Arts Integration Lesson Plan

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Chosen National Core Arts Standard:

DA:Pr6.1-Convey meaning through the presentation of artistic work.

VA:Cr3.1.3a- Elaborate visual information by adding details in an artwork to enhance emerging meaning

Mindset Behind Choice:

The chosen arts standard focuses on dance and more specifically, conveying meaning through dance. The Busy Bees lesson centers around student understanding of how flowers reproduce looking through the lens of a continued life cycle. Beginning with a phenomena, students are to develop a greater understanding of the DCI through a series of activities and driving questions. During the elaboration phase, students will work with partners to create flowers with simulated pollen and fashion bees from pipe cleaners. Partners will take turns pollinating each other's flowers using their pipe cleaner bees. The added arts component of dance to convey meaning can be inserted at this stage of the lesson. Partners can choreograph a dance that the bees would then perform to pollinate each flower, mimicking what occurs in nature. The added dance component will allow students to convey the sometimes frantic action of bee as they dive for nectar buzzing from flower to flower distributing pollen along the way. Students will be given choice and freedom of expression conceiving the dance, but would be required to have written choreography demonstrating a deliberate thought process behind their actions thereby deepening understanding of both the dancers and audience. The students will perform their individually choreographed dances for the Kindergarten class.

Also included in the lesson is a drawing component where students will need to make a representation of a flower including the internal parts necessary for pollination. These parts include the stigma. By visually representing a flower and its internal structure, students will deepen their understanding of the how the stigma plays an integral part in the pollination process.

Interdisciplinary Content:

Both the visual representation of a flower and the pollination dance use the arts to help solidify concepts in science. Students are able to express their individual differences through their art form under a constructivist umbrella to further explore concepts in science. Students will also develop core communication skills and analysis of these concepts. Skills learned are then transferable. Allowing students to learn in an environment of creative discovery and individuality can create a love of learning which will serve the student throughout their lives.

Unit or Lesson Title: Busy Bees

Grade Level: 3rd grade

Topic/Theme/Nature of the Investigation: Flower Reproduction

Time Frame: 110 minutes

Materials: White paper or flower template, 2 teaspoons of each cornmeal and coffee grounds per partnership, scissors per student, 2 black and yellow pipe cleaners per student, glue stick per partnership, ¼ cup clay per student, pencil per student, colorful crayons per partnership, 1 popsicle stick per student, 2 inches of masking taper per student, science notebooks, chart paper, markers, and document camera.

STANDARDS

Science Standards

NGSS Performance Expectation: 3-LS1-1 Organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

NGSS Scientific and Engineering Practices: Develop a model of a flower, carry out an investigation on how bees pollinate, analyze data and construct an explanation.

NGSS Scientific and Engineering Practices:

Patterns-similar life cycles/Structure-stigma is sticky/function-grabs pollen

NGSS Disciplinary Core Ideas:

LS1.B Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.

Nature of Science:

Science knowledge is based on empirical evidence

-Science findings are based on recognizing patterns.

Science Models, Laws, Mechanisms and Theories Explain Natural Phenomena

-Science explanations describe the mechanisms for natural events.

Science Addresses Questions About the Natural and Material World

-Science findings are limited to questions that can be answered with empirical evidence.

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

-Science assumes consistent patterns in natural systems

Science is a Human Endeavor

-Most Scientists and Engineers Work in Teams

Art Standards

NCAS

DA:Pr6.1-Convey meaning through the presentation of artistic work.

VA:Cr3.1.3a- Elaborate visual information by adding details in an artwork to enhance emerging meaning

Mathematical Standards

CCSS.Math.Practice.MP3- Construct viable arguments and critique the reasoning of others

CCSS.Math.Practice.MP7 - Look for and make use of structure.

Language Arts Standards

CCSS.ELA-Literacy.SL.3.2 - Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

CCSS.ELA-Literacy.RI.3.7 - Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text.

