



Life Cycle of Stars



The universe is commonly defined as the totality of everything that exists, including all matter and energy, the planets, stars, galaxies and the contents of intergalactic space. We will begin our study of the universe with stars.

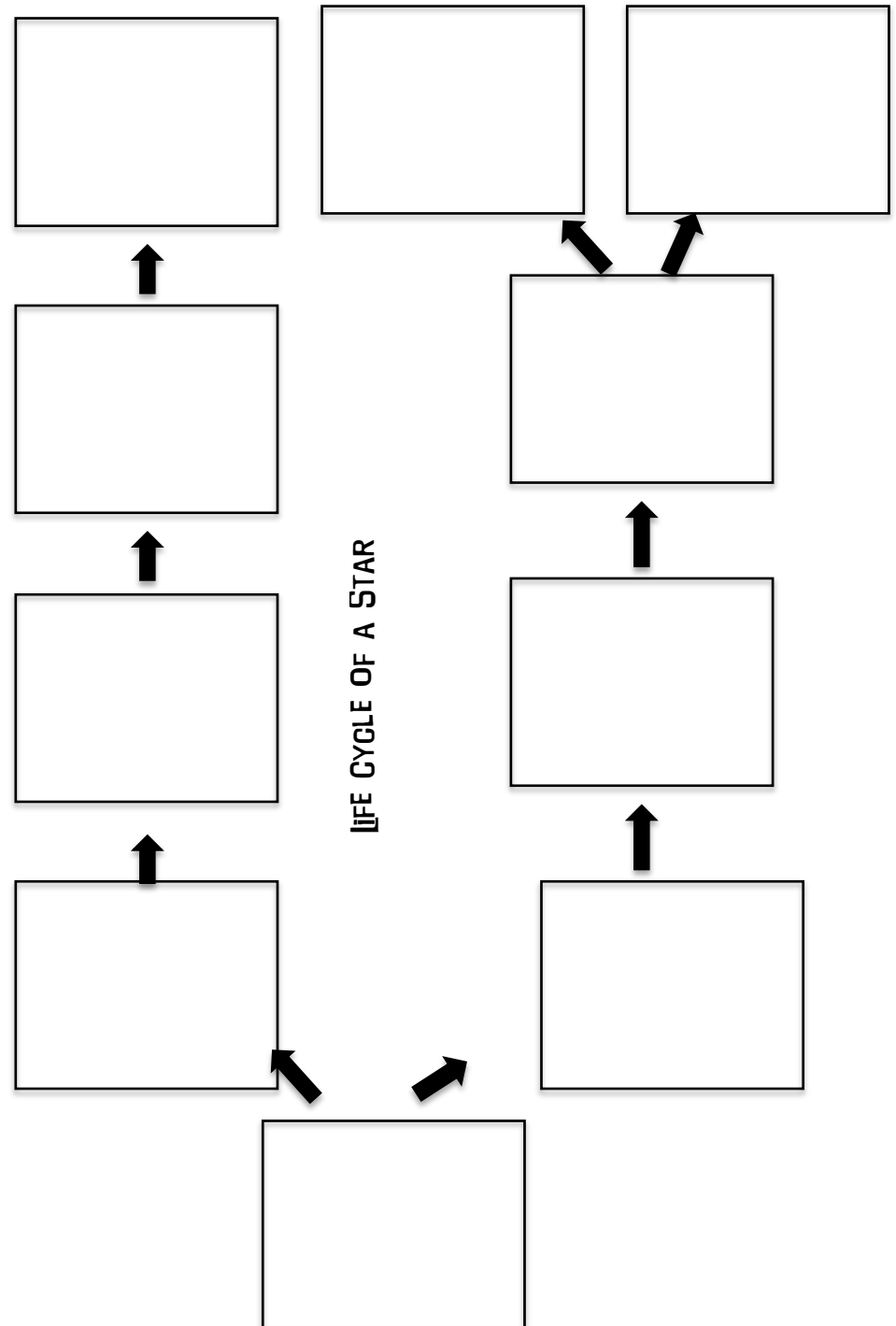
When you look up at the night sky you can see many stars. When you look at the sky during the day you can see one star. That star is our Sun. Our Sun is only one of many, many stars. Stars are glowing balls of hot gases – mostly hydrogen and helium. However, stars vary dramatically in size, temperature, color, brightness, age and distance from our solar system.

A star has a life cycle that follows a pattern from “birth” to “death.” Stars form when clouds of gas become compressed enough to start the process of nuclear fusion. The mass of the new star determines its life cycle.

Materials: Life Cycle of Stars Description Cards, Life Cycle of Stars pictures

What To Do:

1. Cut out the Life Cycle of Stars Description Cards.
2. Take out the Picture cards and match the descriptions to the pictures.
3. Start with the Nebula Description card and try to determine the life cycle of an Average Star from its beginning in the Nebula to its end.
4. Again start with the Nebula Description card and try to determine the life cycle of a Massive Star.
5. Your description cards should fit on the next page.
6. If they fit and your teacher OK's it glue the Description Cards to the next page.





Watch the video *The Sun's Death Affects Earth* and write down 2 things you learned in the space below.

Stars vary widely in their surface temperature. The coolest stars are as cool as 3000°C, while the hottest stars have surface temperatures that are 10 times that hot. The temperature of a star determines its color – from cool, red stars to hot, blue ones. The Sun is a medium temperature yellow star.

Around 1910, astronomers Ejnar Hertzsprung and Henry Russell independently developed what is now known as the Hertzsprung-Russell or H-R diagram. This graph plots the relationship between a star's average surface temperature and its brightness.

On the H-R diagram, most stars, including the sun, fall within a diagonal band of stars called the main sequence. This means that they are in the stage of their life where they are burning hydrogen. When they start burning helium they fall out of the main sequence because they change color and size.

Materials: H-R diagram, colored pencils

What To Do:

1. Notice along the top of the diagram you see different colors of stars. Color each star within a band the color indicated at the top.



2. The diagram is like a graph. What variable is found along the bottom or x-axis?

3. What is unusual about the direction this variable goes? _____

4. What variable is found along the side or y-axis?

5. Stars that are burning hydrogen are in the Main Sequence of stars.

Name a yellow Main Sequence star. _____

Name a blue Main Sequence star. _____

Name a red Main Sequence star. _____

6. Supergiant stars are those of at least 100 times that of our Sun.

Name a white Supergiant star. _____

Name a red Supergiant star. _____

7. Name two other types of stars found on the diagram.

8. Which star is hotter Vega or Pollux? _____

9. Which star is cooler Polaris or Regulus? _____

10. Which star is brighter Spica or TauCeti? _____

11. Which star is dimmer Deneb or Mira? _____

12. Fold and glue the H-R Diagram to the next page.



Name _____ period _____

EXIT TICKET

Life Cycle of Stars

1. Medium size stars, like our Sun, will eventually end up as a –

- A. white hole
- B. black hole
- C. white dwarf

2. Supergiant stars will eventually end up as a –

- A. white hole
- B. black hole
- C. white dwarf

3. Where does our Sun lie on the H-R diagram?

- A. Red supergiant
- B. White dwarf
- C. Yellow Main Sequence

4. According to the H-R diagram what is the relative surface temperature of our Sun?

- A. very hot temperature
- B. medium temperature
- C. cool temperature

5. Which of the following colors is NOT found on the H-R diagram of stars?

- A. Red
- B. Yellow
- C. Green



Name _____ period _____

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Life Cycle of Stars

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- C. Yellow Main Sequence

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4. Medium size stars, like our Sun, will eventually end up as a –

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