

California State
AIMS Activities supporting Third Grade Science Standards of Learning

PHYSICAL SCIENCE

- 1. Energy and matter have multiple forms and can be changed from one form to another. As a basis for understanding this concept, students know:**

Resource: “Heat Energy,” Primarily Physics

- a. energy comes from the sun to the Earth in the form of light.**

“Light Sources,” Primarily Physics

Explore different sources of light.

Resources:

“Energy Concept Map

“What is Energy,” (fact sheet) Primarily Physics

- b. sources of stored energy take many forms, such as food, fuel, and batteries.**

“Life in the Food Chain,” Field Detectives

Learn about food chains and webs by observing organisms.

“Pyramid of Choices,” Jaw Breakers and Heart Thumpers

Classify foods according to the groups represented on the USDA Food Guide Pyramid.

“Butter and Margarine Candles,” Off the Wall Science

Build and burn butter and margarine candles to observe energy transformation.

“The Burning Walnut,” Off the Wall Science

Burn walnuts to observe the stored heat energy.

- c. machines and living things convert stored energy to motion and heat.**

- d. energy can be carried from one place to another by waves, such as water waves and sound, by electric current, and by moving objects.**

“Wind Rollers,” Popping with Power

Build a roller that is powered by the wind

“Sound is Vibration,” Primarily Physics

“Traveling Sounds,” Primarily Physics

“Slinky Sounds,” Primarily Physics

In all three activities students will demonstrate that energy can be carried from one place to another by waves

Resource: “Sound Energy,” Primarily Physics

- e. matter has three forms: solid, liquid and gas.**

“Melt an Ice Cube,” Primarily Physics

Observe ice as it changes from solid to liquid state

“Room for Change,” *AIMS: 13.9*

Observe water as it changes from liquid to solid state

“The Inverted Tumbler,” Off the Wall Science

Observe properties of a gas by studying air in an inverted tumbler

“Can it Matter?” *AIMS: X.2*

Identify states of matter hidden in film canisters using the sense of hearing

f. evaporation and melting are changes that occur when the objects are heated.

“Water in Five Containers,” Off the Wall Science

Explore evaporation of water in different sized containers.

“Salty Water,” Off the Wall Science

Heat salty water to observe evaporation.

“Puddle Pushers,” AIMS: IX.6

Observe and measure evaporation of water from a puddle.

g. when two or more substances are combined a new substance may be formed that can have properties that are different from those of the original materials.

“A Matter of Change,” AIMS: XII.2

“Candied Apple,” AIMS: II.7

Using cooking experiences to investigate changes in matter when two or more substances interact to form new substances with different observable properties.

h. all matter is made of small particles called atoms, too small to see with our eyes.

“Water Molecule,” Water Precious Water

“Atoms,” Electrical Connections

In both activities, students will construct paper models of atoms and molecules.

i. people once thought that earth, wind, fire, and water were the basic elements that made up all matter. Science experiments show that there are over 100 different types of atoms which are displayed on the Periodic Table of the Elements.

2. Light has a source and travels in a direction. As a basis for understanding this concept, students know:

Resource: “Light Energy,” Primarily Physics

a. sunlight can be blocked to create shadows.

“Just Passing Through,” Primarily Physics

Use a flashlight to discover which materials are transparent, translucent, or opaque.

“Me and My Shadow,” Pieces and Patterns

Measure the lengths of shadows at different times of day to determine when a shadow casts its longest and shortest image.

“Mr. Groundhog, Mr. Groundhog,” Cycles of Knowing and Growing

Measure lengths of shadows.

“Shadow Shows,” AIMS: XII.1

Measure the relationship between the length of the shadow and the time of day.

“Sunny Side Up,” Overhead and Underfoot

Discover information about the relationship of the earth to the sun by studying shadow patterns.

b. light is reflected from mirrors and other surfaces.

“Mirrors Reflect,” Primarily Physics
Observe reflections using hinged mirrors.

c. the color of light striking an object affects how our eyes see it.

Resources:

“Color and Light,” *AIMS*: IV.4

“Sunsets and Rainbows,” *AIMS*: IV.5

LIFE SCIENCE

3. Adaptations in physical structure or behavior may improve an organism’s chance for survival. As a basis for understanding this concept, students know:

a. plants and animals have structures that serve different functions in growth, survival, and reproduction.

“Table Manners,” Critters

Simulate food gathering with four different types of insect mouths.

