Level Five Science

Scientific Investigation

Identify the Problem — Sample Activity No.
Identify problems that can be solved by conducting experiments. 5644, 5645

Plan the Experiment
Create a written plan for an experiment. 5646, 5647

Conduct Scientific Experiments
Design/conduct a scientific experiment within the rules and ethics of science. 5648, 5649

Collect and Organize Data
Collect data to support the result of an experiment. 5650, 5651

Record Observations
Keep records of observations during an experiment. 5652, 5653

Unexpected Findings
Explain that scientific experiments can result in unexpected findings leading to new questions and experiments. 5580, 5654, 5655

Control Groups in Experiments
Design and conduct an experiment incorporating the use of a control group. 5656, 5657

Time Line of Scientific Events
Develop a time line of major events and people in history of science, that includes major events in other fields. 5658, 5659

Changes in Matter

Structural Components of Atoms
Identify electrons, protons, and neutrons as basic structural components of atoms. 5660, 5661

Construction of Matter
Know that matter is made of atoms that may join to form molecules and compounds, and that the state of matter is determined by the motion of molecules. 5662, 5663

Elements
Know that elements have atoms of only one kind and that elements can be organized in systematic way. 5664, 5665

Periodic Table
Understand the basics of a periodic table: elements and their symbols; atomic numbers equal number of protons in each atom; table divided into metals and nonmetals. 5666, 5667

Characteristics of Electricity
Identify electricity as the flow of electrons: positive pole (terminal) and negative pole (terminal). 5668, 5669

Unit of Electrical Force
Learn about voltage (the force that makes electrons flow), volt (the unit of electrical force, or push), alternating current (AC), direct current (DC), and alternator. 5670, 5671

Electrical Measurement
Know how electricity is measured: volts, amps (amperage), ohms, Ohm's law: volts = amps x ohms. 5672, 5673

Electric Power
Know how electric power is measured: watts (wattage), volt x amp = watt. 5687, 5688

Conductors and Insulators
Know the difference between conductors and insulators. 5675, 5676

Structure of Circuits
Know the structure of simple electrical circuits: closed circuit, open circuit, short circuit. 5677, 5678

Series and Parallel Circuits
Demonstrate principles of series and parallel electrical circuits. 5679

Electrical Resistance and Ohms
Understand electrical resistance and the use of ohms. 5681

Electrical Safety
Learn about electrical safety. 5683, 5684

Changes in Matter

continued

Michael Faraday

Sample Activity No.

Describe the scientific contribution of Michael Faraday. 5685, 5686

Thomas Edison

Describe the scientific contribution of Thomas Edison. 5674

Light

Light as Energy

Know that light is a form of energy, and that the speed of light is 186,000 miles per second. 5689, 5690

Characteristics of White Light

Describe basic characteristics of white light: visible spectrum, light waves, reflection, refraction. 5691, 5692

Opaque/Transparent/Translucent

Describe basic characteristics of white light: opacity, transparency, translucence. 5693, 5964

Light Measurement

Know how light is measured: wavelengths, frequency, cycle. 5695, 5696

Light Interaction with Matter

Show how light is reflected, refracted, or absorbed when it interacts with matter and how colors appear as a result. 5697

Reflections of Light

Describe use and basic design of kaleidoscopes, flashlights, and mirrors. 5699, 5540

Describe use and basic design of eyeglasses, prisms, and cameras. 5541, 5542

Optics and Magnifiers of Light

Describe use and basic design of binoculars, microscopes, and telescopes. 5543, 5544

Lasers and Photocopiers

Describe use and basic design of lasers, and photocopiers. 5545, 5546

Organisms

The Smallest Unit of Life

Identify the cell as basic unit of life and smallest unit that can reproduce itself. 5547, 5548

Characteristics of a Cell

Describe the structure and function of cell parts: cell membrane, cytoplasm, mitochondria, ribosomes. 5549, 5550

Function of Cell Parts

Describe the function of cell parts: nucleus, nuclear membrane, vacuoles, endoplasmic reticulum. 5551, 5552

Single and Multi-celled Organism

Give examples of single-celled and multicellular organisms. 5553, 5554

Plant and Animal Cells

Identify similarities and differences between plant and animal cells. 5555, 5556

Parts of a Microscope

Decribe simple compound microscope: eyepiece, ocular tube, coarse adjustment knob, fine adjustment knob, arm, base, mirror, aperture or diaphragm, stage, low-power and high-power objective lenses. 5557, 5558

Ernest Just

Describe the scientific contribution of Ernest Just. 5559, 5560

Classifying Living Things

Five Major Kingdoms

Describe the five major kingdoms: Monera, Protista, Fungi, Plantae, Animalia. 5563, 5564

Method to Classifying

Learn classifications of living things: kingdom, phylum, class, order, family, genus, species; and the work of Carolus Linnaeus. 5561, 5562

Level Five Science

Life Cycle and Reproduction

Sample Activity No.

