Notice of Assessment Task
Year 9 Science
Exploring the Origins and Evolution of the Universe: A Journey from the Big Bang to the Present

Date of initial notification:	Date of submission of task:
Wednesday 21 February 2024 Week 4 Term 1	Wednesday 6 March 2024 Week 6 Term 1

Teacher:	Task Number: 1

Time Allowed: Section 1: 2 Weeks | **Section 2**: 1 Period

Course Component/Focus area/topic/module:
Earth & Space

The Task

In this captivating cosmic journey assignment, students will explore the depths of the universe's origins and evolution. The assignment is structured into two parts to enrich understanding and inspire creativity in unravelling the mysteries of the Big Bang Theory and its profound implications for the universe's unfolding. Part A of the task will require students to conduct research and design a poster on several cosmological concepts. Additionally, Part B will focus on students' ability to provide solutions through a in class task.

Part A

Research and Poster Design

Students will employ critical thinking and research skills to conduct in-depth exploration of the Big Bang Theory and the subsequent eras of the universe's evolution, utilising the provided scaffold to guide their research. Through analysis of scientific literature, evaluation of evidence, and synthesis of complex concepts, they will gain insights into cosmological principles.
Students will then apply their research findings to create a visually engaging poster, showcasing their creativity and visual communication skills.

Part B

In-Class Task

Students will participate in an in-class assessment, focusing on the analysis and interpretation of Hertzsprung-Russell (H-R) Diagrams. This in-class task will provide students with a practical opportunity to apply their knowledge and understanding of the development of stars.

Outcomes/Competencies to be assessed in this task:

SC5-8WS applies scientific understanding and critical thinking skills to suggest possible solutions to identified problems.
SC5-9WS presents science ideas and evidence for a particular purpose and to a specific audience, using appropriate scientific language, conventions, and representations.
SC5-12ES describes changing ideas about the structure of the Earth and the universe to illustrate how models, theories and laws are refined over time by the scientific community.

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Time Allowed: 2 Weeks

Task Outline

Part A: Research and Poster Design

Students are tasked with researching the following topics and crafting comprehensive research reports.

1. **Introduction to the Big Bang Theory:** Begin your research by providing an overview of the Big Bang theory. Explore its origins, key proponents, and the fundamental principles that underpin this cosmological model.
2. **Formation of the Universe:** Investigate the early moments of the universe's existence following the Big Bang. Discuss concepts such as cosmic inflation, nucleosynthesis, and the formation of elementary particles.
3. **Eras of the Universe:** Explore the different eras of the universe's evolution, including the Radiation Era, Matter Era, and Dark Energy Era. Describe the characteristics of each era and the significant events that occurred during them.
4. **Formation of Stars:** Investigate and outline the intricate processes underlying the formation of stars subsequent to the Big Bang. Explore the mechanisms involved in the birth of stars, including gravitational collapse, proto-stellar accretion disks, and nuclear fusion.

Part B: Poster Design

Design a poster that visually represents the key concepts and information from your research report. Include images, diagrams, and illustrations to enhance understanding.

1. Content Presentation: Organise the content of your poster into sections corresponding to the different aspects of the Big Bang Theory and the eras of the universe's evolution. Use concise text and bullet points to convey information effectively.
2. Visual Representation: Use colours, fonts, and graphics to make your poster visually appealing and easy to read. Incorporate relevant visuals such as timelines, diagrams of the universe's evolution, and images of celestial objects.

Outcomes/Competencies to be assessed in this task:

SC5-9WS presents science ideas and evidence for a particular purpose and to a specific audience, using appropriate scientific language, conventions, and representations.

SC5-12ES describes changing ideas about the structure of the Earth and the universe to illustrate how models, theories and laws are refined over time by the scientific community

Feedback: How will I receive feedback on this task?

☐ Written

☐ Individual

- *If you are absent on the day that the task is due, you MUST see your teacher the next day (not your next lesson) that you are present at school to show your medical certificate or produce a misadventure form (refer to your Assessment Booklet for a copy of the form).*
- *Exemptions and extensions for any other reason will only be determined at the discretion of the Head Teacher, and only in extenuating circumstances. You must advise the Head Teacher as soon as possible if you know you are unable to submit the task on the due date.*
- *All appeals must be lodged within 48hrs of receipt of the task. Students who may consider an appeal are not permitted to take their task home. The original task cannot be altered in any way prior to the appeal process.* See Assessment booklet for details.

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Part A - Scaffold

Students should use the scaffold questions to guide research efficiently. Explore the Big Bang theory's fundamentals and key proponents. Investigate concepts like cosmic inflation and nucleosynthesis for the universe's early moments. Analyse the eras of the universe's evolution and the processes of star formation post-Big Bang.

1. Introduction to the Big Bang Theory:

- What is the Big Bang theory, and why is it considered the prevailing model for the origin of the universe?

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- Who were the key proponents or scientists associated with the development of the Big Bang theory?

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- What are the fundamental principles that form the basis of the Big Bang theory, and how do they explain the universe's origins?

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2. Formation of the Universe:

- What were the early moments of the universe's existence like following the Big Bang?

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- What is cosmic inflation, and how does it contribute to the expansion of the universe?

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- How does nucleosynthesis play a role in the formation of elements in the universe?

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- Can you explain the formation of elementary particles and their significance in the early universe?

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3. Eras of the Universe:

- What are the different eras in the evolution of the universe, and how do they differ from each other?

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- Describe the characteristics of the Radiation Era and the significant events that occurred during this period.

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- What distinguishes the Matter Era from other eras, and what were the key developments during this time?

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- How does the Dark Energy Era contribute to our understanding of the universe's expansion and future?

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4. Formation of Stars:

- What are the processes involved in the formation of stars after the Big Bang?

