

Master Module, First Grade AG SEEDLINGS UNIT

Leading Scientific Question

As our environment changes, how are humans, animals, and plants able to adapt?

Scientific Sub-question

Where does our food come from and the process from farm to table.

What is harvesting? What careers focus on harvesting food?

Lesson- From Bee to Pie

Read a-loud, "How to Grow an Apple Pie" by Beth Charles.

Discussion on how apples grow and where they come from.

Students will watch short video clip on Pennsylvania Apple Orchards.

How do people distribute produce like apples?

Students will use measuring and fractions to follow Apple Pie Cup Recipe. Students complete guided worksheet.

Extension Activity: teacher can take students to a apple orchard or guide students through a virtual tour.

Scientific Sub-question

How do humans design and mimicking animals to help them survive, grow, and meet our needs?

What is migration and how are Monarch Butterflies able to travel so far?

Lesson- Shape of Wings

Students will use the reading passage on Monarch butterfly wings.

Students will watch short video clips on butterfly wings. Then have discussion on the important of wings to meet pollinator's needs. to survive.

What have humans learned from butterfly wings and other animal external structures?

Students will design a monarch butterfly model. Students will have model "clapp" its wings.

illustrations "The Girl Who Drew Butterflies" by Joyce Sidman.

Scientific Sub-question

How are humans and animals similar to their parents? How are they different?

How are animal offspring born with similar external and internal structures as their parents?

Lesson- The Flight of the Monarch Butterfly

Students will read passage about the migration of Monarch Butterflies.

Students will watch short video clips on the butterfly migration.

Read a-loud, "Winged Wonders, Solving the Monarch Migration Mystery" by Meeg Pincus

Do all offspring act or look like their parents? What evdience can be used to show this?

Students will design their own butterfly using the butterfly template.

Students will learn how to use a compass. Students will use a compass to direct their butterfly's migration.

Scientific Sub-question

How do we know there is an issue or threat in our environment?

What is an environmental threat?

Lesson- The Emerald Trap

Teacher will guide students in reading & discussion on E.A.B. and invasive species.

Students will watch short video on how to stop the threat of Emerald Ash Borers.

What is an invasive species and how can people protect their environment?

Students will follow guided worksheet to design and make a E.A.B. decoy.

Students will use guided worksheet to design and make a E.A.B. trap.

Students will collect data on designed trap.

Master Module, Second Grade

AG SEEDLINGS UNIT

Leading Scientific Question

How do humans, animals, and plants adapt to different environments?

Scientific Sub-question

Where does our food come from and the process from farm to table.

How do pollinators contribute to the pollination of plants?

How do animals and plant life adapt to different habitats?

Scientific Sub-question

How do we know there is an issue or threat in our environment?

What is harvesting? What careers focus on harvesting food?

How do people distribute produce like apples?

What is pollen and what do pollinators do with pollen?

How do bees contribute to the growth of plants?

What is migration and what pollinators migrate?

Do pollinators still pollinate while migrating?

What is an environmental threat?

What is an invasive species and how can people protect their environment?

Lesson- From Bee to Pie

Read a-loud, "How to Grow an Apple Pie" by Beth Charles.

Students will use measuring and fractions to follow Apple Pie Cup Recipe. Students complete guided worksheet.

Discussion on how apples grow and where they come from.

Extension Activity: teacher can take students to an apple orchard or guide students through a virtual tour.

Students will watch short video clip on Pennsylvania Apple Orchards.

Lesson- Pollinator Relay

Teacher will show the short video, "How Pollination Works" & have class discussion.

Students will play pollinator relay. & collect data on pollen points.

Teacher will model how to play pollinator relay using student guided worksheet.

Teacher will guide students to graph data from relay game.

Read out loud the book, "Summer's Flight, Pollen's Delight" by Flora Caputo.

Lesson- Where in the World is R.T. Hummingbird?

Students will watch short video and discuss video, "Ruby-Throated Hummingbird Facts".

Students will work in small groups to navigate the northern migration journey of R.T. Hummingbird.

The teacher will then read aloud the following book, "My Tiny Life By Ruby T. Hummingbird" by Paul Meise.

Students will check work and conclude with one of short student resource video clips.

Lesson- The Emerald Trap

Teacher will guide students in reading & discussion on E.A.B. and invasive species.

Students will follow guided worksheet to design and make an E.A.B. decoy.

Students will watch short video on how to stop the threat of Emerald Ash Borers.

Students will use guided worksheet to design and make an E.A.B. trap.

Students will collect data on designed trap.

Third Grade Master Module

AG SEEDLINGS UNIT

Leading Scientific Question

Pollinators - How can evidence and claims support our understanding of living organisms and their environment?

Scientific Sub-question

How are fossils evidence of pollinators life cycles?

- How do research scientist analyze & interperate data to provide evidence about fossils?
- How can models describe pollinator's unique & diverse life cycles?

