



## Life Cycle of a Star Observation

**Prep Time:** 10 minutes

**Grades:** 5-8

**Lesson Time:** 55-60 minutes

### Essential Questions:

- How does a star form?
- What happens when it dies?
- Why do some form blackholes?

### Objectives:

- Students will be able to model the life cycle of a star.

### Standards:

- MS-ESS1-2- Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- MS-ESS1-3 Analyze and interpret data to determine scale properties of objects in the solar system.

### Teacher Prep:

- This lesson requires enough laptops to have one for every 2-4 students.
- You should split your students into groups of 2-4 students and assign each group to be either the Low Mass Star, High Mass Star, or Very High Mass Star.
- Remind students they must click on the designated circles in the program for it to work. Clicking around on the screen could skew their path.
- There is an option to return to the home screen and follow a start a different mission. This can be done if time remains.
- There is an attached table with the phases of the star cycle. Print these out and cut out the individual boxes. Scatter them and lay them out on a desk or stick them to a wall. Be sure to print multiple copies, seeing as some of the steps are the same for different stars.
- Some of the steps are purposely incorrect for an additional challenge.

### Teacher Notes/Background:

- This activity is based on the information from the Let's Launch!: Maya Explores the Sun and Stars video but goes more in depth about the life cycle of different stars (dependent on their mass).
- Prep computers with the PowerPoint file ahead of time, if you feel your students don't have a solid enough understanding or this is a new topic, this could be done on a projector in front of the entire class and students could be called on to answer the questions, click to the next slide, etc.

## Life Cycle of a Star Observation

<b>Engage</b> (5 minutes)	<p><b>Opening Demonstration:</b></p> <ul style="list-style-type: none"> <li>• Students complete a warm up activity.</li> <li>• Turn and Talk: talk to a partner and discuss questions like “what is a star made of?” or “how hot do you think a star is?”</li> <li>• Have students share out their ideas and/or questions.</li> </ul>	<p><b>Materials:</b> N/A</p>
<b>Explore</b> (5 minutes)	<p><b>Recap:</b></p> <ul style="list-style-type: none"> <li>• Briefly recap main ideas from Sun and Stars video about protostars, the temperature of stars, and nuclear fusion.</li> <li>• Students will be completing a mission in the PowerPoint activity that will teach them about the life cycles of stars with different masses.</li> </ul>	<p><b>Materials:</b> N/A</p>
<b>Explain</b> (35 minutes)	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Students can do this in small groups of 2-4 or individually, if enough computers are available.</li> <li>• Assign each student or group a star: Low Mass, High Mass, or Very High Mass.</li> <li>• Explain that they need to follow the directions clearly on the screen or else they will not have the correct information for their star.</li> <li>• Printable worksheets are included to use to accompany the videos.</li> <li>• The PowerPoint can be repeated so they can follow each mission if there is time.</li> <li>• While students are completing the PowerPoint, they should come up to where the printed cards are located.</li> <li>• As they complete each step, they should come find the correct card that corresponds with each step and bring it back to their seats. Organize them on a desk to create a visual representation of the life cycle.</li> <li>• Some cards are incorrect on purpose! Watch out!</li> </ul>	<p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• PowerPoint activity</li> <li>• Printable worksheets</li> <li>• Printed cards</li> </ul>
<b>Elaborate</b> (5 minutes)	<p><b>Review:</b></p> <ul style="list-style-type: none"> <li>• Ask students questions out loud to make sure they are understanding the material.</li> </ul> <p><b>Questions:</b></p> <ul style="list-style-type: none"> <li>• What is a factor that affects a star’s life cycle?</li> <li>• What is nuclear fusion?</li> <li>• What phase do all stars go through?</li> </ul>	<p><b>Materials:</b> N/A</p>

## Life Cycle of a Star Observation

<b>Evaluate</b> (5 minutes)	<b>Sharing Out:</b> <ul style="list-style-type: none"><li>• Have students use the sheet they filled out to share the path of their star's life.</li><li>• Have a student from each mission share (one from Low Mass Star, one from High Mass Star, one from Very High Mass Star).</li></ul>	<b>Materials:</b> <ul style="list-style-type: none"><li>• Completed printable worksheets for reference</li></ul>
--------------------------------	---	--

### Extensions and Enrichment:

- Students can complete this activity more than once or all follow the same mission in group, then switch groups for the next mission, so they can work with other classmates.

### Additional Resources:

- *Launchpad: Life Cycle of a Star:* Each of us is made from star stuff. But how are stars formed? Take a closer look at the life cycles of stars and learn where stars come from, how they change, and what happens to stars when their lives come to an end. Find out about your connection to the cosmos.

<https://nasaclips.arc.nasa.gov/video/launchpad/launchpad-life-cycle-of-a-star>

# Life Cycle of a Star Observation

## Following the Life Cycle of Stars

Complete this worksheet as you follow along with the PowerPoint. Be sure to follow all directions on the PowerPoint exactly, failure to do so could cause complications in your mission.

