

## Practice Quiz: Life Cycles of Very Massive Stars

1. Which of these stars would fit the description of “very massive,” according to the notes?

**Circle all that apply.**

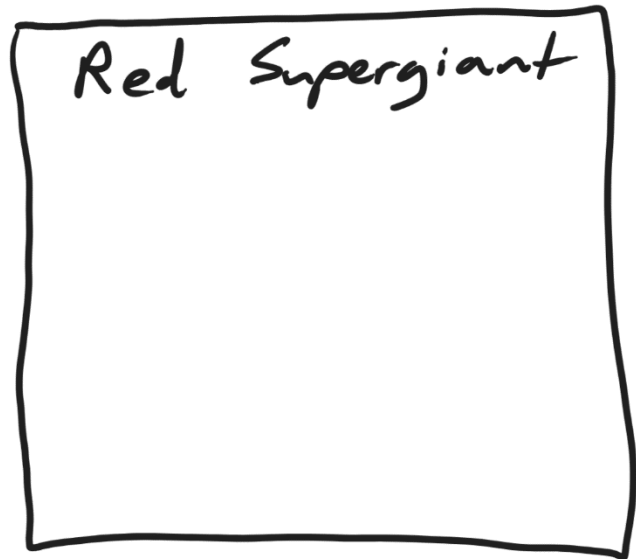
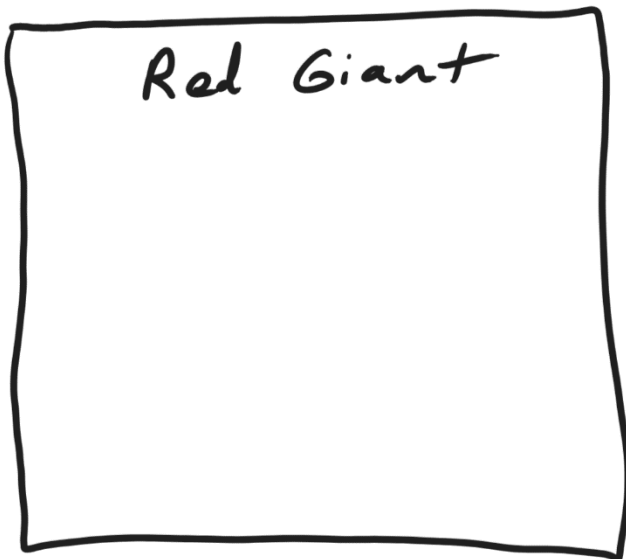
- |   |                             |
|---|-----------------------------|
| a. $\frac{1}{2}$ as massive as the Sun. | d. 10x the mass of the Sun  |
| b. The same mass as the Sun             | e. 20x the mass of the Sun  |
| c. Twice as massive as the Sun          | f. 100x the mass of the Sun |

2. Select the stages in a Massive Star’s life cycle, and number them to indicate their order. Some of the descriptions below do not apply.

NeutronStar/Black Hole/ Recycling  
Protostar  
Nebula  
White Dwarf  
Red Supergiant

Main Sequence Star  
Supernova  
Red Giant  
Black Dwarf

3. Draw two cross-section diagrams showing the layers of a red giant and a red supergiant. Label the material in the innermost layer and the two outermost layers in which fusion is happening. The number of layers in your red supergiant does not have to be exactly correct.



4. What is the heaviest element that can be made by nuclear fusion in a star?
5. Name element that can only be created by a supernova.

6. a. When a massive star runs out of nuclear fuel that it can fuse, the outer layers of the star begin to move. Describe the **direction** and **speed** of the star's outer layers just after fusion stops in the star.
- b. After a short time, the speed and the direction of the outermost star layers changes. Explain why they change.
- c. Describe the **speed** and **direction** of the star's outermost layers after the change referred to in part b.
- d. Why is the speed in part C very different from the speed in part A? Use the momentum formula to help illustrate your answer.

7. Explain why humans wouldn't exist if there had not been a supernova

8. After a supernova, some of the star's core remains. What does the core become, and what are the required conditions for each possibility:

The core becomes a \_\_\_\_\_ if \_\_\_\_\_

The core becomes a \_\_\_\_\_ if \_\_\_\_\_

Bonus: List all three of the interesting Neutron Star facts from the class notes.