Lesson- DIY Plant Fossils

- Students will read & interrupt article "Prehistoric Pollinators"
- Students will watch video on fossils.
- Students will go outside & observe school's envoriment. Choose a plant specimen.
- Students will make a fossil model of plant specimen using DIY fossil recipe.
- Read Aloud- "The Street Beneath My Feet." By Charlotte Guilain
- When model is set, students will intepret & collect data on fossils.

Scientific Sub-question

What characterisitcs do some pollinator species use to survive?

- What traits do bees use to communicate?
- Can the Waggle Dance be influenced by the bee's enviroment?

Lesson- The Waggle Dance

- Students will read & interrupt article, *on the Waggle Dance.*
- Students will watch video to observe the waggle dance.
- Read aloud- "Bee Dance" by: Rick Chrustowski
- Students will create their own Waggle Dance to communicate to others where a food source is.
- Students will perform drafted Waggle Dance to test it. (Alternate; students draw key using arrows to show food source as a form of communication.)

Scientific Sub-question

How does the environment affect living organisms? (How do living organisms affect the environment?)

- How do humans affect the envoriment?
- How do pollinators affect the envoriment?

Lesson- Bee-Healthy Farm

- Student will read & answer questions in "Bee Healthy Farms" reading passage, located in google folder.
- Watch short student videos about "Planting a Garden" and/or "The Arboretume at Penn State".
- Teacher will model to student how to read "Plants Arranged by Bloom time List" located in google folder.
- Students will create a garden layout of different nutritional plants for pollinators.
- Read aloud- "The Farm That Feeds Us." By: Nancy Castaldo

Scientific Sub-question

How can pollinator traits be influenced by their environment?

- Can plant structures show evidence of what pollinators benefit from them?
- Can pollinator's traits evolve overtime due to thier enviroment?

Lesson- Match That Pollinator

- Students will read about the important of plant structures and what pollinators are attracted to.
- Students will watch video on reccomended videos.
- Read aloud- "Evelyn The Adventurous Entomologist" by: christine Evans
- Students will measure and match lengths of pollinators' tongues.
- Students will then use measurement data to correlate the correct plant for pollinating & collecting.

Fourth Grade Master Module

AG SEEDLINGS UNIT

Leading Scientific Question

How do pollinator's & plant's structures help them grow?

Scientific Sub-question

How do plants & animals use their internal & external structures to support growth, behavior, and reproduction?

Scientific Sub-question

How do pollinators use their senses?

Scientific Sub-question

How do pollinators use their senses to touch, taste, see, and smell?

Scientific Sub-question

How does the environment affect living organisms? (How do living organisms affect the environment?)

Do external structures support growth, behavior, and reproduction?

Are pollinators & plants symmetrical?

Lesson- Pollinator Symmetry

Students will read article & learn about symmetry in "The Mystery of Symmetry".

Students will use the Pollinator Symmetry worksheet to paint or color symmetrical structures of pollinators.

Students will review article by answering reflection questions on article.

Students will create their own symmetrical insect.

Read-aloud: "How to Build an Insect" by: Roberta Gibson

Can pollinators receive different types of information through their senses?

How do pollinators process & respond to received information?

Lesson- The Waggle Dance

Students will read & interrupt article, "The Waggle Dance"

Students will create their own Waggle Dance to communicate to others where a food source is.

Students will watch video to observe the waggle dance.

Students will perform drafted Waggle Dance to test it. (Alternative: to code on paper with arrows signs as directions to food source.)

Read aloud- "Bee Dance" by: Rick Chrustowski

Do all pollinators use their senses the same way?

Do plants have senses?

Lesson- Darwin's Orchid

Introduce with read a-loud, "Pollen Darwin's 130-year Prediction" by: Peter Willis.

Students will take native plant and do a flower dissection.

Student will watch short video, "Look inside a Flower!"

Students will illustrate & write observation notes/data on dissection flower activity.

Extension Activity: Penn State Extension website of activities

How do humans affect the environment?

How do pollinators affect the environment?

Lesson- Bee-Healthy Farm

Student will read & answer questions in "Bee Healthy Farms" reading passage, located in google folder.

Teacher will model to student how to read "Plants Arranged by Bloom time List" located in google folder.

Watch short student videos about "Planting a Garden" and/or "The Arboretum at Penn State".

