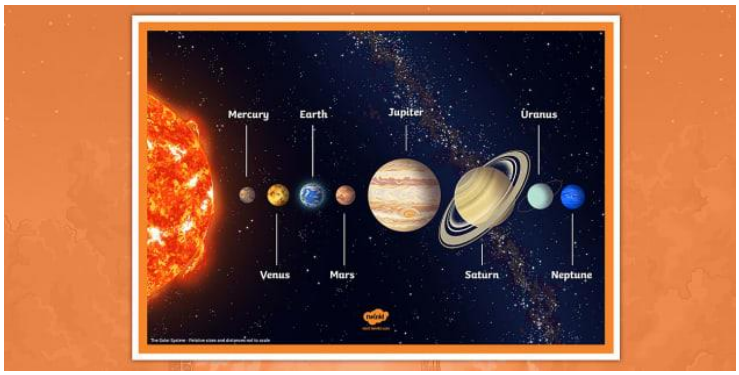
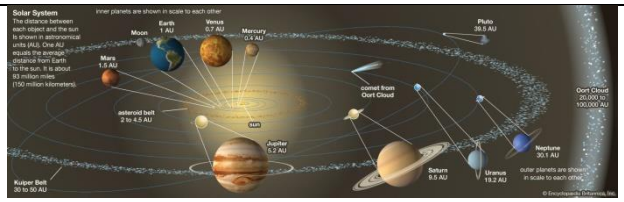
BASIC 9

WEEKLY LESSON PLAN – WEEK 6

Strand:	Systems		**Sub-Strand:**	The Solar System	
Content Standard:	B9.3.2.1 Demonstrate knowledge of other non- planetary bodies such as comets, asteroids, and their relationship with the solar system				
Indicator (s)	B9.3.2.1.1 Understand the movement of non-planetary bodies in the solar system		**Performance Indicator:** learners can identify examples of planetary and non-planetary objects in the Solar System.		
Week Ending	16-02-2024				
Class	B.S.9	**Class Size:**		**Duration:**	
Subject	Science				
Reference	Science Curriculum, Teachers Resource Pack, Learners Resource Pack				
Teaching / Learning Resources	Pictures, Videos, Charts.		**Core Competencies:**	• Creativity and Innovation • Manipulative skills • Operational skills.	

DAY/DATE	PHASE 1 : STARTER	PHASE 2: MAIN	PHASE 3: REFLECTION
TUESDAY	Assist Learners to explain the keywords and terminologies in the lesson. **Terminologies** • Planets • solar system • asteroids • satellites • astronomical • meteoroids • galaxies • Sun • elliptical orbits • magnetic field • asteroid belt • comet • dwarf planet • Kuiper belt • meteor • meteor shower	1. With the aid of a diagram, explain the concept of "Solar System" to the Learners. 2. Discuss with the Learners about the components of the Solar System. 3. Assist Learners to identify the characteristics of the components of Solar System. 4. Learners brainstorm to identify the planetary systems. 5. Show Learners video displaying the orderly arrangement of Planets.  **Composition of the solar system**	Learners brainstorm to draw the Solar System and its components. **Exercise;** Draw the Solar System and label the parts.

- meteoroid



List of largest non-planets in the solar system

There are eight planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Two of the largest moons are bigger than the smallest planet, Mercury. Here are the top 10 largest non-planets in our solar system (eight of them are moons and two of them are dwarf planets)

Mercury – The first planet in the Solar System. It's also the smallest planet in the Solar System. Mercury takes just 88 days to complete an orbit around the Sun.

Venus – The second planet from the Sun. In many ways, Venus is a twin to our own Earth. It has nearly the same size and mass as Earth, but the thick atmosphere on Venus makes surface temperatures hot enough to melt lead. Venus is also unusual because it rotates backwards to all the other planets.

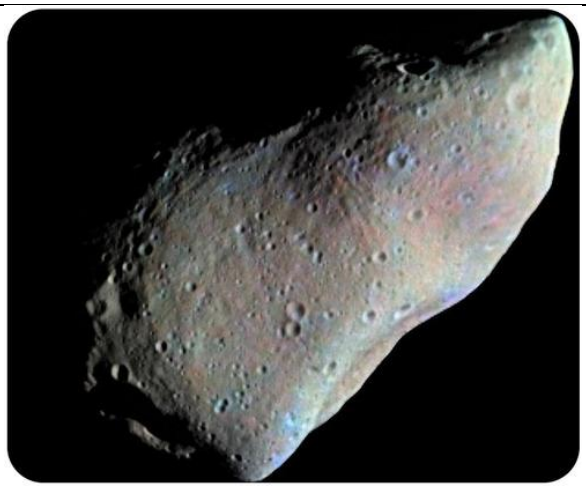
Earth – Our home planet, the third planet from the Sun. Earth is the only planet in the Solar System known to support life. This is because we are at just the right distance from the Sun so that our planet doesn't get too hot or too cold. We also have one moon – the Moon.

