**Oxford Virtual Academy Syllabus – Dinosaur Hill**

Exploring the natural sciences, we will take a hands-on look at several different aspects of earth-science topics by placing the children directly in the shoes of the scientists that work their respective fields to have them live a day in the life. With topics that range from geology (learning how to excavate and polish their own rocks) and meteorology (using a weather station to take accurate measurements and graph them) to paleontology (the children will make their own fossils and dig up dinosaur bones from the sand using real life tools of the trade) and zoology (learning how to research and provide the best habitats for animals) and everything between.

**Introduction to Earth Science**

Welcome to Dinosaur Hill! For this special first class we will tour the grounds of the nature preserve, taking a simple interpretive walk while talking about any points of interest that happen to show themselves. Inside we will familiarize ourselves with the nature center’s inhabitants and displays while discussing just what earth science is and why the natural/pure sciences are important for mankind.

**Paleontology, the study of fossils**

 Inside we will break the ice by discussing out favorite dinosaurs and sharing some dinosaur stories. Afterwards we will begin to display several dinosaur fossil castings for the children to hold and manipulate while learning about dinosaur anatomy. Afterwards we will put together our own fossils to take home before heading out to our dinosaur dig and excavating a fossilize dinosaur of our own using true paleontological methods.

**Hydrology, the study of water**

 With 364 quintillion gallons of water on the planet we have a lot to talk about. We will discuss the many uses of water that we have throughout our days (some of which might not be as obvious as you’d think) before breaking down the locations of all the water on planet earth. We will get up and play a game to teach us about the water cycle and produce our own watershed inside before heading out onto the trails to see the power of water in action.

**Pollution**

 Mankind has given the earth a lot, but unfortunately not all of that has been beneficial. The United States alone generates 230 million tons of trash a year! We will take a look at the resources that we gather from the world, likening it to a very large scale version of minecraft, before running through a hands-on story about pollution where we will ‘accidentally’ pollute a sample of water. Children will be given tools to help clean up the water and we will see how much work is involved to clean up a mess on such a scale. Outside we will search for signs of the old garbage dump that was at Dinosaur Hill.

**Meteorology, the study of atmosphere and weather**

 It’s easy to just use your cell phone to look up the weather, but how do the scientists who give us this news actually figure out what to say? Outside we will set up our very own weather station to measure the atmospheric pressure, temperature, humidity, and more while we piece together and record our very own weather predictions using data we gather ourselves. Afterwards we will make our own weather tools to take home and try them out on the preserve.

**Astronomy, the study of space**

 Now this topic has a lot to discuss so we’re going to have to jump right in (literally). Inside we will have our portable planetarium up where we will explore our galactic backyard, learn a little about the constellations and the stories behind them and finally watch an entertainingly immerse movie about the earth, the moon and the sun. Afterwards we will put together our own star maps to take home and continue seasonal stargazing at home.

**Geology, the study of rocks and minerals**

 We’re really going to rock this topic. Inside we will have a large collection of fossils, minerals and rocks to explore. We will learn about the properties and differences between many before placing several beneath stereoscopes for better looks at their intricacies. We will conduct a rock hardness test to learn about the Mohs scale and learn how to tumble rocks into stones for making our own jewelry. No class about geology would be complete without a volcano demonstration so we plan on firing up one of our own.

**Entomology, the study of insects**

 We will begin this day by learning about the differences between bugs, insects, and other creepy-crawlies but turning ourselves into an insect! Once we know just what it takes to be an insect we will take a few of our in-house critters out for a show. From giant cockroaches and tarantulas to strange dessert beetles we will have our skin crawling from excitement! Afterwards we will sweep the preserve for insect specimens and then take them inside to look at beneath high-powered stereoscopes to create a naturalist journal of what we found.

**Zoology, behavior and adaptations**

There’s a lot to talk about regarding Zoology at Dinosaur Hill so we’re breaking this massive topic down into three different days. The first we will take a look at animal adaptations. We’ll get to experience behavioral and physical adaptations throughout the animal kingdom that assist with the collection of food and construction of shelters, focusing heavily on our suburban friend the squirrel. We’ll even have exploration stations out for the children to independently work for a portion of the day.

**Zoology, life cycles**

In our second day of zoology we shall explore the ways in which organisms change over time, focusing on our frogs and butterflies but not limiting ourselves to them. We will define and elaborate on metamorphosis and put together our own life cycles to take home.

**Zoology, ethically keeping animals**

 To conclude zoology we will take a look at all of the animals that call dinosaur hill home. We will take out several of our in-house animals to learn about their behaviors, personalities, habitational requirements and dietary preferences. We will even learn how to research and keep animals of your own and have a chance to feed and care for many of the animals that we see.

**Botany, the study of plants**

 With winter on the edge of turning we will spend a bit of some learning about what plants in our region of the world do to get ready for the dormant months by transitioning a tree through the seasons indoors. We will bring out hand lenses and flower charts and dissect a flower and label its parts. Afterwards we will learn about the way in which plants develop and change over time by transforming ourselves into seeds and follow along with the plant’s life cycle. We will even put our own seed in a pot to take home and grow to keep track of its progress all winter long!

**Ecology, the study of natural relationships**

 It takes a village to raise a child, but it takes an ecosystem to raise a squirrel. Join us for a very special class all about animal interactions. We will investigate the way in which all living things share the forest and benefit from one another while simultaneously competing for resources. Included in this class, we will be taking a look at invasive species and playing a game to uncover the significant damage they can do. We will also take a look at the food chain and create our own food web to take home.

**Biology, the study of living organisms**

 To end off our series about earth science we will look at one final chapter to the world’s story: biology. From viruses, bacteria, fungi, plants and animals we will investigate the many living organisms that call our planet home while spotting differences between the way in which they grow, behave and share the world. We will learn how to spore a mushroom, take a look at bacteria beneath a microscope, interact with living animals (unique to the previous ones), and even have a biological party to celebrate the end of the semester.