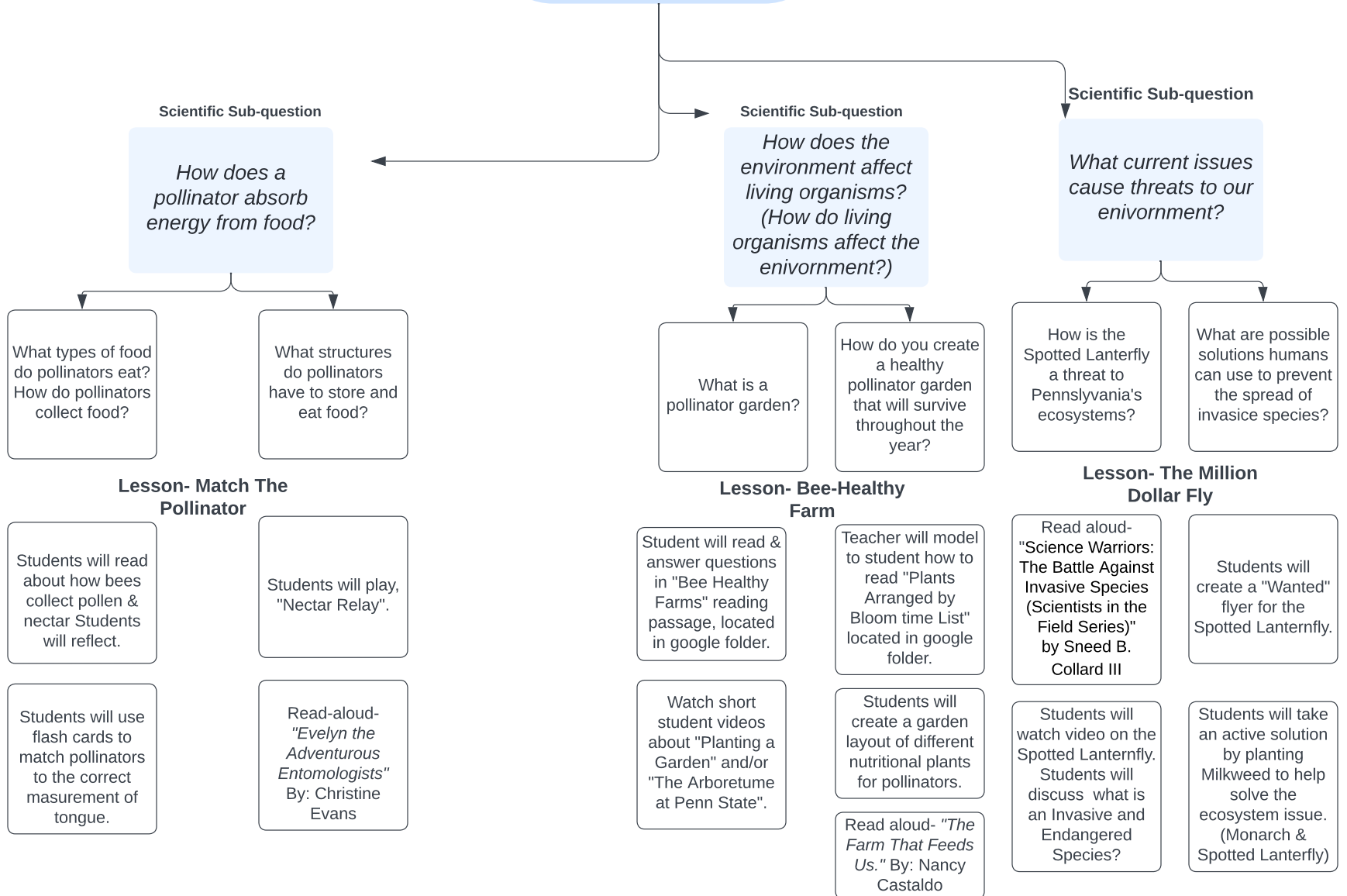
Students will create a garden layout of different nutritional plants for pollinators.

Read aloud- "The Farm That Feeds Us." By: Nancy Castaldo

Fifth Grade Master Module AG SEEDLINGS UNIT

Leading Scientific Question

How do living organisms use water, air, and light to survive?



Scientific Sub-question

How does a pollinator absorb energy from food?

What types of food do pollinators eat?
How do pollinators collect food?

What structures do pollinators have to store and eat food?

Lesson- Match The Pollinator

Students will read about how bees collect pollen & nectar Students will reflect.

Students will play, "Nectar Relay".

Students will use flash cards to match pollinators to the correct measurement of tongue.

Read-aloud- "Evelyn the Adventurous Entomologists" By: Christine Evans

Scientific Sub-question

How does the environment affect living organisms? (How do living organisms affect the environment?)

What is a pollinator garden?

How do you create a healthy pollinator garden that will survive throughout the year?

Lesson- Bee-Healthy Farm

Student will read & answer questions in "Bee Healthy Farms" reading passage, located in google folder.

Teacher will model to student how to read "Plants Arranged by Bloom time List" located in google folder.

Watch short student videos about "Planting a Garden" and/or "The Arboretume at Penn State".

Students will create a garden layout of different nutritional plants for pollinators.

Read aloud- "The Farm That Feeds Us." By: Nancy Castaldo

Scientific Sub-question

What current issues cause threats to our environment?

How is the Spotted Lanternfly a threat to Pennsylvania's ecosystems?

What are possible solutions humans can use to prevent the spread of invasive species?

Lesson- The Million Dollar Fly

Read aloud- "Science Warriors: The Battle Against Invasive Species (Scientists in the Field Series)" by Sneed B. Collard III

Students will create a "Wanted" flyer for the Spotted Lanternfly.

Students will watch video on the Spotted Lanternfly. Students will discuss what is an Invasive and Endangered Species?

Students will take an active solution by planting Milkweed to help solve the ecosystem issue. (Monarch & Spotted Lanternfly)