

NERRS Estuaries 101 Middle School Curriculum
Activity 5: Planet Plankton
Next Generation Science Standards (NGSS) Alignment

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
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| <p>Developing and Using Models Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. • Develop and use a model to describe phenomena. <i>Students design and test models of plankton.</i> [Exercise 1]</p> <p>Planning and Carrying Out Investigations Planning and carrying out investigations in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions. • Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. [Exercise 1,3]</p> <p>Analyzing and Interpreting Data Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. • Analyze and interpret data to determine similarities and differences in findings. <i>Students determine whether plankton observed is phytoplankton or zooplankton.</i> [Exercise 3]</p> <p>Using Mathematics and Computational Thinking Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. <i>Students use a stop watch to time how long model plankton floats.</i> [Exercise 1]</p> <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions</p> | <p>LS1.A: Structure and Function • In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3) <i>Students observe and design plankton.</i> [Exercise 1]</p> <p>LS1.B: Growth and Development of Organisms • Animals engage in characteristic behaviors that increase the odds of reproduction. (MS-LS1-4) [Exercise 1]</p> | <p>Scale, Proportion, and Quantity • Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. Students make a model of plankton at a larger scale. (MS-ESS2-2) <i>Students look at plankton under microscope.</i> [Exercise 1,3]</p> <p>Structure and Function • Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts; therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2) [Exercise 1,3]</p> |

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| <p>supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories.</p> <ul style="list-style-type: none"> • Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints. • Construct a scientific explanation based on valid and reliable evidence obtained from sources (including students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-LS1-5), (MS-LS1-6) <i>Students design plankton models and undertake a phototropism demonstration.</i> [Exercise 1,3] <p>Engaging in Argument from Evidence Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).</p> <ul style="list-style-type: none"> • Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. <i>Students explain why plankton is phyto or zoo.</i> [Exercise 1,3] <p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 6–8 builds on K–5 experiences and progresses to evaluating the merit and validity of ideas and methods.</p> <ul style="list-style-type: none"> • Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. <i>Students gather plankton, observe under microscope, and answer questions.</i> [Exercise 2,3] | | |