SCIENCE·3D

SEA TURTLE WORLD

SCIENCE PERFORMANCE EXPECTATIONS AND DISCIPLINARY CORE IDEAS

In the Elementary School Mission, 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**, Sea Turtle World (NGSS Grade 5), students will learn about turtles, the distribution of water on the planet, sea turtles and their ecosystems, the flow of energy and matter in ecosystems, and interactions within ecosystems. They will also explore how nutrients fuel the growth of plants and other producers and how technology is helping protect wildlife.
- During **Mission Research**, students will work to develop a better understanding of the proportions of different forms of water on Earth. They will also develop ideas about how energy and matter flows through a sea turtle's ecosystem.
- In the **Science Mission**, students will use data from Abaco, The Bahamas to investigate how nutrients affect plant growth and how the amount and quality of food influences where sea turtles are found. They will also explore how predators might influence the behavior of sea turtles. This mission challenges students to develop hypotheses and test their predictions using data.
- In the **STEM Project**, students will explore the idea of trade-offs and identify them in their own lives. Then, they will explore trade-offs that are made by engineers and the trade-offs that are important in solving environmental challenges.
- The **Explore Your Backyard** activity has students refresh their understanding of the positive, negative, and neutral interactions that occur among species in ecosystems. Then, they'll explore a local ecosystem to identify the interactions that occur in their region.

SCIENCE/ENGINEERING AND DESIGN DISCIPLINARY CORE IDEAS AND PERFORMANCE EXPECTATIONS

MISSION READER

5-LS-1	Support an argument that plants get the materials they need for growth chiefly from air and water.
LS1.C	Organization for matter and energy flow in organisms.
5-LS2 -1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
LS2.A	Interdependent relationships in ecosystems.
LS2.B	Cycles of matter and energy transfer in ecosystems.
5-ESS2-2	Describe and graph the amounts and percentages of water and freshwater in various reservoirs to provide evidence about the distribution of water on Earth.
5-PS3-1	Use models to describe that energy in animals' food was once energy from the sun.
ESS3.C	Human impacts on Earth systems. This focuses on human impacts on turtles through overharvesting and damaging nesting beaches.

MISSION RESEARCH

5-LS2 -1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
LS2.A	Interdependent relationships in ecosystems.
LS1.C	Organization for matter and energy flow in organisms.
LS2.B	Interdependent relationships in ecosystems.
5-ESS2-2	Describe and graph the amounts and percentages of water and freshwater in various reservoirs to provide evidence about the distribution of water on Earth.
ESS3.C	Human impacts on Earth systems.
PS1.A	Structure and properties of matter: the amount of matter is conserved even when it transitions even when it seems to vanish.
5-PS3-1	Use models to describe that energy in animals' food was once energy from the sun.

*ELA and Math standards to come

GRADE 5 SEA TURTLE WORLD NGSS STANDARDS

SCIENCE MISSION

LS1.C	Organization for matter and energy flow in organisms.
5-LS2 -1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. This is not covered explicitly in the activity; full coverage is in the Background activity. This standard, however, should be something that students are able to piece together from the lines of inquiry in the activity, which follows how matter moves through the ecosystem of Abaco, The Bahamas.
LS2.A	Interdependent relationships in ecosystems.
LS2.B	Cycles of matter and energy transfer in ecosystems.

STEM PROJECT

5-ESS3-1	Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
ESS3.C	Human impacts on Earth systems.
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.
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.

EXPLORE YOUR BACKYARD

LS2.A	Interdependent relationships in ecosystems.

CROSS CUTTING CONCEPTS

Patterns: Reader, Mission Research, Science Mission, Explore Your Backyard
Cause & effect/Mechanisms & predictions: Reader, Mission Research
Scale proportion and quantity: Reader, Mission Research, Science Mission
System and system models: Reader, Mission Research, Science Mission
Energy and matter (flows, cycles and conservation): Reader, Mission Research, Science Mission
Structure and function: Reader, STEM Project
Stability and change: Reader

CONNECTION TO ENGINEERING, TECHNOLOGY AND APPLICATIONS OF SCIENCE

Interdependence of Science, Engineering and Technology: Reader, Science Mission
Influence of Science, Engineering and Technology on Society and the Natural World: Reader

CONNECTION TO NATURE OF SCIENCE

Scientific investigations use a variety of methods: Reader, Science Mission
Scientific knowledge is based on empirical evidence: Reader, Mission Research, 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, Mission Research, Science Mission
Science is a way of knowing: Reader, Mission Research, Science Mission, STEM Project, Explore Your Backyard
Scientific knowledge assumes an order and consistency in natural systems: Reader, Mission Research, Science Mission, Explore Your Backyard
Science addresses questions about the natural and material world: Reader, Mission Research, Science Mission, Explore Your Backyard

SCIENCE AND ENGINEERING PRACTICES

Asking questions and defining problems: Reader, Science Mission, STEM Project
Developing and using models: Mission Research, Science Mission, Explore Your Backyard
Planning and carrying out investigations: Science Mission, Explore Your Backyard
Analyzing and interpreting data: Science Mission
Using mathematics and computational thinking: Science Mission
Constructing explanations and designing solutions: Mission Research, Science Mission
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

*ELA and Math standards to come