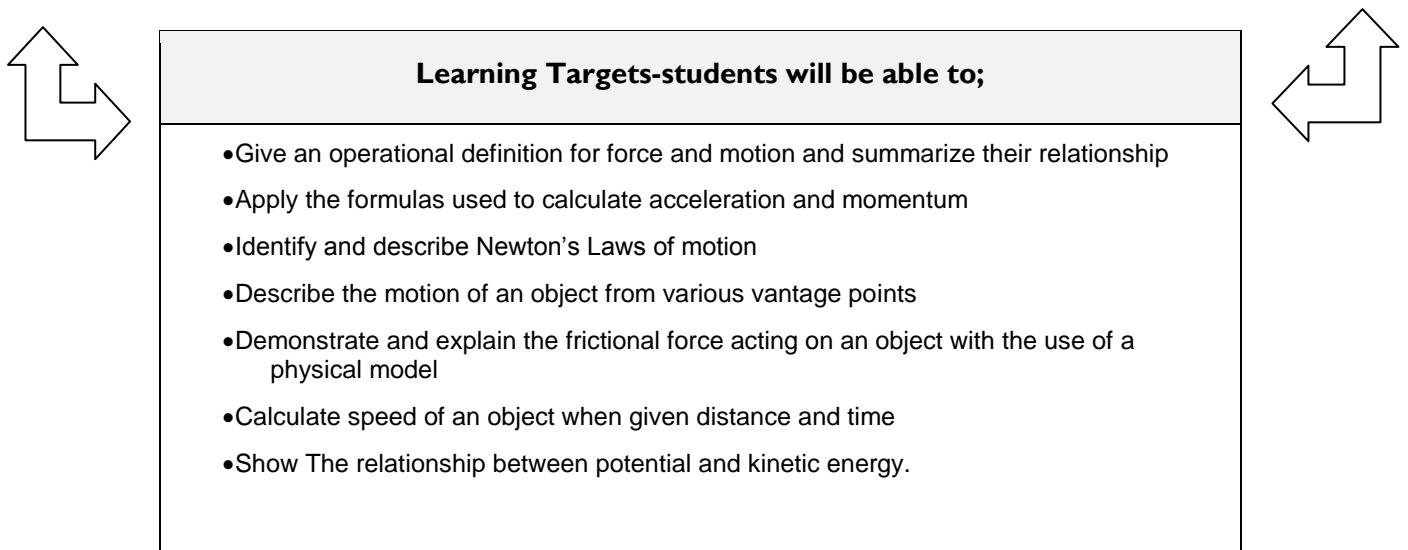
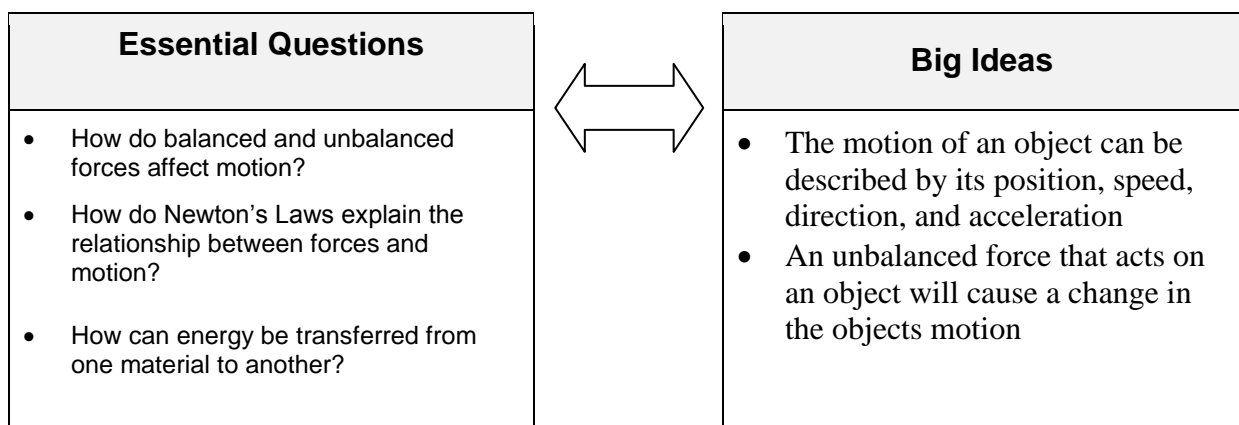
Teaching Strategies

- Evaluation of lab reports, rubrics to assess writing, written assessment
- Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology
- Utilization of key terms

Resources

Prentice Hall Science Explorer: Physical Science, 2009

Unit Title	8.3 Force and Motion
Time frame	9-10 Weeks
21 st Century Themes	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility
Interdisciplinary focus and technology integration	Technology Math



Assessment	
Rubrics	Teacher-created Assessment
Lab Reports	Classroom Participation
Homework completion	Group Participation

Differentiation

Hands-on Activities
Diagnostic Assessment
Kinaesthetic
Re-teaching
Enrichment Activities
Cooperative Learning
Peer Tutoring
Tiered Instruction
Alternative Assessment

Content Standards

What state content standards are to be addressed?

