STEMscopes NGSS 3D
K-12 SCIENCE

Plant Trait Inheritance and Variation

1st Grade Sample Lesson

www.stemscopes.com/science

Scope (Unit) Plant Trait Inheritance and Variation

Explore (Lesson) Activity - Plant Babies

The following pages introduce lesson resources that guide you through the STEMscopes NGSS 1st grade lesson. This sample lesson does not include all the elements and features of our digital and print science curriculum.

Resource List:

The following resources, as well as additional Scope resources not listed, can be found in the digital curriculum *1st Grade Scope, Plant Trait Inheritance and Variation*.

Home

- Standards Alignment
- Sample Lesson Plan
- Teacher Background
- CCC and SEP Scoring Rubric
- Answer Keys
- Materials List

Engage

- Investigative Phenomena – Introductory activity that facilitates a connection between the content and real-world phenomena and encourages students to ask why or how something happens.
- Graphic Organizer – Students fill this in as they work through the elements of this Scope.
- Accessing Prior Knowledge – A brief probing activity to gauge students' prior knowledge before engaging in the inquiry process.
- Hook – An engaging activity that includes instructor preparation, supplemental resources, and ready-made handouts for students.

Explore

- Explore 1: Activity – This sample lesson.
- Explore 2: Activity

Explain

- Picture Vocabulary – Key terms explained through pictures and by definition.
- Linking Literacy – Strategies to help students comprehend difficult informational text.
- Science Rock – A musical/video software platform where students can sing and learn from standards-based science songs.
- STEMscopedia – Reference materials that include parent connections, career connections, technology, and science news.
- Communicative Science – A class activity in which students use different forms of communication to discuss scientific topics connected to the content of this Scope.
- Concept Review Game – An interactive game that helps students review important concepts.
- Content Connections Video – A short video that supports student understanding of the content.
- Simulation Practice – A ready-made interactive experience to support students' understanding of the science concept.

Elaborate

- Math Connections
- Read Alouds
- Career Connections
- Scientist Spotlight
- SEP Simulations

Evaluate

- Claim-Evidence-Reasoning
- Open-Ended Response Assessment
- Multiple Choice Assessment

Intervention

- Guided Practice
- Independent Practice
- Concept Attainment Quiz

Acceleration

- Extensions
- Science Art
- Books on Topic

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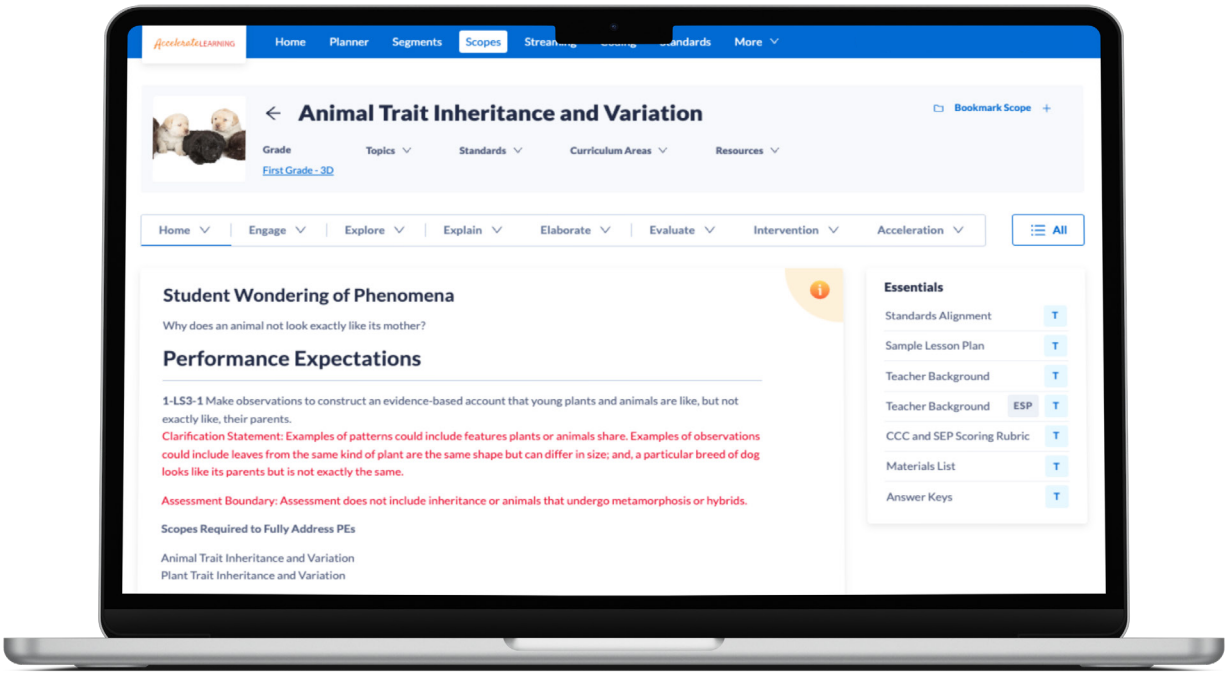
Scope (Unit) Plant Trait Inheritance and Variation



