

6 Stars and the Universe – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	Write it 3 times (English)		
Sun	_____	_____	_____
star	_____	_____	_____
Universe	_____	_____	_____
hydrogen	_____	_____	_____
helium	_____	_____	_____
nuclear fusion	_____	_____	_____
galaxy	_____	_____	_____
Milky Way	_____	_____	_____
light-years	_____	_____	_____
nebula	_____	_____	_____
mass	_____	_____	_____
red giant	_____	_____	_____
white dwarf	_____	_____	_____
supernova	_____	_____	_____
wavelength	_____	_____	_____

English**Write it 3 times** (English)

redshift

expanding

Big Bang

Recall

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

- 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** , made mostly of **hydrogen** and **helium** . Its energy comes from **nuclear fusion** : hydrogen nuclei join to make helium, releasing huge energy.

A **galaxy** is billions of stars held together by gravity. Our Sun is one star in the **Milky Way** . Distances between stars are measured in **light-years** (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**), then lives as a stable star, then dies. What happens at the end depends on its **mass** :

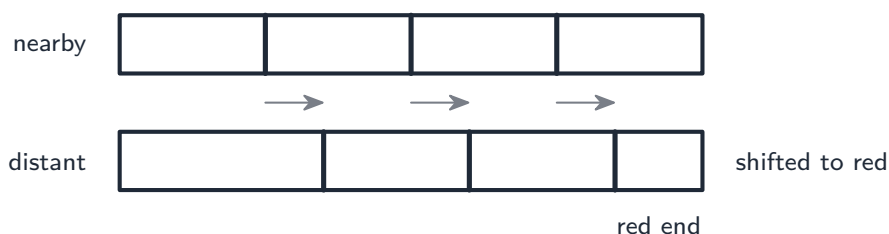


A medium star (like the Sun) becomes a **red giant** , then a **white dwarf** . A heavy

star explodes as a **supernova** .

■ 3 The expanding Universe

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



Running this backwards, everything started together — the **Big Bang** 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]