You in Outer Space Curriculum Map

	The Sun	The Earth, Moon, and Sun	The Planets and Forces in Space	The Universe and Beyond
k-1	**Topic: The Sun is Hot** **Content Statements** 1. The Sun's shape is perceived to be round. 2. The color of the Sun can be described in more than one way. 3. The Sun is larger than the Earth or the moon. 4. The Sun is the primary source of energy for the earth. 5. The amount of exposure to sunlight affects the amount of warming or cooling of air, water, and land. 6. It is dangerous to be outside in the bright Sun for too long. Never look directly at the Sun. **Key Terms:** Sun, Earth, sunlight, temperature, thermometer, heat	**Topic: The Sun and Moon** **Content Statements** 1. The Sun is a star, the Earth is a planet, and the moon is a satellite. 2. The Sun and Earth's moon appear to be the largest and brightest lights in the night sky. 3. The Earth and its moon travel around the Sun. It takes a full year and an extra part of a day to do this. 4. The Earth is spinning on an imaginary line while it travels around the Sun. This causes day and night. **Key Terms:** day, night, year, spin, revolve, imaginary, line, shape, Sun, Earth, moon	**Topic: Earth is a Planet** **Content Statements** 1. The Earth is a planet. 2. The Sun is not a planet. 3. The moon is not a planet. 4. The planet, Earth, has air, water, and land. 5. On Earth, objects fall down. **Key Terms:** Earth, Sun, moon, planet, fall down	**Topic: What is in the Sky** **Content Statements** **1.** Stars are visible at night. 2. Some stars are visible in the evening or morning. 3. Some stars are brighter than others. 4. Stars are not planets, but both can be seen in the sky. 5. Stars are on fire, but not like a campfire. 6. Sometimes the moon can be seen during the day. **Key Terms:** star, bright, dim, planet, fire, moon
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You in Outer Space Curriculum Map

	The Sun	The Earth, Moon, and Sun	The Planets and Forces in Space	The Universe and Beyond
2	**Topic: The Sun is a Star** **Content Statements** 1. The Sun is a medium-sized star and everything in our system of planets move around it. 2. The Sun is not a solid. It is a big fiery ball of hot gases. 3. There are trillions of other stars in the universe, just like our Sun. 4. The stars create patterns in the sky in which pictures are imagined and stories are told. 5. Scientists, navigators, and others use the stars to determine directions. **Key Terms:** star, hydrogen, helium, constellation, revolve, navigation, Sol, North Star, , Big Dipper, Ursa Major, Ursa Minor, folklore	**Topic: The Earth and its Moon** **Content Statements** 1. The Earth and the moon have characteristics that are similar (both have mountains, volcanoes, craters; both have rocks although without weathering and erosion the moon rocks are larger, neither have its own light source) 2. The Earth and its moon are also very different (the Earth has water, the Earth has an atmosphere, the moon is much hotter and colder) 3. The moon stays in orbit around the Earth since Earth's gravitational force is stronger. **Key Terms:** mountain, volcano, crater, atmosphere, light source, earthshine, temperature	**Topic: Earth's Crust & Core** **Content Statements** 1. The Earth is the only planet to have water. 2. The Earth has air all around which forms its atmosphere. 3. The Earth has land and water on its surface which forms Earth's crust. 4. The Earth's crust is not the same everywhere. 5. Objects are pulled to the center of the Earth. **Key Terms:** Earth, planet, atmosphere, Earth's crust, Earth's core	**Topic: Looking at the Sky** **Content Statements** 1. The number of stars changes when looking through a telescope. 2. Star patterns do not change, although their position does. 3. Different stars can be seen in throughout the year. 4. There are giant rocks floating in space. 5. Humans have at times left litter in space. 6. Telescopes enlarge the appearance of objects in the sky. **Key Terms:** telescope, magnify, star pattern (constellation), Big Bear, Big Dipper, North Star
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You in Outer Space Curriculum Map

