

Parent Curriculum Guide
Rockdale Elementary
School
8th Grade Science

Rockdale School District 84



This curriculum guide provides an overview of what your child will learn by the end of 8th grade in science. While this is an overview, your child's actual experience may differ from this guide depending on your child's individual needs. This guide focuses on the key skills your child will learn, which will build a strong foundation for success in other subjects and in future learning opportunities. If your child is meeting the expectations outlined in this curriculum guide, he or she will be well prepared for freshman science.

How Can I help?

You should use this guide as a resource to gain an understanding of the key skills that will be introduced and/or mastered by your child this year. This will help promote a better understanding, as well as allow for a strong relationship to be developed with your child's teacher. Regular ongoing dialogue about teaching and learning, beyond parent-teacher conferences, is expected and desired.

At home, you play an important role in setting and reinforcing high expectations for your child, while providing support for your child in meeting them. If your child needs additional help or wants to learn more about a topic, work with his or her teacher to identify opportunities for support or to find additional resources to supplement the learning. High expectations do not just surround the content being learned. Your conveyed expectations should also surround the development and use of the following soft skills: effective time-management, persistence and perseverance, self-confidence, growth mindset, productive use of constructive criticism, thinking critically, exhibiting independence, and being motivated.



8th grade Science



Summary description with key emphasis/activities

Science at HBRMS follows the Next Generation Science Standards (NGSS). For more information regarding the NGSS please visit <http://www.nextgenscience.org/search-standards-dci>.

In the spring of 2016 there will be an Illinois State Science test for 8th grade.

Unit 1- Structure and function (MS-LS1-1, MS-LS1-2, MS-LS1-3, MS-LS1-4, MS-LS1-6, MS-LS1-8)

- Living versus non living
 - Characteristics of living things
 - Needs of living things
- Cell theory
 - What are cells
 - Cell Model Project
 - Structure
 - Function
- Cell organization
 - Comparing cells of different organisms
 - Cell hierarchy- Single cell-tissue-organ-organ system
 - Mitosis
 - Cell differentiation
- Cell process- sun as an energy source
 - Diffusion/osmosis
 - Active transport
 - Photosynthesis
 - Respiration
 - Carbon Dioxide Lab



Unit 2- Genetics (MS-LS3-1, MS-LS3-2, MS-LS4-5, MS-LS2-5)

- Behaviors and structures for successful reproduction
 - Sexual versus Asexual i. Plants- sexual , lizard- asexual
- Meiosis versus Mitosis
- Changes in DNA
 - Genetic variation
 - Probability Labs
 - Inheritance
 - DNA Model Lab
 - Human Trait Lab (Taste Strips)
 - Mutations
 - Humans uses of genetics
- Environment and Genetic variation
 - Genetic Research Paper and Presentation

Unit 3- Matter and Energy in Organisms and Ecosystems (MS-LS2-1, MS-LS2-2, MS-LS2-3, MS-LS2-4)

- Flow of energy through a system
 - Food webs
 - Biomes
 - Population dynamics
- Changes in environment and impacts
 - Other organisms
 - Humans
 - Project

Unit 4 – Natural Selection and Adaptations (MS-LS4-1, MS-LS4-2, MS-LS4-3, MS-LS4-4, MS-LS4-6)

- Interrelationship of organisms through evidence
 - Fossils
 - Geography
 - Homologous structures
 - Vestigial Structures
- Natural Selection theory
 - Darwin's finches
- Genetic change and the ability to survive
- Adaptations over time



A sample of skills to be gained:

- Conduct an investigation to provide evidence that living things are made of cells; either on or many different types or numbers.
- Develop and use a model to describe the function of a cell as a whole and ways parts of the cell contribute to the function.
- Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- Construct a scientific explanation base of evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage of memories.
- Use arguments based on evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants.
- Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms.
- 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.
- Construct a scientific explanation based on evidence for how environmental and genetic factor influence the growth of organisms.
- Construct an argument supported by evidence that changes to physical or biological components of an ecosystem affects populations.
- Analyze and interpret data to provide evidence for the effects of resource availability on populations.
- Construct an explanation that predicts patters of interactions among organisms.
- Develop a model to describe the cycling of matter and flow of energy among living and non-living pars of an ecosystem.
- Analyze and interpret data for patterns in the fossil record that documents the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operated today as in the past.
- Use scientific ideas to construct an explanation for anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.



- Construct an explanation based on evidence that describes how genetic variation of traits in a population increases some individuals' probability of surviving and reproducing in a specific environment.
- Use mathematical representations to support explanations of how natural selection may lead to increases or decreases of specific traits in a population over time.



Help your Child learn at home

List of primary sources for learning:

- Prentice Hall Science Explorer-Cells and Heredity, From Bacteria to Plants, Environmental Sciences.

As you invest in your child in many different ways each day, take the following things into consideration as you invest in his or her learning. These strategies will have a direct impact on the learning of your child at home.

- Create a suitable place for learning at home to be completed.
- Create a daily routine and stick to it as much as possible.
- Work with your child on their homework on a regular basis. Have them start the homework on their own and then provide assistance when asked. When they ask for help, try utilizing the following prompts to help them think through their learning.
 - What do you remember from the learning activities in school?
 - Is there a place that you can reference that will help you?
 - What do you think would help?
 - Explain to me what you are struggling with.
 - What do you think you should do next?

It is important to help your child work through the answer, not just provide them with the answer. This process is extremely important in helping your child develop strategies that can be used whether he or she is with you or not.