Student Wondering of Phenomena

Why does an animal not look exactly like its mother?

Performance Expectations

1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Clarification Statement: Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size, and a particular breed of dog looks like its parents but is not exactly the same.

Assessment Boundary: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.

Scope (Unit) Overview

Scope (Unit) Plant Trait Inheritance and Variation

Three-Dimensional Focus

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Planning and Carrying Out Investigations Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-LS3-1)	LS3.A (1): Inheritance of Traits Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1) LS3.B (1): Variation of Traits Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.	Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS3-1)

Animal Trait Inheritance and Variation

Explore 1: Activity - Bugs!

Everyday Phenomena

What traits do parents pass to their offspring?

Description

(SEP) Students create and observe how offspring differ by incorporating various traits from both mother and father bugs.

Materials

Printed Material

1 Bugs! (per student)
1 Trait Table (per group)
1 Student CER (per student)

Reusable

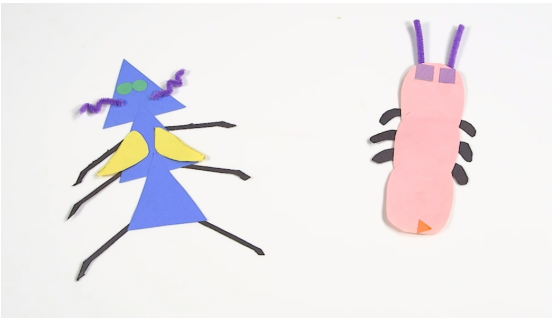
1 Box of Crayons (per group)
1 Box of Markers (per group)
1 Glue (per group)

Consumable

1 Construction paper (per group)
2 Pipe cleaners (per group)

Preparation

- Make a “mom” bug and a “dad” bug, using the table provided.
- Create the bugs using the same materials the students will use during their activity. You may want to list the traits used to create each bug below the “mom” bug and “dad” bug on chart paper.



Procedure and Facilitation Points

1. As students work through the activity, look for teachable moments to introduce students to the following vocabulary terms. Try to point out examples of the terms as students are working so that they can connect the meaning of the word with their experiences. Encourage students to use the following words as they create and discuss their bugs.
    a. **Parent**: a living thing that makes a new living thing
    b. **Offspring**: a new living thing made by other living things
    c. **Young**: a living thing that was recently made by its parents
    d. **Individuals**: single living things
    e. **Recognizable**: able to be identified
    f. **Similar**: having some parts that are the same or almost the same
2. Discuss:
    a. **(CCC)** In what ways can offspring look similar to their parents? They can have the same color of hair or color of skin; they can have the same number of legs, eyes, etc.
    b. What traits do you think you share with your family? Answers will vary and should reflect their characteristics and features as compared with their parents' features.
    c. **(SEP)** When parents have more than one offspring, do they look similar or exactly the same?They'll probably look similar, but not exactly the same. They might have the same hair color and eye color and number of arms and legs. They might look different because they have different hair colors, eye colors, nose shapes, etc.
    d. If you have a brother or sister, do you look exactly like him or her? We both have two eyes and 10 fingers, but we look different because of [answers will vary based on students features]. Even identical twins will probably explain features that are different.
3. Explain to students that they will create a bug at their table that looks similar to the bug parents. Every table group should create their own bug.
4. As a class, students should observe the different traits of the parent bugs. Demonstrate how students can choose traits from both the mom bug and the dad bug.
5. Students will observe the features on the mom and dad bugs and discuss their traits with their group.
6. Pass out one copy of the Trait Table handout to each group to use as a reference for the mom's and dad's characteristics.
7. As a group, students will decide which traits their bug will get from its parents.
8. Students will create their bug and complete Bugs!
9. Have students go on a gallery walk and see all the different bugs that were created from the same parents.
10. Students should choose one offspring bug and complete page 2 of Bugs!
11. Discuss:
    a. Which traits did your bug get from the mom? Our bug's eye color, body shape, and body color were inherited from the mom.
    b. Which traits did your bug get from the dad? Our bug's body markings, legs, and wings were inherited from the dad.
    c. When you observe all the bugs in the class, what do you notice? Some of the bugs look almost exactly alike. Some of the bugs look different from each other and only have a few traits in common.
    d. **(CCC)** Even though the bugs were all different, what patterns did you notice? All the bugs got their traits from either the mom or the dad bug. Overall, they still looked like bugs, not like a different animal.
        i. Record this example of a pattern on the class crosscutting concept chart. Discuss other examples of patterns that the students have previously explored. Charts can be found in the teacher toolbox.
12. Explain to students that they were all choosing from the same traits, but that each group created a different bug. This is a great time to show students how different variations of the traits can be seen with the same set of parents.