	The Sun	The Earth, Moon, and Sun	The Planets and Forces in Space	The Universe and Beyond
3	**Topic: The Sun is a Clock** **Content Statements** 1. The position of the Sun changes. 2. The Sun casts a shadow and this shadow changes shape depending on where the Sun is in the sky. 3. Farmers rely on the Sun's position to decide when to plant and harvest crops. 4. The Sun rises and sets every day. **Key Terms:** shadow, sundial, revolve, rotate, sunrise, sunset, solar eclipse	**Topic: The Phases of the Moon** **Content Statements** 1. The moon is visible at different times of the day, and sometimes the moon is not visible at all. 2. The moon rotates as it travels around the Earth. 3. As it revolves around Earth the shape of the moon that is seen from Earth changes very slowly throughout the month. 4. Since the moon is very close to Earth, men and women have been to the moon to learn more about it. 5. The Earth, Sun and moon influence one another **Key Terms:** lunar cycle, Full Moon, New Moon, quarter, three quarters, solar eclipse, lunar eclipse, space travel, satellite, space station, lunar rover, lunar module	**Topic: Earth is Terrestrial** **Content Statements** 1. Earth is one of eight planets that orbit the sun. 2. Some of the planets have a moon (or moons) that orbit it. 3. All objects are made of matter. 4. Each of the eight planets has characteristics that are similar and different from Earth. 5. The force that pulls objects toward the Earth's core is gravity. **Key Terms:** Earth, Mercury, Venus, Mars, Saturn, Jupiter, Neptune, Uranus, terrestrial, gaseous, gravity	**Topic: Matter in Space** **Content Statements** 1. There is water in space (our atmosphere). 2. There is gas in space (planets, the sun, the comet's tail, etc.) 3. There are solids in space (planets, asteroids, etc.) 4. Some objects are attracted to one another in space. 5. Scientists have instruments and devices on Earth that they use to learn about space. **Key Terms:** atmosphere, comet, meteoroid, asteroid, magnetism, force, robots, radar, remote sensors
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You in Outer Space Curriculum Map

	The Sun	The Earth, Moon, and Sun	The Planets and Forces in Space	The Universe and Beyond
4	**Topic: The Sun is Energy** **Content Statements** 1. The Sun was born in a vast cloud of gas and dust about 5 billion years ago. 2. Stars burn a fuel known as hydrogen, but they do not burn in the same way that a fire does. 3. The Sun is a source of energy that can be harnessed and controlled. 4. We know much about the Sun due to satellite images and telescopes developed to study the Sun. **Key Terms: s**un spots, solar flares, solar winds, fusion, hydrogen, helium, radiation, convection currents	**Topic: Position Matters** **Content Statements** 1. When I live along the Atlantic Ocean in Maine, I have a very different experience with the interactions of the Sun, Earth, and its moon than if I were to live in Australia or Alaska. These interactions cannot be ignored. 2. At certain times of the year, there is more sunlight than at others. 3. There are many stories and legends that people have imagined to explain the interactions of the Sun, Earth, and its moon. 4. Man has created maps of the moon and Sun as a model of their surface. These maps help scientists answer questions and solve problems. **Key Terms:** Northern and Southern Hemisphere, legends, folklore, spring and fall equinox, summer and winter solstice, lunar atlas	**Topic: 8 Planets in Our Solar System** **Content Statements** 1. The Earth is one of eight planets that orbit the Sun. 2. Mercury, Venus, Earth, and Mars are terrestrial planets. 3. Terrestrial planets share similar characteristics. 4. Saturn, Jupiter, Neptune, and Uranus are gaseous planets. They are different from the terrestrial planets. 5. The force that pulls objects toward the Earth's core is gravity. **Key Terms**: Earth, Mercury, Venus, Mars, Saturn, Jupiter, Neptune, Uranus, terrestrial,	**Topic: Journey in Space** **Content Statements** 1. The Earth is a small part of our solar system. 2. Our solar system is only a small part of the Universe. 3. One's point of view will change depending on the way space is observed. Special tools are devised to improve the way we look. 4. Space satellites and space ships are affected by forces in space. 5. Astronauts have to attend special trainings to prepare them to go into space. **Key Terms:** Galileo's telescope, Hubble telescope, glovebox, lift, propulsion, thrust, microgravity
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You in Outer Space Curriculum Map

