

Ledyard Public Schools

Grade 1 Science Curriculum

Unit of Study: LIFE

Suggested Time: 10 weeks

Content Standard 2.2 Plants change their forms as part of their life cycles.

- The life cycles of flowering plants include seed germination, growth, flowering, pollination and seed dispersal.

Essential Questions: How do plants grow?

Focus Question #1 What is the life cycle of a flowering plant?

Expected performances (A19) The student will be able to:

- a. describe the parts of a plant (seed, root, stem, leaf, flower) and tell the function of each part.
- b. observe and record the appearance of plants in different stages of their life cycle.
- c. describe the life cycle of a flowering plant (i.e. seed germination, growth, flowering, pollination, and seed dispersal).

Focus Question #2: How do light and water affect plant growth?

Expected performances (A20) The student will be able to:

- a. explore and describe the effects of light and water on seed germination and plant growth.

Teacher note: *Several informational texts on this topic are available for classroom use (see student resource list.)*

Required Activities:

Engage: Using a magnifier, students examine a variety of small objects and describe and sort them according to their properties. Students fill in a chart with description of characteristics (see *Delta Science Module From Seed to Plant*, Activity 1.)

1. Students plant both a class garden and individual planter cups and observe and record the growth of several kinds of plants through drawings and sentences (see *Delta Science Module From Seed to Plant*, Activity 2.) (A19a)
2. Students examine and compare dry seeds and those that have been soaked and learn the function of each seed part by reading informational text (see *Delta Science Module From Seed to Plant*, Activity 3.) (A19a)

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3. Students examine sprouted seeds and observe and document, through drawings and labels, the development of roots and shoots (see *Delta Science Module From Seed to Plant*, Activity 4.) (A19a,b)
4. After setting up two kinds of sprouting containers, students observe the roots and shoots. They document progress using drawings and sentences (see *Delta Science Module From Seed to Plant*, Activity 5.) (A19a,b)
5. Students document the direction of root growth and set up an experiment to try and make the roots grow upward (see *Delta Science Module From Seed to Plant*, Activity 6.) (A19b)
6. Students measure and record growth of their plants over time and compare the rates of growth of various types of plants (see *Delta Science Module From Seed to Plant*, Activity 7.) (A19b)
7. Students water their plants according to different watering schedules, compare their plant's responses, and draw conclusions about how much water plants need (see *Delta Science Module From Seed to Plant*, Activity 8.) (A20a)
8. Students examine plant stems and leaves and discuss their function (see *Delta Science Module From Seed to Plant*, Activities 9 and 10.) (A19a)
9. Students observe and document through drawings and written sentences, the response of plants to sunlight and discuss why plants need sunlight (see *Delta Science Module From Seed to Plant*, Activity 11.) (A20a)
10. Students examine exposed roots of several plants and compare them to the roots of sprouting plants (see *Delta Science Module From Seed to Plant*, Activity 12.) (A19a)
11. Students diagram the complete life cycle of a pea plant (see *Delta Science Module From Seed to Plant*, Activity 13.) (A19a, b)

Teacher note: Information on seed dispersal and pollination can be found in informational text resources, such as *DSR From Seed to Plant*, *Seeds Get Around* by Nancy White etc.

Assessment:

1. Students draw and label the parts of a plant (seed, root, stem, leaf, flower) and write a sentence telling the purpose of each part. (A19a)

Teacher note: This assessment may be done on the computer (see appendix for template on CD.)

2. Students order the stages in the life cycle of a sunflower plant (see Delta Teachers Guide pg. 113 for directions, and appendix for Assessment Activity Sheet 1 Part A and Part B.) (A19b, c)

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3. Students identify the effects of watering a plant too little, too much and the right amount by matching a watering schedule to pictures of plants (see Delta Teachers Guide pg. 114 for directions, and appendix for Assessment Activity Sheet 2, Part A, Question #2.) (A20a)
4. Students illustrate what happens to a plant left next to a directional light source (see Delta Teachers Guide p.114 for directions and appendix for Assessment Activity Sheet 2, Part B, Question #4) (A20a)

Teacher note: Questions #2 and #4 appear on one page in the appendix for your convenience. However, you may use the complete Assessment Activity Sheet 2, Parts A and B if you wish.

