

TEACHER'S MANUAL

This Suitcase Program provides the materials and lesson plans for teachers of grades K-2 with content and activities increasing in difficulty by grade level. Activities in this Suitcase Exhibit may assist in meeting the Tennessee State Standards.

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TENNESSEE STATE STANDARDS FOR K-2

K.ETS1.1	Ask and answer questions about the scientific world and gather information using the senses.
K.ETS1.2	Describe objects accurately by drawing and/or labeling pictures.
K.ETS2.1	Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable scientific questions.
1.LS1.1	Recognize the structure of plants (roots, stems, leaves, flowers, fruits) and describe the function of the parts (taking in water and air, producing food, making new plants).
1.LS1.3	Analyze and interpret data from observations to describe how changes in the environment cause plants to respond in different ways.
1.LS2.2	Obtain and communicate information to classify plants by where they grow (water, land) and the plant's physical characteristics.
1.ETS1.1	Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.
1.ETS2.1	Use appropriate tools (magnifying glass, basic balance scale) to make observations and answer testable scientific questions.
2.LS2.1	Develop and use models to compare how animals depend on their surroundings and other living things to meet their needs in the places they live.
2.LS3.1	Use evidence to explain that living things have physical traits inherited from parents and that variations of these traits exist in groups of similar organisms.
2.ESS1.1	Recognize that some of Earth's natural processes are cyclical, while others have a beginning and an end. Some events happen quickly, while others occur slowly over time.
2.ETS2.1	Use appropriate tools to make observations, record data, and refine design ideas.

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY I: Plant Parts

DURATION OF ACTIVITY: 30 minutes

LESSON OBJECTIVES

Students will examine the parts of plants and learn their names and functions.

GUIDING QUESTION

How do the parts of a plant help it survive?

TENNESSEE STATE STANDARDS

- K.ETS1.1 Ask and answer questions about the scientific world and gather information using the senses.
- K.ETS1.2 Describe objects accurately by drawing and/or labeling pictures.
- 1.LS2.2 Obtain and communicate information to classify plants by where they grow (water, land) and the plant's physical characteristics.

MATERIALS INCLUDED

"Parts of a Plant" Floor Puzzle

MATERIALS PROVIDED BY TEACHER

Selection of live plants
Utility knife (teacher only)
Paper
Pencils
Crayons and/or markers

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY II: Flowers

DURATION OF ACTIVITY: 30-45 minutes

LESSON OBJECTIVES

Students will learn the names and functions of the parts of a flower. Students will learn how pollination works. Students will make their own flower models.

GUIDING QUESTION

What parts do flowers have and why?

TENNESSEE STATE STANDARDS

- K.ETS1.1 Ask and answer questions about the scientific world and gather information using the senses.
- K.ETS1.2 Describe objects accurately by drawing and/or labeling pictures.
- 1.LS1.1 Recognize the structure of plants (roots, stems, leaves, flowers, fruits) and describe the function of the parts (taking in water and air, producing food, making new plants).
- 1.LS1.3 Analyze and interpret data from observations to describe how changes in the environment cause plants to respond in different ways.
- 2.LS3.1 Use evidence to explain that living things have physical traits inherited from parents and that variations of these traits exist in groups of similar organisms.
- 2.ESS1.1 Recognize that some of Earth's natural processes are cyclical, while others have a beginning and an end. Some events happen quickly, while others occur slowly over time.

MATERIALS INCLUDED

Botany (Flower) Poster
Flower Model

MATERIALS PROVIDED BY TEACHER

Selection of fresh flowers
Paper (construction and/or white)
Scissors
Crayons and/or markers
Double-stick tape
Clear tape
"Tacky" glue
Pipe cleaners (large and small)

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY III: Bees

DURATION OF ACTIVITY: 30-45 minutes

LESSON OBJECTIVES

Students will learn the names and functions of a honeybee's parts.
Students will learn how honeybees help pollinate certain plants and why they are attracted to flowers.

GUIDING QUESTION

What are the parts of a honeybee?

TENNESSEE STATE STANDARDS

- K.ETS1.1 Ask and answer questions about the scientific world and gather information using the senses.
- K.ETS1.2 Describe objects accurately by drawing and/or labeling pictures.
- K.ETS2.2 Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable scientific questions.
- 1.ETS1.1 Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.
- 1.ETS2.1 Use appropriate tools (magnifying glass, basic balance scale) to make observations and answer testable scientific questions.
- 2.LS1.2 Obtain and communicate information to classify animals (vertebrates-mammals, birds, amphibians, reptiles, fish, invertebrates-insects) based on their physical characteristics.

MATERIALS INCLUDED

Honeybee Life History Bio-Plastic Mount
Inflatable Bee Model
Dried Bees (8)
Magnifiers (10)
Photos of Bees on Flowers (2)

MATERIALS PROVIDED BY TEACHER

Video of bees pollinating, if available

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY IV: Pollination

DURATION OF ACTIVITY: 3 parts, 30 minutes each

LESSON OBJECTIVES

Part A: Students will make drawings or models of flowers, identifying all the parts, using characteristics that attract bees. (Glitter is used for pollen.)

Part B: Students will act out roles of bees and flowers in the pollination process, collecting “nectar” and dispersing “pollen.”

Part C: Students will observe real pollen and ovules, and learn how pollination leads to the formation of seeds.

GUIDING QUESTION

How do bees and flowers help each other?

TENNESSEE STATE STANDARDS

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|----------|---|
| K.ETS1.1 | Ask and answer questions about the scientific world and gather information using the senses. |
| K.ETS1.2 | Describe objects accurately by drawing and/or labeling pictures. |
| 1.LS1.1 | Recognize the structure of plants (roots, stems, leaves, flowers, fruits) and describe the function of the parts (taking in water and air, producing food, making new plants). |
| 1.LS2.3 | Recognize how plants depend on their surroundings and other living things to meet their needs in the places they live. |
| 2.LS1.1 | Use evidence and observations to explain that many animals use their body parts and senses in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. |
| 2.LS2.1 | Develop and use models to compare how animals depend on their surroundings and other living things to meet their needs in the places they live. |
| 2.ETS2.1 | Use appropriate tools to make observations, record data, and refine design ideas. |

MATERIALS INCLUDED

Botany (Flower) Poster
Flower Model
The “Flower of a Flowering Plant” Microslide
2 Microviewers
Pipettes (30 plus)

MATERIALS PROVIDED BY TEACHER

Selection of fresh flowers
Double-stick tape and clear tape
“Tacky” glue
Glitter
Scissors
Pencils
Markers and/or crayons
Pipe cleaners
Paper cups
Cotton balls
Food coloring

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY V: Observing and Describing Seeds

DURATION OF ACTIVITY: 30-45 minutes

LESSON OBJECTIVES

Using four of the five senses, students observe, draw, describe and discuss four seeds: kidney bean, pea, grass, and pumpkin.

GUIDING QUESTION

What are the differences and similarities among seeds?

TENNESSEE STATE STANDARDS

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| K.ETS1.1 | Ask and answer questions about the scientific world and gather information using the senses. |
| K.ETS1.2 | Describe objects accurately by drawing and/or labeling pictures. |
| K.ETS2.1 | Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable scientific questions. |
| 1.ETS2.1 | Use appropriate tools (magnifying glass, basic balance scale) to make observations and answer testable scientific questions. |
| 2.ETS2.1 | Use appropriate tools to make observations, record data, and refine design ideas. |

MATERIALS INCLUDED

Magnifiers (10)
Student Seed Sets (4 different seeds: kidney bean, pea, grass, pumpkin)
Extra Ziploc bags

