5th Grade Science A Syllabus

Course Description:

Grade 5 Science continues to build on the science skills that have been obtained in years previous. There will be an emphasis on earth and space science, life science, and physical science. Students will begin the course by focusing on earth and space science by looking at the solar system and planets. Students will come to an understanding of the concept of the earth as a sphere and the earth's place in the solar system. The course continues with a focus on physical science and the different tools that can measure force, time, and distance. They will also grow in their understanding of how light and sound travel and interact with each other as well as the different types of energy. The semester concludes with a look into life science and the ways that organisms are interconnected. 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
Balloons
Pencil
Tape measure
Clothespin
Graph Paper
Flashlight
Colored pencils
Wine Glass (with rim is best)

Module	Lesson Title	Objectives
1	Intro to Solar System	1. Define solar system, sun, planet, orbit, gravity, moon, asteroid, comet, and meteorite. 2. Describe that the solar system includes the sun and all celestial bodies that orbit the sun, and be able to describe the different types of objects briefly. 3. Understand that the sun is one of many stars that exist in the universe, and that it is part of the Milky Way. 4. Understand that each planet in the solar system has unique characteristics, and be able to describe those characteristics and differences.

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Module	Lesson Title	Objectives
	Milky Way	1. Define solar system, sun, planet, orbit, gravity, moon, asteroid, comet, and meteorite. 2. Describe that the solar system includes the sun and all celestial bodies that orbit the sun, and be able to describe the different types of objects briefly. 3. Understand that the sun is one of many stars that exist in the universe, and that it is part of the Milky Way. 4. Understand that each planet in the solar system has unique characteristics, and be able to describe those characteristics and differences.
	Dwarf Planets	1. Define solar system, sun, planet, orbit, gravity, moon, asteroid, comet, and meteorite. 2. Describe that the solar system includes the sun and all celestial bodies that orbit the sun, and be able to describe the different types of objects briefly. 3. Understand that the sun is one of many stars that exist in the universe, and that it is part of the Milky Way. 4. Understand that each planet in the solar system has unique characteristics, and be able to describe those characteristics and differences.
	Asteroids, Meteoroids, and Comets	1. Define solar system, sun, planet, orbit, gravity, moon, asteroid, comet, and meteorite. 2. Describe that the solar system includes the sun and all celestial bodies that orbit the sun, and be able to describe the different types of objects briefly. 3. Understand that the sun is one of many stars that exist in the universe, and that it is part of the Milky Way. 4. Understand that each planet in the solar system has unique characteristics, and be able to describe those characteristics and differences.
	Planet Orbits and Gravity	1. Describe the effects of gravity, how it helps create the orbits of the planets in the solar system. 2. Describe the formation of the solar system, including the sun and the planets that orbit the sun. 3. Describe the unique characteristics of each planet in the solar system, including each planet's distance from the sun, size, composition, and orbit. 4. Identify those planets that have moons and/or debris that orbit them.

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Module	Lesson Title	Objectives
	Mercury, Venus, and the Formation of the Solar System	1. Describe the effects of gravity, how it helps create the orbits of the planets in the solar system. 2. Describe the formation of the solar system, including the sun and the planets that orbit the sun. 3. Describe the unique characteristics of each planet in the solar system, including each planet's distance from the sun, size, composition, and orbit. 4. Identify those planets that have moons and/or debris that orbit them.
	Earth, Mars, Jupiter and Saturn	1. Describe the effects of gravity, how it helps create the orbits of the planets in the solar system. 2. Describe the formation of the solar system, including the sun and the planets that orbit the sun. 3. Describe the unique characteristics of each planet in the solar system, including each planet's distance from the sun, size, composition, and orbit. 4. Identify those planets that have moons and/or debris that orbit them.
	Uranus, Neptune and Dwarf Planets	1. Describe the effects of gravity, how it helps create the orbits of the planets in the solar system. 2. Describe the formation of the solar system, including the sun and the planets that orbit the sun. 3. Describe the unique characteristics of each planet in the solar system, including each planet's distance from the sun, size, composition, and orbit. 4. Identify those planets that have moons and/or debris that orbit them.
	Gravity and Orbits	1. Identify and describe the differences between comets, asteroids, and meteoroids. 2. Identify and describe the similarities between comets, asteroids, and meteoroids. 3. Describe why comets, asteroids, and meteoroids orbit the sun. 4. Know the difference between meteoroids, meteors, and meteorites.
	Comets	1. Identify and describe the differences between comets, asteroids, and meteoroids. 2. Identify and describe the similarities between comets, asteroids, and meteoroids. 3. Describe why comets, asteroids, and meteoroids orbit the sun. 4. Know the difference between meteoroids, meteors, and meteorites.