Optional Activities:

1. Students discuss what plants need to grow and plant a marigold seed to take home.
Delta Science Module From Seed to Plant, Activity 14

Vocabulary to Highlight

flower – part of some plants that makes seeds

leaf – part of a plant that makes food

life cycle – changes a plant goes through during its life

pollination – transfer of pollen in a flower

root – part of a plant that helps it stand up and takes in water and nutrients from the soil

seed – part of a plant that grows to be a new plant

seed dispersal - ways seeds travel

seedling – a young plant

sprout – to start to grow

stem – the part of a plant that brings water through the plant

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Resources Needed:

- Student:** Plantworks by Rhonda Howie
A Dandelion's Life by John Himmelman
From Seed to Pumpkin by Jan Kottke
The Mountain that Loved a Bird by A. McLerran
Seeds Get Around by Nancy White
Sprout and Grow window by Educational Insights
- From Seed to Sunflower by G. Legg
The Reason for a Flower by Ruth Heller
The Tiny Seed by Eric Carle
From Seed to Plant Delta Science Reader
- Teacher:** Delta Science Module *From Seed to Plant* kit and teacher guide
Classroom Plants Delta Science Reader
Video: *Where do plants come from?*
- Internet:** <http://www.urbanext.uiuc.edu/gpe/> site for lesson plans, background information, extensions, and resources

Content Standard 2.3 Earth materials have varied physical properties which make them useful in different ways.

- Soils can be described by their color, texture and capacity to retain water.
- Soils support the growth of many kinds of plants, including those in our food supply.

Essential Questions: How are Earth's materials (i.e. soil) useful?

Focus Question #1 What are the properties of soil?

Expected performances (A21) The student will be able to:

- a. describe the properties of soil (such as color, texture, and capacity to retain water).
- b. sort soils by properties such as particle size, color, and composition. [Math: AR1.1 a1]

Focus Question #2: How do the properties of soil affect plant growth?

Expected performances (A22) The student will be able to:

- a. relate the properties of soil types (e.g., particle size, color, composition) to their ability to retain water and support the growth of plants.
- b. explain the importance of soil in growing plants, including those in our food supply.

Required Activities:

1. Students sort and compare different soils by properties, including particle size, color and texture. Students draw, label, and use words to describe these properties (see *Little Scientists Sand and Soil Unit*. Activities 1.1, 1.2, 1.3) (A21a, b)
2. Students learn where sand comes from by simulating weathering. They compare and contrast the materials before and after the simulation (see *Little Scientists Sand and Soil Unit*. Activity 1.4) (A21a)
3. Students relate the properties of different soil types and their ability to support the growth of certain plants. Students graph plant growth and record observations in their science notebooks (see *Little Scientists Sand and Soil Unit*. Activities 2.1, 2.2, 2.3, 2.4, 2.5) (A22b)

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4. Students use magnifying glasses to observe the size of holes in several materials. They then conduct an investigation to see which types of soil absorb water and which types let water pass through. Students record information in their science notebook (see *Little Scientists Sand and Soil Unit: Activities 3.1, 3.2, 3.3*) (A22a)
5. By building with sand and clay, students explain why different types of soil allow us to build different things. Students provide a written response to the essential question, How is soil useful? (see *Little Scientists Sand and Soil Unit: Activities 4.1,4.2*)

Teacher note: Several informational texts on this topic are available for classroom use (see appendix for literacy/numeracy suggestions for each book.)

Assessment:

Given pictures, students answer selected response questions about soil. Given a bar graph, students analyze data and chose the soil which allows for the growth of the tallest plants, responding in writing to justify their selection to questions 5 and 9. (See Sand or Soil Written Assessment , Little Scientist Teachers Manual pages 32-33. This assessment also appears in the appendix.)

Teacher note: The teacher will read questions to students. The students will circle the correct selected response and complete the written response.

Written response to the essential question, How is soil useful? (see #5 above.)

Optional Activities:

1. Students use a variety of materials to create their own special stone (see *Little Scientists Sand and Soil Unit: Activity 4.3*)

Vocabulary to Highlight

Clay – a type of soil formed by very fine grains of weathered rock.

Gravel – small, rough edged stones

Humus - dried bits of plants and other living things

Porous – relating to the number of pores (small holes) in a material through which liquid may pass.

