

Georgia Standards of Excellence – Expedition Ocean

Below you will find the following aligned to the GA Standards of Education

Mission 1 – Living and Working Undersea			
Lesson	Grade Level	Subject area	Standard(s)
Lesson 2: Under Pressure	9 th – 12 th	Chemistry	SC5c
Lesson 3: Dive in	9 th – 12 th	Chemistry	SC3c

Mission 2 – Life on the Reef			
Lesson	Grade Level	Subject area	Standard(s)
Lesson 1: Coral Creations	7 th	Life Science	S7L2a
Lesson 2: Where in the World is my Coral Larvae?	7 th	Life Science	S7L3a
Lesson 3: Fish Detective	7 th	Life Science	S7L1a; S7L1b
Lesson 4: Connect to Protect	7 th	Life Science	S7L4c

Mission 3 – Seas of Change			
Lesson	Grade Level	Subject area	Standard(s)
Lesson 1: Can you Take the Heat?	9 th – 12 th	Environmental Science	S8P3b; S8P3c
Lesson 2: More Acidity, More Problems	9 th – 12 th	Environmental Science	SEV5a; SEV5d; SEV4b
Lesson 3: SOS – Rising Seas	9 th – 12 th	Environmental Science	SEV4a

Mission 4 – Space Prep			
Lesson	Grade Level	Subject area	Standard (s)
Lesson 1: Deign an AUV	8 th	Physical Science	SEV2c
Lesson 2: Buoyancy: From Sea to Space	6 th	Earth Science	S6E1d
Lesson 3: The Best Analog	6 th	Earth Science	S6E1c

Mission 1 – Living and Working Undersea: 9-12th Chemistry

Lesson 2: Under Pressure – Boyle’s Law

9-12 th Grade Chemistry Pacing Guide	
Mission 1: Living and Working Undersea – Lesson 2: Under Pressure – Boyle’s Law	
Georgia Standards of Excellence	Aquarius Academy Connection
Chemistry - Unit 4	
Thermochemistry and Gas Laws	
<p>SC5. Obtain, evaluate, and communicate information about the Kinetic Molecular Theory to model atomic and molecular motion in chemical and physical processes.</p> <p>c. Develop and use models to quantitatively, conceptually, and graphically represent the relationships between pressure, volume, temperature, and number of moles of a gas.</p>	<p>c. Students will use models to quantitatively, conceptually, and graphically apply concepts of the Kinetic Molecular Theory to represent volume to moles, particles to moles and Avogadro’s number in relation to temperature and pressure.</p>

Lesson 3: Dive in – Henry’s Law

9-12 th Grade Chemistry Pacing Guide	
Mission 1: Living and Working Undersea – Lesson 3: Dive in – Henry’s Law	
Georgia Standards of Excellence	Aquarius Academy Connection
Chemistry - Unit 3	
Thermochemistry and Gas Laws	
<p>SC3. Obtain, evaluate, and communicate information about how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions.</p> <p>c. Use mathematics and computational thinking to apply concepts of the mole and Avogadro’s number to conceptualize and calculate</p> <ul style="list-style-type: none"> • percent composition • empirical/molecular formulas 	<p>c. Students will use Avogadro’s Number, mathematics and conceptual thinking to apply concepts of the mole to calculate percent composition, molecular formulas, and molar mass of gasses.</p>

<ul style="list-style-type: none"> • mass, moles, and molecules relationships • molar volumes of gases 	
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Mission 2: Life on the Reef – 7th Grade Life Science

Lesson 1: Coral Creations

7th Grade Life Science Pacing Guide	
Mission 2: Life on the Reef – Lesson 1: Coral Creations	
Georgia Standards of Excellence	Aquarius Academy Connection
Quarter 1 – Unit 1	
Structure & Function of Cells	
<p>S7L2. Obtain, evaluate, and communicate information to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.</p> <p>a. Develop a model and construct an explanation of how cell structures (specifically the nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, and mitochondria) contribute to the function of the cell as a system in obtaining nutrients in order to grow, reproduce, make needed materials, and process waste.</p>	<p>a. Students develop a model of a cell and construct an explanation of the cell structures that help animals in obtaining nutrients in order to grow, reproduce, make needed materials, and process waste.</p>

