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| Key Area of Astrobiology |
| Origin of Life – what were the chemical conditions necessary for the emergence of life? |
| Sciences Experiences and Outcomes |
| SCN 2-01a - I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction.SCN 2-20a - Through research and discussion, I have an appreciation of the contribution that individuals are making to scientific discovery and invention and the impact this has made on society.SCN 2-20b - I can report and comment on current scientific news items to develop my knowledge and understanding of topical science.SCN 2-17a - Having explored the substances that make up Earth’s surface, I can compare some of their characteristics and uses.SOC 2-07a - I can describe the major characteristic features of Scotland’s landscape and explain how these are formed.SCIENTIFIC SKILLS**Inquiry and Investigative Skills***Plans and designs scientific investigations and enquiries** Formulates questions and predictions (hypotheses), with assistance, based on observations and information.

*Carries out practical activities in a variety of learning environments** Contributes to carrying out all the procedures.
* Makes observations and collects information and measurements using appropriate devices and units. *(Possible link to MNU 2-11b)*

*Analyses, interprets and evaluates scientific findings** Relates findings to the wider world.
* Identifies and discusses additional knowledge and understanding gained.

*Presents scientific findings** Reports collaboratively and individually using a range of methods.

**Scientific Analytical Thinking Skills*** Applies understanding, and a combination of more than one science concept, to solve problems and provide solutions.

**Skills and attributes of scientifically literate citizens*** Presents a reasoned argument based on evidence, demonstrating understanding of underlying scientific concepts, and engages with the views of others.
* Demonstrates understanding of the relevance of science to their future lives and the role of science in an increasing range of careers and occupations.
* Demonstrates increased awareness of creativity and inventiveness in science, the use of technologies in the development of sciences and the impact of science on society.
* Expresses informed views about scientific and environmental issues based on evidence.
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| Prior Learning |
| See Teacher notes word document in module folderSuggested Prior Learning – introduction to types of rocks, rock cycle. Suggest using the Primary Science Framework from Highland Council, SCN 2-17a materials (requires GLOW log-in) <https://glowscotland.sharepoint.com/sites/national/sciences/Lists/Web%20Links/AllItems.aspx> (click on Materials, then SCN 2-17a) |
| Learning Intentions and Success Criteria |
| LI* We are learning about how the earth formed and life began

SC* I can discuss key events in earth’s history
* I can work with a group to order the key events in earth’s history
* I can justify my decisions, drawing on information I have learned
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| Suggested Learning activities  |
| 1. Introduce The Big Bang and development of life on Earth. In groups, ask learners to complete a KWL grid to highlight their prior understanding of the Big Bang and origins of life on earth. Then watch The Big Bang and me (10 mins)<https://www.youtube.com/watch?v=nYkdDniQJyw>Discuss the clip and revisit the KWL grid, developing big questions which can be addressed or researched through the toic.2. Timeline activity – major events in the history of the earth – evolution. (two  versions available – differentiated resource)(a) In groups of 3/4 initially hand out picture cards, get learners to discuss and order  them according to their ideas.(b) Issue the descriptor cards and then ask each group to match descriptions to  images. (options to jigsaw here)(c) Re-order or adjust timeline to reflect new information from the descriptor cards(d) Produce final timeline. To extend the challenge, use square paper to create a  scaled timeline of the key events. Take pictures of finalised timelines, both  pictorial and scaled versions as appropriate.3. Plenary ActivityAssessment opportunity: Use bigger versions (A4) of the pictorial cards and split the class in to two groups. Asks them to re-create the order as a team, holding the images in front of them.Possible follow up activities:-* Parental engagement: Learners share big bang clip with parents and discuss. Possibility of adding timeline cards to school website to facilitate discussion at home and replicate timeline challenges. Some card sets may need to be sent home for those who cannot print at home.
* Pupils could follow up with individual projects or research on one of the major events that interests them. For example: The Big Bang, Star formation, Homosapien evolution.
* Concept Cartoon – Penguins Evolution
* Study famous scientists associated with Astrobiology and the challenges/obstacles associated with research and development.
* Urey
* Miller
* Oparin
* Haldane
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| Resources |
| * 8 small sets of history of the earth cards – images and descriptors separately
* If required:-

(a) Concept cartoon – Penguins evolution(b) A4 size of card sort pictures for plenary activity |
| Safety |
| No concerns |
| Approaches to Assessment |
| As described in plenary activity. Teacher observation during lesson |