K.Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

NGSS Performance Expectation

K.ESS3-1à Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.

NGSS Disciplinary Core Ideas

ESS3.A: Natural Resources

•   Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

NGSS Science & Engineering Practices

Developing and Using Models

Analyzing Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions.

•   Use a model to represent relationships in the natural world. (K-ESS3-1)

NGSS Crosscutting Concepts **Systems and System Models**

•   Systems in the natural and designed world have parts that work together. (K-ESS3-1)

Teacher Page

MSDE STEM Standards of Practice

1. Learn and Apply Rigorous Science, Technology, Engineering, and Mathematics Content

2. Integrate Science, Technology, Engineering, and Mathematics Content

3. Interpret and Communicate STEM Information

4. Engage in Inquiry

5. Engage in Logical Reasoning

6. Collaborate as a STEM Team

7. Apply Technology Appropriately

MARYLAND STATE DEPARTMENT OF EDUCATION
Preparing World-Class Students

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Maryland College and Career Ready Standards
Mathematics

Common Core State Standards Connections:
MP.2- Reason abstractly and quantitatively. (K-ESS3-1)

MP.4- Model with mathematics. (K-ESS3-1)

K.CC- Counting and Cardinality (K-ESS3-1)

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)

Maryland College and Career Ready Standards

ELA/Literacy

Common Core State Standards Connections:

R.K.1- With prompting and support, ask and answer questions about key details in a text. (K-ESS2-2)

W.K.1- Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2)

W.K.2- Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS2-2),(K-ESS3-3)

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)

SL.K.5- Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1)

Overview

Students will be examining the global issue of deer population in local communities. According to the Maryland Department of Natural Resources, the abundance of deer poses threats to natural forest ecosystems and to other wildlife species. The DNR also states that, deer are responsible for Maryland's farmers and other citizens sustaining millions of dollars worth of damage to crops, landscaping and vehicles. "Managing the deer population to satisfy recreational interests, while at the same time reducing damage concerns, is a challenging and controversial process." (pg. 1, DNR) By the end of the lesson students will understand that all living things need water, air, and resources from the land and they live in places that have the things they need. Students will be asked to figure out a way to encourage the deer to move out of the community and keep the deer population down because the deer are eating peoples plants/flowers/gardens and causing car accidents in the community. Students will do this by learning about the ecosystem deer live in and learning about the types of plants and environments they like and predators deer have.

Teacher Page

Kindergarten

Enduring Understands and Essential Questions
taken from Montgomery County Integrated Curriculum

Marking Period 3-Week 2

<u>Enduring Understandings</u>

Plants have external features that help them survive in different places in Maryland.

How do plants use external features to survive in Maryland?

What are some of the external features of plants living in Maryland?

<u>Essential Questions</u>

How do plants use external features to survive in Maryland?

What are some of the external features of plants living in Maryland?

Marking Period 3-Week 3

<u>Enduring Understandings</u>

Animals have external features that help them survive in different places in Maryland.

How do animals use external features to survive in Maryland?

What are some of the external features of animals living in Maryland?

<u>Essential Questions</u>

How do animals use external features to survive in Maryland?

What are some of the external features of animals living in Maryland?

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Kindergarten

Enduring Understands and Essential Questions
taken from Montgomery County Integrated Curriculum

Marking Period 3-Week 4

<u>Enduring Understandings</u>

Plants and animals have external features to survive in their environment.

How do external features of plants and animals help them survive in different places?

Some states have different environments and different plants and animals may live there.

What are some plants and animals found in different places?

<u>Essential Questions</u>

How do external features of plants and animals help them survive in different places?

What are some plants and animals found in different places?

Teacher Page

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Suggested Student Outcomes
Kindergarten

Life Science (Science)

3.K.D.1. Recognize that living things are found almost everywhere in the world and that there are somewhat different kinds of living things in different places.
- Observe, describe, and give examples and describe the many kinds of living things found in different places in Maryland.
- Explain that the external features of plants and animals affect how well they thrive in different kinds of places.

Skills and Processes (Science)

1.K.A.1. Raise questions about the world around them and be willing to seek answers to some of them by making careful observations and trying things out.
- Seek information through reading, observation, exploration, and investigations.

1.K.B.1. People are more likely to believe your ideas if you can give good reasons for them.
- Develop reasonable explanations for observations made, investigations completed and information gained by sharing ideas and listening to others' ideas.
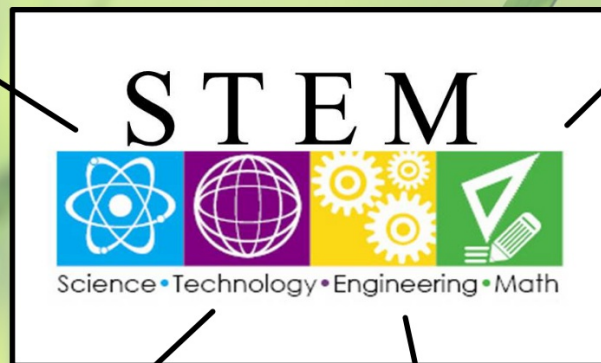
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Transdisciplinary Connections

Learning about ecosystems and the types of plants and animals that make that ecosystem work efficiently.

