Unit 4: Heredity: Inheritance and Variation of Traits

Content Area: **Science**
Course(s):
Time Period: **Generic Time Period**
Length: **3 weeks**
Status: **Published**

Disciplinary Core Ideas

Inheritance of Traits

- Many characteristics of organisms are inherited from their parents. (3-LS3-1)
- Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)

Variation of Traits

- Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)
- The environment also affects the traits that an organism develops. (3-LS3-2)

LA.3.SL.3.4	Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
MA.3.3.MD.B.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
LA.3.W.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
3-LS3	Heredity: Inheritance and Variation of Traits
3-LS3-1	Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.
3-LS3-2	Use evidence to support the explanation that traits can be influenced by the environment.
LA.3.RI.3.1	Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
LA.3.RI.3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea.
LA.3.RI.3.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

Essential Questions

Essential Unit Question:

What kinds of traits are passed on from parent to offspring?

What environmental factors might influence the traits of an organism?

Objectives:

-Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

-Use evidence to support the explanation that traits can be influenced by the environment.

Concepts that will be taught...

• Similarities and differences in patterns can be used to sort and classify natural phenomena (e.g., inherited traits that occur naturally).

• Many characteristics of organisms are inherited from their parents.

• Different organisms vary in how they look and function because they have different inherited information.

• Cause-and-effect relationships are routinely identified and used to explain change.

• Other characteristics, which can range from diet to learning, result from individuals' interaction with the environment.

• Many characteristics involve both inheritance and environment.

• The environment also affects the traits that an organism develops.

Students will be able to:

Sort and classify natural phenomena using similarities and differences

Analyze and interpret data to make sense of phenomena using logical reasoning.

Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

Identify cause-and-effect relationships in order to explain change.

Use evidence (e.g., observations, patterns) to support an explanation.

Use evidence to support the explanation that traits can be influenced by the environment.

Examples of the environment's affect on traits could include:

- Normally tall plants that grow with insufficient water are stunted.

- A pet dog that is given too much food and little exercise may become overweight.

Activities

1. Have students plant four different pea plants labeled "Light, no light, water, no water" and put them in their respective places around the room. Students will chart the effect the enviroment had on the plants and the differences they noticed between them. (Page A 14-15 in textbook)

2. Mystery Science: Power of Fowers; Life Cycle, Traits and Heredity (4 weeks)

#1: Why Do Plants Grow Flowers? (Flowering and Reproduction); In this Mystery students learn how and why flowers are pollinated. In the activity students create a model of a flower.

#2: Why Do Plants Give us Fruit? (Reproduction) In this Mystery students learn about why plants grow fruit. In the activity, they practice identifying fruit versus vegetables

#3: Why are some apples red and some green? (Inheritance, Traits, and Selection) In this Mystery students learn how the food we eat is a result of selection. In the activity students taste different apples and identify the traits human beings have selected for.

#4:How Could You Make the Biggest Fruit in The World (Fruiting, reproduction) In this Mystery students continue exploring how human beings have modified plants based on our knowledge of how plants inherit their traits. In the activity students play a pattern-matching game where they discover that some fruits are related to each other.

Materials & Resources

www.mysteryscience.com

Pea seeds, Cartons or cups, Soil, water, textbook, Chapter test

Mystery Science Supplies:

Mystery #1:

Each student will need:

- a Make-a-Flower sheet and a Flower Base sheet
- markers or colored pencils to color with (green and two other colors)
- scissors
- two or three pipe cleaners
- a sticky label
- a glue stick (students can share)

To see that pollen is transferred from one flower to another, students need two different kinds of pollen. For each table, you need:

- two small paper cups
- a tablespoon of pollen for each cup

Here are powders that work as pollen and are available at the grocery store. Choose two.

- ground coffee
- cornmeal
- cinnamon
- ground sage or dill weed

Mystery #2

Each student will need:

- a Science Fruit or Science Vegetable sheet
- a pencil
- a toothpick
- a plate or paper towel with a slice of tomato, celery, cucumber, potato, and radish

Mystery #3

- an Apple Taste Test sheet.
- a pencil
- a paper towel or paper plate
- a toothpick
- a sample of four different apples

You will need 4 different varieties of apple across different colors, textures, and flavors. (We recommend Granny Smith, Red Delicious, Golden Delicious, and Honeycrisp. Other possibilities are Gala, Fuji, or Jazz). For a class of 30, you'll need two apples of each variety, for a total of 8 apples.

Mystery #4

Each student will need:

- a Odd One Out worksheet
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- scissors

Each pair of students will need:

- a set of Plant Cards

Assessment

Chapter Review Page A 34

Chapter Test Page 1

Chapter vocabulary (W/S page 23 in Reading in Science Resources)

Mystery Science:

Mystery 1-4 assessment

Summative assessment

Accommodations & Modifications

- Large print textbooks
- Additional time for assignments
- Review of directions
- Have student restate information
- Provision of notes or outlines
- Concrete examples
- Adaptive writing utensils
- Support auditory presentations with visuals
- Weekly home-school communication tools (notebook, daily log, phone calls or email messages)
- Space for movement or breaks
- Extra visual and verbal cues and prompts
- Books on tape
- Graphic organizers
- Quiet corner or room to calm down and relax when anxious

- Preferential seating
- Alteration of the classroom arrangement
- Reduction of distractions
- Answers to be dictated
- Hands-on activities
- Use of Manipulatives
- Follow a routine/schedule
- Alternate quiet and active time
- Teach time management skills
- Rest breaks
- Verbal and visual cues regarding directions and staying on task
- Daily check-in special education teacher
- Visual daily schedule
- Varied reinforcement procedures
- Immediate feedback
- Personalized examples