Sand – a part of soil that comes from rock and other things broken into small grains

Silt – very fine gritty particles of rock found along riverbanks

Soil – small particles of rock

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Resources Needed:

- Student:** Soil by Robin Nelson
Looking at Soil by Judith Rosenbaum
Diary of a Worm by D. Cronin
An Earthworm's Life by John Himmelman
What is Soil? by Ellen Ungaro
Worm Vue Wonders by S&R Science Supplies
- Teacher:** *Little Scientists Sand or Soil Kit* and teachers manual
Soil Science (Delta Science Reader)
- Internet:** <http://www.urbanext.uiuc.edu/gpe/> site for lesson plans, background information, extensions, and resources
<http://school.discovery.com/schooladventures/soil/> site for lesson plans K-5 and background information
<http://yucky.discovery.com/noflash/worm/pg000103.html> site about worms, includes videos

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Unit of Study: SCIENCE AND TECHNOLOGY IN SOCIETY

Suggested Time: 6 Weeks

Content Standard (1.4) The properties of materials and organisms can be described more accurately through the use of standard measuring units.

- Various tools can be used to measure, describe and compare different objects and organisms.

Essential Question: How can we use tools to compare objects and organisms?

Focus Question #1: How do we use tools to measure objects and organisms?

Focus Question #2: How do we use tools to describe objects and organisms?

Expected performances (A17) The students will be able to:

- estimate the size and weight of different objects and organisms using standard and non-standard measurements. [Math: GM3.3 b2, c1]
- use standard and non-standard tools (e.g. balances and rulers) to quantify properties of objects and organisms (such as size and weight). [Math: GM3.3 b2, c1]
- compare the size and weight of different objects and organisms using estimation and measurement skills. [Math: GM3.3b2, c1]

Required Activities:

Teacher note: This unit will be taught in conjunction with the mathematics unit on measurement. Several informational texts on this topic are available for classroom use (see appendix for literacy/numeracy suggestions for each book.)

Measuring/Comparing Activities

- Teacher reads *How Big is a Foot* and facilitates a discussion about **non-standard** measurement and tools that can be used to measure real-life objects from the classroom. Using tools such as foam feet, paper clips, hands, links, construction paper hands/feet and unifix cubes, students estimate and measure classroom objects. Students record data in table format and analyze the results. They then compare their data. (A17a)
- Teacher reads *Inch by Inch* and facilitates a discussion about tools used for **standard** measurement (rulers, measuring cups, inchworm stamps, meter sticks and scales). Students use a physical referent (such as the length of their thumb) to estimate, then measure classroom objects in inches. They record data in chart form and analyze the results. They then compare their data. (A17b)

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- Using different size containers (small, short, fat, tall, skinny, narrow. etc.) students estimate the number of cups of rice that would fill the container. After estimating, students fill containers with the rice and record the number of cups.
Variation: use different size objects, such as beans, pom-poms, etc. to fill the same containers. Students then compare their data.

Weighing/Comparing Activities

- Teacher reads _____. Students estimate then weigh classroom objects using a balance. They record data in chart form and analyze the results. They then compare their data. (A17b)
- Students use a balance and a scale and discuss the similarities and differences. The teacher models weighing an object on a scale and explains how to read the weight. Students place an empty container on the scale and fill the container with rice to equal one pound. Students count and record the number of scoops that it takes to equal one pound. Students choose objects around the room that are about one pound in weight. Using terminology a little more than/a little less than one pound, they sort and compare their results. (A17b)

Assessment:

- Using a non-standard measure (paper clip) students estimate length, record their estimate, and measure length using the clip. (A17a, b)
(see Math Assessment items 15.3, 23.3, which can also be found in the appendix.)
- Using pictures of objects on a balance, students circle the one which weighs more. Using pictures of containers, students circle the one that can hold the most milk. (A17c)
(see Math Assessment item 16.3, which can also be found in the appendix.)

Optional Activities:

Measurement activities in *Growing with Mathematics*

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Vocabulary

Balance – tool used to find the mass of an object

Compare – showing how things are alike

Estimate – a number close to an exact amount

Equal – the same amount

Least – the smallest amount

Length – a measure of how long something is

Less than – a smaller amount

More than – a greater amount

Most – nearly all

Scale – tool used to find the weight of an object

Weigh – a measure of how heavy something is

Resources Needed:

Student:

Being a Scientist BIG book by Nancy White

Measuring Up BIG book

A World of Tools BIG book

How Big is a Foot? By R. Myller

Inch by Inch BIG book by L.Lionni

Inchworm and a Half by Elinor Pinczes

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Tools:

English/metric tape measures

Inchworm and centibug rulers

Primary balance scales

Foam Foot Measurement feet

Platform scale 11lbs.

