6 Stars and the Universe – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
Sun	太阳			
star	恒星			
Universe	宇宙			
hydrogen	氢			
helium	氦			
nuclear fusion	核聚变			
galaxy	星系			
Milky Way	银河系			
light-years	光年			
nebula	星云			
mass	质量			
red giant	红巨星			
white dwarf	白矮星			
supernova	超新星			
wavelength	波长			

English	中文	Write it 3 times (English)		
redshift	红移			
expanding	膨胀			
Big Bang	大爆炸			

Recall

From Part 1 you know the Sun is at the centre of the Solar System. The **Sun** 太阳 is a **star** 恒星 – and there are billions more. Here we look at stars and the whole **Universe** 宇宙.

- A star makes energy by joining nuclei together.
- Stars are born, live and die.

Nothing here is hard – it just tells the story.

New ideas

Read these first, then do the Practice.

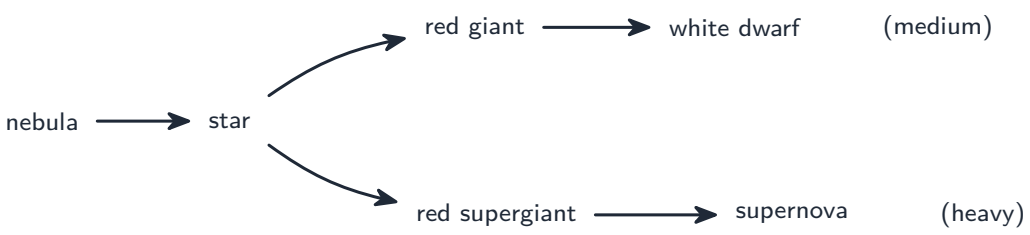
1 The Sun as a star

The Sun is a medium **star** 恒星, made mostly of **hydrogen** 氢 and **helium** 氦. Its energy comes from **nuclear fusion** 核聚变: hydrogen nuclei join to make helium, releasing huge energy.

A **galaxy** 星系 is billions of stars held together by gravity. Our Sun is one star in the **Milky Way** 银河系. Distances between stars are measured in **light-years** 光年 (the distance light travels in a year).

2 The life cycle of a star

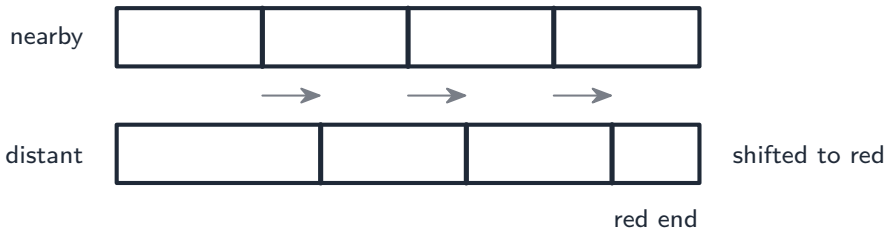
A star forms from a cloud of gas and dust (a **nebula** 星云), then lives as a stable star, then dies. What happens at the end depends on its **mass** 质量:



A medium star (like the Sun) becomes a **red giant** 红巨星, then a **white dwarf** 白矮星. A heavy star explodes as a **supernova** 超新星.

■ 3 The expanding Universe

Light from distant galaxies is shifted to a longer **wavelength** 波长 (towards red) – this is **redshift** 红移. The further a galaxy, the bigger its redshift, so galaxies are moving apart: the **Universe** 宇宙 is **expanding** 膨胀.



Running this backwards, everything started together – the **Big Bang** 大爆炸 theory.

Watch out: a star's energy comes from **nuclear fusion** (small nuclei *joining*), not from burning. Redshift means a galaxy's light is stretched to **longer** wavelengths as it moves *away* – the bigger the redshift, the faster and further the galaxy.

Practice

Try these in order.

6.1 What is the Sun mostly made of? [1]

6.2 Name the process that makes the Sun's energy. [1]

6.3 What is a *galaxy*? [1]

6.4 Name the stage a medium star (like the Sun) swells into near the end of its life. [1]

6.5 What is *redshift*, and what does it tell us about the galaxies? [2]

6.6 Name the theory that says the Universe started from a single point. [1]

6.7 Challenge. The light from a distant galaxy shows a **large** redshift. State what this tells you about (a) the galaxy's motion and (b) its distance compared with a galaxy of small redshift. [2]