Plymouth Public Schools' Science and Technology/Engineering Program Grade 2 Integrated Science Learning Standards

An Introduction to the Massachusetts Department of Elementary and Secondary Education Science and Technology/Engineering Curriculum Framework

Effective teaching and learning in science fosters engagement and has rigor, relevance, and coherence embedded within. It couples practice with content to give the context for performance. A program with these components encourages students to analyze and explain phenomena and experience; engages with practices to build, use, and apply knowledge; and builds a storyline over time and among disciplines. The state standards that form this program are outcomes that reflect what a student should know and be able to do as a result of instruction. Science and engineering practices, which are included in these standards, are not teaching strategies; they are important learning goals and skills to be learned, also as a result of instruction. The standards listed below are not intended to represent an exhaustive list of all that could be included in our district's science program, nor should this list prevent students from going beyond the standards where appropriate. (Excerpts from Curriculum Framework)

Overarching Theme – Wholes and Parts

In grade 2, students start to look beyond the structures of individual plants and animals to looking at the environment in which the plants and animals live as a provider of the food, water, and shelter that the organisms need. They learn that water is found everywhere on Earth and takes different forms and shapes. They map landforms and bodies of water and observe that flowing water and wind shapes these landforms. Grade 2 students use their observation skills gained in earlier grades to classify materials based on similar properties and functions. They gain experience testing different materials to collect and then analyze data for the purpose of determining which materials are the best for a specific function. They construct large objects from smaller pieces and, conversely, learn that when materials are cut into the smallest possible pieces, they still exist as the same material that has weight. These investigations of how parts relate to the whole provide a key basis for understanding systems in later grades. (Excerpts from Curriculum Framework)

ESS2. Earth's Systems

2-ESS2-1. Investigate and compare the effectiveness of multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

Clarification Statements:

1. Solutions to be compared could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.
2. Solutions can be generated or provided.

2-ESS2-2. Map the shapes and types of landforms and bodies of water in an area.

Clarification Statements:

1. Examples of types of landforms can include hills, valleys, river banks, and dunes.
2. Examples of water bodies can include streams, ponds, and rivers.
3. Quantitative scaling in models or contour mapping is not expected.

2-ESS2-3. Use examples obtained from informational sources to explain that water is found in the ocean, rivers and streams, lakes and ponds, and may be solid or liquid.

2-ESS2-4(MA). Observe how blowing wind and flowing water can move Earth materials from one place to another and change the shape of a landform.

Clarification Statement:
Examples of types of landforms can include hills, valleys, river banks, and dunes.

LS2. Ecosystems: Interactions, Energy, and Dynamics

2-LS2-3(MA). Develop and use models to compare how plants and animals depend on their surroundings and other living things to meet their needs in the places they live.

Clarification Statement:
Animals need food, water, air, shelter, and favorable temperature; plants need sufficient light, water, minerals, favorable temperature, and animals or other mechanisms to disperse seeds.

LS4. Biological Evolution: Unity and Diversity

2-LS4-1. Use texts, media, or local environments to observe and compare:

a. different kinds of living things in an area, and
b. differences in the kinds of living things living in different types of areas.

Clarification Statements:

1. Examples of areas to compare might include temperate forest, desert, tropical rain forest, grassland, arctic, and aquatic.

2. Specific animal and plant names in specific areas are not expected.

PS1. Matter and Its Interactions

2-PS1-1. Describe and classify different kinds of materials by observable properties of color, flexibility, hardness, texture, and absorbency.

2-PS1-2. Test different materials and analyze the data obtained to determine which materials have the properties that are best suited for an intended purpose.

Clarification Statements:
1. Examples of properties could include, color, strength, flexibility, hardness, texture, and absorbency.
2. Data should focus on qualitative and relative observations.

2-PS1-3. Analyze a variety of evidence to conclude that when a chunk of material is cut or broken into pieces, each piece is still the same material and, however small each piece is, has weight. Show that the material properties of a small set of pieces do not change when the pieces are used to build larger objects.

Clarification Statements:
1. Materials should be pure substances or microscopic mixtures that appear contiguous at observable scales.
2. Examples of pieces could include blocks, building bricks, and other assorted small objects.

2-PS1-4. Construct an argument with evidence that some changes to materials caused by heating or cooling can be reversed and some cannot.

Clarification Statement:
1. Examples of reversible changes could include materials such as water and butter at different temperatures.
2. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and burning paper.

PS3. Energy

2-PS3-1(MA). Design and conduct an experiment to show the effects of friction on the relative temperature and speed of objects that rub against each other.

Clarification Statements:
1. Examples could include an object sliding on rough vs. smooth surfaces.

2. Observations of temperature and speed should be qualitative.

ETS1. Engineering Design

2.K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same design problem to compare the strengths and weaknesses of how each object performs.

Clarification Statements:

1. Data can include observations and be either qualitative or quantitative
2. Examples can include how different objects insulate cold water or how different types of grocery bags perform.