Teacher Resources:

Internet Resources:

www.illuminations.nctm.org – lesson plans, student activities

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Unit of Study: PHYSICAL

Suggested Time: 4 Weeks

Content Standard 1.1 The sun appears to move across the sky in the same way every day, but its path changes gradually over the seasons.

- An object's position can be described by locating it relative to another object or the background.
- An object's motion can be described by tracing and measuring its position over time.

Essential Question: What makes objects move the way they do?

Focus Question #1: How can we describe an object's position?

Focus Question #2: How can we change the position of an object?

Expected performances (A10) The student will be able to:

- a. describe position of objects in relation to another object (e.g., the tree is in front of the wall, the swings are behind the school, the pencil is on the table, etc.)
- b. demonstrate and describe how the motion of objects can be changed by pushing and pulling
- c. demonstrate and explain that the amount of force exerted on an object determines how much the object will move.

Teacher note: This content standard is shared between grades 1 and 2. Grade 2 will address the movement of the sun and changes in the length of shadows.

Required Activities:

Teacher note: Several informational texts on this topic are available for classroom use (see appendix for literacy/numeracy suggestions for each book.)

1. Students use a Venn diagram to sort and classify the force of movement (pushes and pulls. See "Force Families" *Lakeshore Force and Motion Tub.*) (A10b)
2. Teacher reads *Rosie's Walk*, focusing students' attention on the positional words: across, around, over, past, through, under. Students act out *Rosie's Walk*. (A10a)
3. Students rewrite Rosie's walk using different positional words (such as above, below, inside, outside, right, left, before, after, between). This may be done individually or as a class book. (A10a)

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4. Students brainstorm a list of all the ways they push and pull as they play. Students draw a picture of a sport they play and write a few sentences to go with the picture explaining how push and pull forces are used (see “Sport Spotlight” *Lakeshore Force and Motion Tub.*) (A10b,c)
5. Using picture cards (from *Lakeshore Force and Motion Tub*), students discuss or act out how they could move the object on the card. (A10b)
6. Students make a connection to jobs done at home and school that requires them to use a force. They choose four jobs, draw a picture and write a sentence to describe the type of force used (see appendix, “Everyday Forces”).)
7. Students explore the amount of force exerted on an object determines how much the object will move by using the internet site <http://classroom.ic-schools.net/sci-units/force.htm#3>, (choose Force and Motion, Grade 1, Pushes and Pulls). (A10a)

Teacher note: *This expected performance may be reinforced and connected to playground activities such as playing games involving balls, swinging, etc. or during PE activities.*

Assessment:

1. Students match pictures to the words push and pull (see appendix “A Full Wagon”).) (A10b)
2. Students demonstrate positional words by placing an object (such as a stuffed animal, unifix cube, toy car...teacher’s choice) in **front** of a table, **behind** a table, **on** a table and **under** a table (see appendix for recording sheet, “Positional Words Assessment”).) (A10a)
3. Given a picture, students will mark where how far the toy will roll given a hard push, and provide justify their response in writing (see appendix “How Far Will It Go?) (A10c)

Optional Activities:

Students match pictures to the words push and pull (see appendix “A New Toy”).)

Students circle the object in each picture that takes more force to move (see appendix “Moving Day”).)

Students create a web to describe how things move (see “Movement Webs” *Lakeshore Force and Motion Tub.*)

Students explore the rules of force and motion (see “Amazing Marbles” *Lakeshore Force and Motion Tub.*)

Students explore how force can start, stop or change the direction of an object (see “Direction Discovery” *Lakeshore Force and Motion Tub.*)

Students role-play the movement of objects (see “Motion Charades” *Lakeshore Force and Motion Tub.*)

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Teacher note: Any other activities found in the Lakeshore Force and Motion Tub would be appropriate as optional activities.

