

David E. Owens – Science Department

Department Philosophy:

The science students attending David E. Owens Middle School will be immersed in a comprehensive Earth, Life and Physical Science program. The philosophy underlying this science program is to engage and empower every student with the necessary critical thinking, analytical, and reasoning skills to succeed in an ever-changing world. Our goal is to create and develop a body of independent thinkers and lifelong learners.

The *It's About Time* Project Based Inquiry Science units lead students through an entire range of collaborative activities, hands-on projects and interactive investigations. Students pursue answers, conduct investigations, make models, collect and analyze data, weigh evidence, write explanations and discuss and present findings to their peers. Everything they are doing leads closer to the achievement of the unit goal.

Science Units of Study

	6 th Grade	7 th Grade	8 th Grade
Unit 1	<p>Digging In</p> <p>By the end of this Launcher Unit students will be able to learn what scientist do and how they do it, and begin to think as themselves student scientists by collaboration, analyzing data, designing investigations, and constructing explanations.</p>	<p>Animals In Action</p> <p>Students will use observations to investigate two animal behaviors: feeding and communication. In order to facilitate these observations, students will design observational methods for data collection, recording, and analysis. They will then implement reliable procedures, and use evidence to construct explanations and make recommendations to accomplish the Big Challenge of building an animal enclosure.</p>	<p>Diving Into Science</p> <p>Students are introduced to the practices of science and working together in collaborative groups. Students learn to design and conduct experiments, use lab instruments and engage in the social practices of scientists. During this Unit students will: analyze data, design investigations, conduct experiments, make observations, record data, analyze data, write scientific explanations and make recommendations.</p>
Unit 2	<p>Ever Changing Earth</p> <p>Students build their knowledge about Earth and the processes that shape it through models, data collection, analysis, and information</p>	<p>Good Friends and Germs</p> <p>In an effort to understand how they can prevent their good friends from getting sick, students investigate various aspects of human health and then create a summary of what they are learning about</p>	<p>Air Quality</p> <p>At the end of this unit students will understand the; four states of matter, phase changes of matter, atomic structure, periodic table, atomic bonding, composition of air, acids</p>

	<p>sharing throughout the Unit. At the end of the Unit students should be able to answer the Big Question: What processes within Earth cause geologic activity? by connecting all of the information gathered through readings, investigations, and information sharing, students are able to ultimately create an explanation for the changes happening in the region of their Earth structures.</p>	<p>diseases, disease spread, and disease prevention. Students then use what they have learned to make personal recommendations about what can be done to avoid transmitting disease to other people. The unit concludes as the class as a whole develops a set of recommendations for staying healthy, helping others to stay healthy, and how to make their school a healthier place.</p>	<p>and bases, and the process of combustion. Additionally students will understand how combustion releases stored energy that can be used to generate electricity and do work. The serious impact of the air pollution from combustion of fossil fuels is presented through case study analysis about pollution problems in Los Angeles and the Adirondacks. The case studies introduce how pollution can harm nonliving, and living things, and that pollution generated in one area can travel and settle in other areas. Methods to reduce pollution and clean air are introduced.</p>
<p>Unit 3</p>	<p>Astronomy</p> <p>By the end of this unit students will be able to make a distinction between science fiction and science facts. Students will be able to reflect on how astronomers answer questions based on facts by making observations and collecting data. Students will be able to create a summary of what they know, and what they learned about objects in the solar system that may collide with Earth and how this can help them answer the Big</p>	<p>Living Together</p> <p>Students learn about ecology and the relationships between the nonliving and living components in an ecosystem. Through study of a fictional community, students learn how everyday use of water in homes, local businesses, farming, industry, and recreation, affects the quality of water that living things depend upon. As a result, students conclude that the quality of water can change the land and affect organisms that depend on the water.</p>	<p>Vehicles In Motion</p> <p>At the end of the Unit students should be able to achieve the Unit Challenge: Design and build a vehicle that will go straight, far, and fast, and carry a load. Students will be able to make design changes and test the effects of those changes on vehicle performance. Ultimately, students apply Newton’s laws of motion to design a vehicle capable of carrying a load while negotiating a “test track” of obstacles, such as hills or rough surfaces.</p>

	Question.		
Unit 4	<p>Weather Watch</p> <p>At the end of the Unit students should be able to achieve the Unit Challenge: Develop a Plan for Responding to a Severe Weather Event, by identifying a severe weather event that can occur in their region and develop a plan to protect people as a severe weather event approaches a city in their region.</p>	<p>Genetics</p> <p>Students will develop an understanding of how genetics can be used to help feed the world. After being introduced to the worldwide problem of food shortages, students investigate how to develop varieties of rice that could alleviate food shortages with the goal of developing a strain of rice that will thrive in various different environmental conditions. They begin by focusing on breeding and natural and artificial selection. After identifying how far artificial selection can develop the right kinds of rice, they consider the role genetic engineering can play in promoting development of more nutritious and/or more robust rice varieties. Within this context, students learn about sexual and asexual reproduction, variation, natural and artificial selection, meiosis and mitosis, and the promises and potential threats of genetic engineering.</p>	<p>Energy</p> <p>Students will investigate how different forms of energy such as light, heat, sound, and chemical are obtained, transformed and move from place to place. They will understand the indicators of energy being transformed. They will understand the relationship between work and kinetic energy. They will learn about exothermic and endothermic reactions, and how mass and temperature influences thermal energy. Students will investigate electrical energy, electromagnets and magnetic fields. Students will build and test circuits to light a bulb. Non-fossil fuel methods to produce electrical energy are introduced.</p>