

**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. Instruction will include real life application, hands-on projects and assessments, and video and short research projects.

**Materials Needed:**

- Three types of seeds: corn (maize), bean (lima or other large bean), and radish
- 8.5"x 11" piece of cardstock or light cardboard
- Ziploc or plastic lunch bag
- Paper towel
- Masking Tape
- Water
- 2 to 4 weeks of experiment time
- Optional Magnifying glass

Module	Lesson Title	Objectives
1	Ecosystems	<ol style="list-style-type: none"> <li>1. Describe or illustrate what an ecosystem is</li> <li>2. Identify and describe the major characteristics of different types of ecosystems.</li> </ol>
	Ethiopian Highlands	<ol style="list-style-type: none"> <li>1. Describe the how the mountains in Ethiopia were formed.</li> <li>2. Identify the primary consumers in the Ethiopian Highlands.</li> </ol>
	Andes and Rockies Ecosystems	<ol style="list-style-type: none"> <li>1. Describe how organisms perform a variety of roles in an ecosystem.</li> <li>2. Illustrate how energy entering ecosystems as sunlight is transferred and transformed by producers into energy that organisms use through the process of photosynthesis.</li> <li>3. Identify producers and consumers in mountain ecosystems.</li> </ol>
	The Himalayas Ecosystem	<ol style="list-style-type: none"> <li>1. Describe how organisms perform a variety of roles in the Himalayas.</li> <li>2. Identify and compare the wild goats found in mountain ecosystems.</li> </ol>

## 5<sup>th</sup> Grade Science B Syllabus

Module	Lesson Title	Objectives
	Ecosystem Review	<ol style="list-style-type: none"> <li>1. Describe or illustrate what an ecosystem is.</li> <li>2. Describe how organisms perform a variety of roles in an ecosystem.</li> </ol>
	Tundra Plants	<ol style="list-style-type: none"> <li>1. Identify and describe the different types of tundra ecosystems.</li> <li>2. Identify and describe the plants and animals of the tundra.</li> </ol>
	Tundra Animals	<ol style="list-style-type: none"> <li>1. Describe how organisms perform a variety of roles in an ecosystem.</li> <li>2. Identify producers and consumers in the tundra ecosystem.</li> </ol>
	Arctic Tundra Ecosystem	<ol style="list-style-type: none"> <li>1. Describe how organisms perform a variety of roles in an ecosystem.</li> <li>2. Identify producers and consumers in the tundra ecosystem.</li> </ol>
	Forest Ecosystem	<ol style="list-style-type: none"> <li>1. Describe or illustrate what an ecosystem is.</li> <li>2. Describe or illustrate how energy entering ecosystems as sunlight is transferred and transformed by producers, through the process of photosynthesis, into energy that organisms use.</li> <li>3. Identify producers and consumers in a forest ecosystem.</li> <li>4. Describe how organisms perform a variety of roles in an ecosystem.</li> </ol>
	Taiga	<ol style="list-style-type: none"> <li>1. Describe how organisms perform a variety of roles in an ecosystem.</li> <li>2. Identify the primary producers and consumers in the Taiga forest.</li> </ol>
	Temperate Coniferous Forest	<ol style="list-style-type: none"> <li>1. Identify producers and consumers in a forest ecosystem.</li> </ol>
	Temperate Broadleaf Forest	<ol style="list-style-type: none"> <li>1. Identify producers and consumers in a forest ecosystem.</li> </ol>
	Forest Ecosystem	<ol style="list-style-type: none"> <li>1. Describe or illustrate what an ecosystem is.</li> <li>2. Describe or illustrate how energy entering ecosystems as sunlight is transferred and transformed by producers, through the process of photosynthesis, into energy that organisms use.</li> <li>3. Identify producers and consumers in a forest ecosystem.</li> <li>4. Describe how organisms perform a variety of roles in an ecosystem.</li> </ol>

## 5<sup>th</sup> Grade Science B Syllabus

Module	Lesson Title	Objectives
2	Ecosystem: Energy Flow	<ol style="list-style-type: none"><li>1. Describe or illustrate what an ecosystem is.</li></ol>
	The Rainforest Ecosystem	<ol style="list-style-type: none"><li>1. Describe how organisms perform a variety of roles in an ecosystem.</li><li>2. Describe or illustrate how energy entering ecosystems as sunlight is transferred and transformed by producers, through the process of photosynthesis, into energy that organisms use.</li><li>3. Identify producers and consumers in a tropical rainforest ecosystem.</li></ol>
	Ecosystems: Tropical Rainforest	<ol style="list-style-type: none"><li>1. Describe or illustrate what an ecosystem is.</li><li>2. Describe how organisms perform a variety of roles in an ecosystem.</li><li>3. Identify producers and consumers in a tropical rainforest ecosystem</li></ol>
	Energy flow in Marine Life	<ol style="list-style-type: none"><li>1. Describe or illustrate what an ecosystem is.</li><li>2. Describe the flow of energy through a marine ecosystem.</li></ol>
	Marine Ecosystem	<ol style="list-style-type: none"><li>1. Describe or illustrate what an ecosystem is.</li><li>2. Describe how organisms perform a variety of roles in an ecosystem.</li><li>3. Describe how energy entering ecosystems as sunlight is transferred and transformed by producers, through the process of photosynthesis, into energy that organisms use.</li><li>4. Identify producers and consumers in a marine ecosystem.</li></ol>
	North Atlantic and Coral Reef	<ol style="list-style-type: none"><li>1. Describe or illustrate what an ecosystem is.</li><li>2. Describe how organisms perform a variety of roles in an ecosystem.</li><li>3. Describe how energy entering ecosystems as sunlight is transferred and transformed by producers, through the process of photosynthesis, into energy that organisms use.</li><li>4. Identify producers and consumers in a marine ecosystem.</li></ol>