Vocabulary

Force – a push or a pull

Motion – a change in the position of an object

Push – a force that moves things away from you

Pull – a force that moves things towards you

Resources Needed

Student:

Rosie's Walk BIG book by Pat Hutchins

Make Things Move! By Emily Rothschild

Push It Pull It by Bernardo Lopez

Fast or Slow by B. Lopez

Back and Forth by P. Murphy

Inside, Outside, Upside Down by Stan Berenstain

Push and Pull by Patricia Murphy

Up and Down by P. Murphy

What is Mass? By Don Curry

Teacher: *Lakeshore Force and Motion Tub*

Internet: <http://classroom.jc-schools.net/sci-units/force.htm#3>

Curriculum Alignment with CT Standards for Scientific Inquiry, Literacy and Numeracy

GRADES 1 PHYSICAL

Expected Performances		Required Activities					
		Force Families	Rosie's Walk – Read / Rewrite	Sport Spotlight	Connect Object to Movement	Everyday Forces	Greater Force, Greater Movement
AINQ. 1	Make observations and ask questions about objects, organisms and the environment.	X	X	X	X	X	X
AINQ. 2	Use senses and simple measuring tools to collect data.						
AINQ. 3	Make predictions based on observed patterns.						X
AINQ. 4	Read, write, listen and speak about observations of the natural world.	X	X	X		X	
AINQ. 5	Seek information in books, magazines and pictures.		X				X
AINQ. 6	Present information in words and drawings.	X	X	X		X	
AINQ. 7	Use standard tools to measure and describe physical properties such as weight, length and temperature.						
AINQ. 8	Use nonstandard measures to estimate and compare the sizes of objects.						
AINQ. 9	Count, order and sort objects by their properties.						
AINQ. 10	Represent information in bar graphs.						

Curriculum Alignment with CT Standards for Scientific Inquiry, Literacy and Numeracy

GRADES 1 EARTH

Expected Performances		Required Activities				
		Activities 1.1 – 1.3	Activity 1.4	Activities 2.1 – 2.5	Activities 3.1 – 3.3	Activities 4.1 – 4.2
AINQ. 1	Make observations and ask questions about objects, organisms and the environment.	X	X	X	X	X
AINQ. 2	Use senses and simple measuring tools to collect data.	X		X		
AINQ. 3	Make predictions based on observed patterns.					X
AINQ. 4	Read, write, listen and speak about observations of the natural world.		X	X	X	X
AINQ. 5	Seek information in books, magazines and pictures.					X
AINQ. 6	Present information in words and drawings.	X	X	X	X	
AINQ. 7	Use standard tools to measure and describe physical properties such as weight, length and temperature.			X		
AINQ. 8	Use nonstandard measures to estimate and compare the sizes of objects.					
AINQ. 9	Count, order and sort objects by their properties.	X				
AINQ. 10	Represent information in bar graphs.			X		

Curriculum Alignment with CT Standards for Scientific Inquiry, Literacy and Numeracy

GRADES 1 LIFE

Expected Performances		Required Activities						
		Activity 2 Activity 3	Activity 4 Activity 5	Activity 6 Activity 7	Activity 8	Activities 9 and 10	Activity 11 Activity 12	
AINQ. 1	Make observations and ask questions about objects, organisms and the environment.	X X	X X	X X	X	X	X X	
AINQ. 2	Use senses and simple measuring tools to collect data.	X				X		
AINQ. 3	Make predictions based on observed patterns.	X		X X				
AINQ. 4	Read, write, listen and speak about observations of the natural world.	X X	X X				X	
AINQ. 5	Seek information in books, magazines and pictures.		X			X		
AINQ. 6	Present information in words and drawings.	X	X X	X X		X	X	
AINQ. 7	Use standard tools to measure and describe physical properties such as weight, length and temperature.			X	X			
AINQ. 8	Use nonstandard measures to estimate and compare the sizes of objects.							
AINQ. 9	Count, order and sort objects by their properties.							
AINQ. 10	Represent information in bar graphs.			X				

Curriculum Alignment with CT Standards for Scientific Inquiry, Literacy and Numeracy

GRADES 1 STS

Expected Performances		Required Activities	Non-Standard Activities	Standard Meas. Activities	Estimation of Volume	Use of Balance	Balance vs. Scale
AINQ. 1	Make observations and ask questions about objects, organisms and the environment.						
AINQ. 2	Use senses and simple measuring tools to collect data.					X	X
AINQ. 3	Make predictions based on observed patterns.						
AINQ. 4	Read, write, listen and speak about observations of the natural world.						
AINQ. 5	Seek information in books, magazines and pictures.						
AINQ. 6	Present information in words and drawings.						
AINQ. 7	Use standard tools to measure and describe physical properties such as weight, length and temperature.			X		X	X
AINQ. 8	Use nonstandard measures to estimate and compare the sizes of objects.		X		X	X	
AINQ. 9	Count, order and sort objects by their properties.						X
AINQ. 10	Represent information in bar graphs.						