Plankton & Plastics Standards

Connections to Massachusetts Curriculum Frameworks:

Grade 3:

3-LS4-3. Construct an argument with evidence that in a particular environment some organisms can survive well, some survive less well, and some cannot survive.

3-LS4-4. Analyze and interpret given data about changes in a habitat and describe how the changes may affect the ability of organisms that live in that habitat to survive and reproduce.

Grade 4:

4-LS1-1. Construct an argument that animals and plants have internal and external structures that support their survival, growth, behavior, and reproduction.

Grade 5:

5-ESS3-1. Obtain and combine information about ways communities reduce the impact on the Earth’s resources and environment by changing an agricultural, industrial, or community practice or process.

5-LS1-1. Ask testable questions about the process by which plants use air, water, and energy from sunlight to produce sugars and plant materials needed for growth and reproduction.

5-LS2-1. Develop a model to describe the movement of matter among producers, consumers, decomposers, and the air, water, and soil in the environment to: a. show that plants produce sugars and plant materials; b. show that animals can eat plants and/or other animals for food, and c. show that some organisms, including fungi and bacteria, break down dead organisms and recycle some materials back to the air and soil.

5-PS3-1. Use a model to describe that the food animals digest: a. contains energy that was once energy from the Sun, and b. provides energy and nutrients for life processes, including body repair, growth, motion, body warmth, and reproduction.

5-ESS3-2(MA). Test a simple system designed to filter particulates out of water and propose one change to the design to improve it. **Can be incorporated upon request.**
Grade 6:

6.MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution. Include potential impacts on people and the natural environment that may limit possible solutions.

6.MS-ETS1-5(MA). Create visual representations of solutions to a design problem. Accurately interpret and apply scale and proportion to visual representations. **Can be incorporated upon request.**

6.MS-ETS2-2(MA). Given a design task, select appropriate materials based on specific properties needed in the construction of a solution. **Can be incorporated upon request.**

Grade 7:

7.MS-LS2-2. Describe how relationships among and between organisms in an ecosystem can be competitive, predatory, parasitic, and mutually beneficial and that these interactions are found across multiple ecosystems.

7.MS-LS2-4. Analyze data to provide evidence that disruptions (natural or human-made) to any physical or biological component of an ecosystem can lead to shifts in all its populations.

Grade 8:

8.MS-LS1-5. Construct an argument based on evidence for how environmental and genetic factors influence the growth of organisms.
ESS3: Earth and Human Activity

- ESS3.A: Natural Resources
  
  o **By the end of grade 5.** All materials, energy, and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not.

  o **By the end of grade 8.** Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geological processes (link to ESS2.B). Renewable energy resources, and the technologies to exploit them, are being rapidly developed.

- ESS3.C: HUMAN IMPACTS ON EARTH SYSTEMS
  
  o **By the end of grade 5.** Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. For example, they are treating sewage, reducing the amounts of materials they use, and regulating sources of pollution such as emissions from factories and power plants or the runoff from agricultural activities.

  o **By the end of grade 8.** Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of many other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. Typically, as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.

- ESS3.D: GLOBAL CLIMATE CHANGE
  
  o **By the end of grade 5.** If Earth's global mean temperature continues to rise, the lives of humans and other organisms will be affected in many different ways.

  o **By the end of grade 8.** Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.
Grade 3
- **VA:Cr1.1.3** Elaborate on an imaginative idea.
- **VA:Re7.2.3** Determine messages communicated by an image.
- **VA:Cn10.1.3** Develop a work of art based on observations of surroundings.

Grade 4
- **VA:Cr1.1.4** Brainstorm multiple approaches to a creative art or design problem.
- **VA:Re7.2.4** Analyze components in visual imagery that convey messages.
- **VA:Cn10.1.4** Create works of art that reflect community cultural traditions.

Grade 5
- **VA:Cr1.1.5** Combine ideas to generate an innovative idea for art-making.
- **VA:Re7.2.5** Identify and analyze cultural associations suggested by visual imagery.
- **VA:Cn10.1.5** Apply formal and conceptual vocabularies of art and design to view surroundings in new ways through art-making.

Grade 6
- **VA:Cr1.1.6** Combine concepts collaboratively to generate innovative ideas for creating art.
- **VA:Re7.2.6** Analyze ways that visual components and cultural associations suggested by images influence ideas, emotions, and actions.
- **VA:Cn10.1.6** Generate a collection of ideas reflecting current interests and concerns that could be investigated in art-making.
Philosophical foundations and lifelong goals
The philosophical foundations and lifelong goals establish the basis for the new standards and illuminate artistic literacy by expressing the overarching common values and expectations for learning in arts education across the five arts disciplines (see page 17 for an in-depth explanation of artistic literacy).

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<tr>
<th>Philosophical Foundation</th>
<th>Lifelong Goals</th>
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<td><strong>The Arts as Communication</strong></td>
<td>Artistically literate citizens use a variety of artistic media, symbols and metaphors to independently create and perform work that expresses and communicates their own ideas, and are able to respond by analyzing and interpreting the artistic communications of others.</td>
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<td>In today’s multimedia society, the arts are the media, and therefore provide powerful and essential means of communication. The arts provide unique symbol systems and metaphors that convey and inform life experience (i.e., the arts are ways of knowing).</td>
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<td><strong>The Arts as Creative Personal Realization</strong></td>
<td>Artistically literate citizens find at least one arts discipline in which they develop sufficient competence to continue active involvement in creating, performing, and responding to art as an adult.</td>
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<td>Participation in each of the arts as creators, performers, and audience members enables individuals to discover and develop their own creative capacity, thereby providing a source of lifelong satisfaction.</td>
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<td><strong>The Arts as Culture, History, and Connectors</strong></td>
<td>Artistically literate citizens know and understand artwork from varied historical periods and cultures, and actively seek and appreciate diverse forms and genres of artwork of enduring quality/significance. They also seek to understand relationships among the arts, and cultivate habits of searching for and identifying patterns, relationships between the arts and other knowledge.</td>
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<td>Throughout history the arts have provided essential means for individuals and communities to express their ideas, experiences, feelings, and deepest beliefs. Each discipline shares common goals, but approaches them through distinct media and techniques. Understanding artwork provides insights into individuals’ own and others’ cultures and societies, while also providing opportunities to access, express, and integrate meaning across a variety of content areas.</td>
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<td><strong>Arts as Means to Wellbeing</strong></td>
<td>Artistically literate citizens find joy, inspiration, peace, intellectual stimulation, meaning, and other life-enhancing qualities through participation in all of the arts.</td>
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<td>Participation in the arts as creators, performers, and audience members (responders) enhances mental, physical, and emotional wellbeing.</td>
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<td><strong>The Arts as Community Engagement</strong></td>
<td>Artistically literate citizens seek artistic experience and support the arts in their local, state, national, and global communities.</td>
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<td>The arts provide means for individuals to collaborate and connect with others in an enjoyable inclusive environment as they create, prepare, and share artwork that bring communities together.</td>
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