Big Bang: evidence and model limits

Teacher / technician

YEAR 11 / LESSON 112 / PHYSICS ONLY

Staff preparation and answer guidance. Keep separate from student sheets. Record actual measurements separately from labelled practice examples.

Coverage and delivery

Physics only: 8.13P–8.14P. Past evolution of the universe, redshift and cosmic microwave background.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Booklets	1 per learner	30
Evidence cards and rulers	1 set per pair	15 sets

Immediate safety

Desk-based evidence discussion. No explosions, flames, balloons, microwave equipment or radiation sources are used.

Preparation and delivery

Read alongside the student method

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1. Label every figure as schematic or reference information and distinguish observations from explanatory models.

2. Distinguish evidence about the past evolution of the universe from claims about an ultimate cause or a central explosion.

Close of lesson

- Retain the evidence argument and collect cards.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- Galaxy redshift evidence and the cosmic microwave background.
- Large-scale expansion.
- Relic radiation from the early universe, stretched as the universe expanded.
- About 2.7 K.
- No; it was released when the universe became transparent much later.
- No; the simple central-explosion picture is misleading.

References and provenance

Pearson Physics specification

NASA: cosmological redshift

NASA LAMBDA: cosmic microwave background

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.