13. Discuss:
    a. We chose the different traits for our bugs, but do you think that parents get to choose the traits of their children? No, what we look like is based on what our parents look like.
14. **(SEP)** Add new information to the class Graphic Organizer, then students should complete the CER.

Connection to the Investigative Phenomena

Once students have completed the activity, have them refer to the Investigative Phenomena question, anchor their learning, and revise their thinking.

Math Moment

You can extend this learning task by connecting it to math standard *1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. After students create the parent and offspring bugs, have them compare the lengths of each.*

Have three students choose one of their bugs to share with the class. Then ask the three students to order the lengths of their bugs from longest to shortest.

Check out this module's Math Connections for further practice!

Language Acquisition Strategies

Sentence Stems

After finishing the activity, the students can complete the sentence stems in their journals for review or as a clarification.

Emerging: _ and _ look like their parents. Animals don't look exactly like their parents because __.

Expanding/Bridging: _, _, and _ look like their parents, but not exactly the same. This happens because __.

Intervention Strategies

Roadblock: Does Not Complete Assignments

Students may have a hard time finishing the assignment due to the number of traits seen in the bugs. You may reduce the number of traits and have students choose from that smaller list, or you may limit the number of choices. For example, tell students they must use the body size of the mom and the body color of the dad, but they are allowed to choose the eye color. Find more strategies for students who fail to complete assignments in the Intervention Toolbox.

Explore

Animal Trait Inheritance a

Explore Lesson

Name: _____ Date: _____

Bugs!

The **body size** will be _____, just like the _____ bug.

The **body shape** will be a _____, just like the _____ bug.

The **body color** will be _____, just like the _____ bug.

The **eye shape** will be _____, just like the _____bug.

The **eye color** will be _____, just like the _____bug.

The **antennae** will be _____, just like the _____ bug.

The **tail** will be _____, just like the _____ bug.

The **wings** will be _____, just like the _____ bug.

The **legs** will be _____, just like the _____ bug.

Bug Drawing

Explore

Bugs!

Draw a sibling bug from another group.

Explore

Name: _____ Date: _____

Bugs!

The **body size** will be ___large___, just like the ___mom___ bug.

The **body shape** will be a ___triangle___, just like the ___dad___ bug.

The **body color** will be ___blue___, just like the ___dad___ bug.

The **eye shape** will be ___square___, just like the ___mom___ bug.

The **eye color** will be ___purple___, just like the ___mom___ bug.

The **antennae** will be ___zigzag___, just like the ___dad___ bug.

The **tail** will be ___no tail___, just like the ___dad___ bug.

The **wings** will be ___yellow___, just like the ___dad___ bug.

The **legs** will be ___short, fat___, just like the ___mom___ bug.

Bug Drawing

The student drawing should reflect the choices made above.

Explore

Bugs!

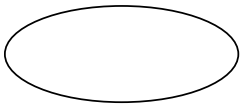
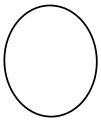
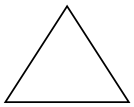
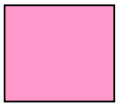
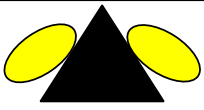
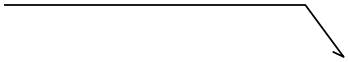
Draw a sibling bug from another group.