Tally graph to represent student opinions on what ecosystem we live in. (Using words like, more, less, greatest, fewest to describe data)

STEM
Science • Technology • Engineering • Math

PebbleGo, materials to illustrate a solution, Discovery Education Videos

Developing and explaining a solution to solve the deer problem in the community.

Teacher Page

Looking ahead ...
1st Grade

Enduring Understands and Essential Questions
taken from Montgomery County Integrated Curriculum

Week 2
<u>Enduring Understandings</u>
Living things hav basic needs that must be met to survive.
How do living things meet their basic needs for survival?
<u>Essential Questions</u>
How do living things meet their basic needs for survival?

Teacher Page

Looking Ahead ...
Suggested Student Outcomes
1st Grade

Life Science
3.K.E.1 Develop an awareness of the relationship of features of living things and their ability to satisfy basic needs that support their growth and survival.

- Make observations of the features of many different kinds of plants within an environment to identify and begin building a list of some of the basic needs these organisms share, such as water, light, etc.
- Make observations of the features and behaviors of many different kinds of animals with an environment to identify and begin building a list of some of the basic needs these organisms share, such as water, air, etc.

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The 5 E's

Engage

Explore

Explain

Extension/Elaboration

Evaluation

Engage

To engage students, students will be shown a collage of a variety of plants and animals. The spotlight tool (tool in Activinspire) will be used to promt students to ask questions about what they will be learning about. Through quesions such as, what are all these photographs of? (spotlighting the animals) and what are all these photographs of? (spotlighting all the plants) Students will come up with the topic of plants and animals. [page 16]

[page 17] Students will be prompted with the following questions and a word splash will be created with their ideas.

What do we know about plants and animals? What do they need to survive? Can every animal and plant live everywhere in the world? Why? Why can't a polar bear live in the dessert? Why can't a tree live in the ocean?

For each questions students will engage in a Think-Pair-Share to talk about ideas before sharing aloud. Student responses will be written on the board.

[page 18-19] After disussing general questions about plants and animals, students will engage in answering questions about what kinds of plants and animals they have seen in their backyard/neighborhood.

What types of plants do you see in your backyard? In your neighborhood? Outside of our school? What types of animals have you seen in your backyard? In your neighborhood? Outside of our school?

Students will work in table groups to create a poster showing different types of plants and animals they have seen.

What do you know about plants and animals?

Plants and Animals

What types of animals have you seen in your backyard?

Work with the friends at your table to draw pictures of different animals you have seen in your backyard!
You will need:

poster paper

What types of animals have you seen in your backyard?

Explore

Students will be looking at the ecosystem they live in. (Forest)

[Page 22] Students will discuss the types of animals they have seen and the types of plants to determine which ecosystem they live in. Students will engage in a Think-Pair-Share to discuss ideas before sharing a loud. Students will vote on which ecosystem they live in. Tally marks will be used to show this data. Questions such as, Why do you think that? How do you know we don't live in a desert? How do you know we don't live in a grassland? How do you know we live in a forest? What types of things tell you we live in a forest and not a grassland/desert?

[Page 23] Students will watch a video about forests. This video introduces forest habitats and the needs and adaptations of animals who live there. Students will see a wide variety of animals and learn how they meet their basic needs of survival. After watching the video, questions such as, "What types of animals have you seen in your backyard", will be asked to get students thinking about their ecosystem. Page 19 can be revisted and additional animals that students may not have mentioned can be added.

[Page 24] Students are introduced to the problem. There is an over abundance of deer in our neighborhoods and communities. On page 25 students will look at a map of their neighborhood and be asked where they think the deer are coming from. Students will also be asked why they think the deer are moving into the neighborhoods. Questions: What do you think the deer want? Why do you think they don't want to stay in the forest? Possible student answers: Maybe there isn't enough food, maybe they like the food in our backyards better, etc.

Explore

[page 25] Students will look at a map of their neighborhood. Students will try and figure out where the deer are coming from. Students will notice the forest near the school and hopefully make the connection that the deer are coming from the forest that surrounds the school.

[page 26] Students will be introduced to the mission they need to complete. Students will work in small groups to design a solution to keep the deer population down in the neighborhoods. Studnets will use resources such as computers, PebbleGo and non-fiction books to reserach things that might encourage the deer to leave the neighborhood. Students might also look at types of predators deer have and think about ways they can use these animals to help the population of deer.

   Questions that will help guide students in the design process of their solution: How could we prevent deer from coming into the neighborhood? Why do you think they are in the neighborhood? What do they like about it? How could we take out the things they like? Do deer have any predators? Is there a way we could scare the deer away?

What type of Ecosystem do you think we live in?

Forest?

How many? _____

Desert?

How many? _____

Grassland?

