Yeatman-Liddell College Preparatory Middle School

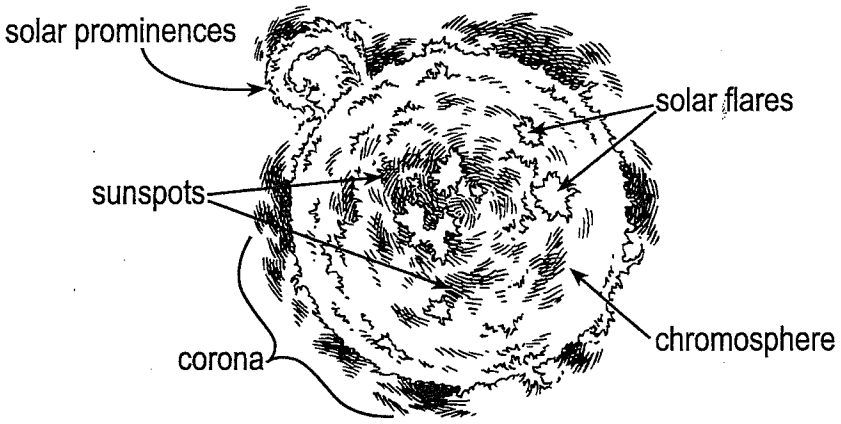
Winter Break Packet

Science

2014-2015

Fun Sun Facts

Name: _____



Directions: Read the Sun facts. Answer the questions below.

- The largest solar prominences can be over 310,000 miles long. They are longer than solar flares.
- Solar flares are massive explosions in the corona and chromosphere on the surface areas of the Sun.
- The corona is the outer atmosphere of the Sun. It extends millions of miles into space.
- The chromosphere extends about 1,500 miles deep into the surface of the sun.
- The photosphere is the visible surface of the Sun, which is the top 370 miles of the Sun's surface.
- The core of the Sun is about 174,000 miles across the center of the Sun.
- The diameter of the Sun is about 864,400 miles at the Sun's equator.
- The chemical makeup of the photosphere is about $\frac{3}{4}$ hydrogen and about $\frac{1}{4}$ helium.
- Sunspots are dark, visible patches on the photosphere. They are cooler than the other areas on the photosphere.
- Sunspots come in regular 11 year cycles. Sunspots only last about two weeks.

What Do You Know ?

1. Which two gases make up the Sun?

_____

2. What is the scientific name for the visible surface of the Sun?

_____

3. What feature of the Sun extends millions of miles into space?

_____

4. Which feature of the Sun covers its surface for the top 1,500 miles?

_____

5. How often do sunspots appear on the Sun? How long do they last?

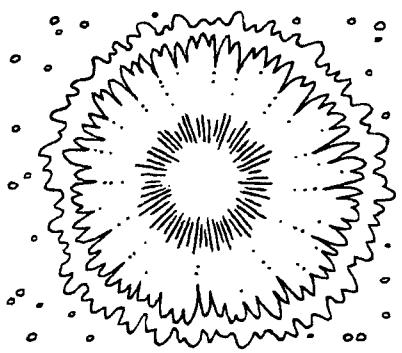
_____

Stars: Red Giants and Supernovas

Name: _____

Our local star is the Sun. It appears to be rather small as stars go. Stars are fueled by hydrogen, and they exist until the last of their hydrogen fuel is used up. Our Sun will not run out of hydrogen for 5 billion years. Then our Sun will swell up and become a red giant. The core will continue to burn helium, the other main fuel in a star. A red giant can swell to a thousand times its previous size, although its core is still dense and no larger than Earth. Our own Sun is expected to swell to only 30 times its present diameter. It will look very large, nonetheless, in the sky. The red giant may throw off its outer shell and become a planetary nebula. The core becomes a white dwarf that will shine until its heat radiates away. It will eventually shrink to a dark cinder no longer capable of producing light. This will still take billions of years.

Unlike our Sun, giant stars contract or draw in upon themselves. They begin to absorb energy instead of giving it off. As the energy is used up, the mass or size of the star increases. A giant star is pressured by gravity until it eventually explodes into a supernova. The first few seconds of a supernova produce 100 times all the energy our Sun will produce in 10 billion years. The supernova actually shines more brightly than all of the other stars in that galaxy. They are so bright that they can be seen from Earth. Astronomers have observed supernova explosions in 1054 CE, 1572 CE, and 1604 CE. A more recent one was observed in 1987 and could be seen without a telescope in the Southern Hemisphere.



supernova

What Did You Learn ?

1. Which of the following shines more brightly than any star in the night sky?
   Ⓐ nova Ⓑ supernova Ⓒ nebula Ⓓ red giant
2. What will our Sun become when it runs out of fuel?
   Ⓐ red giant Ⓑ white dwarf Ⓒ supernova Ⓓ both A and B
3. What gas provides fuel for the Sun to burn?
   Ⓐ nebula Ⓑ hydrogen Ⓒ helium Ⓓ both B and C
4. When a star comes to an end, what fuel has been used up?
   Ⓐ white giant Ⓑ helium Ⓒ hydrogen Ⓓ both B and C

What Am I ?

I am a giant star pressured by gravity that explodes into an extremely bright light in a galaxy and can be seen at great distances.

S ____ ____ ____ ____ ____ ____ ____ ____

Warm-Up 148

Types of Stars

Name: _____

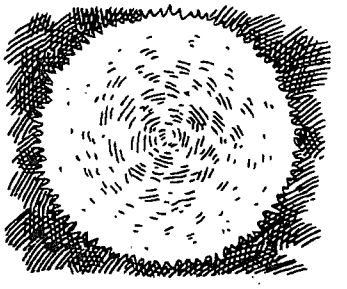
Directions: Study the chart. Answer the questions below.

Red dwarf	Orange star	Yellow star
M-type star Surface 5,400°F	K-type star 8,460°F	G-type star 10,800°F

Yellow-white star	White star	Blue-white star	Blue giant
F-type star Surface 13,500°F	A-type star Surface 18,000°F	B-type star Surface 36,000°F	O-type star Surface 63,000°F

Facts to Know

A yellow star is called a G-type star. Our Sun is a star of this type. A G-type star has an average surface temperature of about 10,800°F. For example, the average surface temperature of our Sun is about 9,900°F. In general, blue stars are hotter than red stars. The hotter a star, the brighter it shines. The energy of a star is released at the surface as light and heat. Nuclear reactions occur at the center of a star. Most stars have two main gases: hydrogen and helium.



Questions

1. What is the coolest star mentioned above? What is its average surface temperature?

   _____

2. What is the hottest star mentioned above? What is its average surface temperature?

   _____

3. What color is our Sun? What is its average surface temperature?

   _____

4. Which star letter represents the hottest star?

   _____

5. What are the fuels burned in stars?

   _____

6. Which star letter represents the coolest star?

   _____