The student drawing should represent a bug drawing from another group with the above features.

Explore

Name: _____ Date: _____

Trait Table

Traits	Mom Bug	Dad Bug
Body size	Large 	Small 
Body shape	Oval 	Triangle 
Body color	Pink 	Blue 
Eye shape	Square 	Circle 
Eye color	Purple 	Green 
Antennae	Straight	Zigzag 
Tail	Short, pointy, orange 	No tail 
Wings	No wings 	Yellow 
Legs	Short, fat 	Long, skinny 

Explore

Name: _____ Date: _____

Bugs!
Claim-Evidence-Reasoning

Think like a scientist and complete the sentence.

Claim

Young animals look like their _____, but none of _____ them look exactly the _____.

Evidence

List two pieces of evidence from the activity that show you know the sentence above is true.

1. _____
2. _____

Explore

Bugs!

Student Rubric

	3	2	1
Claim	☺ ☺ ☺ My claim was correct.	☺ ☺ I made a claim, but it was incorrect.	☺ I did not make a claim.
Evidence	☺ ☺ ☺ I gave evidence that helped me make my claim.	☺ ☺ I gave evidence, but it did not have anything to do with my claim.	☺ I did not give any evidence.

Explore

Name: _____ Date: _____

Bugs!
Claim-Evidence-Reasoning

Think like a scientist and complete the sentence.

Claim

Young animals look like their parents, but none of them look exactly the same.

Evidence

List two pieces of evidence from the activity that show you know the sentence above is true.

1. The baby bug has some of its mom's traits, but not all of them.

2. The baby bug has body markings, legs, and wings like the dad.

Explore

Bugs!

Student Rubric

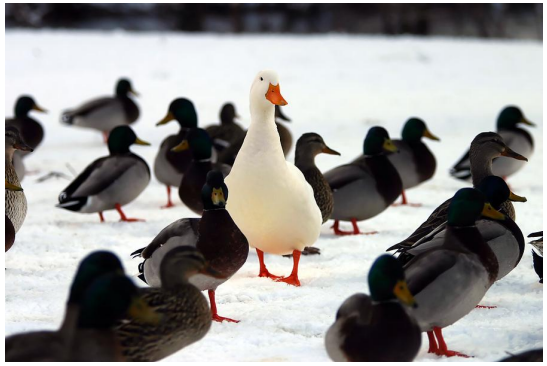
	3	2	1
Claim	☺ ☺ ☺ My claim was correct.	☺ ☺ I made a claim, but it was incorrect.	☺ I did not make a claim.
Evidence	☺ ☺ ☺ I gave evidence that helped me make my claim.	☺ ☺ I gave evidence, but it did not have anything to do with my claim.	☺ I did not give any evidence.

Picture Vocabulary

Animal Trait Inheritance and Variation

Picture Vocabulary

Individual



Single living thing

Offspring

A new living thing made by other living things

Parent

A living thing that makes a new living thing

Recognizable

Able to be identified

Similar

Having some parts that are the same or almost the same

Young

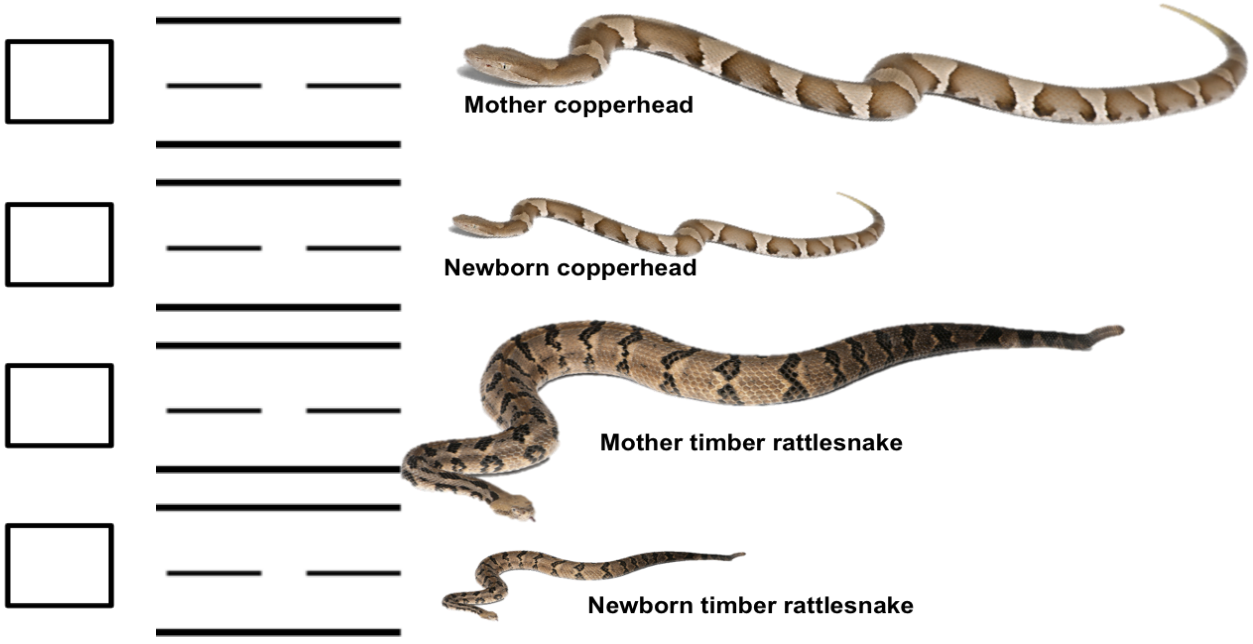
A living thing that was recently made by its parents