“Noses for Nectar,” Bats Incredible

Simulate a mega-bat feeding process which contributes to plant pollination.

“Stem Study,” Primarily Plants

Experiment with celery to explore the function of plant stems.

“Hide and Seek,” Critters

Construct a critter to observe the effects of camouflage on animal survival.

“Bears Feet,” *AIMS*: XI.5

Compare and contrast different bears’ feet and describe how features of the feet contribute to survival.

Resources:

“Plant Parts,” Primarily Plants

“Plant Structure,” Budding Botanist

b. examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

entire book, Exploring Environments

In this set of explorations, students will investigate different environments as though they were taking an expedition through each. Background information backdrop scenes, sample plants and animals, and a Science Buddy have been provided to help students examine the complex interactions between living things and how they meet their survival needs. The instructional approach is very open-ended and student-centered.

c. living things cause changes in the environment where they live; some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.

“Fallen Leaf,” Cycles of Knowing and Growing

Study fallen leaves to observe the process of decomposition.

Resources: see descriptive paragraphs in Exploring Environments

d. when the environment changes, some plants and animals survive and reproduce, and others die or move to new locations.

“Missing Moths,” Critters

Observe a simulated environment with moths made of paper to see the effects of camouflage.

“Gone Fishing,” Critters

Use paper fish cut outs to see the effect of camouflage on prey populations.

“A Special Plot,” Field Detectives

Closely observe a small section of the playground to study the changes that occur over time.

- e. some kinds of organisms that once lived on Earth have completely disappeared; some of these resembled others that are alive today.**

EARTH SCIENCE

- 4. Objects in the sky move in regular and predictable patterns. As a basis for understanding this concept, students know:**

- a. the patterns of stars stay the same, although they appear to move across the sky nightly, and different stars can be seen in different seasons.**

“Sky Watchers,” Cycles of Knowing and Growing

Observe day and night skies to study patterns and changes and record observations in sky watching book.

- b. how the moon’s appearance changes during the four-week lunar cycle.**

“Look at the Moon,” Cycles of Knowing and Growing

“Moon on a Strip,” Cycles of Knowing and Growing

In the two activities students will observe the sky over a period of months to determine how the moon changes and construct a moon observation calendar and journal.

- c. telescopes magnify the appearance of some distant objects in the sky, including the moon and the planets. The number of stars that can be seen through telescopes is dramatically greater than can be seen by the unaided eye.**

- d. the Earth is one of several planets that orbit the sun, and the moon orbits the Earth.**

Resource: “When the Planets go Spinning Around,” (song) AIMS: X.2

- e. the position of the sun in the sky changes during the course of the day and from season to season.**

“Me and My Shadow,” Pieces and Patterns

Measure the lengths of shadows at different times of day to determine when a shadow casts its longest and shortest image.

INVESTIGATION AND EXPERIMENTATION

The following standards should be woven together with the previous Life, Physical and Earth Science Standards at the time these topics are taught. The Investigation and Experimentation Standards should not be viewed or taught as separate skills which are disembodied from appropriate science content. The AIMS activities listed above which incorporate any of the Investigation and Experimentation Standards are marked by an icon (IE-icon here) which contains the letter(s) of the relevant standard(s).

- 5. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to**

address the content the other three strands, students should develop their own questions and perform investigations. Students will:

- a. repeat observations to improve accuracy, and know that the results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated, methods being used, or uncertainty in the observation.**
- b. differentiate evidence from opinion, and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed.**
- c. use numerical data in describing and comparing objects, events and measurements.**
- d. predict the outcome of a simple investigation, and compare the result to the prediction.**
- e. collect data in an investigation and analyze them to develop a logical conclusion.**

California State
AIMS activities supporting Fourth Grade Standards of Learning

PHYSICAL SCIENCE

1. Electricity and magnetism are related effects that have many useful applications in everyday life. As a basis for understanding this concept, students know:

a. how to design and build simple series and parallel circuits using components such as wires, batteries, and bulbs.

“Sparky’s Light Kit,” Electrical Connections

Design and build a complete circuit that lights a bulb using only a D-cell, a bulb, and a jumbo paper clip or wire.

“Path Finders,” Electrical Connections

Learn about complete and incomplete circuits by trying to light a bulb using various systems of bulbs, wires, and cells (batteries).

“Electrical Circuits,” Electrical Connections

Build and observe series and parallel circuits

“Short Cuts,” Electrical Connections

Build several different parallel circuits, each with a switch, and will discover the effect on each circuit when the switch is opened and closed.

b. how to build a simple compass and use it to detect magnetic effects, including Earth's magnetic field.