5.2.6.C.1
5.2.6.C.2
5.2.6.C.3
5.2.8.C.1
5.2.8.C.2
5.1A-D

Approaches to Learning

Observation skills- observing and communicating data in a lab report

Analyzing skills – recognizing relationships

Evaluation skills- developing criteria for judging their own work

Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments

Inquiry skills – formulate questions, hypothesize and conduct experiments

Learning Experiences

- “Define and discuss speed and velocity. Calculate basic speed=distance/time word problems and graph various speed/time relationships.
- Paper Airplane Lab: Students will practice calculating speed, distance and time while designing the farthest flying paper airplane. Write a well written lab report.
- Define and discuss balanced and unbalanced forces and the motion of an object when acted upon by external forces.
- Introduce Newton’s first law and inertia. Discuss the relationship between inertia, car crashes, seatbelts and airbags.
- “Egg-stra” Safe Car Design Lab: Students design a container which will protect a raw egg when dropped from the roof of the school. Write a well written lab report.
- Inertia Stations Lab: tablecloth pull, penny on an index card flick, inertia tower, bowling ball dribble and mini-skateboard ramp. Write a well written lab

Teaching Strategies

- Evaluation of lab reports, rubrics to assess writing, written assessment
- Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology
- Utilization of key terms

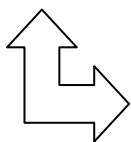
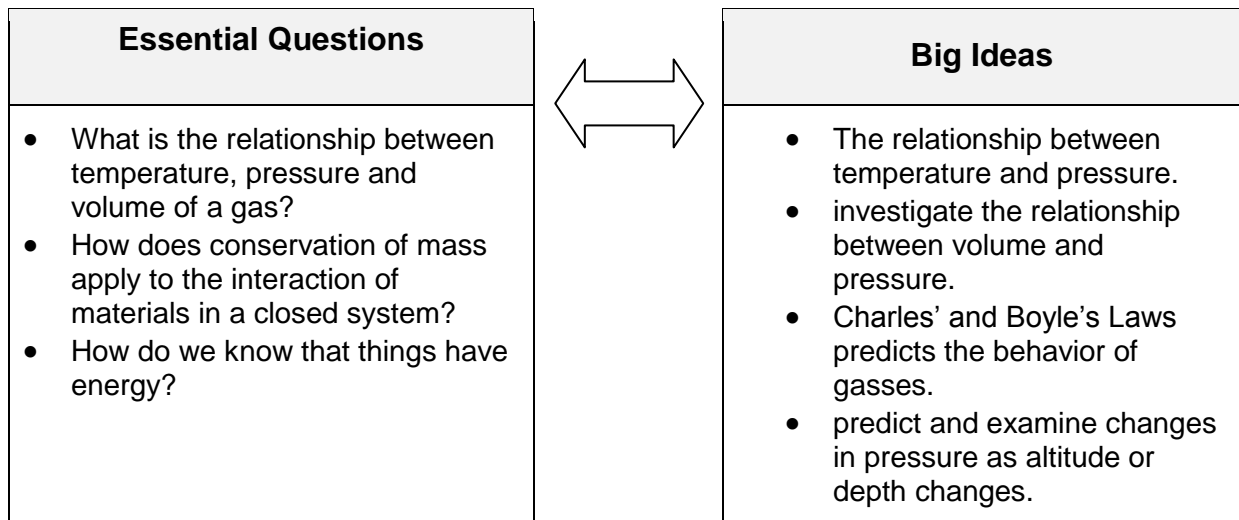
report.

- Introduce Newton's second law. Discuss the relationship between force, mass and acceleration. Discuss the relationship between mass, velocity and momentum. Complete word problems.
- Discuss the Law of Conservation of Momentum. Ball drop demo: Drop a tennis ball on top of a basketball. Students will also create alternative demos and predict their results.
- Conservation of Momentum Lab: How far will a marble roll up a hill? Why will the marble never reach its original height? Transfer of Momentum in a marble crash. Write a well written lab report.
- Define and discuss Newton's third law.
- Balloon Car Lab: Students design a car that is powered solely by the air being expelled from a balloon. Write a well written lab report.
- Define and discuss free fall, air resistance, terminal velocity and gravity. Demonstrate hammer vs. feather drop. Calculate the acceleration of different objects during free fall. Explore the myth that a penny will kill a human if dropped from a tall building.
- Calculate the effects of air resistance on free fall by completing word problems.
- Introduce Amusement Park physics. Define and discuss kinetic energy, potential energy, free fall, projectile motion, centripetal force and friction as they relate to roller coasters.
- Centripetal force demo: Spin a cup of water tied to a string around your head in a circle.
- Roller Coaster Lab: Students will use foam tubes and marbles to create mini roller coasters. (Friction from different tubes, weight of marbles and height of release will be the variables explored.) Write a well written lab report.
- Roller coaster design project: Students construct model roller coasters they would like to be seen built at great adventure. Physics forces must be labeled and explained in full detail.

