National Science Standards

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LWS - Correlation to National Science K-4 Report

27-Aug-2002

Final Grade: **2**

Student: Lara Croft

Enrolment Code: LWSlara

Class: 3 Living With Science

Instructor: Mark 1

Range: [All Dates]

Comments: This is an example one of the reports available to teachers once students have completed some of the LWS assignments. In this case Lara's work is being reported against the National Science Standards, k-4.

Calculated on handed in work only.

Key:

3 - Can work independently
2 - Requires limited instruction
1 - Requires close instruction
- - Not Worked On

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Competence Report

Student: Lara Croft (LWSlara)
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2 *LWS - Correlation to National Science K-4 Report*

- **Student is able to ask a question about objects, organisms, and events in the environment.**
  - Debates issues that relate to physical science.
  - Debates issues that relate to life science.
  - Debates issues that relate to Earth and space science.
  - Debates issues that relate to science.

2 Student can plan and conduct a simple investigation.

1 Measures pulling forces using a newton meter.
1 Measures the effect that the force of gravity has on a mass placed on an inclined plane.
3 Observes that images are reversed when reflected in a mirror.
1 Uses lenses to bend light rays.
3 Discovers that the stretch of spring is proportional to the weight placed on it.
1 Observes the change from kinetic energy into heat and sound energy when rubbing hands together.
1 Measures and compares the heat insulation properties of different materials.
3 Uses litmus paper to find out if samples are acidic, basic or neutral.
3 Uses a virtual weather station to record temperature and rainfall.
1 Uses a solar panel to generate electricity in a circuit.
2 Uses a lever to balance weights.
3 Uses an analogue light meter to measure light levels in a room.
3 Determines the effect of exercise on heart rate.
3 Observes the effects of tap water, salt water and fertilizer on the growth of plants in a nine day period.
3 Replicates and observes the stages of the water cycle.
1 Separates solids and liquids using filter paper.

2 Student is able to employ simple equipment and tools to gather data and extend the senses.

1 Measures pulling forces using a newton meter.
1 Measures the effect that the force of gravity has on a mass placed on an inclined plane.
3 Identifies the parts and controls of a microscope.
3 Uses litmus paper to find out if samples are acidic, basic or neutral.
3 Uses a virtual weather station to record temperature and rainfall.
1 Uses a motion sensor to measure distances.
3 Uses a ruler and a motion sensor to measure height.
3 Uses an analogue light meter to measure light levels in a room.
3 Uses a digital light meter to measure light levels in a room.
1 Observes flower pollen magnified by a microscope.
3 Separates mixtures using a sieve.
1 Separates solids and liquids using filter paper.
1 Measures temperature using thermometers.

2 Student is able to use data to construct a reasonable explanation.

- Writes a report about a physical science topic.
- Writes a report about a life science topic.
- Writes a report about an Earth and space science topic.

1 Interprets electrical diagrams to predict the behavior of electrical components connected in parallel.
2 Uses flow diagrams to track the conversion of energy.
3 Compares the heat loss in different materials using graphs.
3 Uses graphs to plot the change of temperature over periods of time.
1 Describes the changes that occur in different materials when they are cooled.

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- **Student can communicate investigations and explanations.**
  - Makes a presentation about a physical science topic.
  - Creates a physical science poster.
  - Makes a presentation about a life science topic.
  - Creates a life science poster.
  - Makes a presentation about an Earth and space science topic.
  - Creates an Earth and space science poster.
  - Debates issues that relate to physical science.
  - Critiques written and oral explanations of a physical science.
  - Critiques written and oral explanations of a life science.
  - Critiques written and oral explanations of science.
  - Makes a presentation on science.

2 **Student understands that objects have many observable properties, including size, weight, shape, color, temperature, and the ability to react with other substances.**
  3 Discovers that materials containing iron stick to magnets.
  2 Squashes a ball and stretches a spring to observe the effects of pushing and pulling forces.
  3 Uses litmus paper to find out if samples are acidic, basic or neutral.
  3 Uses a simple classification key to sort three different types of metal.
  3 Uses a ruler and a motion sensor to measure height.
  1 Tests a series of different objects to find if they are flexible, inflexible or elastic.
  2 Compares the force of friction between different materials.
  3 Observes the mixing of colored light to make other colors, including the making of white light.
  1 Discovers the elastic properties of metal springs.
  1 Measures and compares the heat insulation properties of different materials.
  3 Sorts rocks into sedimentary, metamorphic and igneous rock types.
  3 Separates mixtures using a sieve.
  1 Separates solids and liquids using filter paper.
  3 Observes the effect of adding an insoluble material to a liquid.
  1 Relates the weight, shape and size of a material to its density.