“Make a Compass,” Mostly Magnets

Construct a magnetic compass using a magnetized needle.

Resource: “Science Information/Glossary” Mostly Magnets

c. electric currents produce magnetic fields and how to build a simple electromagnet.

“Make an Electromagnet” Mostly Magnets

Construct an electromagnet and test variables for strength.

“The Electromagnetic Connection,” Electrical Connections

Discover that electromagnetic currents produce a magnetic field.

Resource: “Electromagnetism Fact Sheets,” Electrical Connections

d. the role of electromagnets in the construction of electric motors, electric generators, and simple devices such as doorbells and earphones.

“How to Make an Electric Motor,” Electrical Connections

Build a simple electric motor.

e. electrically charged objects attract or repel each other.

“Static Strokes,” Electrical Connections

Explore static electricity by testing a variety of small objects.

“Static Magic,” Popping with Power

Explore static electricity by testing a variety of small objects.

Resources:

“Static Electricity,” Electrical Connections
“St. Elmo’s Fire,” Electrical Connections

f. magnets have two poles, labeled north and south, and like poles repel each other while unlike poles attract each other.

“Face to Face,” Mostly Magnets

Use pairs of magnets to discover how like and unlike poles react to one another.

“Floating Magnets,” Mostly Magnets

Experiment with two or more stacked ring magnets and observe how they interact.

“Magnetic Tug-of-War,” Mostly Magnets

Quantify magnetic interaction between two ring magnets to discover the mathematical relationship between attraction and repulsion.

“Magnetic Lines,” Mostly Magnets

Investigate to discover the magnetic field lines.

g. electrical energy can be converted to heat, light and motion.

“Circuit Breakers,” Electrical Connections

Build a circuit breaker and learn its function as part of a circuit.

Sparky’s Light Kit,” Electrical Connections

Design and build a complete circuit that lights a bulb using only a D-cell, a bulb, and a jumbo paper clip or wire.

Resource: “Lightbulbs: The Inside Story,” Popping with Power

LIFE SCIENCE

2. All organisms need energy and matter to live and grow. As a basis for understanding this concept, students know:

a. plants are the primary source of matter and energy entering most food chains.

“Life in the Food Chain,” Field Detectives

Observe food webs and food chains on the playground.

“Pizza Parts and Web Wheels,” Field Detectives

Use a pizza’s ingredients to discover parts of the food chain.

“Producing a Producer,” Field Detectives

Sprout alfalfa seeds to show the beginning of the food chain.

b. producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs, and may compete with each other for resources in an ecosystem.

“Bean a Great Place to Live,” Field Detectives

Determine different arrangements of animals that can live in a habitat according to space.

“Life in the Food Chain,” Field Detectives

Observe food webs and food chains on the playground.

“Pyramid Pile-Up,” Field Detectives

Build and use a model to show the structure of a food pyramid.

Resource: “Food Chains/Food Web,” Critters

c. decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.

- “Dirt Dwellers,” Field Detectives
Locate, collect, and observe decomposer animals in the soil.
- “From Leaf to Soil,” Field Detectives
Observe decomposition of leaves.

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept, students know:

a. ecosystems can be characterized in terms of their living and non-living components.

- “Floor Samples,” Field Detectives
Observe non-living components of a habitat.
- “A Watched Pot,” Field Detectives
Observe and water soil containers, recording any changes.
- “Comfort Clues,” Field Detectives
Record how temperatures vary within a habitat.
- “A Warrant for Water,” Field Detectives
Test water percolation in different areas of playground habitat and compare water retention in soil samples.
- “Compacted Playground,” Field Detectives
Predict and observe what happens to soil and plants when people walk on them
- “Fishing for Clues,” Field Detectives
Explore the basic needs that a habitat provides for organisms by making and using a model.
- “What Makes Soil,” Overhead and Underfoot
Explore components of different soil samples.
- Resource: entire book Exploring Environments

b. for any particular environment, some kinds of plants and animals well, some survive less well, and some cannot survive at all.

- “Hide and Seek,” Critters
Make a critter and see the effects of camouflage on animal visibility.
- “Moth Maps,” Critters
Try to locate moths camouflaged on a coordinate grid and map their locations.
- “Habitat Comparisons,” Our Wonderful World
Compare and contrast organisms in two different habitats.
- Resource: entire book Exploring Environments

c. many plants depend on animals for pollination and seed dispersal, while animals depend on plants for food and shelter.