Life Cycle of a Plant
Identify the life cycle of covered-seed (flowering) plants: fertilization, embryo, endosperm, seed coat, germination, plant growth, flowers, new seeds. 5567, 5568

Reproduction of a Plant
Investigate reproduction of covered-seed (flowering) plants: petals, stamen, anther, pistil, ovule, ovum, pollen, pollination, pollen tube, ovary, embryo, germination, fruit. 5565, 5566

Life Cycle of Naked-Seed Plant
Identify the life cycle of naked-seed (conifer) plants: pollen, seed, male and female cones. 5569, 5570

Common Pollen Carriers
Identify common pollen carriers: insects, birds, wind. 5571, 5572

Reproduction of Non-seed Plant
Investigate reproduction of non-seed (moss, fern) plants (spores). 5573, 5574

Weather

Weather and Climate
Differentiate between weather and climate. 5611, 5620

The Water Cycle
Describe hydrologic cycle and role of evaporation, precipitation, and condensation of water in atmosphere. 5615, 5601

Layers of the Atmosphere
Know that the Sun and Earth heat the atmosphere and that atmosphere has layers: troposphere, stratosphere, mesosphere, ionosphere, and exosphere. 5616, 5617

Classification of Clouds
Classify clouds (cirrus, stratus, cumulus, cumulonimbus) by composition, height, and type of precipitation. 5636, 5637

Instruments to Collect Data
Use weather instruments to collect data and measure air temperature (thermometer), precipitation (rain gauge), and wind speed (anemometer). 5613, 5638

Air Pressure and Humidity
Use weather instruments to collect data and measure air pressure (barometer) and humidity (hygrometer). 5629, 5639

Identify Pressure Systems
Identify pressure systems, fronts, and other features on weather maps and charts. 5618, 5640

Develop Forecasts
Develop forecasts using pressure systems, fronts, and other features on weather maps. 5641, 5642

The Earth's Climate Zone
Describe Earth's climate zones and what causes each. 5612, 5634

Meteorology
Describe meteorology as a field of study. 5635, 5614

Forever Changing Earth

Earth's Interior
Study basic structure of Earth's interior: crust, mantle, outer core, inner core. 5619, 5602

Plate Tectonics
Explain that some changes in Earth's surface are due to plate tectonics. 5633

Measuring an Earthquake
Define: tsunamis, seismograph, and the Richter scale. 5606, 5607

Results of an Earthquake
Identify what happens in an earthquake, major faults, fault zones, Mid-Atlantic Ridge. 5621, 5603

Changes of Earth's Surface
Learn that changes on Earth's surface are from forces acting upon it. Explain volcano's structure: magma, lava, active, dormant, extinct. Locate the Ring of Fire. 5622, 5610

Level Five Science

Forever Changing Earth

continued

Continental Drift and Pangaea

Sample Activity No.

Learn how heat flow and movement within Earth move the continents. Describe continental drift and Pangaea. 5604, 5623, 5605

Volcanoes and Folded Mountains

Understand how volcanic mountains and folded mountains are formed. 5609

Mountains and Ocean Basins

Learn how plate movement creates mountains and ocean basins, and how fault-block mountains and dome-shaped mountains are formed, and about the Mariana Trench. 5625, 5632

Rocks and Fossils Tell a Story

Learn how rocks and fossils record events of Earth's history, documenting plate movements, volcanic eruptions, erosion and deposition. 5643, 5626

Ice Cores and Tree Rings

Learn how ice cores and tree rings record events of Earth's history, documenting plate movements, volcanic eruptions, erosion, and deposition. 5630, 5627

Geology

Describe geology as a field of study. 5628, 5631

Human Body

Body and Mind

Identify personal interests, capabilities, values, personal strengths, weaknesses, and ways to maximize strengths. Describe conditions that contribute to disease: contaminated food or water, lack of immunization, poor nutrition, improper hygiene, lack of sleep and rest. 56021, 56022, 56023, 56025, 56027, 56028, 56029, 56030, 56031, 56032, 56033, 56034, 56035