Course Description:

In the first semester of Science 7, students will learn about the scientific method and hone their understanding of using scientific measurements to Earth and Space Science. Also included are lessons on Earth maps and globes including detailed instruction on how to find specific locations using latitude and longitude. Much of the first semester focuses on space science. Students will learn about Earth movements, seasons, the Moon, tides, solar and lunar eclipses, the Sun and its role as the main source of light and energy in the solar system. They will learn about planets, asteroids, meteors, comets and their orbits and how force gravity holds it all together. There are lessons on things outside the solar system such as stars, constellations, nebulae, the Milky Way and galaxies beyond. There have been many recent discoveries in space science. Accordingly, careful attention has been given to presenting the most updated information available in areas of discovery such as stars with planets and the latest methods of detecting them as well as a look at NASA's most recent Curiosity landing on the Martian surface.

Module	Lesson Title	Objectives
Scientific Thinking	Observation and Science	● Describe how scientists use the five senses in observing the world around them. ● Recognize the importance of observation skills.
	Scientific Thinking	● Distinguish between science and pseudoscience. ● Evaluate the relationship between empirical evidence and scientific explanation.
	Scientific Theories and Laws	● Define scientific law and scientific theory. ● Distinguish between scientific laws and scientific theories.
	Forming a Hypothesis	● Define the characteristics of a good hypothesis.
	Designing an Experiment	● Define what a controlled experiment is. ● Distinguish between the independent and dependent variables and the constants in an experiment. ● Identify the characteristics of a well-designed experiment.

	Data Collection in Science	• Distinguish between qualitative and quantitative data. • Describe different measurement systems used to measure and record object's properties. • List examples of measuring instruments and tools and their purpose in science.
	Analyzing Data	• Calculate the mean, median, and mode of a set of data.
	Conclusions and Experimental Evaluation	• Draw conclusions based on the results of an experiment. • Evaluate an experiment's procedure for errors that impact the results. • Understand the importance of peer review to the scientific process.
Discovering Space	Origin of the Universe	• Describe the events that occurred during and after the Big Bang.
	Objects in Space	• Identify and distinguish between the different types of objects in the universe.
	Distances in Space	• Define astronomical unit. • Understand the size of the solar system. • Understand the importance of the Voyager mission.
	Stars	• Understand the life cycle of a star • List the main types of stars. • Identify the characteristics of stars.
	Galaxies	• Be able to identify the different types of galaxies.
	The Role of Gravity	• Know how gravity holds our solar system. • Describe the strength of gravity on different objects.
	Solar Systems	• Know what a solar system is. • Describe how a solar system is formed.

The Moon	The Moon	• Identify the Moon as a satellite to Earth. • List the characteristics and structure of Earth's moon.
	Movement of the Moon	• Describe the phases of the Moon as the Moon orbits the Earth. • Define waxing and waning.
	Gravity and the Moon	• Describe the relationship between the Earth and the Moon. • Identify the characteristics of the gravity of the Moon. • Compare the gravity on the Moon to the gravity on the Earth.
	Tides	• Describe the relationship between the gravitational pull of the moon and the changes in the ocean tides. • Describe how the phases of the Moon affect tides. • Describe the causes of high and low, spring and neap tides.
	Lunar Eclipses	• Describe the alignment of the Sun, Earth, and Moon during partial and total eclipses of the Moon. • Distinguish between the three types of lunar eclipses.
	Solar Eclipses	• Describe the alignment of the Sun, Earth, and Moon during partial and total eclipse of the Sun. • Distinguish between the types of solar eclipses.
	Moons of Other Planets	• Describe the moons of the five planets, besides Earth, with moons in our solar system.

	Moon Exploration	● Describe the progression of technology that led to us landing on the Moon. ● Identify the key events in the history of moon exploration.
Earth's Place in the Universe	Earth	● Define the term "sphere" as it relates to the Earth. ● Distinguish between the four spheres on Earth; lithosphere, hydrosphere, atmosphere, and biosphere.
	Earth's Relationship with the Sun	● Describe the importance of the Sun in providing energy to Earth's spheres.
	Earth's Greenhouse Effect	● Describe how the greenhouse effect operates to warm the atmosphere. ● Explain how humans have affected the greenhouse effect on Earth.
	Earth's Movement	● Describe Earth's four primary movements and their effect on Earth. ● Distinguish between the aphelion and perihelion of Earth's orbit.
	Seasons - Summer and Winter	● Identify the relationship between Earth's tilt on its axis and its yearly orbit to the seasons. ● Define solstice, and identify when they occur.
	Seasons - Fall and Spring	● Define equinox, and identify when equinoxes occur.
	Seasons in the Hemispheres and Poles	● Identify the relationship between the seasons in the Northern and Southern Hemispheres. ● Identify the extreme seasonal characteristics near Earth's poles.
The Solar System	The Sun	● Understand that the Sun has different parts. ● Understand the source of the Sun's fuel. ● Know the types of phenomena that occur in the sun.
	Terrestrial Planets	● Identify the four inner planets by their characteristics.

	Gas Giants	• Identify the characteristics of the gas giants.
	Discovery of Planetary Orbits	• Describe how our understanding of planetary orbits has changed over time. • Identify the scientists responsible for advancing our understanding of orbits.
	Orbits of Planets	• Describe a planet's elliptical orbit, including identifying aphelion and perihelion. • Define escape velocity, and describe what happens when an orbital body escapes an orbit.
	Dwarf Planets	• Distinguish between dwarf planets and planets. • Distinguish between dwarf planets and small solar system bodies.
	Asteroids	• Describe the characteristics of asteroids. • Identify where asteroids are found in our solar system.
	Meteors	• Identify the composition of meteoroids. • Distinguish between meteors, meteoroids, and meteorites.
	Comets	• Identify the characteristics of comets.
Humans and Earth	Brief History of Humanity	• Describe a brief history of humanity. • Be able to connect advancements in technology and agriculture to increases in human population.
	Human Population	• Identify the impact of the increasing human population on Earth's natural resources. • Describe activities of human beings that pose a threat to natural resources. • Explain why humans are the dominant species on Earth.
	Science Professions	• Distinguish between physical and life sciences, the divisions of the natural sciences. • Identify the main fields of study in the physical sciences. • Identify the main fields of study in the life sciences.

	Earth and Space Science Professions	● Identify main branches of study in Earth science and space science. ● Describe the professions offered by engineering and STEM.
	Science and Technology	● Describe how science and technology depend on one another. ● Describe major technological advancements which led to scientific discoveries.
	Technology Design	● Describe the steps to the technological design process.