Written Overview:

The purpose of the Green Thumbs and Dirty Fingernails unit is to provide second grade students with an opportunity to learn about plants - including plant parts, plant needs, and plant characteristics. Throughout the unit, students will be expected to obtain new knowledge of plants from their science texts; but many hands-on opportunities (including labs) will also be provided to make this unit a "real-world" experience. The use of technology will also be implemented as students are asked to observe plant growth, and then record their observations using a pre-formatted spreadsheet template. Maybe the most exciting project for students, however, will be the opportunity to plant and care for their own mini-garden. After completing this unit, students will have acquired a new sense of respect for the plant world and should realize that they play an important role in keeping our earth healthy and green!

Planning Guide

Creating Learner-Focused
Schools

LU Title: Green Thumbs and Dirty Fingernails

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Grade Level: Second Grade

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Subject Area: Science

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CONTENT KNOWLEDGE

Declarative

- Conclude that each seed plant produces its own kind of seed
- Conclude that a tree is a seed plant and produces seeds
- Identify each part of a seed
- Identify the leaves, stem and roots of a

Procedural

- Compare/Contrast seed coats
- Classify seeds according to fruits, vegetables, trees, and flowering plants and organize it in a spreadsheet
- Hypothesize the kind of plant that will be produced by planting a certain kind of seed
- Compare flowers of different green plants

plant

- Describe the changes a plant undergoes as it grows
- Describe and list elements needed within an environment for seed to germinate and grow
- Identify the part of a green plant called the flower
- Identify different kinds of fruit
- Create a "Forest In A Jar" and describe the stages of "succession" using a word-processing template
- Design a garden, using computer software, and then plant a garden that would support the growth of plants in the proper climate zone

ESSENTIAL QUESTIONS

- If given your own planet to live on, what plants would you take with you and why?
- What are the changes a plant undergoes during its growth cycle (from seed to adult)?
- What environmental conditions would encourage or inhibit the growth of plants?
- What plants would survive and flourish in a garden in your climate zone?

INITIATING ACTIVITY

*Students will take a walk through the forest (or take a "virtual" journey using a software program) to explore plant life within an ecosystem.

*Brainstorm and type a list of all the plants students are familiar with.

*Type a written response to the question: If given your own planet to live on, what types of plants would you bring along and why?

Connection to State Learning Standards

Content Area: Math, Science and Technology

Level: Primary

Benchmarks: MST1 SI 1 - (1) Ask "why" questions in attempts to seek greater understanding. MST1 ED 1 - (2) Identify simple		**Benchmarks: MST2 IS 1 - (1) Know basic distinctions among computer software, such as word processors, special purpose**

problems and solutions. MST1 ED1 - (4) Plan and build, under supervision, a model of the solution using familiar materials, processes and hand tools.		**programs, and games. MST2 IS 1 - (3) Access needed information from printed media, electronic databases, and community resources.**

Standard: MST1 Analysis, Inquiry, and Design - The student will use mathematical analysis, scientific inquiry, engineering design, as appropriate, to pose questions, seek answers, and develop solutions.		**Standard: MST 2 Information Systems- Students will access, generate, process, and transfer information using appropriate technologies.**

Unit Theme:

Plant Life

Standard: MST 4 - Science - Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment.		**Standard: MST 5 - Technology - Students will apply technological knowledge and skills to design, construct, use and evaluate products and systems to satisfy human and environmental needs.**

Benchmarks: MST4 (3) Know that plants and animals have features that help them live in different environments. (4) Describe the major stages in the life cycles of selected plants and animals. (6) Know that plants and animals need certain resources for energy and growth.		**Benchmarks: MST5 (3) Identify basic computer hardware. Use the computer as a tool for generating and drawing ideas.**

Learning Experiences

Declarative Knowledge

What declarative knowledge should e in the process of acquiring & integrating? As a result of the unit, the student will know or understand…	What experiences or activities will be used to help students acquire & integrate this knowledge?	What strategies will be used to help students construct meaning, organize and/or store the knowledge?	Describe what will be done.