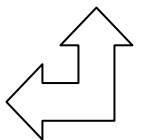
Resources

Prentice Hall Science Explorer: Physical Science, 2009

Unit Title	8.4 Heat, Temperature, and Pressure
Time frame	4-5 Weeks
21 st Century Themes	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility
Interdisciplinary focus and technology integration	Technology Math



Learning Targets-students will be able to;
<ul style="list-style-type: none"> • compare and contrast the difference between heat and temperature. • Explain how a thermometer effectively measures temperature. • Describe that objects expand when heated and contract when cooled, as explained by kinetic molecular theory. • Identify and explain which household materials make good conductors or insulators. • Compare and contrast the difference between conduction, convection and radiation heat.



Assessment	
Rubrics	Teacher-created Assessment
Lab Reports	Classroom Participation
Homework completion	Group Participation

Differentiation

Hands-on Activities
Diagnostic Assessment
Kinaesthetic
Re-teaching
Enrichment Activities
Cooperative Learning
Peer Tutoring
Tiered Instruction
Alternative Assessment

Content Standards

What state content standards are to be addressed?

5.2.8.A
5.2.8.B
5.2.8.C
5.2.8.D
5.4.8.E
5.4.8.F
5.1A-D

Approaches to Learning

Observation skills- observing and communicating data in a lab report

Analyzing skills – recognizing relationships

Evaluation skills- developing criteria for judging their own work

Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments

Inquiry skills – formulate questions, hypothesize and conduct experiments

Learning Experiences

- Define and discuss pressure, heat and temperature. Predict their relationship to each other.
- Deduce the relationship between heat and pressure and the relationship between volume and pressure through a series of labs.
- Pressure Labs: Collapsing Soda Can, Cartesian Diver, Get an Egg into a Flask, Inverted Balloon, Hot vs. Cold Balloons. Conclusions will lead to the discovery of Charles' and Boyle's Laws. Write a well written lab report.

Teaching Strategies

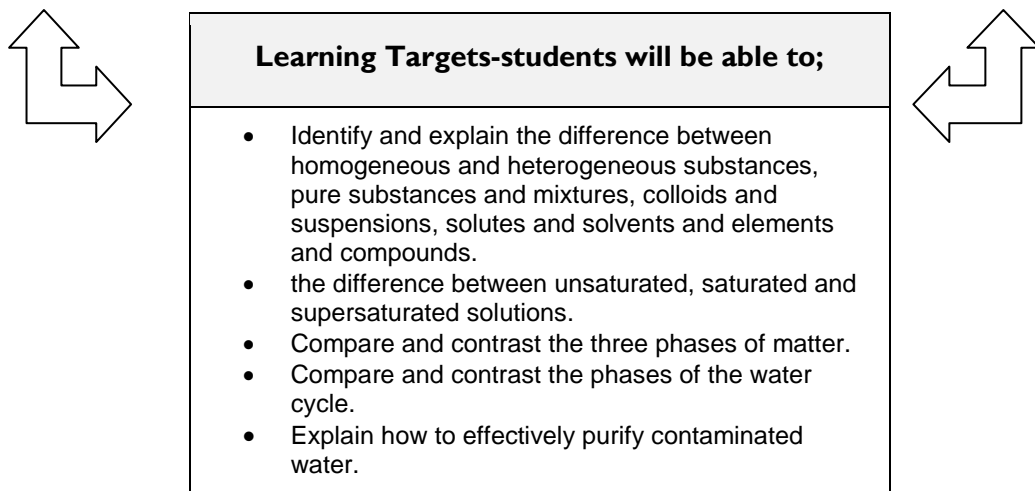
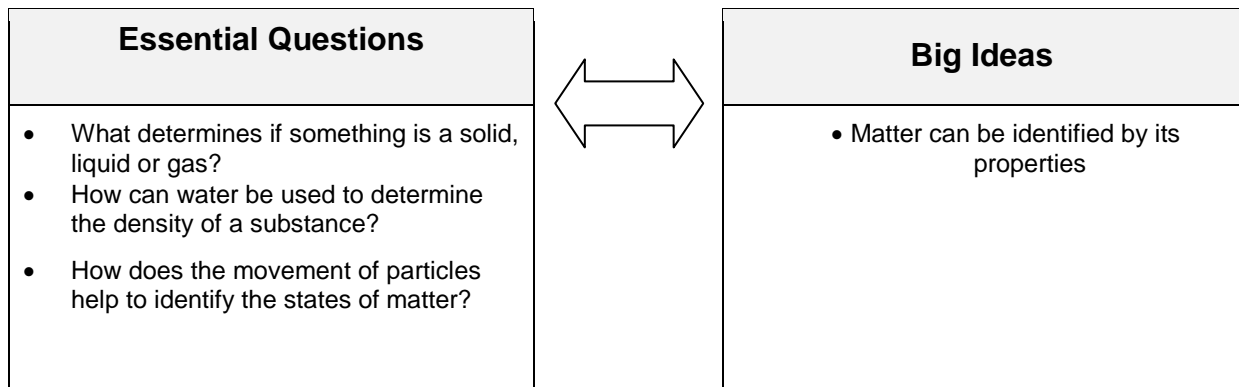
- Evaluation of lab reports, rubrics to assess writing, written assessment
- Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology
- Utilization of key terms