Lesson 2: Where in the World is my Coral Larvae

7 th Grade Life Science Pacing Guide	
Mission 2: Life on the Reef – Lesson 2: Where in the World is my Coral Larvae	
Georgia Standards of Excellence	Aquarius Academy Connection
Quarter 2 – Unit 3	
Genetics, Heredity, and Reproduction	
<p>S7L3. Obtain, evaluate, and communicate information to explain how organisms reproduce either sexually or asexually and transfer genetic information to determine the traits of their offspring.</p> <p>a. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation.</p>	<p>a. Students will develop and use a model to describe how some coral species reproduce through asexual reproduction and some reproduce through sexual reproduction and can result in offspring, with identical genetic information or genetic variation and communicate information found to the class.</p>

Lesson 3 – Fish Detective

7 th Grade Life Science Pacing Guide	
Mission 2: Life on the Reef – Lesson 3: Fish Detective	
Georgia Standards of Excellence	Aquarius Academy Connection
Quarter 4 – Unit 6	
Classification, Review, and Extension	
<p>S7L1. Obtain, evaluate, and communicate information to investigate the diversity of living organisms and how they can be compared scientifically.</p> <p>a. Develop and defend a model that categorizes organisms based on common characteristics.</p> <p>b. Evaluate historical models of how organisms were classified based on physical characteristics and how that led to the six-kingdom system (currently archaea, bacteria, protists, fungi, plants, and animals).</p>	<p>a. Students will develop and defend a model that categorizes fish species based on its characteristics.</p> <p>b. Students will evaluate historical models of how life was classified and where they fall in the six-kingdom system.</p>

Unit 5 – Quarter 4

Interdependence

S7L4. Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments.

c. Analyze and interpret data to provide evidence for how resource availability, disease, climate, and human activity affect individual organisms, populations, communities, and ecosystems.

c. Students analyze and interpret data sets and provide evidence on how resource availability and human activity may affect populations of reef fish and ecosystems throughout the Caribbean, i.e. parrotfish.

Lesson 4 – Connect to Protect

7th Grade Life Science Pacing Guide

Mission 2: Life on the Reef – Lesson 4: Connect to Protect

Georgia Standards of Excellence

Aquarius Academy Connection

Quarter 4 – Unit 5

Genetics, Heredity, and Reproduction

S7L4. Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments.

c. Analyze and interpret data to provide evidence for how resource availability, disease, climate, and human activity affect individual organisms, populations, communities, and ecosystems.

c. Students will evaluate and communicate information to examine the interdependence of organisms with one another and their environment in terms of a marine ecosystem that is being used by multiple stakeholders. They will analyze and interpret data to provide evidence for how resource availability and human activity affect individual organisms, populations, communities and ecosystems with a marine sanctuary by understanding the connectivity of organisms and the importance of resource management.

Mission 3: Seas of Change – Environmental Science

Lesson 1 – Can you Take the Heat?

Environmental Science Pacing Guide	
Mission 3: Seas of Change – Lesson 1: Can you Take the Heat?	
Georgia Standards of Excellence	Aquarius Academy Connection
Unit 2	
Ecology	
<p>SEV2. Obtain, evaluate, and communicate information to construct explanations of stability and change in Earth’s ecosystems.</p> <p>c. Construct an argument to predict changes in biomass, biodiversity, and complexity within ecosystems, in terms of ecological succession.</p>	<p>c. Students will construct an argument to predict changes in biodiversity and complexity within coral reef ecosystems in terms of ecological succession.</p>