2 **Student can measure the properties of objects and materials using tools such as rulers, balances, and thermometers.**
  1 Measures pulling forces using a newton meter.
  3 Uses a ruler and a motion sensor to measure height.
  2 Uses a lever to balance weights.
  3 Uses an analogue light meter to measure light levels in a room.
  3 Uses a digital light meter to measure light levels in a room.
  1 Measures and compares the heat insulation properties of different materials.
  1 Measures temperature using thermometers.

2 **Student knows that objects can be described by the properties of the materials from which they are made, and those properties can be used to separate or sort a group of objects or materials.**
  3 Determines which materials stick to a magnet.
  3 Identifies objects around the classroom that are light sources.
  2 Determines if materials are electrical conductors or electrical insulators using a simple lamp circuit.
  3 Uses litmus paper to find out if samples are acidic, basic or neutral.
  3 Uses a simple classification key to sort three different types of metal.
  1 Tests a series of different objects to find if they are flexible, inflexible or elastic.
  1 Identifies where different natural materials come from.
  2 Compares the force of friction between different materials.
  1 Discovers the elastic properties of metal springs.
  1 Measures and compares the heat insulation properties of different materials.
  3 Describes how density of an object can effect if it floats or sinks in water.

3 **Student understands that objects are made of one or more materials, such as paper, wood, and metal.**
  3 Discovers that materials containing iron stick to magnets.
  3 Uses a simple classification key to sort three different types of metal.
  2 Identifies what natural materials have been used to make a series of sample objects.

1 **Student knows that materials can exist in different states - solid, liquid, and gas.**
  1 Describes the changes that occur in different materials when they are heated.
  3 States the different forms of water in the water cycle.

1 **Student understands that some common materials, such as water, can be changed from one state to another by heating or cooling.**
  1 Describes the changes that occur in different materials when they are heated.
  1 Describes the changes that occur in different materials when they are cooled.
  3 States if changes in different materials, caused by heating and cooling, can be reversed.
  3 States the different forms of water in the water cycle.

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2 Student understands that the position of an object can be described by locating it relative to another object or the background.
- 2 Observes how a varying incline effects the speed of a model car.
- 3 Uses a model car on a track to find when the car has enough energy to travel over a hill.
- 1 Uses a motion sensor to measure distances.
- 3 Discovers that the stretch of spring is proportional to the weight placed on it.
- 1 Observes the effect of the changing the weight of a pendulum on the time of its swing.
- 3 Constructs a bridge to span a gap.

1 Student understands that an objects motion can be described by tracing and measuring its position over time.
- 3 Modifies a crawler so that it can store enough energy to reach the top of a slope.
- 2 Observes how a varying incline effects the speed of a model car.
- 1 Measures the effect that the force of gravity has on a mass placed on an inclined plane.
- 3 Uses a model car on a track to find when the car has enough energy to travel over a hill.
- 1 Observes the change from kinetic energy into heat and sound energy when rubbing hands together.
- 1 Changes the size and shape of a wing of a model airplane to see the effect in the lift given.
- 1 Observes the effect of the changing the weight of a pendulum on the time of its swing.
- 1 Observes the effect of changing the length of a pendulum on the time of its swing.
- 3 Constructs a pendulum to observe the relationship between pendulum weight and length with its swing time.

2 Student knows that the position and motion of objects can be changed by pushing or pulling.
- 1 States if illustrated movements are pushes or pulls.
- 2 Squashes a ball and stretches a spring to observe the effects of pushing and pulling forces.
- 1 Measures the effect that the force of gravity has on a mass placed on an inclined plane.
- 1 Discovers where kinetic, potential, chemical, light, heat and sound energy can occur.
- 3 Uses a model car on a track to find when the car has enough energy to travel over a hill.

