StudyForge
DIGITAL CURRICULUM

Science 10

Credits: 4 **Type:** Online

Course Description:

Earth Science: Do you ever wonder how the universe began? How do scientists propose its beginning, how do other historical models compare to what we understand today? And what do models have to do with any of it? Join us as we get hands on, creating models, understanding models, and reading about models in relation to space, history and many different aspects of science all while learning about different objects in space and their relation and effects on Earth.

Biology: Do you wonder why things in nature are the way they are? Do you wonder why some plants or animals can live in hot, humid areas of the world and some live in cool, dry areas? Genetics are the foundation for the diversity of all living things and in this course, you'll set off on a virtual Student Exchange Program to Brazil to find out more! You'll learn from the locals how the topic of genetics impacts gardens, farms and the Amazon Rainforest. You'll also learn about students' various local concerns and how they're getting involved to take action! After touring the country, marvelling at the rich diversity, you'll "travel" home to research and create an action plan of your own!

Chemistry: Flux, motion, movement, alteration, transformation. All these words apply to *matter*. Matter is dynamic and can undergo dramatic changes! Carbon dioxide and water undergo a chemical change to produce wood, leaves, fruit and much more, and nitrogen and hydrogen can be reacted industrially to produce the fertilizer needed to feed billions of people! Is chemical change random? How can we make sense of it and use chemical change to our advantage? We'll be looking at this question from the perspective of modern atomic theory, chemical kinetics, and thermodynamics. Atoms are in a sort of dance, able to switch their partners to form new molecules, which can switch atoms with other molecules to make other new molecules! In this module, you'll learn about different types of chemical reactions you experience every day, including brushing your teeth and nuclear fusion (believe it or not), and lay a solid foundation for chemistry literacy in a reactive world.

Physics: Energy surrounds us, everywhere! It's in the lifting of a book, the turning of a dial, or the spinning of a wheel. It's in the motion of walking down the street or the dropping of a ball. In this module we dive deep into the relationship between different types of energy, namely potential energy and kinetic energy, and inquire as to how energy is present in some of the most common things around us! Together we will build a book that outlines how energy is conserved in ordinary objects, like the piece of paper or screen you are looking at now!

Major Units and Topics:

- Astronomy
- Scientific Models
- Genetics
- Natural Selection
- Thermodynamics
- Modern Atomic Theory
- Energy

Assessment Requirements:

- Response questions
- Students must complete all lessons and assignments
- Various other lesson assignments
- Projects
- Quizzes
- Labs
- Journal Response
- Each lesson designed to take approximately 45-60 minutes, with the exception of major projects and assignments

Learning Standards Overview:

Content *Students are expected to know the following:*				
Questioning and Predicting	**Earth Science**	**Biology**	**Physics**	**Chemistry**
Demonstrate a sustained curiosity about a scientific topic or problem of personal interest		✔	✔	✔
Make observations aimed at identifying their own questions about the natural world	✔	✔	✔	✔
Formulate multiple hypotheses and predict multiple outcomes			✔	✔
Planning and Conduction	**Earth Science**	**Biology**	**Physics**	**Chemistry**

Collaboratively and individually plan, select, and use appropriate investigation methods, including field work and lab experiments, to collect reliable data (qualitative and quantitative)	✔		✔	
Assess risks and address ethical, cultural and/or environmental issues associated with their proposed methods and those of others	✔	✔	✔	✔
Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data	✔	✔	✔	
Ensure that safety and ethical guidelines are followed in their investigations				✔
Processing and Analyzing Data and Information	**Earth Science**	**Biology**	**Physics**	**Chemistry**
Experience and interpret the local environment	✔	✔	✔	
Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information	✔	✔	✔	✔
Seek and analyze patterns, trends, and connections in data, including describing relationships between variables (dependent and independent) and identifying inconsistencies			✔	✔
Construct, analyze and interpret graphs (including interpolation and extrapolation), models and/or diagrams	✔		✔	✔
Use knowledge of scientific concepts to draw conclusions that are consistent with evidence		✔	✔	✔

Analyze cause-and-effect relationships	✔	✔	✔	✔
Evaluating	**Earth Science**	**Biology**	**Physics**	**Chemistry**
Evaluate their methods and experimental conditions, including identifying sources of error or uncertainty, confounding variables, and possible alternative explanations and conclusions	✔		✔	✔
Describe specific ways to improve their investigation methods and the quality of the data			✔	✔
Evaluate the validity and limitations of a model or analogy in relation to the phenomenon modelled	✔		✔	
Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and secondary sources	✔		✔	✔
Consider the changes in knowledge over time as tools and technologies have developed	✔		✔	✔
Connect scientific explorations to careers in science	✔	✔		
Exercise a healthy, informed skepticism, and use scientific knowledge and findings to form their own investigations and to evaluate claims in secondary sources	✔		✔	✔
Consider social, ethical, and environmental implications of the findings from their own and others' investigations	✔			✔
Critically analyze the validity of information in secondary sources and evaluate the approaches used to solve problems		✔	✔	

Applying and Innovating	Earth Science	Biology	Physics	Chemistry
Contribute to care for self, others, and community through personal or collaborative approaches		✔		
Transfer and apply learning to new situations	✔		✔	✔
Generate and introduce new or refined ideas when problem solving	✔		✔	
Contribute to finding solutions to problems at a local and/or global level through inquiry	✔	✔	✔	✔
Consider the role of scientists in innovation	✔	✔		✔
Communicating	**Earth Science**	**Biology**	**Physics**	**Chemistry**
Formulate physical or mental theoretical models to describe a phenomenon	✔		✔	✔
Communicate scientific ideas, claims, information, and perhaps a suggested course of action, for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions, and representations	✔	✔	✔	✔
Express and reflect on a variety of experiences, perspectives, and worldviews through place	✔	✔	✔	