

# Preparation for the GED® Test Science

## Course Overview

The Preparation for the GED® Test Courses were developed by aligning Plato Courseware with the content subtopics and practices that are aligned to each GED® Test. Each lesson or activity aligns to one or more of the GED® content subtopics or practices. The units are organized by content area. This course is designed to develop the science-content competencies necessary to successfully engage in scientific reasoning in the life sciences, physical sciences, and Earth and space sciences. This course emphasizes the use of the scientific reasoning skills and practices needed for scientific literacy.

## Course Goals

By the end of this course, you will be able to do the following:

- Explain the nature of scientific theories and laws.
- Explain how different proteins produced by a cell carry out critical life functions through systems of specialized cells.
- Use statistics and probability to calculate variation and distribution of expressed traits in a population.
- Explain how genetic variation, natural selection, and environment lead to adaptations in organisms.
- Use evidence to show that changes in the environment may result in changes in a species over time.
- Explain why the human body needs macronutrients and micronutrients to support homeostasis and the use of energy.
- Use mathematics to explain the factors that affect carrying capacity of ecosystems at different scales.
- Identify the forces exerted on an object and predict the object's motion.
- Describe physical and chemical properties and changes of matter.
- Use evidence to explain that natural geological processes result in uneven distributions of natural resources across the globe.

- Create a conceptual model of how the universe may have initially formed from the big bang and explain the observational and experimental evidence that supports this theory.

## General Skills

To participate in this course, you should be able to do the following:

- Understand the basics of spreadsheet software, such as Microsoft Excel or Google Spreadsheets, but having prior computing experience is not necessary.
- Complete basic operations with word processing software, such as Microsoft Word or Google Docs
- Communicate through email and participate in discussion boards.

*For a complete list of general skills that are required for participation in online courses, refer to the Prerequisites section of the Student Orientation, found at the beginning of this course.*

## Course Materials

- Notebook
- Pencils or ink pens
- Computer with internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft Excel or equivalent

## Course Structure

### Unit 1: Cells, Tissues, Organs, and Systems

#### Summary

In this unit, you will evaluate the nature of scientific theories and laws. You'll explain the function of atoms. You'll also use a model to compare the structural and functional differences between plant and animal cells. Then, you'll explain the function of proteins and the role of mitosis and meiosis in producing and maintaining complex organisms. You'll go on to explore body systems and explain how they work together to move the body. You'll then investigate the effects of exercise on muscle activity and the heart rate. Lastly, you'll carry out research on a vaccine and explain its value to public health.

## Unit 2: Heredity and Evolution

### Summary

In this unit, you will focus on some of the key concepts of Life Science. The unit begins with developing an understanding of Biology by understanding the role of DNA and chromosomes. You'll get an understanding of genetics, genetic mutations, genetic traits, heredity, and inheritance patterns. You'll also explore the process of evolution.

## Unit 3: Energy in Life Systems

### Summary

In this unit, you will explore physical and chemical changes and explain various types of chemical reactions that assist life functions. You'll demonstrate photosynthesis and cellular respiration. You'll investigate the growth needs of yeast. You'll also explain the function of macronutrients and micronutrients and analyze your diet. You'll further gain an understanding of matter and energy. Then, you'll explain how the cycling of matter interacts with biological processes. Using mathematics and evidence you'll also explain the carrying capacity and biodiversity of an ecosystem. Lastly, you will design an environmentally sustainable home.

## Unit 4: Energy, Force, and Motion

### Summary

In this unit, you will focus on some of the key concepts of Physical Science. You'll explain conservation of energy, identify different forms of energy, and examine energy change from one form to another. Then you'll analyze heat flow between objects at various temperature. You'll also classify and model waves. Further, you'll explain interactions of light and matter and explore the relationship between position and gravitational potential energy. Finally, you'll study the concept of motion and work by analyzing the motion of objects and identifying the forces exerted on an object and predicting the object's motion.

## Unit 5: Matter and its Interactions

### Summary

In this unit, you will classify matter into different forms and describe the properties and changes of matter. You'll explain the atomic structure based on the element's position in the periodic table. You'll also explain chemical reaction patterns and the energy exerted during a reaction. At the end of this unit, you'll describe aqueous solutions and analyze effects of temperature and concentration on the rate of a chemical reaction.

## Unit 6: Earth and Space

### **Summary**

In this unit, you will explain interactions between Earth's subsystems. You'll study past occurrences of natural hazards to predict future disaster risk. You'll examine the uneven distribution of natural resources throughout the globe. You'll also analyze data to identify changes in Earth's atmosphere since its formation and explain how the atmosphere interacts with other subsystems. You'll explain how landforms and current trends affect the Earth's climate. You'll demonstrate the formation of Earth, the atmosphere, and the oceans. You'll also apply a variety of dating methods to construct an accurate history of Earth and explain the big bang theory. Lastly, you will explain the formation of stars, galaxies, and terrestrial objects, compare objects in the solar system, and explain how space explorations help scientists.

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