3 Student understands that the size of the change in position or motion is related to the strength of the push or pull.
- 1 Measures pulling forces using a newton meter.
- 3 Uses a model car on a track to find when the car has enough energy to travel over a hill.
- 3 Modifies a crawler so that it can store enough energy to reach the top of a slope.
- 3 Modifies a crawler to change the direction it moves in.
- 3 Discovers that the stretch of spring is proportional to the weight placed on it.

2 Student understands that sound is produced by vibrating objects and that the pitch of the sound can be varied by changing the rate of vibration.
- 3 Identifies that sound travels through string as a vibration by using a string telephone.
- 1 Identifies that sound travels as a vibration by speaking into a balloon.
- 1 Observes the relationship between length of rubber band and pitch of sound made by a stringed instrument.
- 3 Observes the relationship between length of tube and pitch of sound made by a wind instrument.
- 3 Observes the relationship between volume of air and pitch of sound made by a percussion instrument.

3 Student knows that light travels in a straight line until it strikes an object and that it can be reflected by a mirror, refracted by a lens, or absorbed by the object.
- 3 Identifies objects around the classroom that are light sources.
- 2 Determines if objects are transparent or opaque using a light ray box.
- 3 Observes that images are reversed when reflected in a mirror.
- 3 Identifies how shadows are formed and how they change depending on their distance from a light source.
- 2 Uses lenses to bend light rays.
- 3 Observes the mixing of colored light to make other colors, including the making of white light.

2 Student understands that heat can be produced in many ways, such as burning rubbing, or mixing one substance with another.
- 3 Observes the force of friction.
- 3 Compares the heat loss in different materials using graphs.
- 1 Measures temperature using thermometers.
- 3 Uses graphs to plot the change of temperature over periods of time.
- 1 Describes the changes that occur in different materials when they are heated.

1 Student understands that heat can move from one object to another by conduction.
- 1
- 1 Identifies the use of insulating domestic water pipes against cold.

1 Student understands that electricity in circuits can produce light, heat, sound, and magnetic effects.
- 2 Determines if materials are electrical conductors or electrical insulators using a simple lamp circuit.
- 1 Uses components, like lamps and buzzers, to discover that electrical energy can be changed into different energies.
- 2 Interprets electrical diagrams to predict the behavior of electrical components connected in series.
- 1 Interprets electrical diagrams to predict the behavior of electrical components connected in parallel.
- 1 Uses a solar panel to generate electricity in a circuit.
- 1 Uses a bar magnet and an electromagnet to find the differences and similarities between them.
- 3 Increases the strength of an electromagnet.

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1 Student understands that electrical circuits require a complete loop through which an electrical current can pass.
- 1 Discovers that electricity cannot flow unless a circuit is complete.
- 2 Discovers how electricity flows in series and parallel circuits.

2 Student knows that magnets attract and repel each other and certain kinds of other materials.
- 3 Determines which materials stick to a magnet.
- 3 Discovers that materials containing iron stick to magnets.
- 3 Observes the magnetic attraction and repulsion forces between the poles of magnets.
- 1 Uses a bar magnet and an electromagnet to find the differences and similarities between them.
- 3 Increases the strength of an electromagnet.

2 Student understands that animal organisms have basic needs, air, water, and food.
- 1 Identifies the nutrients contained in different foods.
- 2 States the energy transfer that occurs between plants to animals and animals to animals in food chains.
- 3 Uses a checklist of the seven life processes to identify if things are living or not living.

2 Student understands that plant organisms have basic needs, air, water, nutrients, and light.
- 2 Observes the growth of a plant when grown under different watering conditions.
- 3 Observes the growth of a plant when grown under different temperature conditions.
- 3 Discovers the effects that sunlight and water have on the growth of plants.
- 1 Determines the nutrients that plants need to grow.
- 3 Observes the effects of tap water, salt water and fertilizer on the growth of plants in a nine day period.

2 Student understands that organisms can survive only in environments where their needs can be met, that the world has many different environments and that distinct environments support the life of different types of organisms.
- 3 Discovers the characteristics of animals that allow them to survive in their natural habitats.
- 2 Discovers the habitats of different animals.

2 Student understands that each plant or animal has different structures that serve different functions in growth, survival, and reproduction.
- 1 Investigates the bones of the human body.
- 1 Investigates the joints of the human body.
- 3 Uses a microscope to view the cells of plants.

3 Student understands that the behavior of individual organisms is influenced by internal and external cues.
- 3 Discovers the characteristics of animals that allow them to survive in their natural habitats.