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Module	Lesson Title	Objectives
	Asteroids	1. Identify and describe the differences between comets, asteroids, and meteoroids. 2. Identify and describe the similarities between comets, asteroids, and meteoroids. 3. Describe why comets, asteroids, and meteoroids orbit the sun. 4. Know the difference between meteoroids, meteors, and meteorites.
	Meteoroids	1. Identify and describe the differences between comets, asteroids, and meteoroids. 2. Identify and describe the similarities between comets, asteroids, and meteoroids. 3. Describe why comets, asteroids, and meteoroids orbit the sun. 4. Know the difference between meteoroids, meteors, and meteorites.
2	The Big Bang	1. Identify events in and following the Big Bang. 2. Explain how stars are born. 3. Describe how stars are classified. 4. Explain the life cycle and death of different types of stars.
	Birth of Stars	1. Identify events in and following the Big Bang. 2. Explain how stars are born. 3. Describe how stars are classified. 4. Explain the life cycle and death of different types of stars.
	Life Cycle of Stars	1. Identify events in and following the Big Bang. 2. Explain how stars are born. 3. Describe how stars are classified. 4. Explain the life cycle and death of different types of stars.
	Life & Death of Stars	1. Identify events in and following the Big Bang. 2. Explain how stars are born. 3. Describe how stars are classified. 4. Explain the life cycle and death of different types of stars.
	Intro to the Sun	1. Describe the basic structure of the sun.
	Structure of the Sun	1. Describe the basic structure of the sun.

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Module	Lesson Title	Objectives
	Rotation and Revolution	1. Describe the cycles and patterns of motion between the Earth and the sun are predictable. 2. Recognize that planets revolve around the sun in elliptical orbits. 3. Recognize that Earth's revolution around the sun takes approximately 365 days. 4. Recognize that Earth's tilt on its axis causes the seasons.
	Seasons	1. Describe the cycles and patterns of motion between the Earth and the sun are predictable. 2. Recognize that planets revolve around the sun in elliptical orbits. 3. Recognize that Earth's revolution around the sun takes approximately 365 days. 4. Recognize that Earth's tilt on its axis causes the seasons.
3	Earth's Tilt and the Seasons	1. Know that Earth's revolution around the sun takes approximately 365 days. 2. Describe how Earth's axis is tilted at an angle of 23.5° 3. Explain how Earth's tilt is the cause of Earth's seasons.
	Spring	1. Know that Earth's revolution around the sun takes approximately 365 days. 2. Describe how Earth's axis is tilted at an angle of 23.5° 3. Explain how Earth's tilt is the cause of Earth's seasons.
	Summer	1. Know that Earth's revolution around the sun takes approximately 365 days. 2. Describe how Earth's axis is tilted at an angle of 23.5° 3. Explain how Earth's tilt is the cause of Earth's seasons.
	Autumn	1. Know that Earth's revolution around the sun takes approximately 365 days. 2. Describe how Earth's axis is tilted at an angle of 23.5° 3. Explain how Earth's tilt is the cause of Earth's seasons.
	Intro to the Moon	1. Identify Earth as having a single moon that revolves around, or orbits, the Earth. 2. Explain how the relationship between Earth and the Moon creates day and night and the phases of the moon. 3. Describe how Earth's rotation on its axis in a 24-hour period produces day and night. 4. Understand how the moon helps create the tides in Earth's oceans.

