Course Description:

Semester B puts great emphasis on life science and begins by focusing on the many ecosystems of the earth and the way that all parts of ecosystems depend on each other. Students will learn the different types of ecosystems that exist. They will learn that ecosystems change and how the changes affect their ability to support their populations. Learners will examine plants; that they have different structures and how those structures allow them to respond to different needs. Students will also grow in their understanding of the importance of good nutrition to all living organisms. The course concludes with a look into the scientific process and the importance of investigations and conclusions in the study of science.

Module	Lesson Title	Objectives
Earth's Ecosystems	Ethiopian Highlands Ecosystems	• Describe how the mountains in Ethiopia were formed. • Identify the primary consumers in the Ethiopian Highlands.
	Andes and Rockies Ecosystems	• Describe the characteristics of the Andes and Rocky Mountains. • Identify producers and consumers in the ecosystems of the Andes and Rocky Mountains.
	Himalayan Ecosystems	• Describe the characteristics of the ecosystems in the Himalayan Mountains. • Compare the wildlife of the Himalayan Mountains.
	Tundra Plants	• Describe characteristics of the tundra, specifically the arctic tundra. • Identify the plants that have adapted to live in the tundra.
	Tundra Animals	• Identify and describe the animals that have adapted to live in the tundra.
	Tundra Ecosystems and Human Influence	• Differentiate between the Arctic and Antarctic ecosystems. • Describe how humans and climate change have affected the Antarctic ecosystem.

	Introduction to Forest Ecosystems	• Differentiate between the three forest ecosystems.
	Taiga Ecosystems	• Identify characteristics of the taiga forests. • Differentiate between the producers and consumers that are found in the taiga. • Describe producers and consumers. • Differentiate between coniferous and deciduous trees.
	Temperate Coniferous Forest Ecosystems	• Describe temperate coniferous forests and the living organisms found there. • Differentiate between temperate coniferous forests and taiga forests. • Identify taiga forest characteristics. • Differentiate between producers and consumers.
More of Earth's Ecosystems	Temperate Broadleaf Forest Ecosystem	• Differentiate between forest types. • Define characteristics of a temperate broadleaf forest.
	Rainforest Ecosystems	• Define characteristics of a rainforest ecosystem. • Differentiate between the layers of the rainforest.
	Human Effects on Rainforests	• Describe how rainforests have impacted human life and how humans affect rainforest ecosystems. • Identify characteristics and consumers of the Amazon rainforest.
	Grassland and Savanna Ecosystems	• Differentiate between temperate and tropical grasslands. • Identify characteristics of grasslands and savannas.
	Temperate Grasslands Ecosystems	• Describe characteristics of temperate grasslands ecosystems. • Identify producers and consumers found in this ecosystem. • Describe how humans have impacted temperate prairies.
	Ocean Zones	• Differentiate between the ocean zones. • Define marine ecosystems.
	Estuaries and Marshes	• Describe characteristics of estuaries. • Differentiate between the different types of marshes.

	North Atlantic Ocean Ecosystems	• Describe North Atlantic Ocean ecosystems and the producers and consumers that live there. • Differentiate between ocean and freshwater ecosystems.
	Coral Reef Ecosystems	• Identify the importance of coral reef ecosystems. • Describe how humans affect coral reefs.
Introduction to Plants	Photosynthesis	• Describe in appropriate detail the process of photosynthesis and write a scientific equation that represents the process. • Identify and describe the parts of a leaf involved in photosynthesis.
	Green Algae and Bryophytes	• Differentiate between vascular and nonvascular plants. • Identify the characteristics of a seedless vascular plant. • Identify characteristics of green algae and bryophytes.
	Ferns and Gymnosperms	• Differentiate between ferns and gymnosperms. • Identify characteristics of ferns, gymnosperms, and conifers.
	Angiosperms	• Identify the characteristics of angiosperms. • Identify the steps of the reproductive pathway of angiosperms. • Differentiate between angiosperms and gymnosperms.
	Plant Seeds	• Differentiate between the parts of a plant seed. • Identify the steps of plant growth and germination.
	Seed Dispersal	• Identify the methods of seed dispersal. • Describe the reasoning behind seed dispersal.
	Roots	• Differentiate between taproot systems and fibrous roots systems. • Describe the parts of a plant. • Describe the functions of roots.

	Stems	• Identify how water and nutrients are transported in a plant. • Differentiate between herbaceous plants and woody plants.
	Leaves	• Identify the parts of a leaf and their functions. • Identify the role a leaf plays in photosynthesis.
Plants and Resources	Plant Nutrients	• Differentiate between mineral and non-mineral nutrients. • Differentiate between macro- and micronutrients. • Identify the role nutrients play within plants.
	Soil Layers	• Differentiate between the soil layers. • Describe the nutrient cycle.
	Soil Life	• Differentiate between organic and inorganic material found in soil. • Identify characteristics of healthy soil. • Define the nitrogen cycle.
	Fertilizer	• Differentiate between organic and inorganic fertilizers. • Describe humus and its use as a fertilizer. • Describe compost.
	Phototropism and Gravitropism	• Describe phototropism. • Describe gravitropism.
	Thigmotropism and Hydrotropism	• Describe thigmotropism and hydrotropism. • Differentiate between the four most common tropistic responses. • Define nastic movements.
	Non-Renewable Resources	• Define nonrenewable resources and provide examples. • Identify why nonrenewable resources are important to humans.
	Renewable Resources	• Define renewable resources and identify examples. • Differentiate between renewable and nonrenewable resources.

Human Nutrition	Nutrition	• Describe the importance of good nutrition. • Differentiate between science calories and food calories.
	Carbohydrates	• Describe characteristics of carbohydrates. • Identify the importance of carbohydrates to our overall health. • Differentiate between simple and complex carbohydrates and provide examples.
	Fats	• Describe fats and provide examples. • Identify the importance of fats in a healthy diet.
	Introduction to Proteins	• Describe proteins and how they affect health. • Describe the role of hemoglobin in your body.
	Proteins and Amino Acids	• Define amino acids and essential amino acids. • Identify how proteins are digested. • Differentiate between complete and incomplete proteins and provide examples of each.
	Micronutrients	• Define micronutrients. • Differentiate between vitamins and minerals. • Identify examples of vitamins and minerals and their effects on the human body.
	Fiber	• Describe fiber and its health benefits. • Identify sources of fiber.
	Healthy Eating	• Identify necessary components of a healthy diet.
Cells, Reproduction, and Scientific Thinking	Cells	• Differentiate between a eukaryotic cell and a prokaryotic cell. • Differentiate between a plant cell and an animal cell. • Identify the function of different cell parts.
	Cells and DNA	• Identify the location of DNA. • Identify the parts of DNA. • Describe why DNA is important.

	Cell Growth and Mitosis	• Identify the process and importance of cell division. • Differentiate between the stages of mitosis.
	Sexual Reproduction	• Define sexual reproduction. • Describe how plants reproduce sexually.
	Asexual Reproduction	• Define asexual reproduction. • Differentiate between the types of asexual reproduction.
	Scientific Theories and Laws	• Differentiate between scientific theories and laws. • Describe the steps of the scientific method.
	Scientific Observations	• Describe the importance of scientific observations. • Differentiate between qualitative and quantitative observations.
	Forming a Hypothesis	• Define hypotheses. • Form hypotheses based on given information.
	Controlled Experiments	• Define controlled experiments. • Differentiate between independent and dependent variables. • Identify the control group in an experiment.
	Measurements in Science	• Describe the importance of the metric system. • Identify how mass, volume, length, and temperature are measured. • Convert measurements within the metric system.