1 Student knows that humans and other organisms have senses that help them detect internal and external cues.
- 1 Uses software to find what parts of the human body give each of the five senses.
- 2 Specifies what senses can be used to identify different things.

2 Student knows that plants and animals have life cycles that include being born, developing into adults, reproducing, and eventually dying, and that the details of this life cycle are different for different organisms.
- 1 Using software, discovers the different stages of the human life cycle.
- 1 Using software, discovers the different stages in the life cycle of butterflies and frogs.
- 3 Uses a board-game to discover the stages in the life cycle of a plant.
- 3 Uses software to discover methods of seeds dispersal from different plants.

- Student understands that plants and animals closely resemble their parents.

2 Student understands that while many characteristics of an organism are inherited from the parents, others are 'learned' from the environment and are not passed on to the next generation.
- 3 Discovers the characteristics of animals that allow them to survive in their natural habitats.
- 2 Uses classification keys to sort animals.
- 2 Creates questions in a classification key to sort a group of farmyard animals.

3 Student knows that all animals depend on plants, that some animals eat plants for food and others eat those animals.
- 2 States the energy transfer that occurs between plants to animals and animals to animals in food chains.
- 3 Identifies the producers primary consumers and secondary consumers in food chains.
- 3 Classifies animals as carnivores, herbivores or omnivores.

3 Student understands that an organisms pattern of behavior are related to the nature of that organisms environment.
- 3 Discovers the characteristics of animals that allow them to survive in their natural habitats.

- Student understands that when an environment changes some plants survive and reproduce, and others die or move to new locations.

3 Student understands that all organisms cause changes in the environment where they live, some of the changes are detrimental and others are beneficial.
- 3 Discovers some of the causes of global warming.
- 3 Identifies what effect pollution can have on rivers and ponds.
- 3 Describes different forms of climate control used to grow plants.

- Student understands that humans depend upon their natural and constructed habitats.

2 Student understands that humans change environments in ways that can be either beneficial or detrimental for themselves and other organisms.
- 3 Identifies what effect pollution can have on rivers and ponds.
- 3 Discovers some of the causes of global warming.
- 2 Explores the effects of global warming and alternative energy sources.

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2 Student understands that earth materials are solid rocks and soils, water, and the gases of the atmosphere.
- 3 Identifies how fossil fuels are made and where they come from.
- 2 Describes the different conditions for the formation of various rocks.
- 3 Sorts rocks into sedimentary, metamorphic and igneous rock types.

2 Student understands that the varied earth materials have different physical and chemical properties which make them useful in different ways.
- 3 Identifies what fossils fuels can be used for.
- 3 Separates mixtures using a sieve.
- 1 Tests if materials are soluble or insoluble.
- 1 Identifies where different natural materials come from.
- 2 Identifies what natural materials have been used to make a series of sample objects.

3 Students know that soils have properties of color and texture, capacity to retain water, and ability to support the growth of many kinds of plants.
- 3 Discovers the effects that sunlight and water have on the growth of plants.
- 3 Observes the effects of tap water, salt water and fertilizer on the growth of plants in a nine day period.

3 Students know that fossils provide evidence about the plants and animals that lived long ago.
- 3 Uses a virtual excavation to find different fossils.
- 3 Uses software to find out how different types of fossils are formed.

2 Students understand that the sun, moon, stars, clouds, birds, and airplanes all have properties, locations, and movements that can be observed and described.
- 3 Uses software to find out why there is day and night.
- 3 Uses a shadow trainer to find out why shadows change shape during the day.
- 2 Uses software to discover facts about the Moon and its relation to the Earth.
- 2 States the position of the planets in the solar system.
- 3 States the necessary conditions for the formation of clouds and precipitation.

2 Student knows that the sun provides the light and heat necessary to maintain the temperature of the earth.
- 2 States the effects that the Sun has on the light levels on the planets of the solar system.
- 3 Observes the effect that distance has on light levels.

- Student understands that the surface of the earth changes, some changes due to slow processes and some due to rapid processes such as landslides, volcanoes, and earthquakes.

2 Student understands that weather changes from day to day over the seasons.
- 3 Observes the weather during different seasons in a virtual representation of New York.
- 1 Uses a software simulation to find out how seasons are linked to the position of the Earth in relation to the Sun.