- Post lab discussion of results from pressure labs. Define Charles' and Boyle's Laws and kinetic molecular theory.
- Discuss the changes in pressure as altitude or depth changes.
- Demo: Mini-marshmallow in a syringe to represent the effects of pressure on a person's eardrums (Boyle's Law).
- Compare and contrast heat and temperature.
- Insulator Lab: Students investigate the effectiveness of household materials on maintaining the temperature of a beaker of hot water over the course of time. Write a well written lab report.
- Define and discuss convection, conduction and radiation heat.
- Popcorn Lab: Students explore conduction, convection and radiation as methods for making popcorn. Which method tastes the best?

Resources

Prentice Hall Science Explorer: Physical Science, 2009

Unit Title	8.5 Properties of Matter
Time frame	3-4 weeks
21 st Century Themes	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility
Interdisciplinary focus and technology integration	Technology Math Social Studies



Assessment	
Rubrics	Teacher-Created Assessment
Lab Reports	Classroom Participation

Homework Completion		Group Participation	
Differentiation			
Hands-on Activities Diagnostic Assessment Kinaesthetic Re-teaching Enrichment Activities Cooperative Learning Peer Tutoring Tiered Instruction Alternative Assessment			
Content Standards			
5.1 5.2.6A.1-3 5.2.8.A.1-7			
Approaches to Learning			
<u>Observation skills</u> - observing and communicating data in a lab report <u>Analyzing skills</u> – recognizing relationships <u>Evaluation skills</u> - developing criteria for judging their own work <u>Scientific Inquiry Skills</u> – formulate questions, hypothesize and conduct experiments <u>Inquiry skills</u> – formulate questions, hypothesize and conduct experiments			
Learning Experiences		Teaching Strategies	
<ul style="list-style-type: none"> • Create a graphic organizer to define and discuss homogeneous and heterogeneous substances, pure substances and mixtures, colloids and suspensions, solutes and solvents and elements and compounds. • Play <i>What's the Matter</i> Game: Students observe (without touching) 10 different cups of mystery matter. They guess what substance is in the cup and what type of matter it is. • Polymer Lab: What type of matter is a polymer? Students create four different types of polymers. Write a well written lab report. • Define and discuss solutions, solvents and solvents. Compare and contrast unsaturated, saturated and supersaturated solutions. • Rock Candy Lab: Students create rock candy to explore the different types of solutions. Write a well written lab report. • Salt and Sugar Lab: Students deduce the affect of salinity on the boiling point and freezing point of water. Write a well written lab report. • Demo: Can you make an egg float in water? Students develop methods for trying to make an egg float. Discuss the affect of salt on the 		<ul style="list-style-type: none"> •Evaluation of lab reports, rubrics to assess writing, written assessment •Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology •Utilization of key terms 	

