Stars and Planets

GPS S4E1 A-D: Students will compare and contrast the physical attributes of stars, star patterns, and planets.

Physical Attributes of Stars

- Number
- Size
- Color
- Pattern

What is a Star?

- A star is made of:
  dust and gas squeezed together
- This dust and gas is pulled together with great force
- Our universe likely contains more than 100 billion galaxies, and each of those galaxies may have more than 100 billion stars. Yet on a clear, dark night Earth's sky reveals only about 3,000 stars to the naked eye

Red Stars

- Red Dwarf stars can range in size from a hundred times smaller than the sun, to only a couple of times smaller. Because of their small size these stars burn their fuel very slowly, which allows them to live a very long time. Some red dwarf stars will live trillions of years before they run out of fuel. Red dwarf stars are by far the most common type of star in outer space. However very few stars that you see in the sky are red dwarfs. This is because they are so small and make very little light.

Yellow Stars

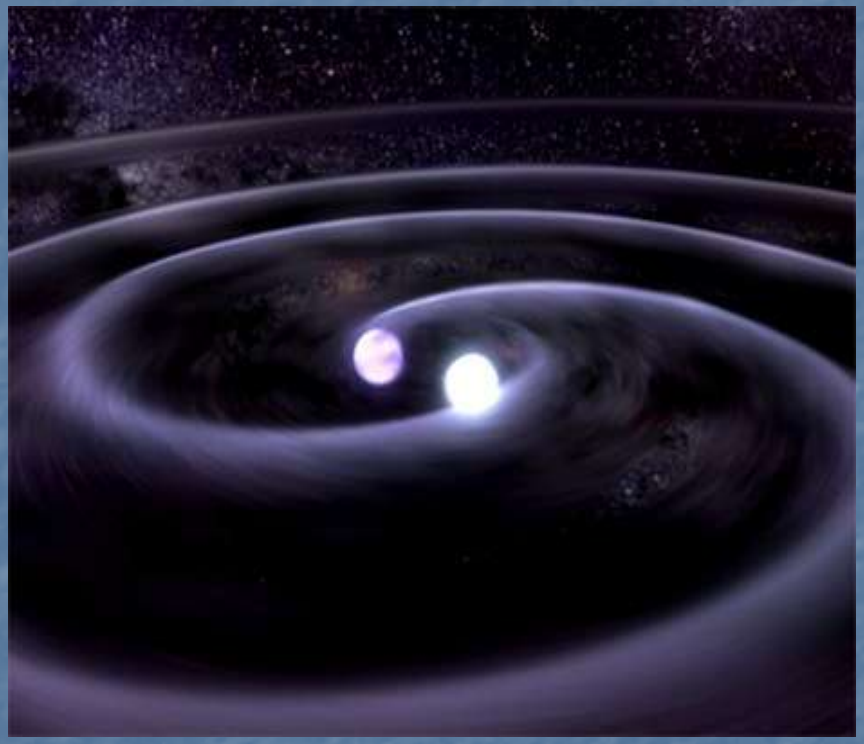
- Like the Sun, these medium sized stars are yellow because they have a medium temperature. Their higher temperature causes them to burn their fuel faster. This means they will not live as long, only about 10 billion years or so. Near the end of their lives, these medium sized stars swell up becoming very large. When this happens to the Sun it will grow to engulf even the Earth. Eventually they shrink again, leaving behind most of their gas. This gas forms a beautiful cloud around the star called a *Planetary Nebula*.

Blue Stars

- Because blue stars are large, and compact, they burn their fuel quickly, which gives them a very high temperature. These stars often run out of fuel in only 10,000 - 100,000 years.
- A blue giant is very bright. Like a light house, they shine across a great distance. Even though blue giant stars are rare, they make up many of the stars we see at night.
- Blue giant stars die in a spectacular way. They grow larger just like the Sun sized stars, but then instead of shrinking and forming a planetary nebula they explode in what is called a *super nova*. Super nova explosions can be brighter than an entire galaxy, and can be seen from very far away.

Pictures of Colored Stars

- http://www.kidsastronomy.com/stars.htm
- http://science.nationalgeographic.com/science/photos/stars-gallery.html



Patterns of Stars

- Stars seem to form patterns in the sky. These patterns are called Constellations.

Stars and Seasons

- Why does the pattern of stars in a constellation stay the same but a planet can be seen in different locations?

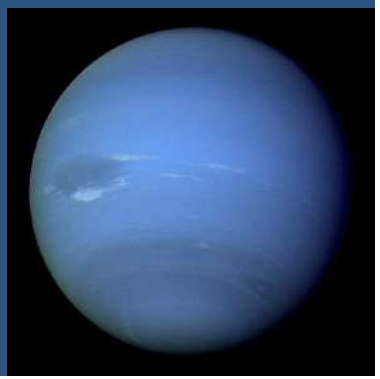
Technology Used to Observe Objects in the Sky

- Telescope
- Space Probes

Similarities and Differences of Planets to the Stars

- <u>Differences:</u>

- Planets move around the sun. Stars don't revolve around things.
- Some stars have nuclear reactions that burn hydrogen in there cores. None of the planets do this.
- Stars form in a cloud of gas while planets form when material in the disk forms around a Pre – Existing star. It begins to condense around ice and rock cores.
- Planets must orbit a star in order to be a planet.
- Stars have to make their own light.
- There are billions of stars in the sky compared to nine planets.



Similarities and Differences of Planets to the Stars

- Similarities

- Like stars, planets are made of gas and dust.
- They both have very hot cores.
- You can see both planets and stars in the night sky.
- Different planets have different sizes just like stars.