- “Seeds Travel,” Primarily Plants
Observe the many ways that seeds can be dispersed by a parent plant.
- “Noses for Nectar,” Bats Incredible
Simulate how nectar eating bats contribute to plant pollination by building a mega-bat nose.
- “Tree Houses,” Field Detectives
Observe organisms in a tree and recognize how the tree provides for their needs.

EARTH SCIENCE

4. The properties of rocks and minerals reflect the processes that formed them. As a basis for understanding this concept, students know:

a. how to differentiate among igneous, sedimentary, and metamorphic rocks by their properties and methods of formation (the rock cycle).

“Rock and Rule,” Overhead and Underfoot

Collect rock samples and classify according to certain properties.

“Pet Rock,” Overhead and Underfoot

Find characteristics of different rock samples.

b. how to identify common rock-forming minerals (including quartz, calcite, feldspar, mica, and hornblende) and ore minerals using a table of diagnostic properties.

5. Waves, wind, water, and ice shape and reshape the Earth's land surface. As a basis for understanding this concept, students know:

a. some changes in the Earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.

“Agent Erosion,” Primarily Earth

Use models and playground observations to observe that rocks are weathered into sand and soil.

“Rain Away,” Water Precious Water

Observe the effects of erosion caused by rain on a bare hillside by constructing a model.

“Don’t Rain Away,” Water Precious Water

Observe how vegetation helps control the erosion caused by rain by constructing a model.

“Sand Dunes and Snow Drifts,” AIMS: IX.5

Explore the effects of obstacles on drifting sand and/or snow by constructing a model.

“Quaking Earth,” Primarily Earth

Build a gelatin model to develop an idea of what happens to earth’s surface and buildings during an earthquake.

“Volcanoes,” Primarily Earth

Construct a model using baking soda and vinegar.

Resource: “Erosion” (song) AIMS: IX.5

b. natural processes, including freezing/thawing and growth of roots, cause rocks to break down into smaller pieces.

“Ice Breakers,” Primarily Earth

Investigate the effects of the freezing of water in simulated rock models.

c. moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).

“Quick Sand,” Down to Earth

Study the effects of a stream slope and rate of flow on its rate of erosion by constructing a model.

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Investigation and Experimentation Standards are marked by an icon (IE-icon here) which contains the letter(s) of the relevant standard(s).

- 6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content the other three strands, students should develop their own questions and perform investigations. Students will:**
 - a. differentiate observation from inference (interpretation), and know that scientists' explanations come partly from what they observe and partly from how they interpret their observations.**
 - b. measure and estimate weight, length, or volume of objects.**
 - c. formulate predictions and justify predictions based on cause and effect relationships.**
 - d. conduct multiple trials to test a prediction and draw conclusions about the relationships between results and predictions.**
 - e. construct and interpret graphs from measurements.**
 - f. follow a set of written instructions for a scientific investigation.**

California State
AIMS Activities supporting Grade Five Standards of Learning

PHYSICAL SCIENCE

1. Elements and their combinations account for all the varied types of matter in the world. As a basis for understanding this concept, students know:

a. during chemical reactions, the atoms in the reactants rearrange to form products with different properties.

“A Strange Change,” *AIMS: XI.10*

Observe chemical changes by conducting experiments.

“Another Look at a Strange Change,” *AIMS: XII.3*

Observe and measure the effects of a chemical change using a thermometer.

“Yeast High Risers,” Fun with Foods

Observe and measure the chemical reaction of yeast in bread dough.

“Homemade Fire Extinguisher,” Off the Wall Science

“Pouring Carbon Dioxide Gas,” Off the Wall Science

Observe a chemical reaction of baking soda and vinegar and CO₂ gas.

“Change Matters,” *AIMS: XI.8*

Determine whether various changes in matter are physical or chemical by conducting experiments.

“Money Laundering,” *AIMS: XII.9*

Discover that the combination of vinegar and salt is a chemical reaction that can clean their pennies.

“Riding on Air,” Soap Film and Bubbles

Produce carbon dioxide gas in an aquarium by mixing baking soda and vinegar.

b. all matter is made of atoms, which may combine to form molecules.

“Macro Molecules,” Soap Film and Bubbles

Build models of water and soap molecules.

“The Water Molecule,” Water Precious Water

Construct a paper model of a water molecule.

