Introduction

Welcome to the world of astronomy! In this worksheet, we will explore the fascinating topic of the Hertzsprung-Russell Diagram and stellar classification. The Hertzsprung-Russell Diagram is a powerful tool that helps us understand the life cycle of stars and the structure of the universe.

Life Cycle of Stars

The life cycle of stars is a complex and fascinating process. Stars are born in giant molecular clouds and go through various stages, including protostar, main sequence, red giant, and white dwarf. Understanding the life cycle of stars is crucial for understanding the universe and its evolution.

1. What is the first stage of a star's life cycle?
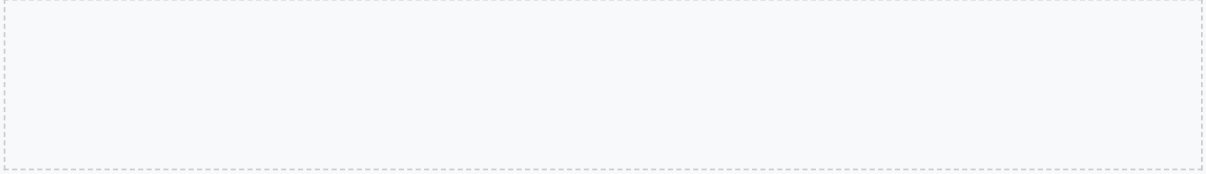
Stellar Classification

Stars can be classified based on their spectral characteristics, including temperature, luminosity, and color. The main types of stars are O, B, A, F, G, K, and M, each with distinct characteristics.

1. What is the hottest type of star?

Hertzsprung-Russell Diagram

The Hertzsprung-Russell Diagram is a graphical representation of the relationship between a star's luminosity and surface temperature. The diagram helps us understand the different stages of stellar evolution, including the main sequence, red giant branch, and white dwarf cooling track.
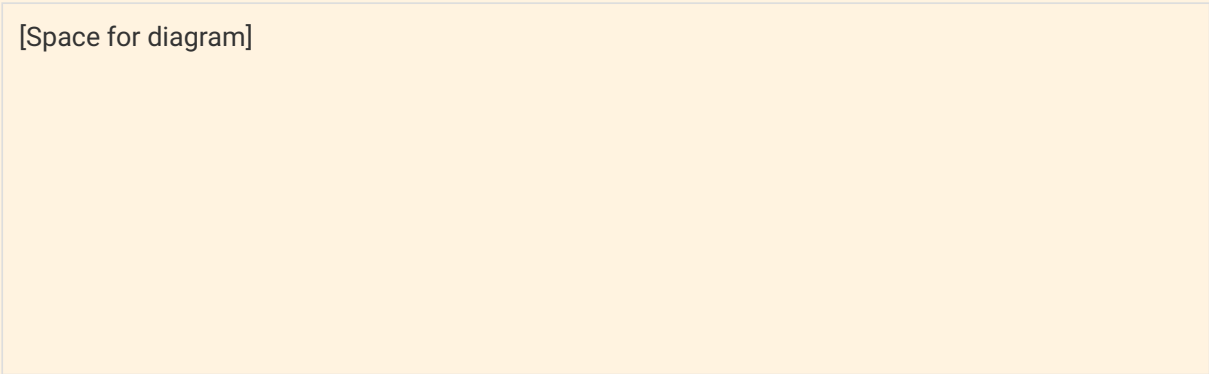
1. What is the main sequence stage of a star's life cycle?

Activities

Group Task:

Draw a diagram of the Hertzsprung-Russell Diagram and label the different stages of stellar evolution.

[Space for diagram]

Quiz

1. What is the life cycle of a star?

2. What is the Hertzsprung-Russell Diagram used for?

Case Study

Read the following case study and answer the questions:

The Sun is a main-sequence star that is about 4.6 billion years old. It is expected to live for another 5 billion years before it becomes a red giant and eventually a white dwarf.

1. What stage of its life cycle is the Sun currently in?

2. What will happen to the Sun in about 5 billion years?

Glossary

Define the following terms:

- Protostar:

- Main Sequence:

- Red Giant:

- White Dwarf:

Conclusion

Individual Reflection:

1. What was the most surprising thing you learned today?

2. How will this learning change your actions in the future?

3. What questions do you still have about environmental impact?

Answer Key

1. 1. a) Protostar
2. 2. a) O
3. 3. b) Main Sequence
4. 4. a) Protostar, main sequence, red giant, white dwarf
5. 5. d) All of the above
6. 6. b) Main Sequence
7. 7. b) It will become a red giant