esri Australia

GIS For Schools

Making mountains

Lesson Map: http://esriaustralia.com.au/education/SpatialActivity14

Engage

Where are Australia's biggest mountain ranges?

➔ Click on the lesson map URL above to open the lesson map. It shows the global distribution of volcanoes.

? Zoom in to Australia. How many significant mountain ranges does Australia have? [7]

? What is the name of Australia's largest mountain range? *[The Great Dividing Range]*

Explore

How do mountains form?

➔ In the Details pane, under the heading Content, tick the checkbox to turn on the layer called Tectonic Boundaries.

➔ Open the Legend, and identify the type of plate movement at each boundary.

? Where do volcanoes most commonly occur? *[Along plate boundaries – specifically converging boundaries]*

? How do plates interact at these 3 boundaries? *[Converging plates crash towards each other; Diverging plates move away from each other; Transforming plates slide past each other in opposite directions]*

? Where do mountain ranges occur in relation to plate boundaries? *[Mostly on top of the boundary, at the edge of plates]*

Explain

Which type of boundary makes the biggest mountains?

? Count the number of mountains that occur near each plate boundary. *[Convergent produces about 25, divergent produces 6, transforming produces 8]*

? Why would converging plate boundaries make more mountains? *[Force of two*

Download student worksheet here.

Time
20 minutes

Activity
Investigate how mountains are formed, by exploring plate tectonics.

Learning Outcome
Students will be able to:

- Identify different types of plate boundaries
- Analyse boundary interactions to determine the cause of mountain ranges
- Understand the formation of plates away from boundaries

ACARA Curriculum Link

Year 8 Geography – Unit 1: Landforms and landscapes

ACHGK048 | ACHGK050 | ACHGS057| ACHGS058 | ACHGS059

Year 9 Science – Earth and space sciences

ACSSU180 | ACSIS166 | ACSUS169 | ACSIS174

Senior secondary Curriculum – Earth and Environmental Science – Unit 1: Introductions to Earth systems

ACSES099 | ACSES098 | ACSES100 | ASES087 | ACSES089

converging, continental plates crashing into each other creates more energy]

➔ Click to open the Bookmark called Australasian Converging Boundaries.

? Most of these converging, oceanic plates do how show a mountain range. What evidence exists to prove that these plates are converging? Zoom in and follow the plate boundaries to investigate. [*Underwater ridges are evident where the ocean is less deep. Chains of islands along the boundary also prove that underwater mountain ranges exist, which have grown in some cases to form islands]*

Extend

What are the exceptions to this rule?

➔ Turn on the layer called Ranges Away from Boundaries. This shows mountain ranges that are not located near plate boundaries.

➔ Investigate the Bookmarks for the Appalachian Mountains in the U.S, and the Scandinavian Mountain Range in Europe.

➔ These two mountain ranges were formed when the U.S collided with Europe long ago.

? What evidence of this exists? *[The coastline near both these mountain ranges seem to piece together perfectly]*

? By investigating boundary type, how can we prove this? *[Across the Atlantic Ocean is a divergent boundary, meaning the two plates were once close, but since moved apart]*

? If these two plates collided to form the Appalachian and Scandinavian Mountain ranges, but are now diverging, what does this suggest about plate movement? *[Over long periods of time, plate boundaries can change]*

➔ Optional: Investigate this further by investigating the Brazilian Highlands (in South America) and its matching mountain range, the Bie Plateau (in Africa).

Next Steps:

Request a free ArcGIS Online Account for your school:

Acknowledgements:

This lesson map uses data sourced from an Esri GeoInquiry.

Accompanying lesson material has been amended to align with the Australian National Curriculum.

Teacher Feedback:

To share your feedback on this, or any Spatial Activity, please contact education@esriaustralia.com.au

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