**Type of Star (circle one):**    Low Mass Star                      High Mass Star                      Very High Mass Star

**What is a nebula?** \_\_\_\_\_  
\_\_\_\_\_

**What is nuclear fusion?** \_\_\_\_\_  
\_\_\_\_\_

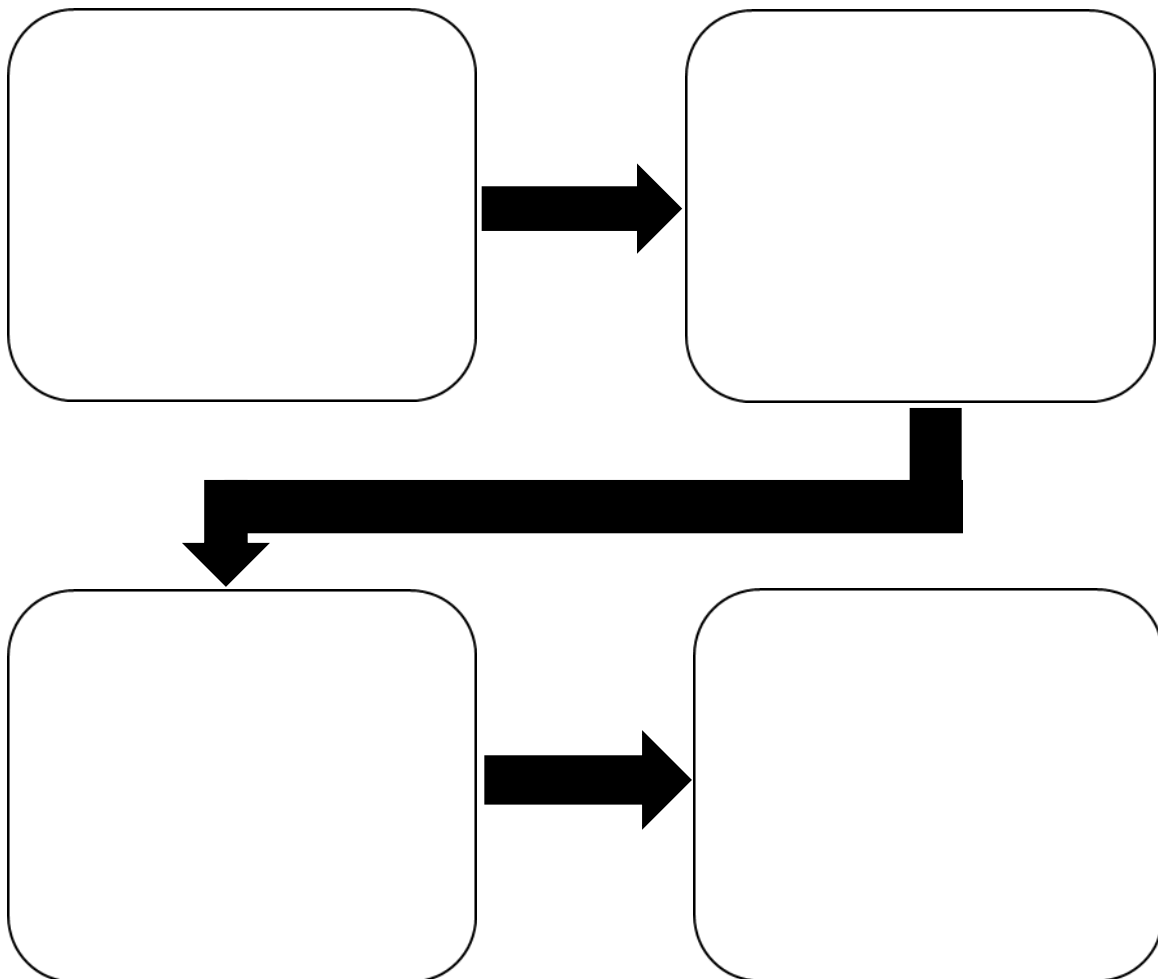
**In a main sequence star, hydrogen is converted into... (circle one):**

Helium

Oxygen

Nitrogen

**Fill out the graphic organizer with four main stages in the life cycle of your star. Be sure to use vocabulary from the PowerPoint:**



### Life Cycle of a Star Observation

<b>Nuclear fusion occurs</b>	<b>A nebula becomes a protostar</b>
<b>A black hole will form</b>	<b>Star enters the Red Giant phase</b>
<b>A White Dwarf remains</b>	<b>A planetary nebula is formed</b>
<b>A neutron star forms</b>	<b>A supernova explosion occurs</b>
<b>Low Mass Star</b>	<b>High Mass Star</b>
<b>Very High Mass Star</b>	<b>Protostar reaches 13,000,000 degrees Fahrenheit</b>
<b>Protostar reaches 15,000,000 degrees Fahrenheit</b>	<b>The mass of the nucleus increases</b>
<b>The mass of the nucleus decreases</b>	<b>The mass of the nucleus stays the same</b>
<b>The outer shell of the star glows yellow</b>	<b>The outer shell of the star glows blue</b>