

SCIENCE 3D

CANOPY CRITTERS

SCIENCE PERFORMANCE EXPECTATIONS AND DISCIPLINARY CORE IDEAS

In this Elementary School Mission (NGSS Grade 4), students will address the general topics below. For a complete list of NGSS standards covered in each segment of the mission, continue reading after the general standards. *Note: Be sure to complete the **Mission Reader** and **Mission Research** before viewing the full **Mission Video**. Explore [How to Use Science 3D](#) to get suggestions on how to pace the mission and options for the order of activities. Math and Language Arts standards will be added shortly.*

- In the **Mission Reader**, *Canopy Critters*, students will learn about structure and function, roles of organisms in ecosystems, interactions among organisms, plant reproduction, and sensory systems. They will also explore light and sound waves, renewable and non-renewable resources, and human impacts on Earth.
- During **Mission Research**, students will investigate natural resources including renewable and non-renewable resources. They will explore human impacts on these resources.
- In the **Science Mission**, students will start by exploring the body systems and sensory systems of canopy animals. They will graph and analyze data to discover differences in vision between species and how their digestive systems work. Then, they will use maps and data to make and test predictions about how animals will respond to human use of the environment and how it influences their ability to disperse seeds.
- In the **STEM Project**, students will compare and contrast the structure and function of animal eyes and camera systems. They will use what they learn about vision to come up with ideas for new camera systems. Then, they will use inspiration from rainforest plants to come up with ideas on how to build stable structures. Finally, they will devise ways for scientists to work in the canopy.
- The **Explore Your Backyard** activity has students explore sound and light waves in their local area and make connections between waves and their everyday lives. There is an additional activity comparing pollination and dispersal in the rainforest to that in their local ecosystem.

SCIENCE/ENGINEERING AND DESIGN DISCIPLINARY CORE IDEAS AND PERFORMANCE EXPECTATIONS

MISSION READER

4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior and reproduction.
LS1.A	Structure and function.
4-LS1-2	Use a model to describe that animals receive different types of information through their senses, process information in their brain, and respond to the information in different ways.
LS1.D	Information processing.
4-ESS3-1	Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
ESS3.A	Natural resources.
4-PS4-1	Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
PS4.A	Wave properties: waves of the same type can differ in amplitude and wavelength.
4-PS4-2	Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
PS4.B	Electromagnetic radiation.
PS4.C	Information technologies and instrumentation.

MISSION RESEARCH

4-ESS3-1	Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
ESS3.A	Natural resources.
4-ESS3-2	Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

SCIENCE MISSION

4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior and reproduction.
LS1.A	Structure and function.
4-LS1-2	Use a model to describe that animals receive different types of information through their senses, process information in their brain, and respond to the information in different ways.
LS1.D	Information processing.
PS4.B	Electromagnetic radiation.

STEM PROJECT

4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior and reproduction.
LS1.A	Structure and function.
4-LS1-2	Use a model to describe that animals receive different types of information through their senses, process information in their brain, and respond to the information in different ways.
LS1.D	Information processing.
3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
ETS1.A	Defining and delimiting engineering problems.
3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
ETS1.B	Developing possible solutions: communicating with peers about proposed solutions is important and can improve design.
ETS1.C	Optimizing the design solution.
ETS1.B	Developing possible solutions.
4-PS4-2	Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
PS4.B	Electromagnetic radiation.

EXPLORE YOUR BACKYARD

4-PS4-1	Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
PS4.A	Wave properties: waves of the same type can differ in amplitude and wavelength.

CROSS CUTTING CONCEPTS

Patterns: [Reader](#), [Science Mission](#), [STEM Project](#)

Cause and effect: Mechanisms and Predictions: [Reader](#), [Science Mission](#), [STEM Project](#)

Scale, proportion and quantity: [Reader](#), [Science Mission](#), [STEM Project](#)

System and system models: [Science Mission](#), [STEM Project](#), [Explore your Backyard](#)

Energy and matter: [Reader](#), [Science Mission](#)

Structure and function: [Reader](#), [Science Mission](#), [STEM Project](#)

Stability and change: [Reader](#), [Mission Research](#), [Science Mission](#)

CONNECTION TO ENGINEERING, TECHNOLOGY AND APPLICATIONS OF SCIENCE

Interdependence of science, engineering and technology: [Reader](#), [Science Mission](#), [STEM Project](#)

Influence of science, engineering and technology on society and the natural world: [Reader](#), [Mission Research](#)

CONNECTION TO NATURE OF SCIENCE

Scientific investigations use a variety of methods: [Reader](#), [Science Mission](#)

Scientific knowledge is based on empirical evidence: [Reader](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

Scientific knowledge is open to revision in light of new evidence: [Reader](#), [Science Mission](#)

Science models, laws, mechanisms and theories explain natural phenomena: [Reader](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

Science is a way of knowing: [Reader](#), [Science Mission](#), [STEM Project](#)

Scientific knowledge assumes an order and consistency in natural systems: [Reader](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

Science addresses questions about the natural and material world: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

SCIENCE AND ENGINEERING PRACTICES

Asking questions and defining: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

Developing and using models: [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

Planning and carrying out investigations: [Science Mission](#)

Analyzing and interpreting data: [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

Using mathematics and computational thinking: [Science Mission](#)

Constructing explanations and designing solutions: [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

Engaging in argument from evidence: [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

Obtaining, evaluating and communicating information: [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)