Grade 3 Science Yearlong Curriculum Plan

Last modified: June 2016

SUMMARY

This YLP starts the year off graphing and analyzing weather data and summarizing information about climates of different regions. We then move on to Motion and Stability: Forces and Interactions to help students understand the forces acting upon their environment. We will then focus on life science topics for the remainder of the year. We begin B3 learning about fossils and survival in specific environments due to characteristics and changes. We then move into B4 and learn about the different traits that are inherited and survival being dependent on reproduction. B5 Continues with this learning and focuses on inherited characteristics as well as the advantages to some of these characteristics for survival. We end the school year off with graphical representations to show that organisms have diverse life cycles and that population is dependent on reproduction. Engineering design is incorporated throughout all blocks because each block has engineering activities that tie into the concepts & topics being learned.

How to Use This Yearlong Plan

This yearlong plan (YLP) document, created by teachers and other curriculum leaders throughout the five districts, provides many of the pieces you need to begin planning your school year.

This document includes:

- A **yearlong map** divided into four (4) quarters that shows when standards should be taught
- A **standards overview** from the state outlining the main categories of the content-area standards as well as general practice standards
- **Block-by-block maps** with additional details of the standards, assessment information when possible (e.g., PARCC) and suggested Understanding by Design (UbD) units
- A **guiding document** to help teachers see the 5DP vision for science integration across domains.

FREQUENTLY ASKED QUESTIONS

1. ***Does this mean I no longer have freedom to decide how to plan my year?***
   The 5DP's goal is to generally align curriculum for the sake of our highly mobile student population. The goal is to create a cohesive learning environment and provide teachers with more opportunities to collaborate, not dictate lesson plans.

2. ***Are there pacing guides? How long should I spend on each standard?***
   Some districts have created pacing guides with suggested time frames. Many of these documents are available on the 5DP Server (www.5districts.com/5dp) under the district-specific documents. If your pacing guides are not posted, please discuss with your curriculum director.

3. ***Will this plan align with my textbook and other content resources?***
   It is unlikely that these will align perfectly with any textbook or resource. This YLP was created with no specific textbook in mind and with the understanding that it needed to work for all five districts, each of which has unique resources. Newer textbooks are better aligned to Common Core standards but may not follow the order of this YLP. Check the 5DP Server to see if your school has created supporting documents to help you match resources to standards.

4. ***The end of the year (May & June) has less guidance in some of these yearlong plans. How should I be using that time?***
   This was done purposely to allow teachers to assess their students' needs during this period. The 5DP has created a supporting document (see "End-of-Year Planning: Ideas to Finish the Year Strongly" found on the 5DP website's Resources page) to help teachers think through the best use of this time.

GRADE 3 SCIENCE STANDARDS OVERVIEW					
SCIENCE, TECHNOLOGY & ENGINEERING STANDARDS	**B1**	**B2**	**B3**	**B4**	**B5**
Earth's Systems					
3-ESS2-1	x				
3-ESS2-2	x				
Earth and Human Activity					
3-ESS3-1	x				
From Molecules to Organisms: Structures and Processes					
3-LS1-1					x
Heredity: Inheritance and Variation of Traits					
3-LS3-1					x
3-LS3-2				x	
Biological Evolution and Diversity					
3-LS4-1			x		
3-LS4-2				x	
3-LS4-3			x		
3-LS4-4			x		
3-LS4-5 MA					x
Motion and Stability: Forces and Interactions					
3-PS2-1		x			
3-PS2-3		x			
3-PS2-4		x			
Engineering Design					
3-5-ETS1-1	x	x	x	x	x
3-5-ETS1-2	x	x	x	x	x
3-5-ETS1-4 MA	x	x	x	x	x

Science Standards Overview

GRADE 3: HUMAN INTERACTIONS

In grade 3, students develop and sharpen their skills at obtaining, recording and charting, and analyzing data in order to study their environment. They use these practices to study the interactions between humans and earth systems, humans and the environment, and humans and the designed world. They learn that these entities not only interact but influence behaviors, reactions, and traits of organisms. Grade 3 students analyze weather patterns and consider humans' influence and opportunity to impact weather-related events. In life science they study the interactions between and influence of the environment and human traits and characteristics. They use the engineering design process to identify a problem and design solutions that enhance human's interactions with their surroundings and to meet their needs. Students consider the interactions and consequent reactions between objects and forces, including forces that are balanced or not. Students reason and provide evidence to support arguments for the influence of humans on nature and nature on human experience.

KEY SHIFTS IN THE REVISED SCIENCE AND TECHNOLOGY/ENGINEERING (STE) STANDARDS

The STE standards are intended to drive coherent, rigorous instruction that results in student mastery and application of scientific, technological and engineering knowledge, reasoning, and skills. The revised standards reflect several key shifts from prior Massachusetts standards, a number of which reflect similar shifts in recent mathematics and ELA standards:

1. *Integration of disciplinary core ideas and practices reflect the interconnected nature of science and engineering.*
   The standards integrate disciplinary core ideas (concepts) with scientific and engineering practices (skills). Currently, Massachusetts science and technology/engineering standards focus primarily on content. The integration of rigorous concepts and practices reflects how science and engineering is applied and practiced every day and is shown to enhance student learning of both.