Initiating Activities: -that plants are a vital part of our environment Activity 1: -that each seed plant produces its own kind of seed -conclude that a tree is a seed plant and produces seeds -how to identify the kind of plant that will be produced by planting a certain kind of seed Activity 2: -the parts of a seed (Vocabulary: seed coat, roots, stem, leaves) -the changes a plant undergoes as it grows -how to identify the leaves, stem and roots of a plant Activity 3: -identify the part of a green plant called the flower (Vocabulary: flower, fruit) -identify different kinds of fruit Activity 4: -describe and list elements within an environment that are needed for a seed to germinate	-nature/plant walk -exploration of a "virtual" ecosystem through use of computer software -textbook [see above] [see above] -textbooks -Movie: "The Magic School Bus Goes To Seed" -observation -textbooks -research encyclopedia -textbooks -observation -textbook -homework/field trip to the grocery store with parent -word-processing -observation -spreadsheet	-brainstorming -K-W-L -sharing -wait-time extended [see above] [see above] -pair and share -oral discussion -journal writing -chart paper -bulletin board game -compile an alphabetical list of flowering plants -research three fruits found in the grocery store by using an online encyclopedia (i.e.-Encarta) -After performing a class lab (see Procedural Knowledge) students will pair-and-share, then type the results on a spreadsheet template.	Students will observe plants in a natural setting. Upon completing observations, student groups will brainstorm and type a list of plants they know. Groups will then type a list of things they want to know about plants. (Upon completion of the unit, students will return and complete the "Learned" portion of the K-W-L). Students will read a selection from their textbook and summarize/share the learned knowledge with a partner. [see above] Students will fill in a spreadsheet template that lists similar characteristics of plants. Students will draw a diagram of the seed (and label parts). Students will observe and discuss changes seen from the "seed in water" experience; then, record a reflective description of the growth process. Students will label parts of a plant through the use of different media. Students will each be given a volume of any encyclopedia. They must find the name of one flowering plant found in that volume.

			Students will be given one week to visit a grocery store with a parent. After finding and choosing three fruits, students will research and type a brief, two-sentence report on each individual fruit. Students will complete a template, using a number key, which rates the development of the seeds in each environment.

Learning Experiences

Procedural Knowledge

What procedural knowledge will students be in the process of acquiring & integrating? As a result of this unit, students will be able to:	**What will be done to help students construct models, shape & internalize the knowledge?**	**Describe what will be done.**
Activity 1: -identify the kind of plant that will be produced by planting a certain kind of seed Activity 2: -the parts of a seed Activity 3: -compare flowers of different green plants Activity 4: -observe, compare and contrast the effects of different	-matching game -lab experiment -pairs of students Explore 3D Garden Designer CD-ROM and print off pictures of two flowers to be shared -4 types of environments will be created within glass containers: • water, sunlight and soil • water, sunlight (NO soil) • water, soil (NO sun) • sunlight, soil (NO water)	-A variety of seeds will individually be glued to a 3" x 5" index card. Students will then attempt to match their seed card with a picture of the fruit it would produce (i.e.-the picture on the seed packet). When all the seeds have been matched, students may turn the card over to reveal the answer and self-check their matches. -Students will saturate two lima beans in water overnight. The following day, the beans will be carefully dissected and students will observe and locate the seed coat, the stored food, and the young plant.

environments on the rate and success of growth		-Students will be assigned two flowers to find on the CD-ROM and then be asked to share a description of their printout. -Pairs of students will take four glass containers and construct four separate "growing environments". Two seeds will then be placed in each container. After a waiting-period of one week, students will begin recording growth rates on a spreadsheet template. After a full four weeks, a final report will be printed out and shared with the other groups.

Learning Experiences

Extending and Refining

What knowledge will students be extending and refining? Specifically, they will be extending and refining their understanding of…	**What reasoning process will they be using?**	**Describe what will be done.**
Observe, compare and contrast the effects of different environments on the rate and success of growth	• **Comparing** • Classifying • Inductive Reasoning **Deductive Reasoning** • **Error Analysis** • **Analyzing Perspectives** • Constructing Support • Abstracting • **Other:**	Following Activity 4 (under Procedural Knowledge) students will be given a one-week weather forecast/scenario in which they will have to predict the effects of the growth rate in relation to the weather patterns. Students will have to describe, in detail, reasons why the plant would or would not grow.

Planning Guide **Unit:**

Step 1	Step 2	Step 3
What *knowledge* will students be *using meaningfully*? Specifically, they will be demonstrating their understanding of and ability to.....	**What reasoning process will they be using?**	**Describe student's products and performances and the criteria for evaluation.**
	[ ] Decision Making (selecting from seemingly equal alternatives or examining the decisions of others) **[ ] Problem Solving** (seeking to achieve a goal by overcoming constraints or limiting conditions) **[ ] Invention** (creating something to meet a need or improve on a situation) **[ ] Experimental Inquiry** (generating an explanation for a phenomenon and testing the explanation) **[ ] Investigation** (resolving confusions or contradictions related to a historical event, a hypothetical past or future event, or to the defining characteristics of something) **[ ] Systems Analysis** (analyzing the parts of a system and how they interact) **[ ] Other:**	**Products/Performances** **Criteria for evaluation**

Rubric:

Key Questions:

What are the key elements, traits, or dimensions that will be evaluated?