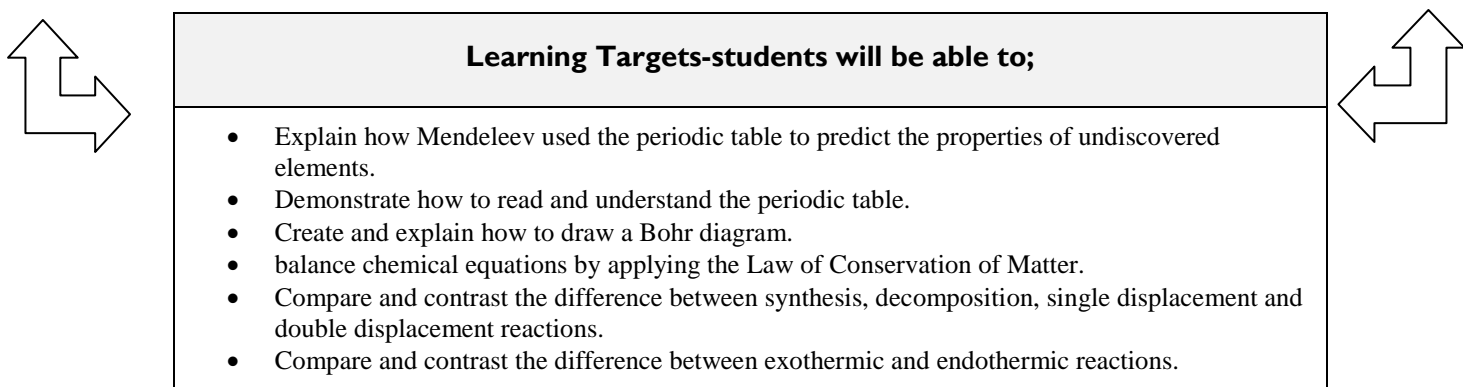
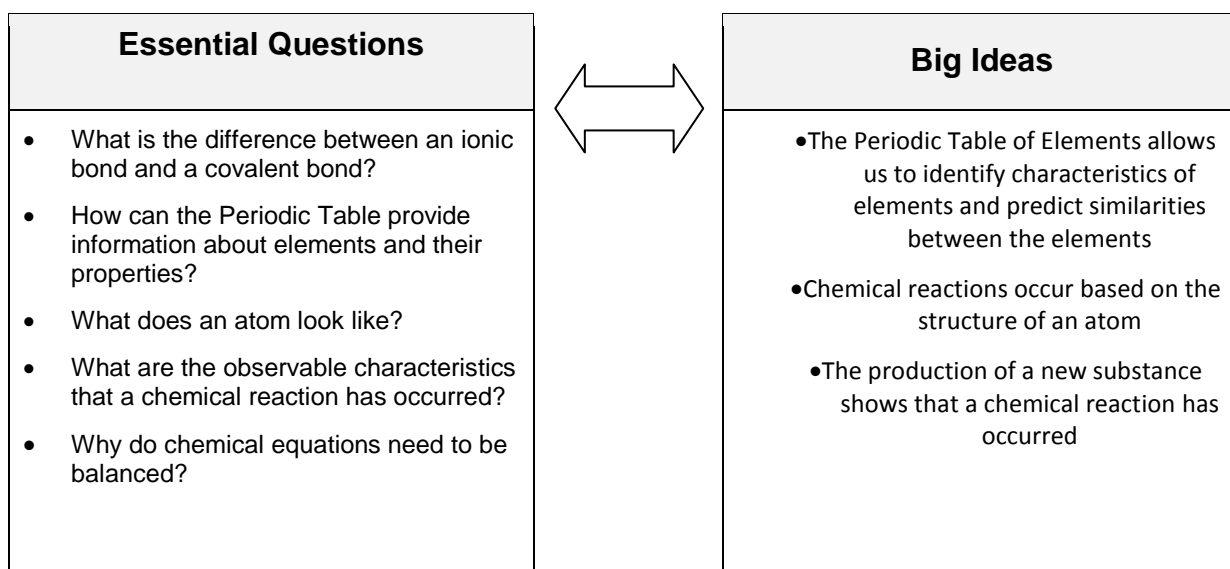
density of water.

- Define and discuss the three phases of matter and the physical and chemical properties associated with each.
- Discuss how the phases of matter play a key role in the effectiveness of the water cycle.
- Purification of Water Lab: Students recreate the water cycle in a beaker to purify a sample of contaminated water. Each phase of the water cycle is clearly demonstrated. Write a well written lab report.”

Resources

Prentice Hall Science Explorer: Physical Science, 2009

Unit Title	8. 6 Chemistry in Action (Atoms, Elements, and Chemical Reactions)
Time frame	6-8 weeks
21 st Century Themes	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility
Interdisciplinary focus and technology integration	Technology Math



Assessment	
Rubrics	Teacher-created Assessment

Lab Reports	Classroom Participation
Homework Completion	Group Participation
Differentiation	
Hands-on Activities Diagnostic Assessment Kinaesthetic Re-teaching Enrichment Activities Cooperative Learning Peer Tutoring Tiered Instruction Alternative Assessment	
Content Standards	
5.1 5.2.6A.1 5.2.6A.2 5.2.6A.3 5.2.8.A.1 5.2.8.A.2 5.2.8.A.3 5.2.8.A.4 5.2.8.A.5 5.2.8.A.6 5.2.8.A.7	
Approaches to Learning	
<u>Observation skills</u> - observing and communicating data in a lab report <u>Analyzing skills</u> – recognizing relationships <u>Evaluation skills</u> - developing criteria for judging their own work <u>Scientific Inquiry Skills</u> – formulate questions, hypothesize and conduct experiments <u>Inquiry skills</u> – formulate questions, hypothesize and conduct experiments	
Learning Experiences	Teaching Strategies
<ul style="list-style-type: none"> Preview the essential questions and connect to learning throughout the unit. Discuss periodic table of the elements, its history and its uses. Color code a periodic table to become familiar with similarities in structure and properties. Practice reading the periodic table to determine the number of protons, neutrons and electrons in a given element. Discuss Bohr diagrams. Practice creating Bohr diagrams with manipulatives. Create Bohr diagrams from scratch. Fireworks Lab: Students will 	<ul style="list-style-type: none"> Evaluation of lab reports, rubrics to assess writing, written assessment Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology Utilization of key terms