	The Sun	The Earth, Moon, and Sun	The Planets and Forces in Space	The Universe and Beyond
5	**Topic: The Sun is a Star** **Content Statements** 1. The Sun is the closest star to Earth. It is actually a medium-sized star. 2. The Sun is one of many stars that exist in the universe. Most of the stars have been given names. 3. A constellation is a group of stars that, when seen from Earth, form a pattern. The stars are divided into 88 constellations. 4. Astronomy and astrology are not the same science. Astrologers have found 12 constellations of the zodiac that they use to make assertions about life events. 5. A sky atlas and constellation maps show how the stars move across the sky throughout the year. **Key Terms:** star, universe, constellation, zodiac, sky atlas, constellation map, Big Dipper, Little Dipper, Ursa Major, Ursa Minor, astronomer, astrologer	**Topic: Planet Earth** **Content Statements** 1. As Earth revolves around the Sun, seasonal changes occur and one year transpires. 2. The Earth's axis is tilted. This tilt affects the amount of direct sunlight that the Earth receives. 3. The Earth spins on its axis. This causes day and night. 4. The northern and southern hemispheres do not experience the same seasons or the same night sky. 5. The Earth's characteristics are unlike any other planet. **Key Terms:** axis, revolve, rotate, tilt, sunrise, sunset, summer & winter solstice, spring & fall equinox, seasons, tilt, lunar cycle	**Topic: Our Solar System** **Content Statements** 1. The Sun is a star. 2. Each of the planets have characteristic behaviors as they circle the Sun. 3. The amount of change in movement of an object depends on the mass of the object and the amount of force being exerted. 4. The placement of a planet in space is indicative of its composition. 5. Cassini developed 3 rules to describe the rotation of the moon. 6. Tools and technology are an essential part of understanding the solar system. **Key Terms:** solar system, planet, asteroid, meteoroid, comet, orbital pattern, dwarf planet, Gian Domenico Cassini	**Topic: How Big is the Universe?** **Content Statements** 1. There are stars and planets located outside our own solar system. 2. The distance between planets can be determined using mathematics, instruments, and inferences. 3. Asteroids are pieces of debris left from the formation of the solar system. 4. Meteors, meteoroids and meteorites are related. 5. Comets are composed of dust and ice and can be found orbiting the Sun within the Kuiper and Oort Belts. 6. The universe is so large, that the distance between stars is recorded in scientific notation. **Key Terms:** asteroid, meteoroid, inner asteroid belt, outer asteroid belt, Kuiper Belt, Oort Cloud, Halley's comet, tail, light years, scientific notation
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You in Outer Space Curriculum Map

	The Sun	The Earth, Moon, and Sun	The Planets and Forces in Space	The Universe and Beyond
6	**Topic: The Star Cycle** **Content Statements** 1. The Sun is one of many stars in the Milky Way galaxy. 2. The Sun star is very different from the planet Earth or any of the other planets. 3. Stars reside at different distances from Earth, which determines how they are viewed. 4. Stars burn a fuel known as hydrogen, but they do not burn in the same way that a fire does. 5. Stars have a star life cycle which begins as a nebula and expands to become a supernova which will eventually collapse or explode. 6. A collapsed star becomes a black hole. **Key Terms:** galaxy, nebula, red giant, white dwarf, black dwarf, supergiant, supernova, neutron star, black hole	**Topic: Earth's Moon** **Content Statements** 1. The moon is closer to Earth than any planet or star; therefore we are able to view the moon with high-powered technologies. 2. The moon does not have a light of its own, nor does the moon have its own energy source. 3. The moon has characteristics that are similar to Earth and very different from Earth. 4. The moon rotates on its own axis as it revolves around the Earth in a counterclockwise direction. 5. We know what the moon looks like because we have sent men to the moon who have done tests, brought back samples, and who have traveled along the surface of the moon. **Key Terms:** reflect, counter clockwise, moonrise, moonset, crater, lava plain, mountain, valley, atmosphere, satellite	**Topic: Forces in Space** **Content Statements** 1. Gravitational force pulls us to the surface of Earth and keeps the planets in orbit around the Sun 2. Centripetal force makes an object follow a curved path. 3. Solids and gases vary in motion of and the spacing and attraction between particles. This principle impacts the characteristics and behavior of objects in space. 4. Micro-gravity is a condition of free-fall. 5. Humans have been exploring space since the 1950s. Many vehicles and tools have been developed for space exploration. **Key Terms:** centripetal force, gravity, inertia, acceleration, artificial gravity, micro-gravity, free-fall	**Topic: Debunking Myths** **Content Statements** 1. Planets, stars, and other phenomena in space have cultural legends and myths that have endured through time. 2. Many of the beliefs are based in some scientific truth. 3. Each star pattern has two or more legends that explain its existence in the sky. 4. For a very long time, people believed that the Earth was the center of the universe. 5. Stars are not all the same, and planets have unique features too. Sometimes these characteristics give rise to misconceptions. 6. UFOs and aliens in space, are they fact or fiction? **Key Terms:** Orien's Belt, Ursa Major, Ursa Minor, the zodiac
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You in Outer Space Curriculum Map