Mars – Mars is the fourth planet from the Sun, and is much smaller and colder than the Earth. Temperatures on Mars can rise to 20-degrees C, but dip down to -140-degrees C in the northern winters. Mars is thought to be the best candidate for life elsewhere in the Solar System. Mars has two small, asteroid-shaped moons: Phobos and Deimos.

Ceres – Ceres is the first dwarf planet in the Solar System, and the largest member of the asteroid belt.

Jupiter – Jupiter is the 5th planet from the Sun, and the largest planet in the Solar System. Jupiter has as much mass as 2.5 times all the rest of the planets combined – almost all of this mass is hydrogen and helium; although, scientists

		think it has a solid core. Jupiter has at least 63 moons. **Saturn** – Saturn is the 6th planet from the Sun, and is well known for its beautiful system of icy rings. Saturn is almost as large as Jupiter, but it has a fraction of Jupiter's mass, so it has a very low density. Saturn would float if you could find a tub of water large enough. Saturn has 60 moons at last count. **Uranus** – Uranus is the 7th planet from the Sun, and the first planet discovered in modern times; although, it's just possible to see with the unaided eye. Uranus has a total of 27 named moons. **Neptune** – Neptune is the 8th and final planet in the Solar System. Neptune was only discovered in 1846. It has a total of 13 known moons. **Pluto** – Pluto isn't a planet any more. Now it's just a dwarf planet. Pluto has one large moon, called Charon, and then two smaller moons. **Eris** – The next dwarf planet in the Solar System is Eris, which was only discovered back in 2003. In fact, it was because of Eris that astronomers decided to reclassify Pluto as a dwarf planet	
THURSDAY	Learners brainstorm to identify examples of non-planetary bodies in the Solar System.	1. Discuss with the Learners about the surface properties of asteroids and other small bodies orbiting the Sun. 2. Show Learners video about the formation and discovery of the Solar System. 3. Assist Learners to create a model to explain the formation of the Solar System. **Asteroids** **Asteroids** are very small, rocky bodies that orbit the Sun. "Asteroid" means "star-like," and in a telescope, asteroids look like points of light, just like stars. Asteroids are irregularly shaped because they do not have enough gravity to become round. They are also too small to maintain an atmosphere and without internal heat they are not geologically active (**Figure** below). Collisions with other bodies may break up the asteroid or create craters on its surface.	Through questions and answers, conclude the lesson. **Exercise;** 1. State 3 small objects or bodies in the Solar System. 2. Write 2 largest bodies in the Solar System.

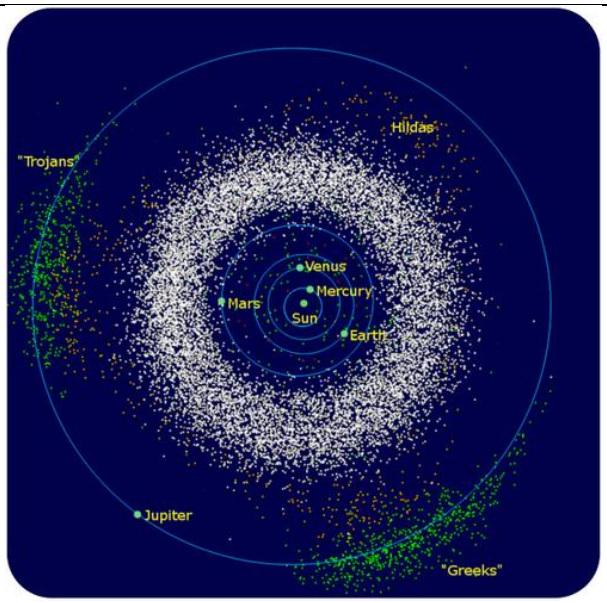


In 1991, Asteroid 951 Gaspra was the first asteroid photographed at close range. Gaspra is a medium-sized asteroid, measuring about 19 by 12 by 11 km (12 by 7.5 by 7 mi).

Asteroid impacts have had dramatic impacts on the shaping of the planets, including Earth. Early impacts caused the planets to grow as they cleared their portions of space. An impact with an asteroid about the size of Mars caused fragments of Earth to fly into space and ultimately create the Moon. Asteroid impacts are linked to mass extinctions throughout Earth history.

The Asteroid Belt

Hundreds of thousands of asteroids have been discovered in our solar system. They are still being discovered at a rate of about 5,000 new asteroids per month. The majority of the asteroids are found in between the orbits of Mars and Jupiter, in a region called the **asteroid belt**, as shown in **Figure** below. Although there are many thousands of asteroids in the asteroid belt, their total mass adds up to only about 4% of Earth's moon.



