

Starlight to Stardust

Track how matter moves through a massive star's life.

8.9 "Earth and space. The student describes the characteristics of the universe and the relative scale of its components. The student is expected to: describe the life cycle of stars and compare and classify stars using the Hertzsprung- Russell..."

NAME _____

DATE _____

1 LABEL THE MODEL _____ Word bank below

Write one process from the word bank in each numbered box. Use each process once to show how one stage leads to the next stage.

WORD BANK

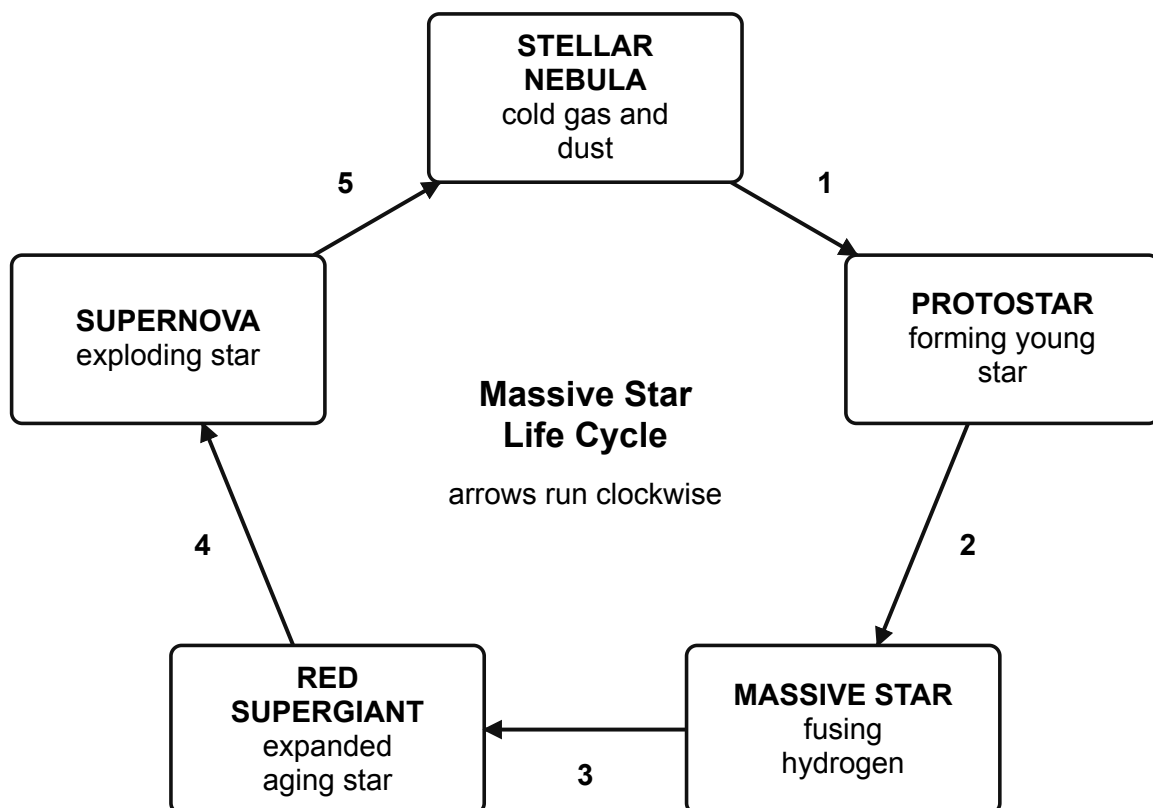
core collapse

ejected gas mixes

fusion begins

gravitational collapse

hydrogen runs low



Arrow numbers match the response boxes on the next student section.

Label the arrows

Use the word bank to write the process for each numbered arrow.