Resources:

“It’s a Small World,” Soap Film and Bubbles

“The Water Molecule,” Water Precious Water

c. metals have properties in common, such as electrical and thermal conductivity. Some metals, such as aluminum (Al), iron (Fe), nickel (Ni) copper (Cu), silver (Ag), gold (Au), are pure elements while others, such as steel and brass, are composed of a combination of elemental metals.

“Heat Energy Travels,” Primarily Physics

Use a metal rod to comprehend heat energy transfer.

d. each element is made of one kind of atom. These elements are organized in the Periodic Table by their chemical properties.

e. scientists have developed instruments that can create images of atoms and molecules showing that they are discrete and often occur in well ordered arrays.

f. differences in chemical and physical properties of substances are used to separate mixtures and identify compounds.

“Messing with Mixtures,” *AIMS: XII.7*

Determine how the ingredients of a mixture can be separated.

g. properties of solid, liquid, and gaseous substances, such as sugar (C₆H₁₂O₆), water (H₂O), helium (He), oxygen (O₂), nitrogen (N₂), and carbon dioxide (CO₂).

“Don’t Flip Your Lid,” *AIMS: XIII.1*

Explore various properties of gases by heating and cooling.

“Pouring Carbon Dioxide Gas,” Off the Wall Science

Observe a chemical reaction of baking soda and vinegar and CO₂ gas.

“Water Olympics,” Water Precious Water

Explore properties of water.

“Water Activities,” Pieces and Patterns

Explore the properties of water and the phenomenon of surface tension.

“Riding on Air,” Soap Film and Bubbles

Study the properties of gas by observing bubbles floating on a layer of carbon dioxide gas.

“Inverted Tumbler in the Aquarium,” Off the Wall Science

Learn that gas occupies space by inverting a cup in a container of water.

“The Melting Ice Cube,” Off the Wall Science

Explore the properties of solids and liquids by melting ice cubes.

“Crazy Colloid,” *AIMS: IV.1*

Explore ways a substance shares the properties of both a solid and a liquid.

h. living organisms and most materials are composed of just a few elements.

i. common properties of salts, such as sodium chloride (NaCl).

LIFE SCIENCE

2. Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials. As a basis for understanding this concept, students know:

a. many multicellular organisms have specialized structures to support the transport of materials.

“Herb and Woody,” Budding Botanist

Study and compare the specialized structures of woody and herbaceous stems.

“Transpiration,” Budding Botanist

Observe the transpiration and water movement that occurs in plant leaves by conducting an experiment.

“Stem Study,” Primarily Plants

Conduct an experiment to understand the function of plant stems.

Resources:

“History of a Tree,” Budding Botanist

“Tree Cookies,” Our Wonderful World

b. how blood circulates through the heart chambers, lungs, and body, and how carbon dioxide (CO₂) and oxygen (O₂) are exchanged in the lungs and tissues.

“You Gotta Have Heart,” From Head to Toe

Demonstrate knowledge of heart structures by labeling a diagram of the heart.

“Take A Breather,” From Head to Toe

Measure lung capacity using a balloon.

“You Take my Breath Away,” From Head to Toe

Measure the rate of respiration while doing various exercises.

- c. the sequential steps of digestion, and the roles of teeth and mouth, esophagus, stomach, small intestine, large intestine, and colon in the function of the digestive system.**

“Casing the System,” *AIMS: XI.1*

Model the digestive system using sausage wrappers.

Resource: “Food Tube,” *AIMS: XI.10*

- d. the role of the kidney in removing cellular wastes from blood and converting them into urine, which is stored in the bladder.**

- e. how sugar, water, and minerals are transported in a vascular plant.**

“Stem Study,” Primarily Plants

Conduct an experiment to understand the function of plant stems.

- f. plants use carbon dioxide (CO₂) and energy from sunlight to build molecules of sugar and release oxygen.**

“Photosynthesis,” Budding Botanist

Observe the production of oxygen through photosynthesis by making an experiment.

- g. plant and animal cells break down sugar to obtain energy, forming carbon dioxide (CO₂) and water (respiration).**

EARTH SCIENCE

- 3. Water on Earth moves between the oceans and land through the processes of evaporation and condensation. As a basis for understanding this concept, students know:**

- a. most of the Earth’s water is present as salt water in the oceans, which cover most of the Earth’s surface.**

“Were You Aware?” Water Precious Water

Predicting and graphing the percent of water types available on earth.