investigate the reaction that takes place when electrons “jump” into different valance shells by experimenting with chemicals used to make fireworks. Write a well written lab report.

- Distinguish between elements and compounds. Discuss counting the number of elements in a given compound. Discuss rules involving coefficients, subscripts and parentheses.
- Discuss the Law of Conservation of Matter and balancing equations. Practice balancing equations.
- Discuss the four types of reactions that can take place in during an experiment (i.e. synthesis, decomposition, single displacement and double displacement). Identify the type of reaction taking place by examining a balanced equation. Identify if a reaction is endothermic or exothermic.

Resources

Prentice Hall Science Explorer: Physical Science, 2009

Unit Title	8.7 Acids and Bases
Time frame	3-4Weeks
21 st Century Themes	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility
Interdisciplinary focus and technology integration	Technology Math

Essential Questions	↔	Big Ideas
<ul style="list-style-type: none"> • What is the difference between an acid and a base? • How do acids and bases aid in digestion? 	↔	<ul style="list-style-type: none"> • distinguish between acids and bases. • examine pH measurement and how pH paper works. • investigate the causes of acid rain. • experiment with the effects of acid rain on different materials. • investigate how acids and bases play a key role in digestion.

↔	Learning Targets-students will be able to;	↔
↔	<ul style="list-style-type: none"> • compare and contrast the difference between acids and bases. • Describe how to measure the pH of a solution. • Explain how to make a natural pH indicator from red cabbage. • Describe how acid rain forms and how it affects the environment. • Explain how acids and bases play a key role in digestion. 	↔

Assessment	
Rubrics	Teacher-created Assessment
Lab Reports	Classroom Participation
Homework completion	Group Participation

Differentiation

Hands-on Activities
Diagnostic Assessment
Kinaesthetic
Re-teaching
Enrichment Activities
Cooperative Learning
Peer Tutoring
Tiered Instruction
Alternative Assessment

Content Standards

What state content standards are to be addressed?

5.2.8.A
5.2.8.B
5.2.8.C
5.2.8.D
5.4.8.E
5.4.8.F
5.1A-D

Approaches to Learning

Observation skills- observing and communicating data in a lab report

Analyzing skills – recognizing relationships

Evaluation skills- developing criteria for judging their own work

Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments

Inquiry skills – formulate questions, hypothesize and conduct experiments

Learning Experiences

- Preview the essential questions and connect to learning throughout the unit.
- Define and discuss the distinguishing properties of acids and bases, including household examples, common uses and effects on the body.
- Examine pH measurement by discussing the effectiveness of pH paper, how pH paper works and practice measuring solutions with pH paper.
- Cabbage Indicator Lab: Students will create a natural pH indicator with red cabbage and compare its effectiveness to standard pH paper. Write a well written

Teaching Strategies

- Evaluation of lab reports, rubrics to assess writing, written assessment
- Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology
- Utilization of key terms