Possible Misconceptions: Students might fail to realize that pollination or plant reproduction takes place when a bee gets pollen from one flower and deposits it on a another flower. They may think that when bees drink the nectar from a flower, it somehow will pollinate it.

Prior Knowledge: Students should have a general understanding of what plants need for survival before embarking on how flower reproduce.

Connection to Content:

NGSS 3-LS1-1 *From Molecules to Organisms: Structure and Processes,* Develop models to describe that organisms have unique and diverse life cycles but all have in common, birth, growth, reproduction and death. The Disciplinary Core Ideas are *LS1.B Growth and Development of Organisms*- Reproduction is essential to the continued existence of every kind of organism.

E-Learning Connections:

Flower Template

Phenomena

Strawberry Plant video

Pollen video

Pollen and Stigma

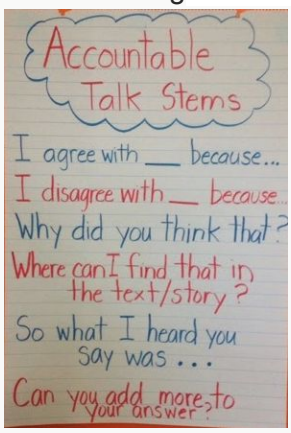
Rubric

Engaging Phenomena:

Phenomena

The bees on flower image is compelling as an anchor phenomena for DCI LS1.B: Growth and Development of Organisms. When asked to use their powers of observation when shown the image, 3rd grade students might describe it as a bee "party". When pressed "why" they think the bees are clustered, they may make the connection to drinking nectar or even honey. The image is not just compelling, it is inclusive. Students from most all cultural backgrounds have personal experience seeing bees in nature. It is both familiar and bizarre, in that students may have encountered one or two bees at a time on any given day, but not many on one flower. As an anchor phenomena, the bee image can be used throughout the lesson. It is also relevant. Throughout early spring until fall, bees can be found all over our home state. The image is engaging and thought provoking and will aid in overall understanding. Through close examination and discussion, students can generate questions concerning bee behavior, knowing that scientists address questions about the natural world. Referring back to the bee image, students can then explain the phenomena and how it speaks to the essential growth and reproduction of plants.

Lesson Section/Time	Teacher/Key Questions	Student	Assessment
Engage- 10 Minutes **Purpose-**	Begin by showing **Phenomena to** students. Ask them	Possible responses: Bees are smelling the flowers, drinking	Assess understanding and prior knowledge

	what they think is going on in the image. Have them turn and talk in their table pods. Brainstorm reasons for phenomena. Chart all responses * Do not correct misconceptions in students' thinking. Revisit after students have gathered enough evidence to correct their own thinking.	honey, hiding inside the flower, or sipping nectar.	through student responses. Listen in on turn and talk, prompting use of accountable talk stems to deepen understanding 
Explore- 20 minutes **Purpose-** To Evaluate and Revise Thinking Based on Growing Understanding	Give students a scenario of making strawberry jelly, but their plant has no berries. Ask why they might happen. Chart responses. Show the **Strawberry Plant video**. * Stop video at 1:30 to avoid the word "hell". Ask students to turn and talk, having them grow ideas.	Possible responses: It is not in the sun, a rabbit might have eaten them, or it's not getting enough water. Students watch video, analyze and converse with table mates about what bees had to do with strawberries.	Note student responses with regards to background knowledge of plant survival. Listen in on turn and talk, noticing continued misconceptions and growing understanding.