“Surf and Sand,” Finding Your Bearings

Do various activities to determine the ratio of water to land on the earth’s surface.

- b. when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled, or as a solid if cooled below the freezing point of water.**

“Puddle Pushers,” *AIMS: IX.6*

Observe and measure the evaporation of water in a puddle over a period of time.

“Mini Water Cycle,” Water Precious Water

Construct and observe a water cycle in a plastic bag.

“Salty H₂O,” Off the Wall Science

Conduct an investigation evaporating salty water.

- c. water moves in the air from one place to another in the form of clouds or fog, which are tiny droplets of water or ice, and falls to the Earth as rain, hail, sleet, or snow.**

“Moving Water,” Water Precious Water

Make a model of the forms water will take when it is heated or cooled.

“Moving Raindrops in the Water Cycle!” Water Precious Water

Model the different forms water will take through the water cycle.

Resource: “Water Cycle” (song), AIMS: IX.7

- d. the amount of fresh water, located in rivers, lakes, underground sources, and glaciers, is limited, and its availability can be extended through recycling and decreased use.**

“A Little Cup Will Do It,” Water Precious Water

Measure the amount of water that can be saved in one week when brushing your teeth by using a cup of water instead of letting the water run.

“Down the Drain,” Water Precious Water

Measure the amount of water wasted while waiting for the water to get hot.

“Drip Drop Flip Flop,” Water Precious Water

Determine some ways to conserve water around your house by constructing a model.

- e. the origin of water used by their local communities.**

“Water Islands,” Water Precious Water

Model various ways communities get their water.

“Mini Water Treatment Simulation,” Water Precious Water

Model a water purification system.

“Help Save the Birds,” Water Precious Water

Plan and conduct an investigation to clean muddy water.

- 4. Energy from the sun heats the Earth unevenly, causing air movements resulting in changing weather patterns. As a basis for understanding this concept, students know:**

- a. uneven heating of the Earth causes air movements (convection currents).**

“When Hot and Cold Meet,” Primarily Physics

Observe convection currents in a container of water.

“Curly Cue,” Popping with Power

Build an air current detector as they explore convection currents in the air.

- b. the influence of the ocean on weather, and the role of the water cycle in weather.**

- c. causes and effects of different types of severe weather.**

- d. how to use weather maps and weather forecasts to predict local weather, and that prediction depends on many changing variables.**

“World Wide Highs,” AIMS: XI.5

Predict, record, and compare the high temperatures of various cities around the world throughout the year.

- e. **the Earth's atmosphere exerts a pressure that decreases with distance above the Earth's surface, and is the same in all directions.**

“Seeing is Believing,” The Sky’s the Limit

Explore discrepant events which demonstrate air pressure.

“Look Out Below,” AIMS: X.4

Observe the ability of air pressure to support water in an inverted cups.

Resource: “Manometer,” AIMS: XIII.5

- 5. **The solar system consists of planets and other bodies that orbit the sun in predictable paths. As a basis for understanding this concept, students know:**

- a. **the sun, an average star, is the central and largest body in the solar system and is composed primarily of hydrogen and helium.**

- b. **the solar system includes the Earth, moon, sun, eight other planets and their satellites, and smaller objects such as asteroids and comets.**

“Planet Trivia,” Out of this World

Participate in a card game reinforcing planetary information.

“Planetary Facts,” Out of this World

Generate graphs and Venn diagrams using information about the planets.

Resources:

“When the Planets Go Spinning Around,” (song), AIMS: X.2

“Can You Planet?” Out of this World

- c. **the path of a planet around the sun is due to the gravitational attraction between the sun and the planet.**

INVESTIGATION AND EXPERIMENTATION

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- 6. **Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content the other three strands, students should develop their own questions and perform investigations. Students will:**

- a. **classify objects (e.g., rocks, plant, leaves) based on appropriate criteria.**

- b. **develop a testable question.**

- c. **plan and conduct a simple investigation based on a student-developed question, and write instructions others can follow to carry out the procedure.**

- d. **identify the dependent and controlled variables in an investigation.**

- e. identify a single independent variable in a scientific investigation and explain what will be learned by collecting data on this variable.**
- f. select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.**
- g. record data using appropriate graphic representation (including charts, graphs, and labeled diagrams), and make inferences based on those data.**
- h. draw conclusions based on scientific evidence and indicate whether further information is needed to support a specific conclusion.**
- i. write a report of an investigation that includes tests conducted, data collected or evidence examined, and conclusions drawn.**