Arrow 1

Arrow 2

Arrow 3

Arrow 4

Arrow 5

2 RUN THE MODEL _____ Use your finished diagram

1 After you place "fusion begins" on the model, which stage does its arrow point to?

2 Which process moves a red supergiant to a supernova?

3 What does the model show happening to ejected gas after a supernova?



CHECK IT

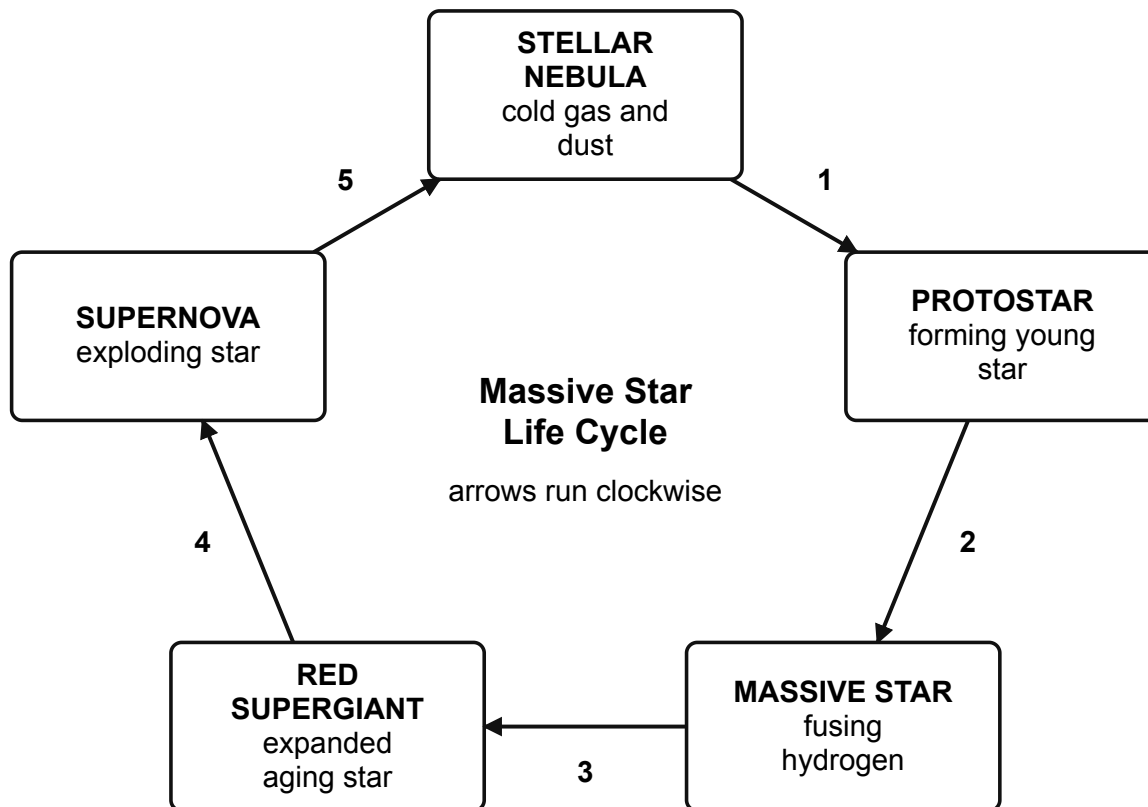
Before you turn it in

- ☐ I used each process once.
- ☐ I followed the arrows in order.
- ☐ I can explain how stellar matter is recycled.

TEST THE MODEL

What important difference between stars does this loop leave out?

PART 1 • COMPLETED MODEL

**Arrow 1**

gravitational collapse

Arrow 2

fusion begins

Arrow 3

hydrogen runs low

Arrow 4

core collapse

Arrow 5

ejected gas mixes

PART 2 • RUN THE MODEL

1. **MASSIVE STAR** (After you place "fusion begins" on the model, which stage does its arrow point to?)
2. **core collapse** (Which process moves a red supergiant to a supernova?)
3. **It mixes into a stellar nebula.** (What does the model show happening to ejected gas after a supernova?)

TEST THE MODEL (SAMPLE ANSWERS)

- It leaves out low-mass stars, which become white dwarfs instead of supernovas.
- It does not show how a star's mass changes its path on the Hertzsprung-Russell diagram.

This model shows the simplified life cycle of a massive star. The final arrow represents ejected material mixing with interstellar gas and dust that can become part of a new stellar nebula.