Admirable Adaptations

Next Generation Science Standards
Disciplinary Core Idea: LS1.A Structure and Function Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.

Science and Engineering Practice 4: Analyzing and Interpreting Data

Crosscutting Concept 6: Structure and Function

Common Core State Standards
CCSS.ELA-Literacy.W.4.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

ACTIVITY DESCRIPTION

Through a classification activity, students will analyze the functions of different plant structures that enable them to survive, grow, and reproduce in their environments.

50 MINUTES

GUIDING QUESTIONS

- What do plants need to survive, grow, and reproduce?
- What types of physical adaptations do plants have that help them meet their needs in their environment?

OBJECTIVE

Students will demonstrate their understanding of the functions of different plant structures by analyzing and classifying different plants according to their physical features.

VOCABULARY

Physical Adaptation - a feature on an organism that makes it better suited to survive in its environment

Botany - the scientific study of plant life

Ecosystem - all of the living and nonliving things in an area and their interactions with one another

Survival - the process of staying alive

MATERIALS

PER GROUP:

- ○ Copy of Plant Needs Graphic Organizer
- ○ Copy of Plant Cards
- ○ Science notebooks or paper

PREPARATION

Copy and cut out the Plant Cards for each group.

Admirable Adaptations Procedures

Engage | 10 minutes

1. Ask students to think about what plants need in order to grow, survive, and reproduce. Have students write their ideas in their science notebooks and share with a partner and then the whole class.
2. Responses may include: sunlight, water, soil nutrients, protection from predators, pollinators, and seed dispersal methods.
3. Break students into small groups and distribute one copy of the Plant Needs Graphic Organizer to each group. Instruct students to work together with their group to brainstorm and list features and structures of plants that help them meet each of these needs. Examples may include: large leaves to absorb sunlight, deep or wide roots to access water, colorful fruit or nectar to attract pollinators, thorns or poisonous fruit to deter predators, edible fruit to disperse seeds by animal consumption, or lightweight seeds to disperse in the wind.
4. Encourage groups to share out their lists of plant structures and discuss how each structure has a function that enables the plant to survive.

Explore | 10 minutes

1. Give each group a set of Plant Cards.
2. Instruct students to work together in their groups to analyze and categorize the cards according to physical features or structures of the plants. Groups can develop their own specific criteria to use for classification.

Explain | 10 minutes

1. Instruct groups to create a title for each of their categories and write a short description of the shared features of the plants within each category.
2. In their science notebooks, have students record the category titles.
3. Instruct groups to share the ways that they organized the Plant Cards, explain their reasoning behind each category, and discuss the features or structures that the plants in each category have in common with the class.
4. If time permits, encourage students to re-categorize the plants using different criteria.

Elaborate | 10 minutes

1. Instruct each student to select one of the categories that was created by their group.
2. In their science notebooks, prompt students to describe the physical structure that defines the category, and specifically how that structure helps the plant meet its survival needs.

Evaluate | 10 minutes

Ask students to complete the summative questions in their science notebooks or as an exit slip.

Summative Questions:

1. List at least four things that plants need to survive, grow, and reproduce.
2. Describe one plant structure that could help a plant meet each need listed in the response to Question 1.
3. What might happen to the plant if it did not have the structure described in the response to Question 1?

Differentiation

Extension: Challenge students to research plants found at their Field Study site and work together to analyze and divide them into different categories according to their physical adaptations.

Notes on Modifications for Your Diverse Learners:

Admirable Adaptations Plant Needs Graphic Organizer

Plant Needs	Water and Nutrients	Sunlight	Dispersing Seeds	Deterring Predators	Other: _____
Plant Features and Structures					

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Plant Features and Structures					

Admirable Adaptations Plant Cards

Prickly pear cactus

- Pads covered with sharp spines
- Tasty, edible fruit with seeds inside
- Grows in sandy or rocky prairies

Wild ginger

- Grows in dense patches under trees
- Leaves are heart-shaped, fuzzy, and bitter
- Seeds have a tasty part on them that ants eat

Switchgrass

- Tall grass that sways in the wind
- Has a deep root system
- Grows in many soil types

Spicebush

- Multi-stemmed dense shrub
- Has fragrant flowers and spicy-tasting leaves
- Produces red fruit in autumn

Indiangrass

- Tall grass that sways in the wind
- Has a deep root system
- Regrows well after a fire

Buttonbush

- Shrub with long, shiny leaves
- Fragrant flowers in globe-shaped clusters
- Ducks and waterfowl eat the seeds

Black raspberry

- Grows along woodland edges and trails
- Tasty fruit is eaten by birds and mammals
- Has sharp thorns along the stem

Pasture rose

- Grows in prairies, savannas and along edges of woods
- Stems have sharp thorns
- Sweet smelling flowers form tasty fruit called rose-hips

Purple coneflower

- Has purple flowers that are a good nectar source
- Grows in prairies and in oak savannas
- Pointy seeds are a favorite of goldfinches

Cattail

- Grows in both wet soil and shallow water
- Can grow new plants from spreading roots
- Produces light, fluffy, cottony seeds

Butterfly weed

- Grows bright orange nectar-filled flowers
- Plant sap tastes bad to most animals
- Fluffy seeds form in long seedpods

Big bluestem

- Tall grass that sways in the wind
- Has a very deep root system
- Stems turn purple-blue at the base