How many? _____

THINK PAIR SHARE

Forest Ecosystem

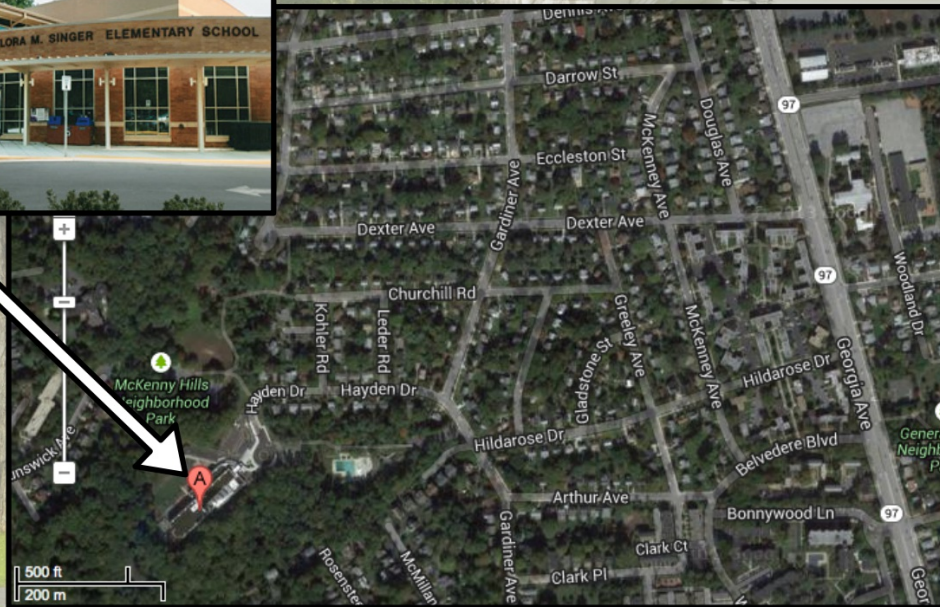Video take from Discovery Education

Student Page

Deer! Watch Out!

Video taken from Discovery Education

Problem: How can we get the number of deer down in the neighborhood?

Student Page

Where are the deer coming from?

How do you know?

Student Page

Your Mission!

Deer can be dangerous in our neighborhood. They can cause car accidents and eat our gardents.

Why is this a problem?

Work in teams and come up with a solution to solve the deer problems in the neighborhood. How can we keep the populations down.

Student Page

Explain

Students will share the solution they have developed with the class. Students sharing will be expected to talk about why they chose that solution and how it will prevent the deer from coming into the neighborhood or how it will keep the deer population down. Students in the audience will also be expected to ask questions about why their classmates picked that solution and how it will help solve the global issue. Before students begin sharing, questions starters will briefly be discussed.

[Page 28] This page will be used to record student solutions. After everyone is done sharing the whole class will talk about the best solutions and why those would be the best solutions. (Will it be safe for people? Is it a doable solution? Who will do this?) Why some solutions might not work will also be discussed. (Why will this solution not work? What can we do to make this solution doable?

Fixing our Neighborhoods

Group 1	Group 2	Group 3

Group 4	Group 5	Group 6

Extension/Elaboration

[Page 30] Students will go back and revise their solutions. Students will try and come up with better solutions or tweak their current solutions with their group members.

[Page 31] Students will be posed with a new question to deepen understanding and test their knowledge on a forest ecosystem. Students will be asked to think about the solutions they have created. Students will then be asked to come up with the perfect ecosystem for deer. Students need to think about a ecosystem that will keep the deer population down and an ecosystem that won't cause harm or damage to humans living in the area. Location of the ecosystem will also be discussed.

Teacher Page

Go back and make changes!

How can we fix the deer population in the neighborhood?

How can we prevent them from coming into the neighborhood?

How can we keep the populations down?

The Perfect Ecosystem

Pretend like you are a deer!

○ If you could live anywhere where would you live?

○ What types of plants would live there?

○ What types of animals would live there?

○ What wouldn't be there?

○ Why are all these components necessary in a forest ecosystem?

Student Page

Evaluation

Students will be asked to explain their forest ecosystem. Students will show understanding of the forest ecosystem by explaining all the components in their ecosystem. Students will need to explain the animals, plants and they location they chose. Acendotal notes will be taken while stuents are explaining their ecosystems to determine student understanding.

Differentiation

Many parts of this lesson is already adapted for diverse learning styles and needs of students. One way is through the use of many Think-Pair-Shares. These allow students to gather thoughts and express them in a more confortable setting before sharing out in front of a large group of students. This strategy of sharing also helps students who may not have an idea or answer yet to hear someone else's idea and give them something to share if they get called on. Another way this lesson is adapted for diverse learning styles and needs is by incorporating various means to give students information. This lesson doesn't have one teaching style, such as lecture, note taking, etc. but instead gets students the information they need through use of video, books, photographs and illustrations. This also helps break up the lesson so it's developmentally appropriate for students aged 5-6 to sit through and listen.

Resources
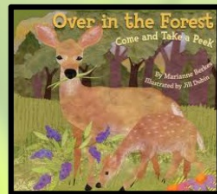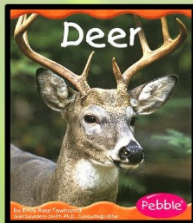
variety of non-fiction books

Teacher Page