Earth's Systems

MS-ESS2-3

CASE FOR THE DEFENSE

Acorn Nuts About Science

EXHIBIT A

FOSSIL EVIDENCE

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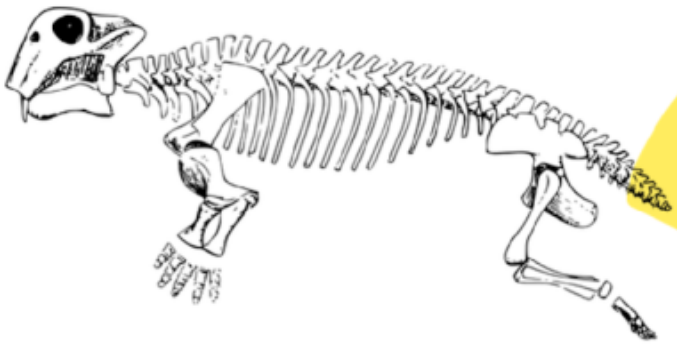
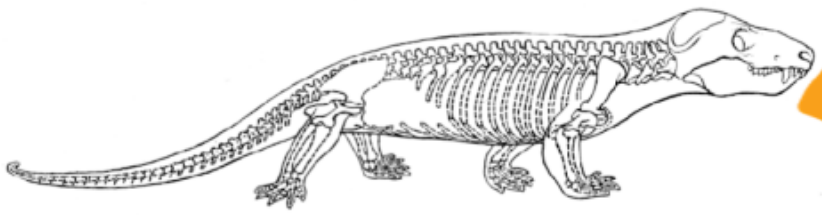
Exhibit A: Fossil Distribution



Lystrosaurus was about the size of a dog. Its name means shovel reptile. It had an unusual look, somewhere between a pig and a lizard. It lived about 270 million years. Fossils of Lystrosaurus are found in India, Antarctica and Africa.

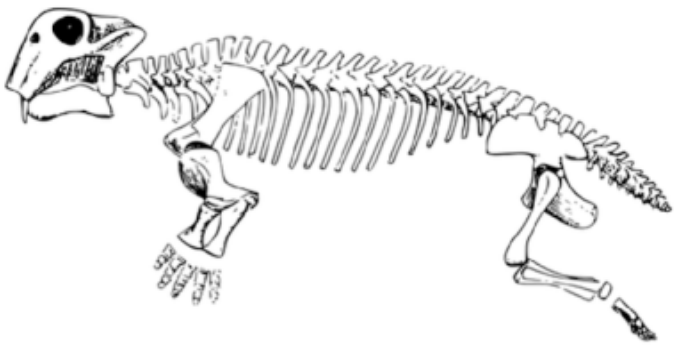
Glossopteris was a plant that had oval shaped leaves. Its name means "tongue shaped". Fossils of this plant are found in Australia, South Africa, South America, India and Antarctica. This plant lived about 300 million years ago.



Fossils of Cynognathus are found in South Africa and South America. The name means 'dog jaw'. Cynognathus was the size of a wolf. It lived in the early Triassic period (250 million years ago).

This is a fossil of Mesosaurus. It looks like a crocodile and would have measured about 1 m in length. Fossils have been found in South America and South Africa. It is thought to have been impossible for this reptile to have swam between continents. These reptiles lived around 270 million years ago.

Exhibit A1: Fossil Distribution



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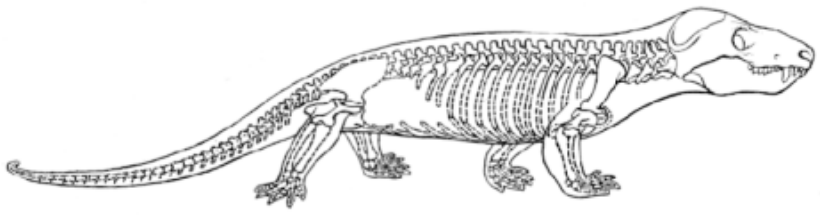