## 5<sup>th</sup> Grade Science B Syllabus

Module	Lesson Title	Objectives
	Grassland and Savanna	<ol style="list-style-type: none"> <li>1. Describe or illustrate what an ecosystem is.</li> <li>2. Describe how organisms perform a variety of roles in an ecosystem.</li> <li>3. Describe how energy entering ecosystems as sunlight is transferred and transformed by producers, through the process of photosynthesis, into energy that organisms use.</li> <li>4. Identify producers and consumers in a grassland ecosystem.</li> </ol>
	Tallgrass Prairie	<ol style="list-style-type: none"> <li>1. Describe or illustrate what an ecosystem is.</li> <li>2. Describe how organisms perform a variety of roles in an ecosystem.</li> <li>3. Describe how energy entering ecosystems as sunlight is transferred and transformed by producers, through the process of photosynthesis, into energy that organisms use.</li> <li>4. Identify producers and consumers in a prairie grassland ecosystem.</li> </ol>
3	Plants: Stems and Transportation	<ol style="list-style-type: none"> <li>1. Describe the difference between herbaceous and woody plants, and the function of stems and wood.</li> <li>2. Describe the transportation of water and nutrients through specialized plant tissues.</li> <li>3. Identify the function of roots and leaves.</li> </ol>
	Photosynthesis	<ol style="list-style-type: none"> <li>1. Describe in appropriate detail the process of photosynthesis and write a scientific equation that represents the process.</li> <li>2. Identify and describe the parts of a leaf involved in photosynthesis.</li> <li>3. Explain what transpiration is, and how it works.</li> </ol>
	Green Algae and Bryophytes	<ol style="list-style-type: none"> <li>1. Distinguish between four different plant groups green algae bryophytes (mosses) ferns and fern allies seed plants (including gymnosperms and angiosperms)</li> </ol>
	Ferns, Conifers and Flowering Plants	<ol style="list-style-type: none"> <li>1. Distinguish between four different plant groups green algae bryophytes (mosses) ferns and fern allies seed plants (including gymnosperms and angiosperms)</li> <li>2. Describe and define the main parts of a flower.</li> <li>3. Describe how flowers reproduce through pollination.</li> </ol>
4	Nutrition	<ol style="list-style-type: none"> <li>1. Define the basic terms used in learning about nutrition.</li> <li>2. Explain how our bodies use food for energy and nutrition.</li> <li>3. Understand how vitamins and minerals are used in our bodies.</li> <li>4. List a variety of foods that provide specific vitamins and minerals.</li> <li>5. Identify specific vitamins and minerals, their food sources, and their health benefits.</li> </ol>

## 5<sup>th</sup> Grade Science B Syllabus

Module	Lesson Title	Objectives
	Proteins and Amino Acids	1. Explain how proteins, amino acids, and fiber are used in our bodies for growth and nutrition.
	Proteins, Amino Acids and Fiber Review	1. List a variety of foods that provide proteins, amino acids, or fiber. 2. Identify types of proteins, amino acids, and fibers, their food sources, and their health benefits.
	Seeds	1. List the basic requirements for seed germination and growth. 2. Describe several methods of seed dispersal common in nature.
5	Roots	1. Identify the parts of a seedling. 2. Identify the function and purpose of the plant's roots.
	Stems	1. Identify the function and purpose of the plant's stem.
	Leaves	1. Identify the function and purpose of the plant's leaves.
	Nutrients	1. Describe the nutrients that make up rich soil.
	Soil Life	1. Identify the organisms that comprise rich soil.
	Fertilizer	1. Distinguish between humus and compost and describe the purpose of a fertilizer.
	Soil System	1. Describe a healthy soil system and its layers.

## 5<sup>th</sup> Grade Science B Syllabus

Module	Lesson Title	Objectives
	Plants Sense and Respond	<ol style="list-style-type: none"><li>1. Explain why plants turn their stems or leaves towards the light (phototropism).</li><li>2. Explain why roots grow down into the soil and stems grow up even when there is no light (gravitropism).</li><li>3. Explain why some vines and other climbing plants respond to touch (thigmotropism).</li><li>4. Consider whether hydrotropism is separate from gravitropism.</li></ol>
6	Cell Division	<ol style="list-style-type: none"><li>1. Explain and describe the basics of cell division.</li><li>2. Describe and define the basics of asexual reproduction in plants and simple organisms.</li><li>3. Define and describe the basics of sexual reproduction in some plants and in most animals.</li></ol>
	The Scientific Process	<ol style="list-style-type: none"><li>1. Define science, and describe why it is important.</li><li>2. List the steps in the scientific method.</li><li>3. Design and carry out a simple experiment.</li></ol>
	Investigations and Conclusions	<ol style="list-style-type: none"><li>1. Understand the steps in the scientific method.</li><li>2. Identify questions that can be answered through scientific investigations.</li><li>3. Practice the scientific method.</li><li>4. Design and conduct a scientific investigation.</li><li>5. Communicate scientific conclusions and explanations.</li></ol>