Lesson 2 – More Acidity, More Problems

Environmental Science Pacing Guide	
Mission 3: Seas of Change – Lesson 2: More Acidity More Problems	
Georgia Standards of Excellence	Aquarius Academy Connection
Unit 1	
Intro to Environmental Science	
<p>SEV5. Obtain, evaluate, and communicate information about the effects of human population growth on global ecosystems.</p> <p>a. Construct explanations about the relationship between the quality of life and human impact on the environment in terms of population growth, education, and gross national product.</p> <p>d. Design and defend a sustainability plan to reduce your individual contribution to environmental impacts, taking into account how market forces and societal demands (including political, legal, social, and economic) influence personal choices.</p>	<p>a. Students will evaluate and communicate information about human induced greenhouse gas emissions and how it is impacted by human population growth. They will construct explanations about the relationship between human impact on the environment in relation to the burning of fossil fuels and greenhouse gasses.</p> <p>d. Design and defend a sustainability plan to reduce their individual contribution to environmental impacts in terms of greenhouse gas emissions by finding ways to reduce their household carbon footprints. They will take into account how societal demands influence personal choices based on the norms they are used to every day in comparison to alternatives that will result in less CO2 emissions (example: electric cars)</p>

Unit 5	
Water, Air & Land Pollution	
<p>SEV4. Obtain, evaluate, and communicate information to analyze human impact on natural resources.</p> <p>b. Design, evaluate, and refine solutions to reduce human impact on the environment including, but not limited to, smog, ozone depletion, urbanization, and ocean acidification.</p>	<p>b. Students will obtain, evaluate and communicate information to reduce their human impact on natural resources by finding ways to reduce greenhouse gas emissions on a global scale. They will design, evaluate and refine solutions to reduce emissions and in turn reduce ocean acidification.</p>

Lesson 3 – SOS Rising Seas

Environmental Science Pacing Guide	
Mission 3: Seas of Change – Lesson 3: SOS Rising Seas	
Georgia Standards of Excellence	Aquarius Academy Connection
Unit 6	
Energy and Waste Populations	
<p>SEV4. Obtain, evaluate, and communicate information to analyze human impact on natural resources.</p> <p>a. Construct and revise a claim based on evidence on the effects of human activities on natural resources.</p>	<p>a. Students will evaluate and communicate information to analyze human impact on natural resources in terms of sea level rise. They will construct a claim based on evidence that sea level rise is occurring due to human activities and therefore impacting natural resources.</p>

Mission 4: Space Prep – 8th Grade Physical Science & 6th Grade Earth Science

Lesson 1 – Design an AUV

8th Grade Physical Science Pacing Guide	
Mission 4: Space Prep – Lesson 1: Design an AUV	
Georgia Standards of Excellence	Aquarius Academy Connection
Unit 2	
Forces and Motion	
<p>S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects.</p> <p>b. Construct an explanation using Newton’s Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object.</p> <p>c. Construct an argument from evidence to support the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia).</p>	<p>b. Students will use Newton’s Laws of Motion to construct an explanation to describe the effects of forces on the motion of their AUV.</p> <p>c. Construct an argument from evidence to support the claim that the amount of force needed to accelerate their AUV is proportional to its mass (inertia).</p>

Lesson 2 – Buoyancy – From Sea to Space

6th Grade Earth Science Pacing Guide	
Mission 4: Space Prep – Lesson 2: Buoyancy - From Sea to Space	
Georgia Standards of Excellence	Aquarius Academy Connection
Unit 1	
Solar Sys. & Universe	
<p>S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved.</p> <p>d. Develop and use a model to explain the interaction of gravity and inertia that governs the motion of objects in the solar system.</p>	<p>d. Students develop and use a model to explain how neutral buoyancy is used underwater to simulate zero gravity in space.</p>

Lesson 3 – The Best Analog

6th Grade Earth Science Pacing Guide

Mission 4: Space Prep – Lesson 3: The Best Analog

Georgia Standards of Excellence

Aquarius Academy Connection

Unit 1

Solar Sys. & Universe

S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved.

c. Analyze and interpret data to compare and contrast the planets in our solar system in terms of: size relative to Earth, surface and atmospheric features, relative distance from the sun, and ability to support life.

c. Students will analyze and interpret data through research on the planets in our solar system to compare and contrast size relative to Earth, surface and atmospheric features, relative distance from the sun, and ability to support life.