	Show **Pollen video**. Ask students what new information they gleaned from the the video to help them solve their problem of no berries. Bring **Phenomena** back up for students to view. Ask what new information they could add to the class chart. Chart responses.	Students observe that bees get pollen all over their bodies and plants have a stigma. Students view the phenomena and revise their original thinking.	Note growing understanding and continued misconceptions.
Explain - 20 minutes **Purpose-** Answer Driving Questions	Ask students driving questions: -Why do bees like flowers? -What does it mean to pollinate a flower? -Where are the pollen and stigma located? -How do bees play a part in pollination? -What problems might humans encounter when they hand pollinate a flower? Ask them again why their strawberry plant might not have any strawberries to make jam. Instruct students to show pollination by	Possible Responses: For the nectar, they smell nice or they are pretty. To go from flower to flower, mixing pollen. A way to make new flowers or berries. They fly from flower to flower. They might not do it right, might just do it to one flower. Students make connections to the bees integral role in pollination to create flowers/berries.	Encourage and praise students for thinking like scientists, assessing new understandings. Check student understanding of flower/plant pollination in their science notebooks. Monitor vocabulary for correct usage.

	drawing a flower with a stigma, pollen and a bee in their science notebooks, labeling each component. Have students share their representations of pollination with the class using the document camera. Invite students to comment on what was done well or areas that need more detail.	Students create model drawings synthesizing the pollination process. Students share their representations with the class and comment on peer work.	
Elaborate-2-25 Minute periods **Purpose-**Simulate Pollination	Instruct students to pick partners. Tell students they will each create a flower which can be free hand or they may use **Flower Template**. Pass out rubrics. Explain. Pass out either template or blank paper according to preference. Each flower must have a stigma and can be colored with crayons. Have students cut out flowers. Set a time limit on flower drawing to keep things moving. Hand each student one black and yellow pipe cleaner. Instruct students to make a "bee" out of the pipe cleaners. * This is a natural stopping point Instruct students they	Students pick partners. Students apprise themselves with the rubric. Students design flowers, color them and cut them out. Students create pipe cleaner bees.	Monitor understanding as students design flowers and stigma. Rotate amongst partners for bee construction.

	will now design a choreographed dance to simulate bee pollination. Refer back to charts to reacquaint students with bee behavior and the pivotal role they play in pollination. Refer to the rubric for specific criteria evaluated in the dance. Model how to record steps in the science notebook. Allow students 10 minutes to choreograph their bee dance. Distribute cornmeal, coffee grounds, glue sticks, craft sticks, clay and masking tape. Instruct students to tape the back of the craft stick to the back of their flower. Have them put glue on the stigma and sprinkle either just cornmeal or coffee grounds on their flower. **NOT BOTH!** Show students how to mound clay to hold their flower upright. Have students practice and complete their pollination dance by dipping their bee from a cornmeal flower to coffee ground flower. Invite Kindergarten students to watch the	Students apply concepts of pollination to their choreographed dance, recording steps in their science notebooks. Students practice their pollination dance with partners, pretending to dip their bees into cornmeal pollen and back to their coffee ground pollen. Students perform their pollination dances for Kindergarten students proving how a bee gets pollen from one flower and spreads it to another and their importance in the pollination process. Students critique and compare their pollination dance to	Check notebooks for developing choreography. Encourage student connections to the concept of pollination.

	pollination dances. Review **Phenomena**. Ask students to compare their pollination simulation to what is occurring in the image.	that of the image.	
Evaluate- 10 Minutes	Direct students to evaluate themselves using the Busy Bees rubric. Collect completed flowers, bees and science notebooks. Evaluate using rubric. Make time to review completed rubrics with each student throughout the next few days.	Students assess themselves using the rubric.	The rubric provides a summative assessment of student understanding.

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Students will add yellow corn meal to simulate pollen. Students will then fashion a "bee" from a pipe cleaner.

Students take turns "pollinating" each other's flower through their individual choreographed dances.

Extending/Application Questions for Whole/Small Group Discourse:

Students will review the phenomena and revise their thinking to reflect growing understanding.

Evaluate

PURPOSE: Assess student understanding of pollination and why plants make flowers.

Skill/Reasoning Learning Objectives

Organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

Assessment Instrument

Rubric

Knowledge Learning Objectives

Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.