	The Sun	The Earth, Moon, and Sun	The Planets and Forces in Space	The Universe and Beyond
7	**Topic: The Sun-centric Solar System** **Content Statements** 1. The Sun is the center of our Solar System. All objects revolve around the Sun. 2. The stars in the Northern Hemisphere appear at different times in the Southern Hemisphere. 3. The Sun is the source of all energy in our solar system. This impacts weather experienced on the Earth and its moon. 4. Thermal energy in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns. 5. We know much about the Sun due to satellite images and telescopes developed to study stars, planets, and other bodies. **Key Terms:** solar system, revolve, Northern Hemisphere, Southern Hemisphere, thermal energy, climate systems, satellite, telescope	**Topic: The Moon Shows Change** **Content Statements** 1. The moon's orbit and its change of position relative to the Earth and Sun result in different parts of the moon being visible from Earth. 2. The phases of the moon are determined by its position to the Earth and Sun. 3. Solar and lunar eclipses can occur. 4. Tides occur as the Sun, Earth, and its moon interact. 5. Some locations have historical significance based on the resident's beliefs and observations of the skies. **Key Terms:** orbit, solstice, equinox, lunar eclipse, penumbra, umbra, solar eclipse, lunar cycle, month, New Moon, Full Moon, crescent, gibbous, waxing and waning, tides, Stonehedge	**Topic: Eight Planets** **Content Statements** 1. Earth is a unique planet. 2. Mercury, Venus, Earth, and Mars are terrestrial planets. Terrestrial planets share similar characteristics. 3. Saturn, Jupiter, Neptune, and Uranus are gaseous planets. They are very different from the terrestrial planets. 4. Each planet moves through space in a different manner. 5. Some planets have more moons than others. 6. Humans have been able to explore the Earth's moon and Mars. 7. All planets have weather and natural disasters that are a result of systems interacting. 8. Questions about planetary alignment have been discussed since before Aristotle and Galileo's time. **Key Terms:** Earth, Mercury, Venus, Mars, Saturn, Jupiter, Neptune, Uranus, terrestrial, gaseous, gravity, scientific notation, astronomical units (AU), light year	**Topic: Solar Systems & Galaxies** **Content Statements** 1. Earth's atmosphere is unique. Its properties change at various elevations. 2. Light energy moves in light waves from the Sun to other planets in the solar system. 3. It is believed that the universe began in a hot "big bang" and continues to expand. 4. Earth is one planet in a vast Solar System. 5. Our Solar System is just one member of a vast Milky Way galaxy (200-400 billion stars) 6. There may be as many as 200 billion galaxies in the Universe. **Key Terms:** light year, satellite imagery, Hubble Telescope, Milky Way galaxy, Andromeda galaxy, light year, Big Bang Theory
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You in Outer Space Curriculum Map

	The Sun	The Earth, Moon, and Sun	The Planets and Forces in Space	The Universe and Beyond
8	**Topic: The Sun's Nuclear Energy** **Content Statements** 1. The Sun was born in a vast cloud of gas and dust about 5 billion years ago. 2. The characteristics of the Sun are very different from those of a planet. 3. Like the Earth, the Sun has four different layers which have very different features. 4. The core of the Sun is very hot. A process called nuclear fusion occurs there. 5. The fusion energy created in the core of the Sun travels out into space as heat and light. 6. The Sun is a source of energy that can be harnessed and controlled. 7. Solar flares and coronal mass ejections affect satellite transmissions on Earth. **Key Terms:** core, corona, nuclear fusion	**Topic: Point of View Matters** **Content Statements** 1. Seasonal changes occur as Earth revolves around the Sun at an angle. 2. As people watch the sky, they can predict events and phenomena on Earth. 3. The northern and southern hemisphere experience different climates due to the placement of the Earth, Sun, and moon at a given time. 4. The east and western hemispheres experience different times of day due to the placement of the Earth, Sun, and moon which result in different time zones. **Key Terms:** gnomon shadow, clockwise, counter clockwise, Southern, Northern, Eastern, and Western Hemispheres, daylight savings time, time zones	**Topic: Laws for Planetary Motion** **Content Statements** 1. Einstein developed two theories of relativity which explain how Newton's Laws interact in space. 2. Kepler's three laws explain planetary motion. 3. Newton's Universal Law of Gravity, built on his own and Kepler's laws of motion, helps to explain the attractive force between a planet and Sun. 4. Escape velocity is the speed in which a body can escape the gravitational speed of another body. It is not a constant. 5. Explorations in space begin with questions. One important question will always be is there life on other planets? **Key Terms:** potential energy, kinetic energy, law of relativity, macrogravity, Johannes Kepler, aphelion, perihelion, period of an orbit, Astronomical Unit (AU), Sir Isaac Newton, gravity, escape velocity	**Topic: Astronomy** **Content Statements** 1. Galaxies are not all the same shape. 2. Stars differ in size, temperature and color. 3. Astronomical units and light years measure distances in space. 4. Planets, stars, and other space phenomenon have unique appearance, composition, size, and relative position in our solar system 5. Asteroids and meteorites have features similar to the crust of some planets. 6. Comets are composed of dust and ice and can be found orbiting the Sun within the Kuiper and Oort Belts. 7. Hubble's Law states that all galaxies appear to be moving away from us. **Key Terms:** [Edwin] Hubble's law, galaxy, universe, comet, asteroid, meteoroid, meteorite, meteor
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