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- Explain how gravitational collapse contributes to the formation of stars.

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- What role do proto-stellar accretion disks play in the birth of stars?

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- How does nuclear fusion ignite and sustain stars, and why is it crucial for their existence?

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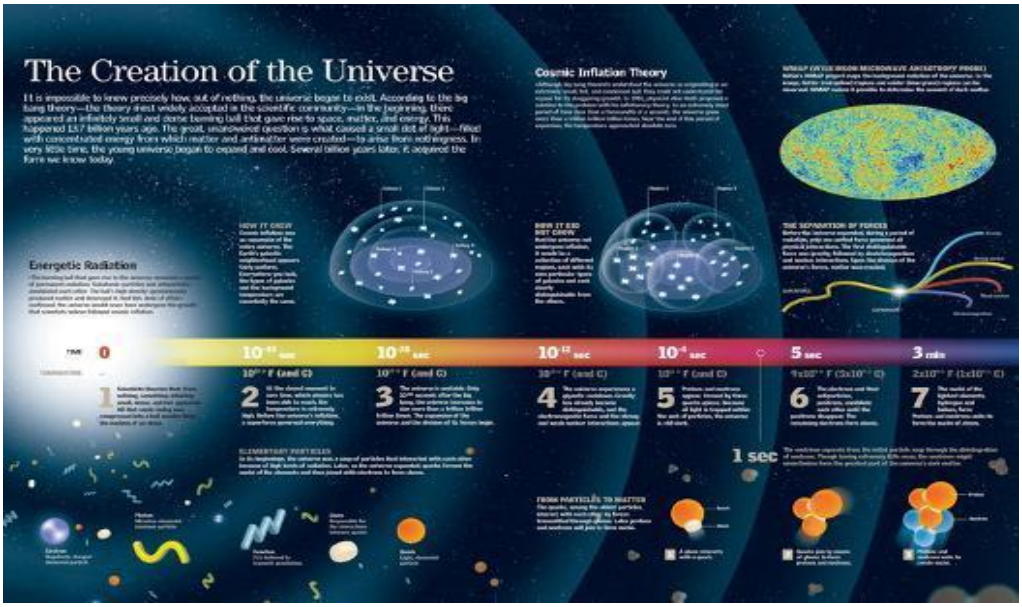
Poster Design Example



Part A – Marking Criteria

Outcomes	Limited	Basic	Sound	Thorough	Extensive	MARKS
SC5-12ES describes changing ideas about the structure of the Earth and the universe to illustrate how models, theories and laws are refined over time by the scientific community	- Provides definition for the Big Bang Theory - Defines one (1) cosmological processes. - Describes the conditions for some of the listed eras of the early universe. - Describe one (1) key processes in the formation of stars. - States the universe has undergone change over time.	- Describes information on the Big Bang Theory, either on its origin, principles or associated scientific figures. - Defines at least two (2) cosmological processes. - Describes the conditions or significance of the listed eras of the early universe. - Describe the key processes in the formation of stars. - Compares two period of the universe to demonstrate change over time.	- outlines information on the Big Bang Theory, including its origin, principles and associated scientific figures. - Provides an explanation for at least two (2) cosmological processes. - Examines the conditions and significance of the listed eras of the early universe. - Outlines the key processes in the formation of stars and provides evidence to support some of the proposed processes. - Contrasts some research to demonstrate the formation and change of the universe over time.	- outlines information on the Big Bang Theory, including its origin, principles and associated scientific figures. - Assesses and provides an explanation for at least two (2) cosmological processes. - Analyse the conditions and significance of the listed eras of the early universe. - synthesis the key processes in the formation of stars and provides evidence to support some of the proposed processes. - Synthesis some research to demonstrate the formation and change of the universe over time.	- Accurately outlines information on the Big Bang Theory, including its origin, principles and associated scientific figures. - Assesses and provides an explanation for at least three (3) cosmological processes. - Analyse and compare the conditions and significance of the listed eras of the early universe. - Synthesis the key processes in the formation of stars and provides evidence to support each of the proposed process. - Synthesis research to demonstrate the formation and change of the universe over time.	
	(1-2 marks)	*(3-4 marks)*	*(5-6 marks)*	*(7-8 marks)*	*(9-10 marks)*	
SC5-9WS presents science ideas and evidence for a particular purpose and to a specific audience, using appropriate scientific language, conventions and representations.	- includes references to cosmological eras or theories to illustrate key concepts. - Uses appropriate language to convey information. - presents data in an arrangement including either units or headings. - limited use of visual design aspects.	- Arranges information cosmological eras or theories to illustrate key concepts. - Uses some scientific terminology to convey information. - presents data in an arrangement including correct units and appropriate headings. - Includes some design features to benefit visual appeal	- Organises information on cosmological eras and theories to illustrate key concepts. - Uses scientific terminology to convey information. - Collects valid data presented in an arrangement including correct units and appropriate headings. - Employing strategic layout choices to enhance visual appealing.	- Organises information on cosmological eras and theories to illustrate key concepts with accuracy. - Consistently uses scientific terminology to convey information. - Incorporates relevant visuals to supplement written information. - Collects valid data presented in an arrangement including correct units and appropriate headings. - Employing strategic layout choices to enhance visual appealing.	- Effectively organises information on cosmological eras and theories to illustrate key concepts with accuracy and clarity. - Consistently and accurately uses correct scientific terminology to convey information. - Incorporates relevant visuals to supplement written information. - Collects accurate and valid data presented in a well-developed arrangement including correct units and appropriate headings. - Employing strategic layout choices to enhance visual appeal and effectively communicate complex scientific concepts.	
	(1-2 marks)	*(3-4 marks)*	*(5-6 marks)*	*(7-8 marks)*	*(9-10 marks)*	

FEEDBACK: