The Universe: "Life and Death of a Star" video questions

Astronomy Name: Period:

1. There are _____ stars in our galaxy.

400 billion

2. What are the pillars of creation?

A cloud of dust and hydrogen gas, a "stellar nursery" for the birth of new stars, in the Eagle Nebular, 700 light years from Earth

3. Each contracting cloud can produce a few dozen to _____ of stars. A star like our sun requires a gas cloud _____ times the size of our solar system. The temperature in the middle of a dust disc is initially _____.

Thousands; hundred; 100s of degrees below zero Fahrenheit

4. After 10 million years, a protostar's core begins to sustain _____

thermonuclear fusion

5. A star's biggest opponent is _____, which wants to crush the star. What holds up the star from gravity, keeping the star in equilibrium?

gravity; nuclear fusion, in the form of pressure

6. How hot a star is relates to the _____ it emits. _____ stars are hotter and _____ stars are cooler.

color; blue; red

7. What are red dwarfs? Why are they not seen in the night sky?

Red dwarfs are small, common stars with lower surface temperature. They are not seen in the night sky because they are dim stars.

8. _____ is the fundamental thing that drives the life history of stars.

Mass

9. Why do more massive stars live *shorter* lives that less massive stars?

Higher temperature, higher pressure, higher fusion rate means they consume their "fuel" faster.

10. What will gravity do to the sun when fusion is over?

Gravity will begin to crush the star. Then the core will heat enough to fuse helium together into carbon. The outer atmosphere will evaporate, ejecting gases, causing a planetary nebula.

11. What is a white dwarf?

The remnant of a main sequence star. When the star runs out of "fuel" it contracts until electrons produce enough pressure to balance the force of gravity. Then it cools in the small, dense state.

12. Our sun will eventually turn into a _____.

White dwarf

13. How can a white dwarf have its "last hoorah"? (Be sure to use the term supernova).

If a white dwarf has a binary star companion, it can grab material from the other star and eventually explode in what's called a thermonuclear runaway called a type IA supernova.

14. What are type II supernovas?
More massive stars (8-10 times the sun) have enough temperature to convert hydrogen to helium, helium into carbon and oxygen, etc. near the end of its life. Finally it tries to fuse iron into other elements, but fails, and then collapses in a huge explosion

15. What connects supernovas with all elements, and even life on Earth?
Supernovas fuse many heavy elements, and directly or indirectly are responsible for creating all the material for the formation of other stars, solar systems, planets, and even spawning the emergence of life on Earth. "We are stardust" is quite literally true.

16. What is a neutron star?
A leftover remnant of a supernova explosion, a neutron star has combined electrons and protons to make neutrons. A neutron star can be only 10 miles across, an unimaginably dense object!

17. One teaspoon of neutron star is the mass of _____ tons. Some neutron stars spin rapidly, and light emitted from the magnetic field can appear to blink off and on, called a _____.
A billion; pulsar
18. A black hole represents the death of a _____ star.
Neutron star
19. Why are black holes called "black holes"?
Because not even light can escape the immense gravitational field.

20. What happens when neutron stars collide?
They disturb the space around them and get closer together, then collide and release more energy than the Sun produces in its entire lifetime

21. What is a globular cluster?
A region of dense, chaotic stars in a galaxy, where stars collide about every ten thousand years.

22. What are blue stragglers?
Large, young blue stars in a globular cluster that may be the result of collision between older main sequence stars.

23. What is a brown dwarf?
Basically a failed star, a brown dwarf is not quite a planet, not quite a star. They have low temperature, and emit very little light. They may have cloud structures like large planets.