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Module	Lesson Title	Objectives
	Night and Day	1. Identify Earth as having a single moon that revolves around, or orbits, the Earth. 2. Explain how the relationship between Earth and the Moon creates day and night and the phases of the moon. 3. Describe how Earth's rotation on its axis in a 24-hour period produces day and night. 4. Understand how the moon helps create the tides in Earth's oceans.
	Phases of the Moon	1. Identify Earth as having a single moon that revolves around, or orbits, the Earth. 2. Explain how the relationship between Earth and the Moon creates day and night and the phases of the moon. 3. Describe how Earth's rotation on its axis in a 24-hour period produces day and night. 4. Understand how the moon helps create the tides in Earth's oceans.
	Tides	1. Identify Earth as having a single moon that revolves around, or orbits, the Earth. 2. Explain how the relationship between Earth and the Moon creates day and night and the phases of the moon. 3. Describe how Earth's rotation on its axis in a 24-hour period produces day and night. 4. Understand how the moon helps create the tides in Earth's oceans.
	Living on Planet Earth	1. Describe the shape of the Earth. 2. List and define common terms used to describe Earth. 3. Describe at least five reasons that life can exist on Earth. 4. List and describe at least five landforms that exist on Earth's surface.
	Freshwater on Earth	1. Describe lakes, rivers, and other water sources. 2. Explain the water cycle and how it connects fresh and saltwater sources. 3. Define groundwater and key terms related to it.
	Position, Motion and Force	1. Understand that movement can be measured by speed. 2. Explain how the speed of an object is calculated by determining the distance (d) traveled in a period of time (t).

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Module	Lesson Title	Objectives
	Measuring Speed	1. Understand that movement can be measured by speed. 2. Explain how the speed of an object is calculated by determining the distance (d) traveled in a period of time (t).
4	Gravity, Mass and Weight	1. read for understanding. 2. perform experiments and activities and draw conclusions. 3. define key terms. 4. analyze and record data in an organizer. 5. understand that a force is a push or a pull. 6. understand that gravitational force is a pull. 7. recognize the relationship between pushes and pulls (forces) and a change in an object's motion, including that greater force on an object leads to greater change in motion.
	Earth and Weight	8.
	Forces, Motion, and Speed	9.
	Force	1. Understand that a force is a push or a pull on an object. 2. Recognize that applying a force to an object can change the object's movement. 3. Understand that the weight of the object and amount of force applied affect the speed of the object. 4. Understand that the amount of change in movement of an object is based on the weight of the object and the amount of force exerted.
	Motion and Forces	1. Understand that a force is a push or a pull on an object. 2. Recognize that applying a force to an object can change the object's movement. 3. Understand that the weight of the object and amount of force applied affect the speed of the object. 4. Understand that the amount of change in movement of an object is based on the weight of the object and the amount of force exerted.

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Module	Lesson Title	Objectives
	Laws of Motion	1. Understand that a force is a push or a pull on an object. 2. Recognize that applying a force to an object can change the object's movement. 3. Understand that the weight of the object and amount of force applied affect the speed of the object. 4. Understand that the amount of change in movement of an object is based on the weight of the object and the amount of force exerted.
	Acceleration	1. Understand that a force is a push or a pull on an object. 2. Recognize that applying a force to an object can change the object's movement. 3. Understand that the weight of the object and amount of force applied affect the speed of the object. 4. Understand that the amount of change in movement of an object is based on the weight of the object and the amount of force exerted.
	Building Blocks	1. Describe the building blocks of matter: elements, atoms, and molecules.
	Properties of Matter	1. Describe observable properties of matter.
	Conservation of Mass	1. Explain the law of conservation of mass.
	Mixtures and Compounds	1. Explain the difference between a mixture and a compound.

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Module	Lesson Title	Objectives
5	Light and Color	1. Describe how light travels as waves. 2. Explain that as light travels from one place to another, it goes in a straight line until it interacts with another object or material. 3. Describe the difference between light being absorbed, bent (refracted), bounced back (reflected), or continuing to travel through the new material. 4. Describe how shadows are formed. 5. Explain how colors are produced when white light is separated into different wavelengths.
	Refraction of Light	1. Describe how light travels as waves. 2. Explain that as light travels from one place to another, it goes in a straight line until it interacts with another object or material. 3. Describe the difference between light being absorbed, bent (refracted), bounced back (reflected), or continuing to travel through the new material. 4. Describe how shadows are formed. 5. Explain how colors are produced when white light is separated into different wavelengths.
	Reflection of Light	1. Describe how light travels as waves. 2. Explain that as light travels from one place to another, it goes in a straight line until it interacts with another object or material. 3. Describe the difference between light being absorbed, bent (refracted), bounced back (reflected), or continuing to travel through the new material. 4. Describe how shadows are formed. 5. Explain how colors are produced when white light is separated into different wavelengths.
	Intro to Sound	1. Describe how sound is produced by vibrating objects. 2. Explain how the rate of vibration is related to the pitch of the sound. 3. Describe how the loudness of sound is measured. 4. Explain what it means that sound requires a medium through which to travel. 5. Describe how sound travels at different speeds in different mediums.