2. *Preparation for post-secondary success in college and careers.*
   The standards articulate key knowledge and skills students need to succeed in entry-level, credit-bearing science, engineering or technical courses in college or university; certificate or workplace training programs requiring an equivalent level of science; or comparable entry-level science or technical courses, as well as jobs and postsecondary opportunities that require scientific and technical proficiency to earn a living wage.

3. *Science and technology/engineering concepts and practices progress coherently from Pre-K to high school.*
   The standards emphasize a focused and coherent progression of knowledge and skills from grade band to grade band, allowing for a dynamic process of knowledge and skill building throughout a student's scientific education. The progression gives students the opportunity to learn more sophisticated material and re-conceptualize their understanding of how the natural and designed world works, leading to the scientific and technical understanding needed for post-secondary success.

4. *Focus on deeper understanding and application of concepts.*
   The standards are focused on a small set of disciplinary core ideas that build across grades and lead to deeper understanding and application of concepts. The standards are written to both articulate the broad concepts *and* key components that specify expected learning.

5. *Each discipline is integrated in grade-by-grade standards Pre-K to grade 8.*
   To achieve consistency across schools and districts and to facilitate collaborative work, resource sharing, and effective education for transient populations, the Pre-K to grade 8 standards are presented by grade level. All four disciplines, including earth and space science, life science, physical science, and technology/engineering are included in each grade to encourage integration across the year and through curriculum, including the use of crosscutting concepts and nature of science themes.

6. *The STE standards are coordinated with the Commonwealth's English Language Arts and Mathematics standards.*

GRADE 3 SCIENCE – Block 1 (September-October)	
SCIENCE STANDARDS	
3-ESS2-1	Use graphs and tables of local weather data to describe and predict typical weather during a particular season in an area. [Clarification Statement: Examples of data could include average temperature, precipitation, wind direction and wind speed.] [Assessment Boundary: Graphical displays are limited to pictographs and bar graphs. Assessment does not include climate change.]
3-ESS2-2	Obtain and summarize information about the climate of different regions of the world to illustrate that typical weather conditions over a year vary by region.
3-ESS3-1	Evaluate the merit of a design solution that reduces the impacts of a weather-related hazard. [Clarification Statement: Examples of design solutions to a weather-related hazard could include a barrier to prevent flooding, a wind-resistant roof, and a lightning rod.]
ENGINEERING DESIGN STANDARDS	
3-5-ETS1-1	Define a simple design problem that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost that a potential solution must meet.
3-5-ETS1-2	Generate several possible solutions to a design problem. Compare each solution based on how well each is likely to meet the criteria and constraints of the design problem.
3-5-ETS1-4 MA	Gather information using various informational resources on possible solutions to a design problem. Present different representations of a design solution. [Clarification Statement: Examples of informational resources can include books, videos, and websites. Examples of representations can include graphic organizers, sketches, models, and prototypes.]
Stem Scopes and Other Resources	Priority Scopes: Weather and Climate and Processes and Impacts of Natural Hazards Supplemental Scope: MCU on Weather

GRADE 3 SCIENCE – Block 2 (November-December)	
SCIENCE STANDARDS	
3-PS2-1	Provide evidence to explain the effect of multiple forces, including friction, on an object. Include balanced forces that do not change the motion of the object and unbalanced forces that do change the motion of the object. [Assessment Boundary: Assessment is limited to one variable at a time: number, size, or direction of forces. Assessment does not include quantitative force magnitude, only qualitative and relative. All descriptions of gravity are limited to a force that pulls objects down.]
3-PS2-3	Conduct an investigation to determine the nature of the forces between two magnets based on their orientations and distance relative to each other. [Assessment Boundary: Assessment is limited to forces produced by magnetic objects that can be manipulated by students.]
3-PS2-4	Define a simple design problem that can be solved by applying the use of the interactions between magnets. [Clarification Statement: Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.]
ENGINEERING DESIGN STANDARDS	
3-5-ETS1-1	Define a simple design problem that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost that a potential solution must meet.
3-5-ETS1-2	Generate several possible solutions to a design problem. Compare each solution based on how well each is likely to meet the criteria and constraints of the design problem.
3-5-ETS1-4 MA	Gather information using various informational resources on possible solutions to a design problem. Present different representations of a design solution. [Clarification Statement: Examples of informational resources can include books, videos, and websites. Examples of representations can include graphic organizers, sketches, models, and prototypes.]
Stem Scopes and Other Resources	Priority Scopes: Objects in Motion and Electric and Magnetic Forces Supplemental Scope: n/a