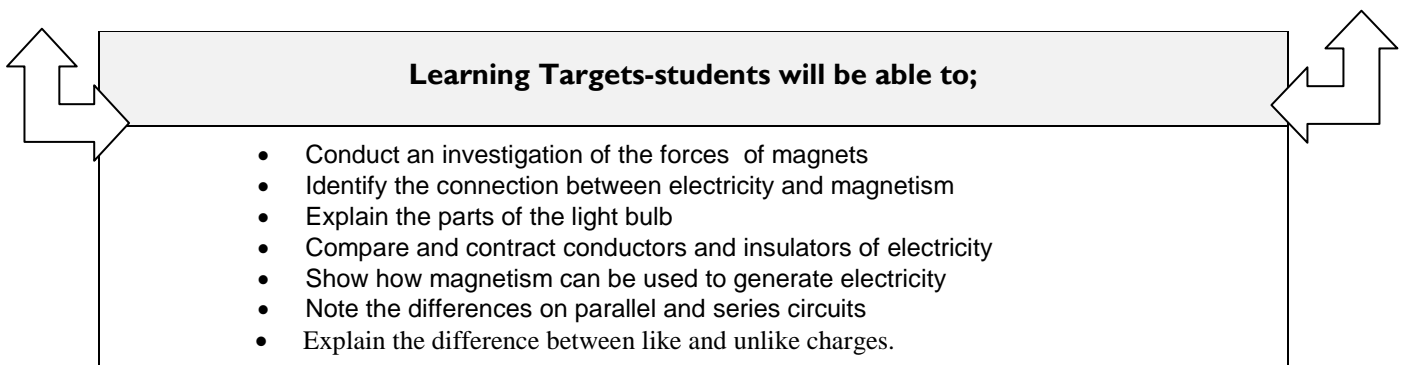
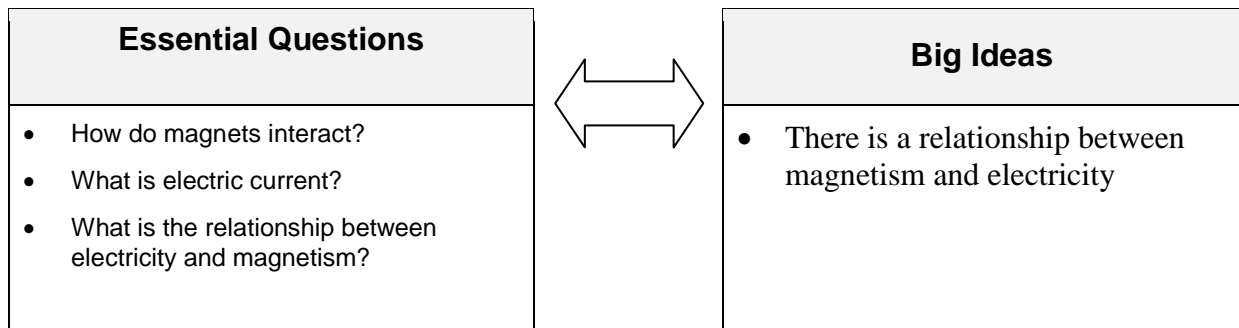
lab report.

- Discuss the causes and effects of acid rain. Examine before and after photos of a variety of structures deteriorated by acid rain. (i.e. monuments, buildings, Statue of Liberty, etc.)
- Hands on Activity: Students will experiment with the effects of acid rain over time on limestone, wood, plastic and metal.
- Hands on Activity: Students will collect samples of rain water over time to determine if acid rain is present in Stanhope. Keep a class log of results.
- Seed Germination and Acid Rain Lab: Students will explore the effects of acid rain over time on seed germination by determining which pH is ideal for plant growth and which is detrimental. Write a well written lab report.
- Discuss the digestive system and the essential roles that acids and bases play in food digestion. Students explore life size human model and identify organs and match them with their function in the digestive system.

Resources

Prentice Hall Science Explorer: Physical Science, 2009

Unit Title	8.8 Electricity and Magnetism	
Time frame	2-3 Weeks	
21 st Century Themes	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility	
Interdisciplinary focus and technology integration	Technology Math Art	History Language Arts



Assessment	
Rubrics	Teacher-created Assessment
Lab Reports	Classroom Participation
Homework Completion	Group Participation
Differentiation	
Hands-on Activities Diagnostic Assessment Kinaesthetic Re-teaching	

Enrichment Activities
Cooperative Learning
Peer Tutoring
Tiered Instruction
Alternative Assessment

Content Standards

5.2.6.D.1
5.2.8.D.1
5.2.8.D.2
5.1

Approaches to Learning

Observation skills- observing and communicating data in a lab report

Analyzing skills – recognizing relationships

Evaluation skills- developing criteria for judging their own work

Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments

Inquiry skills – formulate questions, hypothesize, and conduct experiments

Learning Experiences

- Compare/Contrast graphic organizers for conductors and insulators
- Compare/Contrast graphic organizers for bar magnets and electromagnets
- Step by step instructions about how to construct an electric circuit
- Students will illustrate a series and parallel circuit
- Skills Lab: “Detecting Fake Coins” p 660
- Technology: “Design and Build a Magnetic Paper Clip Holder” pg 668
- Make electricity using a penny
- Skills Lab: “Building an Electric Motor” p 734