1 Student can describe weather by measurable quantities such as temperature, wind direction, and speed, and precipitation.
- 1 Discovers symbols that are used to represent the weather.
- 2 Uses a virtual weather station to record temperature and rainfall.

2 Student understands that objects in the sky such as the sun and the moon have patterns of movement.
- 2 States the position of the planets in the solar system.
- 3 Recognizes planets in the solar system.
- 2 Uses software to discover facts about the Moon and its relation to the Earth.
- 2 Uses software to discover the different phases of the Moon.
- 3 Uses software to find out why there is day and night.
- 3 Uses a shadow trainer to find out why shadows change shape during the day.

2 Student understands and can take part in the problem solving process.
- 3 Finds the effects of giving a crawler more energy.
- 3 Modifies a crawler so that it can store enough energy to reach the top of a slope.
- 3 Modifies a crawler to change the direction it moves in.
- 1 Discovers the uses of a windlass.
- 1 Constructs a windlass to observe that a gear will increase the amount of lift for each turn of its handle.
- 2 Uses different supports to make a bridge stronger.
- 3 Constructs a bridge to span a gap.
- 1 Observes the weakness of a beam bridge.

- Student can work and interact with others in a team.
- - Debates issues that relate to physical science.
- - Critiques written and oral explanations of a physical science.
- - Debates issues that relate to physical science.
- - Critiques written and oral explanations of a physical science.
- - Debates issues that relate to life science.
- - Critiques written and oral explanations of a life science.
- - Debates issues that relate to Earth and space science.
- - Critiques written and oral explanations of an Earth and space science.

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1 **Student can distinguish between objects that occur in nature and others designed and made by people.**
- 1 Identifies where different natural materials come from.
- 2 Identifies what natural materials have been used to make a series of sample objects.

- **Student understands safety rules for home and school, preventing abuse and neglect, avoiding injury, knowing whom to ask for help, and when and how to say no.**

3 **Student understands that individuals have some responsibility for their own health.**
- 2 Discovers the relationship between heartbeat and pulse.
- 3 Determines the effect of exercise on heart rate.

2 **Student knows that nutrition is essential to health.**
- 1 Identifies the nutrients contained in different foods.
- 3 Discovers the food groups necessary for a healthy balanced diet.

- **Student knows that different substances such as tobacco, alcohol, and drugs, can damage the body and how it functions.**
- **Student understands that human populations include groups of individuals living in a particular location.**
- **Student knows that the size of a human population can increase or decrease.**

1 **Student understands that resources are things we get from the living and non-living environment to meet the wants and needs of a population.**
- 1 Identifies renewable and non-renewable energy sources.

3 **Student understands that some resources are basic materials, some are produced from basic resources, and some resources are non-material.**
- 3 Identifies how fossil fuels are made and where they come from.
- 3 Identifies what fossils fuels can be used for.

3 **Student understands that the supply of many resources is limited. but can be extended by recycling and decreased use.**
- 3 Identifies how different materials can be recycled.
- 3 Uses a simple classification key to sort three different types of metal.

2 **Student understands that changes in the environment can be natural or influenced but humans and that pollution is a change in the environment that can influence the health, survival, or activities of organisms.**
- 3 Identifies what effect pollution can have on rivers and ponds.
- 3 Discovers some of the causes of global warming.
- 1 Explores the effects of global warming and alternative energy sources.

2 **Student understands that people continue inventing new ways of doing things, solving problems, and getting work done.**
- 1 Uses a solar panel to generate electricity in a circuit.
- 2 Uses a lever to balance weights.
- 3 Modifies a crawler so that it can store enough energy to reach the top of a slope.
- 3 Modifies a crawler to change the direction it moves in.
- 1 Discovers the uses of a windlass.
- 1 Constructs a windlass to observe that a gear will increase the amount of lift for each turn of its handle.
- 3 Constructs a bridge to span a gap.

2 **Student understands that science and technology have greatly improved food, transportation, health, sanitation, and communication.**
- 3 Uses wing flaps and rudders to control the direction of airplanes in the air.
- 1 Changes the size and shape of a wing of a model airplane to see the effect in the lift given.
- 2 Changes the balance of a model airplane to see the effect on flight.
- 3 Sends messages using radio waves.
- 1 Sends messages using light signals.
- 3 Sends messages using coded signals.