Life Cycle of Stars WebQuest Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Block \_\_\_

**Purpose:**

1. You will learn how to identify stars by their magnitude, color, temperature, and spectral class.

2. You will investigate the process of nuclear fusion explained by Einstein's famous equation

E = MC2 and learn how mass in the form of hydrogen atoms is converted to helium and causes a release of energy that makes stars shine.

3. You will also begin to understand the forces involved in stars that maintain this nuclear reaction and how these forces change as the star ages.

4. You will explore the stages stars progress through from birth to death and how the death of a star depends on its initial mass.

**Task #1: Lights in the Sky**  
Go to the website <http://www.seasky.org/cosmic/sky7a01.html> and answer the following questions:

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| 1. What are constellations? |  |
| 2. What is a star's brightness known as? |  |
| 3. How do astronomers rate the magnitude of a star? |  |
| 4. What is the brightest star in the known universe? |  |
| 5. Are the brightest stars low magnitude or high magnitude? |  |
| 6. Stars are identified by their color; what does the color indicate? |  |
| 7. What color is the hottest star? |  |
| 8. What color is the coolest star? |  |
| 9. What color is our sun? |  |

**Task #2: A Nuclear Furnace**

Continue to read on to the section “A Nuclear Furnace”.

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| 1. The nuclear reactions inside a star, such as our sun, convert hydrogen into helium by means of a process known as. |  |
| 2. What gives a star its energy? |  |
| 3. How many protons does a standard hydrogen atom have in its nucleus? |  |
| 4. How many neutrons does a standard hydrogen atom have in its nucleus? |  |
| 5. The animation shows how stars fuse the hydrogen deuterium and hydrogen tritium to form helium.  Use colored pencil to draw a diagram that shows this nuclear reaction. Label the names of the atoms and draw arrows showing the progression of the reaction |  |

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**Task #3: The Circle of Life**  
Continue to read on to the section “The Circle of Life”.

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| 1. Stars begin their lives as clouds of dust and gas called. |  |
| 2. What is a protostar? |  |
| 3. When does nuclear fusion begin? |  |
| 4. The life span of a star depends on |  |
| 5. Very large, massive stars burn their fuel much \_\_\_\_\_\_\_\_\_\_\_ than smaller stars. |  |
| 6. The life span of smaller stars are much \_\_\_\_\_\_\_\_\_\_ than that of large, massive stars |  |
| 7. When will a star become a red giant? |  |
| 8. Why do some stars become super red giant? |  |
| 9. What will happen when a star exhausts its remaining fuel? |  |
| 10. What is a planetary nebula? |  |
| 11. What is a white dwarf? |  |
| 12. What produces all of the heavy elements required for life? |  |
| 13. What are we made of? |  |
| 14. Using colored pencils, draw a diagram of the life cycle of a star: |  |

**Task #4: Types of Stars**

Continue to read on to the section “Types of Stars”.

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| 1. What does the main sequence represent? |  |
| 2. Is our sun a main sequence star? |  |
| 3. What will decide the amount of time a star spends in the main sequence phase? |  |
| 4. Large, massive stars will have a \_\_\_\_\_\_\_\_\_\_\_\_\_ main sequence stage while less  massive stars will have a \_\_\_\_\_\_\_\_\_ main sequence stage. | |
| 5. What is a red giant? |  |
| 6. What is a white dwarf? |  |