

Geologic Time: Determining the Relative Age of Rocks - Earth Science Regents

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Digital Learning Lesson Instructions – Estimated Time: Approximately 6-8 days

The Earth's geologic history tells a story about the inception of life and the rise and fall of species, showing life is fragile in the face of gradual and sudden changes to the environment. In this unit, students will learn how rock and fossil observations in combination with radioactive dating techniques have been used to construct a geologic time scale.

Essential Questions: How do the clues we find today tell us the story of Earth's past?

Objectives and Standards: (1.2j)

Students will be able to (SWBAT)

- Define key terms: Uniformitarianism, Superposition, Horizontality, Relative Dating, Contact Metamorphism, Folding, Faulting, Intrusion, Unconformity, Weathering, Erosion, Deposition
- Identify sequence of events using rock outcrops and index fossils

TASK 1:

- Open and Read the presentation. Use the presentation to take notes on the student sheet.
 - Task 1_Relative Dating Presentation.pdf
 - Task 1_Relative Dating Student Notes Packet.docx
- Watch this extremely informative video on [Relative Dating](#). It will help you understand how to determine the geologic sequence of events that occurred to make rock formations using an exposed rock cross section, or outcrop. (<https://www.youtube.com/watch?v=fYSeM63Fv0s>)
(Note: This is a 25-minute video, but it is EXTREMELY informative and will really help you understand the next few Tasks. Please watch the entire video)

TASK 2:

- Watch this brief overview video of the three basic laws of relative rock dating: law of superposition, law of crosscutting, and the law of inclusions. Definitions and analogies are provided for each law and provides a good review of the Task 1 materials.
 - [Laws of Relative Rock Dating](#) (<https://www.youtube.com/watch?v=M2Ex5DIjtfU>)
- Review the Geologic Principles you have been learning by completing this worksheet.
 - Task 2_Sequence of Events: Geologic Principles Review.docx
- Put your knowledge into practice by completing multiple choice questions. You should use the Task 1 materials and your ESRT to help you complete today's tasks.
 - Task 2_Relative Dating Multiple Choice Practice.docx

TASK 3:

- Here is another video to help you understand Relative Age and the sequencing of events that occur in rocks over time. [Geologic History by Hommocks](#) (<https://www.youtube.com/watch?v=2gt0WZkpfQo>)
- Determine the sequence of events, from oldest to youngest, in each rock outcrop provided
 - Task 3_Sequence of Events with Outcrops.docx

TASK 4:

- You will complete a virtual lab activity to learn how fossil and rock data can help determine when an organism lived. You will need the following documents and we link to complete this activity.

- Task 4_Virtual Lab Activity Procedure.pdf
- Task 4_Virtual Lab Activity Student Data Sheet.docx
- [Virtual Lab Activity Link](#)
(http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES12/ES12.html)

TASK 5:

- Now that you have a better understanding of identifying rock layers, try Outcrop Correlation. This is when you look at several different outcrops to determine the relative age of rocks from different locations. Here are two quick videos to help get you started.
 - [Outcrop Correlation](https://www.youtube.com/watch?v=i9uyNDCpQPI) (<https://www.youtube.com/watch?v=i9uyNDCpQPI>)
 - [Rock & Fossil Correlation](https://www.youtube.com/watch?v=1JEyNFJBIw) (<https://www.youtube.com/watch?v=1JEyNFJBIw>)
- Practice Correlating Outcrops by completing this worksheet
 - Task 5_Outcrop Correlation.docx

Earth Science Regents practice questions to assess if you have mastered the topic

There are two choices – choose one.

1. Earth Science Regents Practice Questions
 - 6. Regents Practice_Geologic History ESRT.pdf
2. Castle Learning Assignment – students can login and practice questions on their own if they have an account OR teacher can create assessment for students as a grade.