

## Scope and Sequence: Science Grades 3-5

		Lower School		
		3	4	5
<b>Examples at Terra Verde include, but are not limited to:</b>				
<b>PHYSICAL SCIENCES</b>				
<b>Motion and Stability: Force and Interactions</b>				
Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	<ul style="list-style-type: none"> <li>• Hot Wheels Speedometry</li> <li>• Magnet investigations</li> <li>• Playground equipment observation/recordings:                             <ul style="list-style-type: none"> <li>- spinning comet</li> <li>- swing set</li> <li>- zip-line</li> </ul> </li> <li>• Demonstrations of Newton's Laws</li> <li>• Sooner Flight Academy demonstrations/lessons</li> </ul>	X		
Make an observation and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.		X		
Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.		X		
Define a simple design problem that can be solved by applying scientific ideas about magnets.		X		
Support an argument that the gravitational force exerted by Earth on objects is directed down.				X
<b>Energy</b>				
Use evidence to construct an explanation relating the speed of an object to the energy of the object.	<ul style="list-style-type: none"> <li>• Circuit investigations</li> <li>• Music class Sound demonstrations</li> <li>• Prism investigations-refraction of light</li> </ul>		X	
Make observations to provide evidence that energy can be transferred from place by sound, light, heat, and electric currents.			X	

Ask questions and predict outcomes about the changes in energy that occur when objects collide.	<ul style="list-style-type: none"> <li>• Solar energy studies</li> <li>• Static electricity studies</li> <li>• Investigation and Observation of Food Chains</li> </ul>		X	
Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.			X	
Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain warmth) was once energy from the sun.				X
<b>Waves in Technology</b>				
Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.	<ul style="list-style-type: none"> <li>• Earthquake Technology/Study</li> <li>• Wind, sound, solar waves studies</li> </ul>		X	
<b>Matter and Interactions</b>				
Develop a model to describe that matter is made of particles too small to be seen.	<ul style="list-style-type: none"> <li>• Microscope demonstration</li> <li>• Investigation of micro-particles</li> <li>• Cooking</li> <li>• Baking</li> <li>• Saltwater/Sugar Water</li> <li>• Solutions</li> </ul>			X
Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.				X
Make observations and measurements to identify materials based on their properties.				X
Conduct an investigation to determine whether the mixing of two or more substances results in new substances.				X
<b>LIFE SCIENCES</b>				
<b>Molecules to Organisms: Structures and Processes</b>				
Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	<ul style="list-style-type: none"> <li>• Composting</li> </ul>	X		

Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	<ul style="list-style-type: none"> <li>• Study of the cycle of life for organisms</li> <li>• Plant and Animal Structures and Studies</li> <li>• Class Pet Observation and studies</li> <li>• Plant experiments</li> <li>• Gardening</li> <li>• Cell Study (5th)</li> </ul>		X	
Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.			X	
Support an argument that plants get the materials they need for growth chiefly from air and water.				X
<b>Ecosystems: Interactions, Energy, and Dynamics</b>				
Construct an argument that some animals form groups that help members survive.	<ul style="list-style-type: none"> <li>• Geese observation/study</li> <li>• Pond Ecology</li> <li>• Food Chains</li> <li>• Energy Pyramids</li> </ul>	X		
Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.				X
<b>Heredity: Inheritance and Variation of Traits</b>				
Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	<ul style="list-style-type: none"> <li>• Plant and Tree Studies</li> <li>• Tree experiments (connect to cells - 5th)</li> <li>• Plant experiments</li> <li>• Gregor Mendel Research studies</li> </ul>	X		
Use evidence to support the explanation that traits can be influenced by the environment.		X		
<b>Biological Evolution: Unity and Diversity</b>				
Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.	<ul style="list-style-type: none"> <li>• Dinosaur Studies</li> <li>• Fossils and Ancient Life</li> <li>• Sam Noble Museum lessons/visit</li> </ul>	X		
Use evidence to construct an explanation for how the variation in characteristics among individuals of the same species		X		

may provide advantages in surviving, finding mates, and reproducing.	<ul style="list-style-type: none"> <li>• Ecosystems</li> <li>• Overpopulation effects within ecosystems</li> <li>• Adaptation, Camouflage of species for survival</li> </ul>			
Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.		X		
Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.		X		

## EARTH AND SPACE SCIENCES

### Earth's Systems

Represent data in tables and graphical displays to describe the typical weather conditions expected during a particular season.	<ul style="list-style-type: none"> <li>• Rainwater Collection</li> <li>• Rain Gauge usage</li> <li>• Water cycles</li> <li>• Climate/Weather mapping</li> <li>• Land/Water Studies</li> <li>• Experiments in erosion</li> <li>• Gardening</li> <li>• Orchard observations</li> <li>• Terrariums</li> <li>• Topography/ Plate Techtonics</li> <li>• Water Usage Study from Global Perspective</li> </ul>	X		
Obtain and combine information to describe climates in different regions of the world.		X		
Make observations and/o measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.			X	
Analyze and interpret data from maps to describe patterns of Earth's features.			X	
Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.				X
Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.				X

### Earth's Place in the Universe

Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.	<ul style="list-style-type: none"> <li>• Camp Local Classen/ Fossil</li> </ul>		X	
---	--	--	---	--

Support an argument that differences in the apparent brightness of the sun compared to other stars due to their relative distances from Earth.	Records and Observations			X
Represent data in graphical displays to reveal patters of daily changes in length and direction of shadows, day and night, and the seasonal appearances of some stars in the night sky.	<ul style="list-style-type: none"> <li>Astronomy</li> <li>Speed of Light</li> <li>Moon Phases</li> <li>Sundials</li> <li>Shadow Observation</li> </ul>			X
<b>Earth and Human Activity</b>				
Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.	<ul style="list-style-type: none"> <li>Extreme/Severe Weather Studies</li> <li>Fossils to Fuels</li> </ul>	X		
Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	<ul style="list-style-type: none"> <li>OERB</li> <li>Weather patterns</li> <li>Study impacts on Humans</li> </ul>		X	
Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	<ul style="list-style-type: none"> <li>Flood zones, wind damage</li> <li>Earth Rebirth</li> </ul>		X	
Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	<ul style="list-style-type: none"> <li>OU WaTER Center</li> <li>Sooners w/out Borders</li> <li>Expert</li> <li>Parent consultation</li> </ul>			X
<b>ENGINEERING DESIGN</b>				
Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	<ul style="list-style-type: none"> <li>Simple Machine Studies to create Solutions to Everyday problems</li> </ul>	X	X	X
Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	<ul style="list-style-type: none"> <li>Moving from Simple Design Solutions to More Complex</li> </ul>	X	X	X
Plan and carry out fair tests in which variables are controlled and failure points		X	X	X

are considered to identify aspects of a model or prototype that can be improved.	<ul style="list-style-type: none"><li>• Identifying Areas of Need around our Campus</li><li>• Problem Solving by Design</li></ul>			
--	---	--	--	--