Essential Standards and Course Descriptions

Grade 6 Science

Hortonville Middle School | Greenville Middle School

The following document has been created with our parents in mind. The purpose is to communicate with parents related to the 'essential standards' being taught for every subject and in every grade level. Included is also a brief course description written by a collaborative team of teachers representing both middle schools. As a school district, we believe very strongly that although we have two unique middle schools, both schools must ensure a guaranteed and viable curriculum. What this means is that the same 'essential' learning being taught at HMS will also be taught at GMS to ensure that EVERY student, regardless of enrollment, will be prepared to enter Hortonville High School having learned prioritized academic and behavioral expectations.

What is an 'essential standard'? Every school district adopts academic standards for every area of study. The Hortonville Area School District is no different. Unfortunately, not all standards are created equal. This means that some standards have been predetermined by the teaching faculty as most critical or 'essential' for students to learn and demonstrate before moving on to the next grade level. These standards are assessed and reported out to parents on progress reports (formerly called report cards). We sometimes call these our 'must know' standards. This is not to say that all other standards, or 'nice to know standards', are not covered, but they may not be covered to the same level as our 'essential standards'.

Below you will find a listing of courses taught at the 6th grade level in the Hortonville Area School District. Included will also be a brief course description and the 'essential standards' assessed. If you should ever have any questions, we strongly encourage parents to contact our faculty members early and often.

Subject: 6th Grade Science

Course Description: Second only to air, water is an essential element for life on Earth. Journey with us as we explore this amazing substance! We will investigate the properties of water as it changes state in the water cycle powered by the sun and gravity. We will look at how water influences a region's climate and examine its role in weather.

What determines a region's climate? To answer this question, each student will choose a region to investigate. After observing phenomena, we will create models to explain why regions have a specific climate. We will also examine evidence to identify what is going on with Earth's average annual global temperature as well as why climates are changing. What are possible problems that arise due to rising temperatures on Earth? We will explore possible solutions. Students will also collect weather data to identify patterns and conduct investigations to learn how weather develops in order to forecast future catastrophic events.

How does energy travel? What is the difference between the sounds we hear and the light we see? Students will experiment with waves and learn how waves are used in their favorite technological devices.

Finally, what do all living things have in common? CELLS! We will use microscopes to view cells and learn about the tiny little structures inside cells that work together to help the cell perform basic life processes. From there, we will learn about how living things reproduce and why some offspring are exact copies of their parent while other offspring share traits with their parents but are unique. Using models, we will show how genes are passed from parents to offspring and investigate what happens when mistakes—or mutations—occur. We will explore how scientists are using what they know about cells and heredity to try to combat some of the problems humans face as climates change and the population grows.

Essential Standards Taught:

- **MS-ESS2-4**
  Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

- **MS-ESS2-5**
  Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.

- **MS-PS4-2**
  Develop a model to represent how waves are reflected, absorbed, or transmitted through various materials.

- **MS-LS1-2**
  Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.

- **MS-LS3-2**
  Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

- **SEP6-8-.2**
  Develop and use models.

Other Topics Covered:

- MS-PS1-1. Develop models to describe the atomic composition of water molecules.

- MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

- MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's groundwater resources are the result of past and current geoscience processes.

- MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services (Example of ecosystem services: water purification. Examples of design solution constraints could include scientific, economic, and social considerations.)

- MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

- MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

- MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

- MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

- MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

- MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.

- MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.

- MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

- MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

- MS-LS3-1. Develop and use a model (e.g., Punnett squares, diagrams, simulations) to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

- MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
- MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms (e.g., artificial selection, genetic modification, animal husbandry, and gene therapy).
- MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.