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EXHIBIT B

GEOLOGIC EVIDENCE

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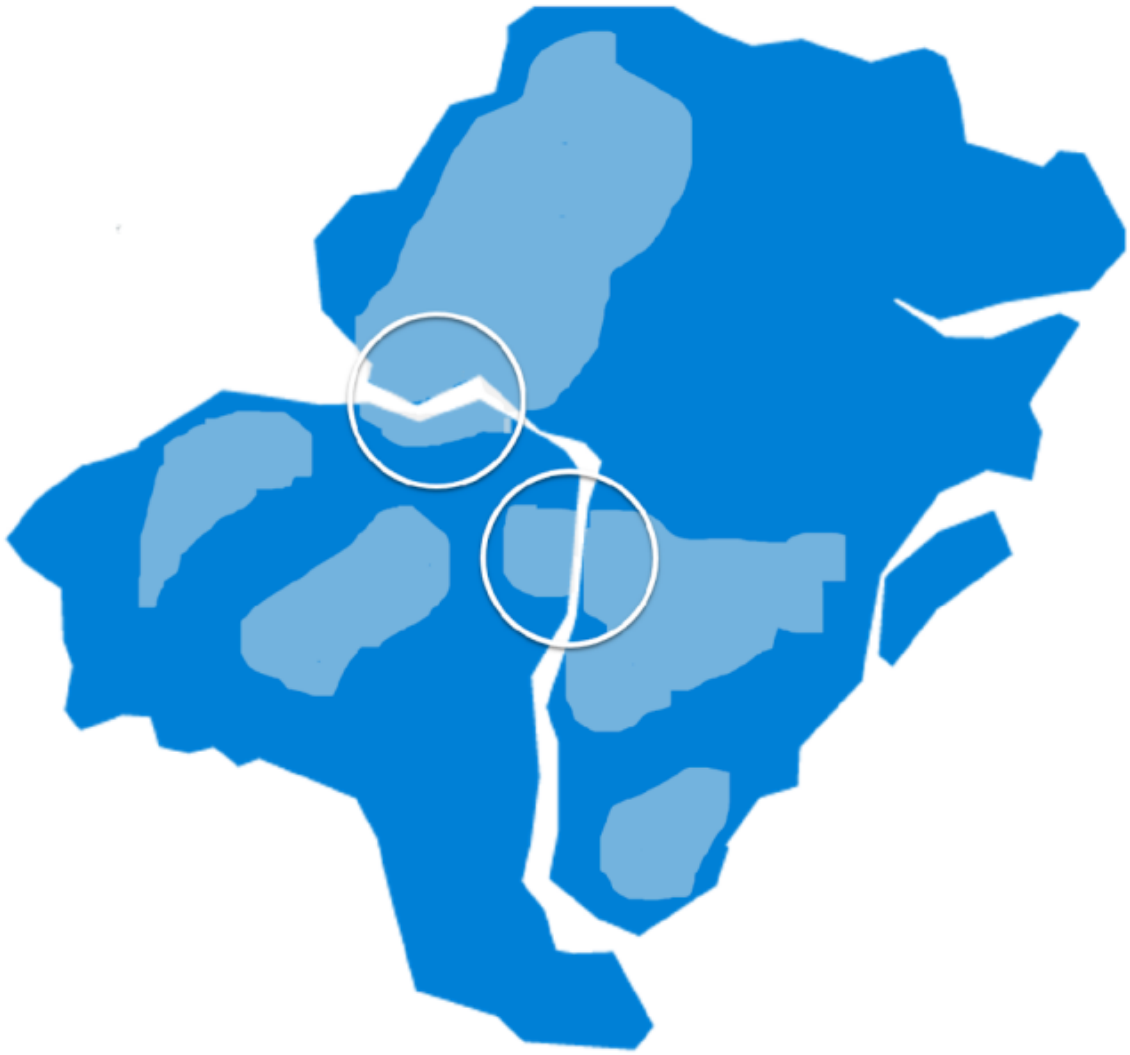
Exhibit B: Geologic Evidence



This map shows rock layers called cratons in South America and South Africa. These rocks are over 2000 million years old.

Geologic Evidence

What do you notice about the rock formations in the circled areas?

Write a short summary outlining the geologic evidence for continental drift in your defense pack.

EXHIBIT C

JIGSAW EVIDENCE

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Exhibit C: Jigsaw Fit

Jigsaw Evidence

It is clear from the diagrams that South American and West Africa fit together like a jigsaw. When you look at Pangea (above) you can easily see how the continents fit together like a jigsaw.