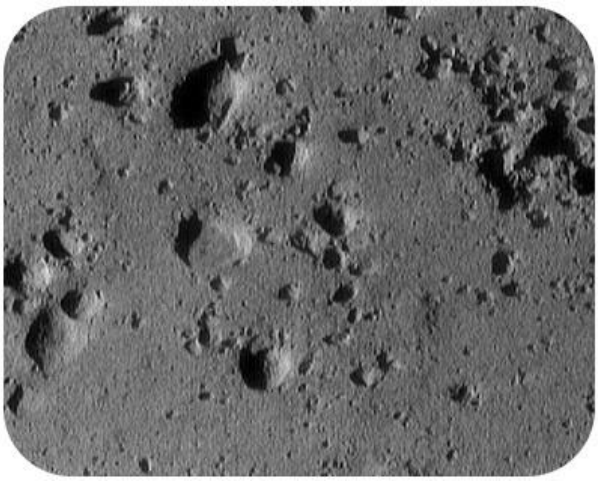
The white dots in the figure are asteroids in the main asteroid belt. Other groups of asteroids closer to Jupiter are called the Hildas (orange), the Trojans (green), and the Greeks (also green).

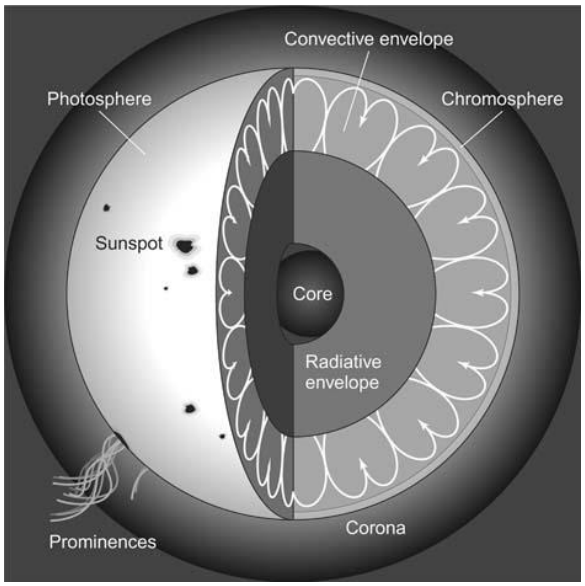
Scientists think that the bodies in the asteroid belt formed during the formation of the solar system. The asteroids might have come together to make a single planet, but they were pulled apart by the intense gravity of Jupiter.

Near-Earth Asteroids

More than 4,500 asteroids cross Earth's orbit; they are near-Earth asteroids. Between 500 and 1,000 of these are over 1 km in diameter.

Any object whose orbit crosses Earth's can collide with Earth and many asteroids do. On average, each year a rock about 5–10 m in diameter hits Earth (**Figure** below). Since past asteroid impacts have been implicated in mass extinctions, astronomers are always on the lookout for new asteroids, and follow the known near-Earth asteroids closely, so they can predict a possible collision as early as possible.

		A painting of what an asteroid a few kilometers across might look like as it strikes Earth. **Asteroid Missions** Scientists are interested in asteroids because they are representatives of the earliest solar system. Eventually asteroids could be mined for rare minerals or for construction projects in space. A few missions have studied asteroids directly. NASA's DAWN mission orbited asteroid Vesta from July 2011 to September 2012 and is on its way to meet dwarf planet Ceres in 2015. 	
FRIDAY	Learners brainstorm to describe the "Sun".	1. Discuss with the Learners about the properties of the sun. 2. Show Learners pictures and video displaying the sun and the planetary environments. 3. Assist Learners to compare the movement of the non-planetary bodies in the solar system. **Properties of the Sun** The energy that we receive from the Sun dictates the environment on Earth that is so important to humanity's existence. But to astronomers, the Sun is the only star that can be studied in great detail; thus, studying the sun is vital to the understanding of stars as a whole. In turn, the study of stars shows us that our Sun is merely an average star, neither exceptionally bright nor exceptionally faint. Evidence from other stars has also revealed their life histories, allowing us a better understanding of the part and future of our particular star. The solar diameter equals 109 Earth diameters, or 1,390,000 kilometers. What we see when we look at the sun, however, is not a solid, luminous surface, but a spherical layer, called	Reflect on the properties of the sun. **Exercise;** State 5 properties of the sun.

		the **photosphere**, from which the bulk of the solar light comes (see Figure). Above the photosphere the **solar atmosphere** is transparent, allowing light to escape. Below the photosphere, the physical conditions of the material of the **solar interior** prevent light from escaping. As a result, we cannot observe this interior region from the outside. The solar mass is equivalent to 330,000 earth masses, or 2×10^{30} kg, for a mean or average density (mass/volume) of 1.4 g/cm^3.  	

Name of Teacher: **School:** **District:**