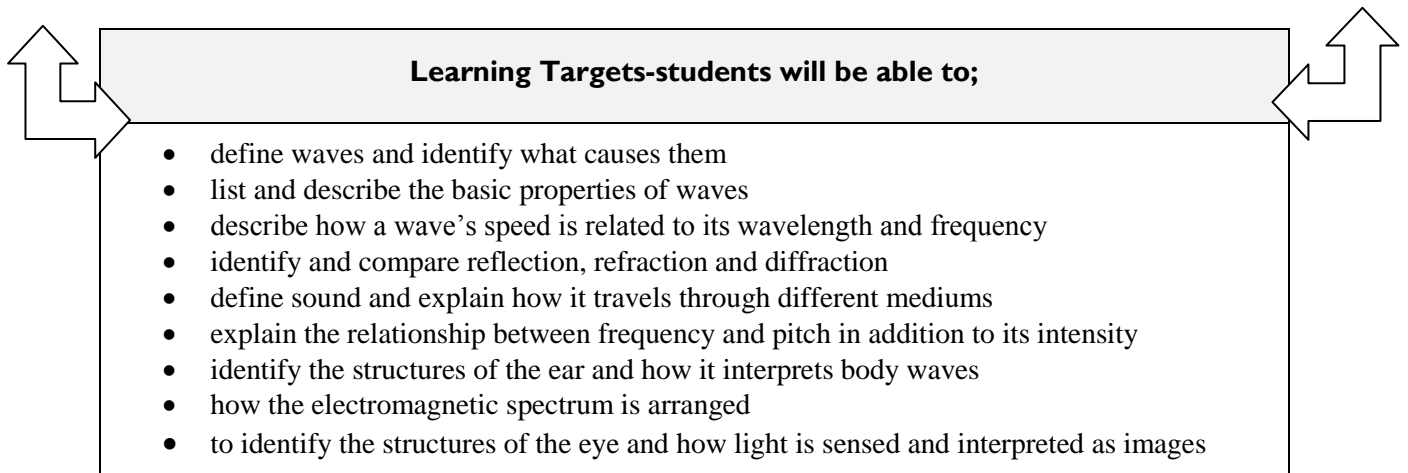
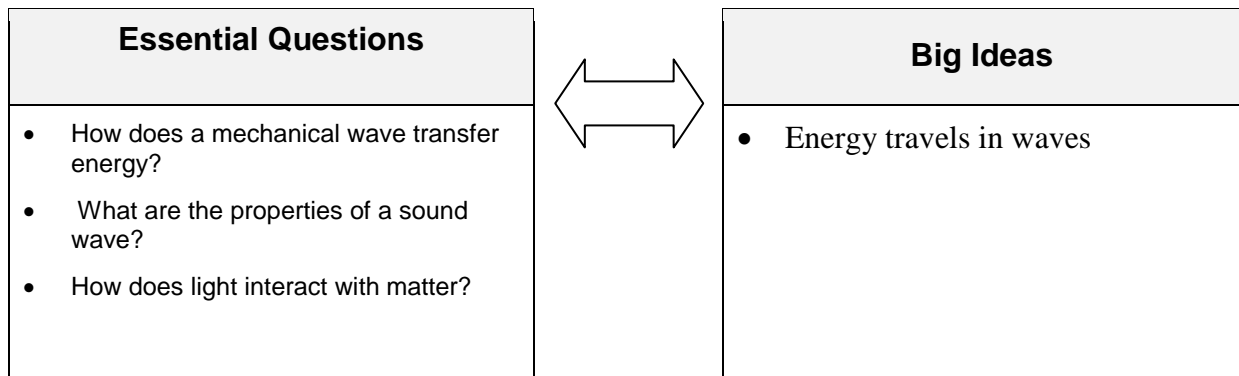
Teaching Strategies

- Evaluation of lab reports, rubrics to assess writing, written assessment
- Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology
- Utilization of key terms

Resources

Prentice Hall Science Explorer: Physical Science

Unit Title	8.9 Sound and Light	
Time Frame	2-3 Weeks	
21 st Century Themes	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility	
Interdisciplinary focus and technology integration	Technology Math Art	History Language Arts



Assessment	
Rubrics	Teacher-created Assessment
Lab Reports	Classroom Participation
Homework Completion	Group Participation
Diagramming and identifying different wave patterns	

Differentiation

Hands-on Activities
Diagnostic Assessment
Kinaesthetic
Re-teaching
Enrichment Activities
Cooperative Learning
Peer Tutoring
Tiered Instruction
Alternative Assessment

Content Standards

What state content standards are to be addressed?

5.2.6.C.1
5.2.6.C.2
5.2.6.C.3
5.2.8.C.1
5.2.8.C.2
5.1

Approaches to Learning

Observation skills- observing and communicating data in a lab report

Analyzing skills – recognizing relationships

Evaluation skills- developing criteria for judging their own work

Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments

Inquiry skills – formulate questions, hypothesize and conduct experiments

Learning Experiences

“Wavy Motions”
“How do waves travel”
“Changing Colors”
“ In the Heat of the Light”
“Can you see everything with one eye?”
“Working with lenses and refraction”

Teaching Strategies

- Evaluation of lab reports, rubrics to assess writing, written assessment
- Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology
- Utilization of key terms

Resources

Prentice Hall Science Explorer: Physical Science