Growing and Spreading Plants

Grade: 2
Subject: Science (STEAM approach)
Unit Focus:
Students investigate plant growth requirements and how plants reproduce and spread through interactions with animals.

Key Understandings & Standards

- **Plant Growth Needs:** Plants require sunlight and water to grow (2-LS2-1).
- **Plant-Animal Interactions:** Plants depend on animals for pollination or seed dispersal (2-LS2-2).
- **Biodiversity & Habitat:** Living things exist in various habitats and occupy different ecological niches (2-LS4-1).
- **Cause & Effect / Structure & Function:**
    - Events (like water or sunlight deprivation) generate observable patterns in plant growth.
    - The structure of animals and plants relates to their function in seed dispersal and pollination.

Essential Questions:

- What do plants need to grow?
- How do plants spread their seeds and reproduce?

Knowledge & Skills

- **Knowledge:**
    - Plants need sunlight and water to grow.
    - Animals can disperse seeds or pollinate plants.
    - Different habitats support different plants and animals.
- **Skills:**
    - Plan and conduct controlled investigations to test plant growth variables.
    - Develop simple models representing plant-animal interactions.
    - Collect and analyze observational data.

Performance Tasks

1. **2-LS2-1:** Test plant growth under different conditions:
    - Light + Water
    - Light only
    - Water only
    - Neither light nor water
    - Record and describe observations to determine plant growth needs.
2. **2-LS2-2:** Model animal-assisted seed dispersal or pollination:
    - Identify structures of animals that aid seed/pollen transport.
    - Show how plant structures interact with animals.
    - Explain how the model demonstrates real-world structure-function relationships.

Learning Activities

- **Mystery Science:** Create models showing how seeds spread.
- **Exploring Plants:** Dissect seeds, observe roots with root viewers, and experiment with capillary tubes to explore plant structure and growth.

Resources:

- Mystery Science modules
- Seeds, root viewers, capillary tube materials for hands-on experiments

Our Changing Earth

Grade: 2
Subject: Science (STEAM approach)
Unit Focus:
Students act as “geological detectives” to explore how Earth changes over time and how landforms are shaped by natural forces like wind, water, and time.

Key Understandings & Standards

- **Earth Events:** Some events occur quickly (floods, storms) and some slowly (erosion, weathering) (2-ESS1-1).
- **Landform Changes:** Wind and water can change the shape of the land (2-ESS2-1).
- **Mapping & Observation:** Maps represent shapes and kinds of land and water; water exists as liquid and solid (2-ESS2-2, 2-ESS2-3).
- **Patterns & Stability/Change:**
    - Patterns in land and water features can be observed.
    - Changes may occur slowly or rapidly.
- **Engineering Connection:** Compare multiple solutions to prevent erosion or protect land (2-ESS2-1).

Essential Question:

- Why does the land change over time?

Knowledge & Skills

- **Knowledge:**
    - Earth events can be rapid or slow.
    - Wind and water reshape the land.
    - Maps can represent landforms and bodies of water.
    - Water exists in solid and liquid forms.
- **Skills:**
    - Develop and use models (maps, paper or digital simulations) to represent land and water.
    - Make evidence-based explanations using observations from multiple sources.
    - Compare and evaluate solutions to prevent erosion or other land changes.

Performance Tasks

1. **2-PS1-2 & 2-PS1-3:** Examine material properties; disassemble and reassemble objects to understand their characteristics.
2. **2-ESS1-1:** Explain Earth events using evidence; distinguish between rapid and slow changes.
3. **2-ESS2-1:** Evaluate multiple solutions to prevent land changes from wind and water.
4. **2-ESS2-2:** Develop models/maps showing land and water features; describe patterns and relationships.
5. **2-ESS2-3:** Identify where water exists on Earth and its forms (liquid or solid).

Learning Activities

- **Mystery Science:** Create maps and paper mountain models to trace rivers and observe canyon formation.
- **Environscape:** Explore different landforms using hands-on models.
- **GIS & GPS:** Use technology to map and identify patterns in local land features.

Resources:

- Mystery Science modules
- Environscape models
- GIS software, GPS units

Science Matters!

Grade: 2
Subject: Science (STEAM approach)
Unit Focus:
Students investigate properties of matter, including water, and explore how matter changes under heating or cooling.

Key Understandings & Standards

- **Properties of Matter:** Different kinds of matter exist; many can be solid or liquid depending on temperature (2-PS1-1).
- **Suitability of Materials:** Different properties are suited for different purposes (2-PS1-2).
- **Building & Reassembling:** Objects can be disassembled and reassembled into new forms (2-PS1-3).
- **Changes in Matter:** Heating or cooling may cause observable changes, some reversible, some not (2-PS1-4).

Essential Question:

- What patterns related to water exist in the natural world?

Knowledge & Skills

- **Knowledge:**
    - Matter has observable properties (color, texture, hardness, flexibility, solid/liquid).
    - Matter changes with temperature; some changes are reversible.
    - Material properties determine suitability for specific purposes.
- **Skills:**
    - Plan and conduct investigations collaboratively.
    - Analyze and classify materials based on properties.
    - Construct evidence-based explanations.
    - Construct arguments with evidence regarding reversible/irreversible changes.

Performance Tasks

1. **2-PS1-1:** Describe and classify materials by observable properties; test properties at different temperatures.

2. **2-PS1-2:** Analyze data to determine which materials are best suited for intended purposes.
3. **2-PS1-3:** Observe how objects made of a small set of pieces can be disassembled and reassembled.
4. **2-PS1-4:** Construct arguments with evidence about which changes caused by heating/cooling are reversible or irreversible.
5. **2-LS4-1:** Compare plant and animal diversity in different habitats.
6. **2-ESS2-2 & 2-ESS2-3:** Develop models/maps to show water locations on Earth and its forms (solid/liquid).

Learning Activities

- **Mystery Science:** Investigate materials and determine best uses based on properties.
- **Hands-On Exploration:** Explore matter with water beads, kinetic sand, and basic chemistry experiments.

Resources:

- Mystery Science modules
- Water beads, kinetic sand, basic chemistry kits