Are the identified elements of equal importance or will they be weighed differently?

	Element #1	Element #2	Element #3
Elements **Scale**	Group Participation	Language Arts	Computer Use
Weights	**25%**	**50%**	**25%**
4	Listens fully to partner's ideas Shares many ideas Uses good cooperation skills	***Capital letters*** are used correctly ***Punctuation*** is used correctly Proper ***grammar*** is used	Demonstrates full knowledge of keyboard Independent usage of software and hardware
3	Mostly listens to partner's ideas Shares some ideas Uses some cooperation skills	***Capital letters*** are used most of the time ***Punctuation*** is used correctly in most cases Proper ***grammar*** is used most of the time	Demonstrates knowledge of most keyboard functions. Operates software and hardware with some assistance
2	Seldom listens to partner's ideas Seldom shares ideas Seldom cooperates with partner	***Capital letters*** are sometimes used correctly ***Punctuation*** is sometimes used correctly Proper ***grammar*** is	Small amount of knowledge regarding keyboard functions Requires much assistance to operate software and hardware

		sometimes used	
1	Does not listen to partner Distracted and/or unwilling to share ideas Exerts no effort to cooperate	***Capital letters*** are rarely used correctly ***Punctuation*** is rarely used correctly Proper ***grammar*** is rarely used	Demonstrates little or no knowledge of keyboard functions Requires constant assistance to operate software and hardware

NOTE: Rubric or other performance assessment instruments may be used.

Constructing a Holistic Scoring Tool (Rubric or Activity Specific Key)

Key Questions:

* How many score points are needed to discriminate among the full range of different *degrees of understanding, proficiency, or quality?*

This response, product, or performance provides evidence of understanding of ***concept/principle/generalization*** or proficiency in ***skill/process/strategy***

Score Point 4	**Score Point 3**
[ ]Listens fully to partner's ideas, shares many ideas, and uses good cooperation skills	**[ ]Mostly listens to partner's ideas, shares some ideas, uses some cooperation skills**
[ ]*Capital letters, punctuation and grammar* are used correctly when writing and typing	**[ ]*Capital letters, punctuation and grammar* is used most of the time**
[ ]Demonstrates full knowledge of keyboard and shows independent usage of software and hardware	**[ ]Demonstrates knowledge of most keyboard functions and operates software and hardware with some assistance**

Score Point 2	Score Point 1
[ ]Seldom listens to partner's ideas, shares very few ideas, seldom cooperates with partner	**[ ]Does not listen to partner, distracted and/or unwilling to share ideas, exerts no effort to cooperate**
[ ]*Capital letters, punctuation and grammar* are sometimes used correctly	**[ ]*Capital letters, punctuation and grammar* rarely used**
[ ]Small amount of knowledge regarding keyboard functions; Requires much assistance to operate software and hardware	**[ ]Demonstrates little or no knowledge of keyboard functions, requires constant assistance to operate software and hardware**

Have You Considered These Yet?

Learn to Learn Skills:

- Be effective communicators.
- Uses appropriate technology.
- Listens effectively.
- Reads with understanding.
- Writes effectively.
- Acts as a responsible citizen.
- Demonstrates responsibility.
- Shows respect for self and others.
- Practices environmental conservation.
- Be perceptive thinkers.
- Applies knowledge from a variety of sources and content areas.
- Develops and applies organizational and problem-solving skills.
- Demonstrates cooperative skills.
- Identifies and supports group goals.
- Initiates ideas.
- Demonstrates the ability to perform different roles in a group.
- Considers different points of view.

Assessment Modifications:

Students who are participating in a Title 1 Reading program will be allowed to read passages from the text with help from the Title 1 teacher (when needed). Students who are having difficulty using the computer for word processing and/or spreadsheets may be provided with an extra "learning session" given by the elementary computer lab teacher.

Unit Schedule/Time Plan:

Implementation of the unit may take 3-4 weeks. Please note, however, that the culminating experience (planting and nurturing a garden) may require extra time due to the varying growth rates of plants. Because of this, educators may wish to start this unit in late winter or very early spring.