



RIVERTON & DISTRICT HIGH SCHOOL

SHE Task: Yr 10 The Big Bang Theory & Red Shift

Name:

Task Overview

Throughout this unit, we have explored:

- the scale and structure of the universe
- how astronomers collect and interpret light
- spectra, redshift and the Doppler Effect
- evidence supporting the Big Bang Theory

Scientists cannot travel across the universe to investigate galaxies directly. Instead, they use evidence collected from light and increasingly advanced technologies to develop scientific models explaining the origin and evolution of the universe.

In this task, you will investigate how redshift provided evidence for the Big Bang Theory and how advances in telescope technology improved scientific understanding of the universe.

Task Question

How has scientific evidence and technological development contributed to the acceptance of the Big Bang Theory?

Success Criteria

You will be successful if you can:

- explain how redshift supports the Big Bang Theory
- explain how technological developments improved scientific understanding
- use evidence to support scientific explanations
- evaluate the reliability of sources
- communicate scientific ideas clearly using appropriate terminology

Your Task

Using ICT (Word or PowerPoint), create a scientific report (600 – 750 words not including bibliography)) that investigates:

Part A — The Big Bang Theory and Redshift

You must:

- briefly describe the Big Bang Theory
- explain what redshift is
- explain how redshift provides evidence that the universe is expanding
- explain how this supports the Big Bang Theory
- evaluate how convincing this evidence is

Part B — Technology and Scientific Understanding

You must:

- investigate at least ONE technological advancement used by astronomers
- explain why the technology was developed
- describe how it improved scientists' ability to study the universe
- explain how it improved scientific understanding of the Big Bang Theory

You may investigate technologies such as:

- optical telescopes
- radio telescopes
- space telescopes
- spectroscopy
- the Hubble Space Telescope
- the James Webb Space Telescope

Part C — Evaluating Sources

You must include:

- a bibliography with at least 3 sources
- Bibliography is formatted correctly using Harvard format

Reminder

The goal of this task is not simply to describe space. The goal is to explain how scientists use evidence, how technology improves understanding and how scientific theories are supported and refined over time.

Suggested Structure

Introduction

- What is the Big Bang Theory?
- Why do scientists need evidence to support theories?

Redshift and Expansion

- What is the Doppler Effect?
- What is redshift?
- How does redshift show galaxies are moving apart?
- How does this support the Big Bang Theory?

Technology and Scientific Advancement

- What technology did you investigate?
- Why was it developed?
- How does it work?
- How did it improve scientific understanding?

Scientific Models and Evidence

- Why is the Big Bang considered a scientific theory?
- How has scientific understanding changed over time?
- Why is scientific knowledge contestable and refined?

Conclusion

- Summarise how evidence and technology support the Big Bang Theory.

Timeline

Week	Focus
Tuesday Week 3	Research and note taking
Thurs & Fri Week 3	Drafting
Tuesday Week 4	Editing
Thurs & Fri Week 4	Finalise report
Friday 22 May	Submission

Helpful Questions

Use these questions to guide your thinking:

- How can light provide evidence about the universe?
- Why was redshift an important discovery?
- Why are technological advances important in astronomy?
- Why do scientific theories change over time?
- What makes evidence convincing in science?

Research Tips

Reliable sources may include:

- NASA
- CSIRO
- ESA (European Space Agency)
- Encyclopaedia Britannica
- science textbooks
- university websites

Extension Challenge (Optional)

Research ONE additional piece of evidence supporting the Big Bang Theory, such as:

- Cosmic Microwave Background Radiation (CMBR)
- hydrogen and helium abundance
- galaxy surveys

Explain how this evidence further supports the Big Bang model.