Endeavor STEM Teaching Certificate Project
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5E Arts Integrated STEM Lesson Plan – Template

This template serves as a guide for developing a lesson that integrates across subject areas and includes the components of a quality STEM lesson. Please use it to support your work and engage in discussions with your instructors and peers when you have questions.

Lesson Title: Plants: Parts, Growth, and Needs

Author: *Laurie Kaffka*

Topic: *Plants, Living Things*

Targeted Grade Level: *Kindergarten*

Time Needed: *This lesson is a unit that will take around 4-6 weeks to complete*

Subject Integration: *Art, ELA, Math, Science*

Justification: Art will be the construction of the plant that the group chooses, ELA- we will be looking at informational texts, their structure, and vocabulary, Math- looking for shapes and patterns in the structure of a plant, Science- learning about the life cycle and structure of a plant

Standards: K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/” less of” the attribute, and describe the difference. (K-LS1-1)

K.G.A.1 Identify and describe shapes- Describe objects in the environment using names of shapes and describe the relative positions of these object using terms such as above, below, beside, in front on, and next to.

W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1)

RI.K.1 With prompting and support, ask and answer questions about key details in the text.

RI.K.4 With prompting and support, ask and answer questions about unknown words in a text.

NGSS Performance Expectations: Students who demonstrate understanding can: K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts:
Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1) --- **Connections to Nature of Science** Scientific Knowledge is Based on Empirical Evidence • Scientists look for patterns and order when making observations about the world. (K-LS1-1)	**LS1.C: Organization for Matter and Energy Flow in Organisms** • All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)	**Patterns** • Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)
Common Core State Standards:		

Math: K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/” less of” the attribute, and describe the difference. (K-LS1-1)

K.G.A.1 Identify and describe shapes- Describe objects in the environment using names of shapes and describe the relative positions of these object using terms such as above, below, beside, in front on, and next to.

ELA: W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1)

RI.K.1 With prompting and support, ask and answer questions about key details in the text.

RI.K.4 With prompting and support, ask and answer questions about unknown words in a text.

ITEEA Standards: None

National Art Standards:

VA:Cr1.2.Ka Engage collaboratively in creative art-making in response to an artistic problem.

VA:Cr2.1.Ka Through experimentation, build skills in various media and approaches to artmaking.

VA:Cr2.3.Ka Create art that represents natural and constructed environments.

VA:Cr3.1.Ka Explain the process of making art while creating.

Measurable Student Learning Objectives: The students will be able to list the parts of a plant and describe the purpose of each part. The students will discuss the needs of plants and the plant life cycle. The students will work cooperatively to design and create a plant using different materials.

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Nature of STEM: *Students will be observing plants and recording date, making predictions, discussing living things and what they need.*

Engaging Context/Phenomena: I will use the engagement portion of Lesson 1: Natural Resources on Earth from the Moon Munchies Elementary Resource from Nasa. Students will investigate natural resources from earth and discuss what they are, where they came from, and how people use them. They will draw these answers on a page instead of writing about them. I will also use the NGSS video of a corn cob sprouting in water.

Data Integration: *Students will compare different plants and record their growth. One plant will be deprived of sunlight, one deprived of an adequate amount of water, and one with all of it's needs met. Also, they will observe and record what happens to a white flour in water with blue food coloring.*

Differentiation of Instruction: *This lesson is going to appeal to my nature learners. I plan on adding some kinesthetic learning by adding a brain break, movement video that teaches about the parts of a plant and what they do (*https://www.youtube.com/watch?v=ql6OL7_qFgU*). Student will also express their learning through creating, writing, drawing, discussing, and giving a presentation. This will help every student find a way to be successful.*

Real-life Connection: *Students learning the growth and needs of a plant can help them in the future if they want to help their parents plant and grow a flower or vegetable garden. I teach in a rural area and some of my students live on or near farms so it is very applicable with them.*

Possible Misconceptions: *Students may think that plants are not alive because they can't move like animals. They also may not understand that a plant needs things to grow.*

Lesson Procedure:

5E Model	5E Objectives
Engage *I will show the students the corn cob sprouting in*	**Procedure:** I will show the students the ngss time lapsed video of a corn cob sprouting in water. I will the pass out a cup of water, bag of air (the students should focus on what is inside the bag, not the bag itself), cup of soil, rock, picture of an animal or a jar with a worm or bug in it and a plant to

water and we will discuss natural resources. Students will also listen to informational texts about plants.	small groups of students. They will complete drawings explaining what they have, where is came from, and why people need it. (This came from Nasa's Moon Munchies Resource Lesson 1) We will also read *How a Seed Grows* and *From Seed to Plant*. Students will discuss what plants need to grow and the life cycle of plants. **Modifications:** I will have to provide lots of scaffolding for the students to answer these questions. The bag of air will be difficult for them to understand but after some explanation they will get it. I also will use a different reporting form for students than the one provided in the original lesson because students are just learning to write and could have difficulty spelling some words. Students will be placed in heterogeneous groups to provide support with difficult areas through discussion. **Standards Addressed** K-LS1-1 **Formative/Summative Assessments** Teacher observation- listening to their discussion and students written work **Resources:** Andersen, P. (2018, July 9). Corn Cob Sprouting in Water. Retrieved March 23, 2020, from https://thewonderofscience.com/phenomenon/2018/7/9/corn-cob-sprouting-in-water Dunbar, B. (2009, July 14). Lesson 1: Natural Resources on Earth. Retrieved March 23, 2020, from https://www.nasa.gov/stem-ed-resources/moon-munchies-lesson1.html Quart sized bags full of air, cups of water, cups of soil, rocks, pictures of animals or bugs in jars Gibbons, G. (1991). *From seed to plant*. New York: Scholastic Inc. Jordan, H. J., & Krupinski, L. (2015). *How a seed grows*. New York, NY: Harper, an imprint of HarperCollinsPublishers.
Explore *Students are using observations of plants in different situations to see what plants need and how they get them.*	**Procedure:** *Students will observe several plants over 2 weeks. Some plants will get everything that they need, others will not get sunlight or water. Students will also observe a white carnation placed in a vase of water with blue food coloring. Students will journal their finding in both experiences.*

	Modifications: *Students will have vocabulary charts to refer to for help. Students have a choice in how to respond. There are also letter sound charts available in the classroom to help students that are trying to sound out words.* **Standards Addressed** *K-LS1-1* **Formative/Summative Assessments** *Students will journal their observations and discuss their findings. They will draw or write about what they discovered that plants need.* **Resources** Several plants. Some placed in dark places, some without water, and some with all of their needs met. A white carnation in water with blue food coloring. Student journals.
Explain Students will explore seeds and the parts of plants and discuss their findings.	**Procedure:** Students will write and draw about parts of plants, types of plants, and the life cycle of a plant. Students will also discuss and complete the booklet Seed on Our Earth from Moon Munchies resource to show what they have learned about seeds. I will show the students several different types of seeds and we will discuss them as they work through the booklet. Students will also look at several parts of a plants with magnifying glasses and discuss what they see. Students can make rubbing from leaves to see and discuss the differences in different types of leaves. **Modifications** Vocabulary charts will be made throughout the lessons and posted for students to refer to in their writing and discussions. Students will be able to write and draw but for students that can not yet write they will be allowed to dictate a sentence. I will write it and they will attempt to copy it. **Standards Addressed:** Math: K.MD.A.2, K.G.A.1, ELA: W.K.7, RI.K.1, RI.K.4, Science: K-LS1-1 **Formative/Summative Assessments:** Students writings and discussion **Resources:** Dunbar, B. (2009, July 14). Lesson 1: Natural Resources on Earth. Retrieved March 23, 2020, from https://www.nasa.gov/stem-ed-resources/moon-munchies-lesson1.html

	Packet of seeds, writing booklet, other writing paper Different plants and parts of plants, several types of leaves, crayons, paper, magnifying glasses
Elaborate Students will choose what kind of garden they would want to grow and make a plan of how they would grow it.	**Procedure:** *Students will work together in groups or pairs to plan what type of garden they will grow, what plants they want in it, and how they want to present it. Students can create a picture wih labels, make a poster about their garden, or make a model out of a shoe box.* **Modifications** *I will provide students with magazines and pictures of different types of plants with the names on them to help them generate ideas and spell the words. Students will be put in heterogeneous groups so that all students can participate in an area that they are stronger at. I will provide help as the groups decide how they want to show their garden.* **Standards Addressed:** *K-LS1-1, K.MD.A.2* **Formative/Summative Assessments** *Students will be assessed on how they work together, their presentation, and the details included in their final product.* **Resources** *Materials: boxes, poster board, paper, glue, paint, markers, crayons, pencils, pictures and magazines with plants*
Evaluate Students will work together to create a plant that has all of the correct parts.	**Procedure:** *Students will work with the same groups that they created the garden with. They will choose one type of plant in their garden. Students will examine the parts of that plant and use a variety of materials to create the different parts of the plant. They will finally put it all together for their finished product.* **Modifications** *Students will again be paired in heterogeneous groups to assist the lower students and help everyone have a chance to be a productive partner. Students will have choice in how they complete this assignment and the materials that they will use.* **Standards Addressed:** *K-LS1-1, K.MD.A.2*

	Formative/Summative Assessments *Students will be assessed by a rubric where they will be graded on the details in their creation and their ability to work together.* **Resources** *Various art materials*

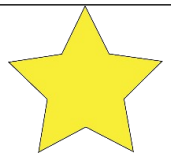
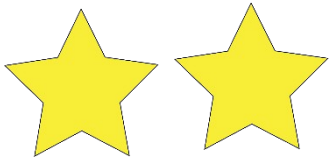
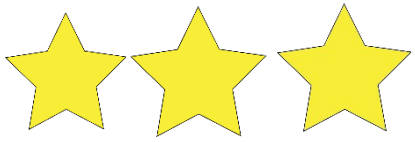
Teacher Background:

Basic knowledge of plants and their growth

Understanding the Moon Munchies Lesson 1

Creating a Plant Rubric

How to have 3 star work

What you need…			

Cooperation	I did my work and put it with my team.	I planned with my team and built my own part.	I planned with my team and worked together to complete the plant.
Plant parts	My plant is incomplete.	My plant is complete but some parts are incorrect.	My plant is complete and all of the parts are correct.
Explanation	I’m not really sure how to tell about my plant.	I can name the plant parts.	I can tell all of the parts of the plant and explain the parts of the plant and how I made it.