Math Connections

Math Connections

Name: _____ Date: _____

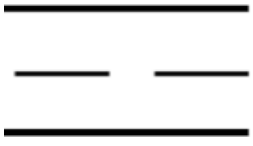
1. A baby snake looks like its parents, only smaller. Look at the pictures below.



a. Measure the length of each snake above with small cubes. Write the total on the line next to the snake.

b. Number the snakes in order from longest to shortest (1–4) in the boxes next to the snakes.

c. How many **more** cubes would be needed to make the newborn copperhead the same size as its mother?



Math Connections

2. Baby animals are born in the zoo every year and look like their parents, only shorter. Look at the pictures below.

Mother zebra
100 inches

Baby zebra
30 inches

Mother gorilla
130 inches

Baby gorilla
20 inches

a. Which animal is taller: the mother zebra or the mother gorilla?

b. Which animal is shorter: the baby zebra or the baby gorilla?

c. How tall are the baby zebra and baby gorilla, together?

d. How tall are the mother zebra and the mother gorilla, together?

Animal Trait Inheritan

Claim-Evidence-Reasoning

CER Assessment

Name: _____ Date: ____

Scenario

Timmy saw some kittens with their mother in the park. He noticed th
kittens were mostly the same color as her, but one was not. He wondered where the other color came from.

Prompt

Thinking like a scientist, where do you think the other color of fur came from?

Claim:
The other color of fur came from _____ .

Evidence: Write how you know!

Draw how you know!

Claim-Evidence-Reasoning

Animal Trait Inheritance and Variation CER

Rubric for Writing a Scientific Explanation

	3	2	1
Claim	☺ ☺ ☺ My claim was correct.	☺ ☺ I made a claim, but it was incorrect.	☺ I did not make a claim.
Evidence	☺ ☺ ☺ I gave evidence that helped me make my claim.	☺ ☺ I gave evidence, but it did not have anything to do with my claim.	☺ I did not give any evidence.

Animal Trait Inheritance and Variation

Claim-Evidence-Reasoning

Name: _____ Date: _____

Scenario

Timmy saw some kittens with their mother in the park. He noticed the kittens were mostly the same color as her, but one was not. He wondered where the other color came from.

Prompt

Thinking like a scientist, where do you think the other color of fur came from?

Claim:
The other color of fur came from the father .

Evidence: Write how you know!

Three kittens have gray fur. One kitten has black fur.

The mother has gray fur.

Draw how you know!

The student drawing might represent a father cat with black fur (no stripes), the mother cat with brown-striped fur, and the kitten with black-striped fur.

Claim-Evidence-Reasoning

Animal Trait Inheritance and Variation CER

Rubric for Writing a Scientific Explanation

	3	2	1
Claim	☺ ☺ ☺ My claim was correct.	☺ ☺ I made a claim, but it was incorrect.	☺ I did not make a claim.
Evidence	☺ ☺ ☺ I gave evidence that helped me make my claim.	☺ ☺ I gave evidence, but it did not have anything to do with my claim.	☺ I did not give any evidence.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