GRADE 3 SCIENCE – Block 3 (January-February)	
SCIENCE STANDARDS	
3-LS4-1	Use fossils to describe types of organisms and their environments that existed long ago and compare those to living organisms and their environments. Recognize that most kinds of plants and animals that once lived on Earth are no longer found anywhere. [Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Comparisons are limited to physical or observable features; not to include dynamic processes or genetics.]
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. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved.]
3-LS4-4	Analyze and interpret data about changes in the environment in an area and describe how the changes may affect the ability of organisms that live in that area to survive and reproduce. [Clarification Statement: Environmental changes should include changes to landforms, distribution of water, climate, and availability of resources. Changes in the environment could range in time from a season to decades. Data should be provided.] [Assessment Boundary: Assessment is limited to a single environmental change, however, it is understood that environmental changes are complex.]
ENGINEERING DESIGN STANDARDS	
3-5-ETS1-1	Define a simple design problem that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost that a potential solution must meet.
3-5-ETS1-2	Generate several possible solutions to a design problem. Compare each solution based on how well each is likely to meet the criteria and constraints of the design problem.
3-5-ETS1-4 MA	Gather information using various informational resources on possible solutions to a design problem. Present different representations of a design solution. [Clarification Statement: Examples of informational resources can include books, videos, and websites. Examples of representations can include graphic organizers, sketches, models, and prototypes.]
Stem Scopes and Other Resources	Priority Scopes: Plant and Animal Extinction and Adaptations Supplemental Scope: MCU Unit-Effects of Environmental Changes on Organisms

GRADE 3 SCIENCE – Block 4 (March-April)	
SCIENCE STANDARDS	
3-LS3-2	Distinguish between inherited characteristics and those characteristics that result from a direct interaction with the environment. Give examples of characteristics of living organisms that are influenced by both inheritance and the environment. [Clarification Statement: Examples of the environment affecting a characteristic could include normally tall plants grown with insufficient water or light are stunted; a lizard missing a tail due to a predator; and, a pet dog that is given too much food and little exercise may become overweight.]
3-LS4-2	Use evidence to construct an explanation for how the variations in characteristics among individuals within the same species may provide advantages to these individuals in their survival and reproduction. [Clarification Statement: Examples might include rose bushes of the same species, one with slightly longer thorns than the other which may prevent its predation by deer; and color variation within a species that may provide advantages so one organism may be more likely to survive and therefore more likely to leave offspring such as rock pocket mice. Examples of evidence could include needs and characteristics of the organisms and habitats involved.]
ENGINEERING DESIGN STANDARDS	
3-5-ETS1-1	Define a simple design problem that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost that a potential solution must meet.
3-5-ETS1-2	Generate several possible solutions to a design problem. Compare each solution based on how well each is likely to meet the criteria and constraints of the design problem.
3-5-ETS1-4 MA	Gather information using various informational resources on possible solutions to a design problem. Present different representations of a design solution. [Clarification Statement: Examples of informational resources can include books, videos, and websites. Examples of representations can include graphic organizers, sketches, models, and prototypes.]
Stem Scopes and Other Resources	Priority Scopes: Environmental Traits and Survival of the Fittest Supplemental Scope: n/a

GRADE 3 SCIENCE – Block 5 (May-June)	
SCIENCE STANDARDS	
3-LS1-1	Use simple graphical representations to show that species have unique and diverse life cycles. Describe that all organisms have birth, growth, reproduction, and death in common but there are a variety of ways in which these happen. [Clarification Statement: Examples can include different ways plants and animals are born (e.g., sprout from a seed, born from an egg), grow (e.g., increase in size and weight, produce new part), reproduce (e.g., develop seeds and spores, root runners, mate and lay eggs that hatch) and die (e.g., length of life).] [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment of animal life cycles is focused on a comparison of the stages, not on a detailed description of any one organism's cycle, nor the differences of "complete metamorphosis" and "incomplete metamorphosis". Assessment does not include details of human reproduction.]
3-LS3-1	Provide evidence, including through the analysis of data, that plants and animals have traits inherited from parents and that variation of these traits exist in a group of similar organisms. [Clarification Statement: Examples of inherited traits that vary can include the color of fur, shape of leaves, length of legs, and size of flowers.] [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance nor prediction of traits. Assessment is limited to non-human examples.]
3-LS4-5 MA	Provide evidence to support a claim that the survival of a population is dependent upon reproduction. [Assessment Boundary: Assessment does not address details of reproduction.]
ENGINEERING DESIGN STANDARDS	
3-5-ETS1-1	Define a simple design problem that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost that a potential solution must meet.
3-5-ETS1-2	Generate several possible solutions to a design problem. Compare each solution based on how well each is likely to meet the criteria and constraints of the design problem.
3-5-ETS1-4 MA	Gather information using various informational resources on possible solutions to a design problem. Present different representations of a design solution. [Clarification Statement: Examples of informational resources can include books, videos, and websites. Examples of representations can include graphic organizers, sketches, models, and prototypes.]
Stem Scopes and Other Resources	Priority Scopes: Life Cycles and Inheritance and variation of Traits Supplemental Scope: n/a