MATERIALS PROVIDED BY TEACHER

Glue
Poster paper
Markers
Pencils

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

SUITCASE EXHIBIT INVENTORY CHECKLIST

School: _____

Check Out: _____

Return Date: _____

MoSH Check In:	Teacher Check In:	Item	Books/Videos/Posters	Teacher Return:
		A	Teacher's Manual	
		B	Photo: "Trumpet Flower"	
		C	Photo: "Hamburger"	
		D	Photo: "Bee"	
		E	Photo: "Hummingbird"	
		F	2 Micro-Slide-Viewer booklets each containing one slide strip "The Flower of a Flowering Plant" (F.1 & F.2)	
		G	Poster: "Fleshy Fruit"	
		H	Poster: "Dry Fruit"	
		I	Poster: "Moss Life Cycle"	
		J	Poster: "Fern Life Cycle"	
		K	Poster: "Lily Life Cycle"	
		L	Poster: "Pine Life Cycle"	
		M	Poster: "Wisconsin Fast Plants"	
		N	Poster: "Flower"	
		O	Book: Audubon Society Field Guide to Flowers	
		P	Book: The Science Book of Things That Grow	
		Q	Book: How a Plant Grows	
		R	Binder: Plants	
		S	Photo: Pollinator - Ant	
		T	Photo: Pollinator - Beetle	
		U	Photo: Pollinator - Wasp	
		V	Photo: Pollinator - Butterfly	
		W	Photo: Pollinator - Moth	

SUITCASE EXHIBIT INVENTORY CHECKLIST

MoSH Check In:	Teacher Check In:	Item	Materials	Teacher Return:
		1	Floor Puzzle 1.1 Roots 1.2 Stem 1.3 Leaf 1.4 Leaf 1.5 Leaf 1.6 Petal 1.7 Seeds	
		2	Germination Model Hanger	
		3	2 Micro-Slide-Viewers (3.1, 3.2)	
		4	Giant Dicot Flower Model (12 pieces number coded to match key in Teacher's Manual/Misc.)	
		5	13 Identified Seeds (5.1- 5.13) (see attached page for seed sample identification)	
		6	26 Unidentified Seeds (2 sets numbered 1-13)	
		7	15 Metric Rulers	
		8	3 x 3 Bags	
		9	Ziploc Bags (several)	
		10	Pipettes	
		11	Honeybee Life History Plastomount	
		12	Monocot / Dicot Plastomount	
		13	Seed Dispersal Plastomount	
		14	6 Magnifiers	
		15	4 dried bees in magnifier boxes	
		16	Inflatable Bee	
		17	Pumpkin Seeds	
		18	Split Peas	
		19	2 Kidney Beans (19.1, 19.2)	
		20	Grass Seeds	
		21	Soybeans	
		22	Oats	
		23	Russian Sunflower	
		24	Mung	
		25	Wheat	
		26	Corn	
		27	Wrinkled Pea	
		28	15 Seed Samples (28.1- 28.15) (see attached page for sample identification)	

SUITCASE EXHIBIT INVENTORY CHECKLIST

Seed Samples Identification

Item#	Materials	
5.1	Black Walnut	
5.2	Sycamore	
5.3	Cottonwood	
5.4	Redbud	
5.5	Catalpa	
5.6	Scotch Pine	
5.7	Silver Maple	
5.8	Black Willow	
5.9	Green Ash	
5.10	Hackberry	
5.11	Red Cedar	
5.12	American Elm	
5.13	Sweetgum	
28.1	Ash	
28.2	Swamp Privet	
28.3	Box Elder	
28.4	Hophornbeam	
28.5	Mallow	
28.6	Paw Paw	
28.7	Yellow Wood	
28.8	Pecan	
28.9	White Indigo	
28.10	Larkspur	
28.11	Bottlebrush Grass	
28.12	Sumac	
28.13	American Lotus	
28.14	Thoroughwort	
28.15	Common Milkweed	