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Module	Lesson Title	Objectives
	Pitch and Loudness	1. Describe how sound is produced by vibrating objects. 2. Explain how the rate of vibration is related to the pitch of the sound. 3. Describe how the loudness of sound is measured. 4. Explain what it means that sound requires a medium through which to travel. 5. Describe how sound travels at different speeds in different mediums.
	Traveling Sound	1. Describe how sound is produced by vibrating objects. 2. Explain how the rate of vibration is related to the pitch of the sound. 3. Describe how the loudness of sound is measured. 4. Explain what it means that sound requires a medium through which to travel. 5. Describe how sound travels at different speeds in different mediums.
	Sound Part 1&2	1. Explain how sound and light are forms of energy. 2. Recognize that sound and light travel as waves. 3. Recognize that sound and light waves can be measured. 4. Describe how sound waves and light waves behave in predictable ways, such as being reflected or refracted.
	Light Part 1&2	1. Explain how sound and light are forms of energy. 2. Recognize that sound and light travel as waves. 3. Recognize that sound and light waves can be measured. 4. Describe how sound waves and light waves behave in predictable ways, such as being reflected or refracted.
6	Nonrenewable Resources	1. Describe the difference between renewable and non-renewable energy sources. 2. Explain why nonrenewable energy sources are important to humans. 3. Discuss the role that energy sources play in food chains. 4. Explain why it is important to protect energy relationships in food chains.
	Renewable Resources	1. Describe the difference between renewable and non-renewable energy sources. 2. Explain why nonrenewable energy sources are important to humans. 3. Discuss the role that energy sources play in food chains. 4. Explain why it is important to protect energy relationships in food chains.

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Module	Lesson Title	Objectives
	Flow of Energy	1. Recognize that energy from the sun provides the energy to sustain almost all life on Earth. 2. Describe why photosynthesis is so important to living things. 3. Explain how energy flows through a food chain.
	Phytoplankton	1. Recognize that energy from the sun provides the energy to sustain almost all life on Earth. 2. Describe why photosynthesis is so important to living things. 3. Explain how energy flows through a food chain.
	Energy Consumers	1. Describe how populations of organisms can be categorized by how they acquire energy. 2. Explain the difference between a producer and a consumer in a food chain. 3. Identify organisms as energy consumers, including identifying the organism as a primary or other level consumer. 4. Describe the variety of ways in which consumers are able to get food.
	Ecosystem	1. Explain how all of the processes that take place within organisms require energy. 2. Identify how populations of organisms can be categorized by how they acquire energy. 3. Describe how, for ecosystems, the major source of energy is sunlight. 4. Explain how food chains and food webs can be used to identify the relationships among producers, consumers, and decomposers in an ecosystem. 5. Describe how organisms perform a variety of roles in an ecosystem.
	Food Chains and Food Webs	1. Explain how all of the processes that take place within organisms require energy. 2. Identify how populations of organisms can be categorized by how they acquire energy. 3. Describe how, for ecosystems, the major source of energy is sunlight. 4. Explain how food chains and food webs can be used to identify the relationships among producers, consumers, and decomposers in an ecosystem. 5. Describe how organisms perform a variety of roles in an ecosystem.

Module	Lesson Title	Objectives
	Deer Cave	1. Explain how all of the processes that take place within organisms require energy. 2. Identify how populations of organisms can be categorized by how they acquire energy. 3. Describe how, for ecosystems, the major source of energy is sunlight. 4. Explain how food chains and food webs can be used to identify the relationships among producers, consumers, and decomposers in an ecosystem. 5. Describe how organisms perform a variety of roles in an ecosystem.