EXHIBIT D

GLACIAL EVIDENCE

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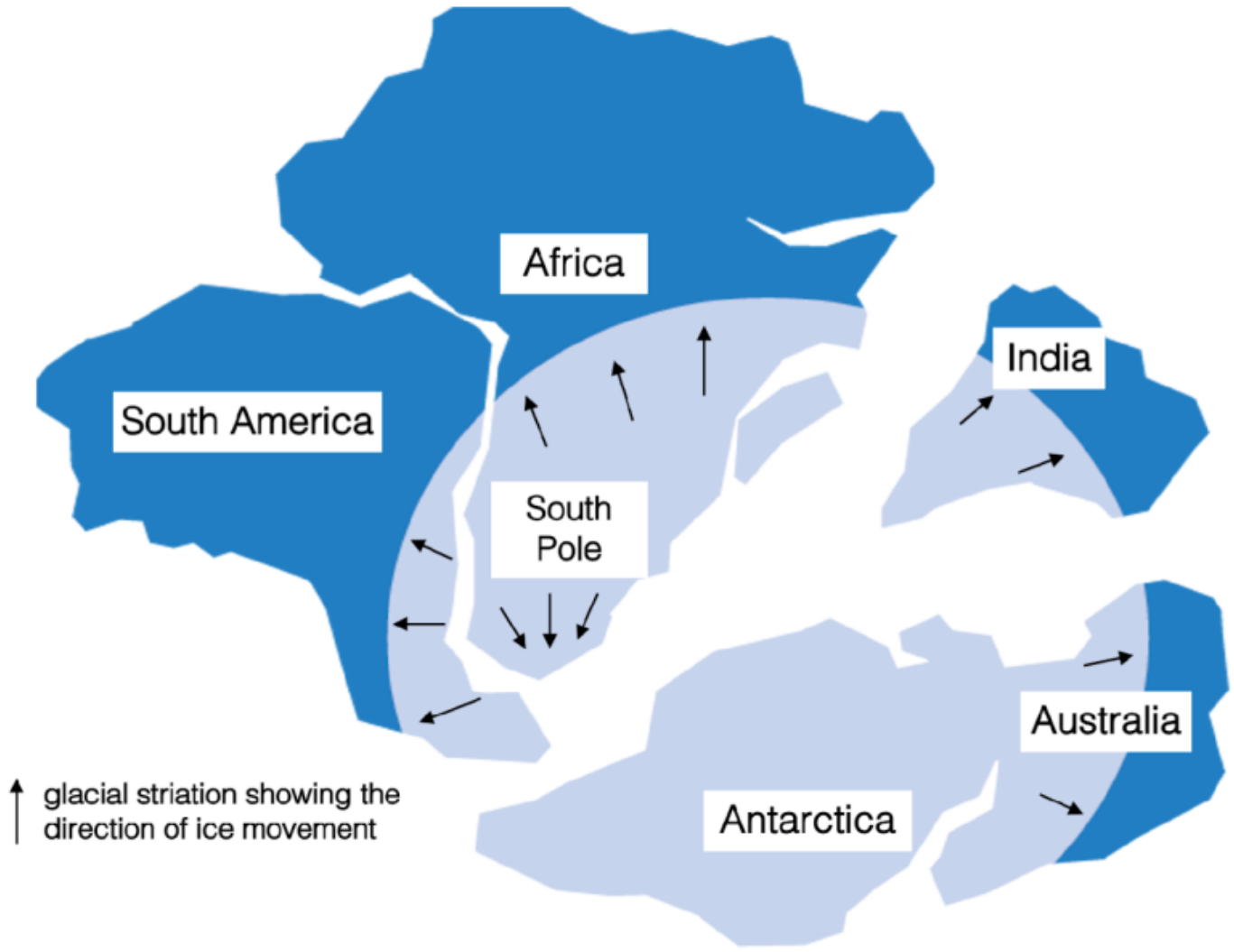
Exhibit D: Glacial Evidence



Glacial Evidence

The Permo-Carboniferous ice sheet is shown in the diagram. This was a glacier that existed about 300 million years ago. Evidence for this glacier is found in deposits in Antarctica, South America, Africa, India and Australia. If the continents didn't move then this glacier would have extended to the equator.

Glacial striations are scratches left on the surface as the ice moves boulders across it. These scratches show the direction of ice movement. When we put the continents together we can see that there was one glacier rather than multiple ones and that it originated from the South Pole.

Build your case based on the evidence above. Explain how the glacier evidence supports the idea of continental drift.

EXHIBIT E1

SEAFLOOR EVIDENCE MAGNETIC STRIPES

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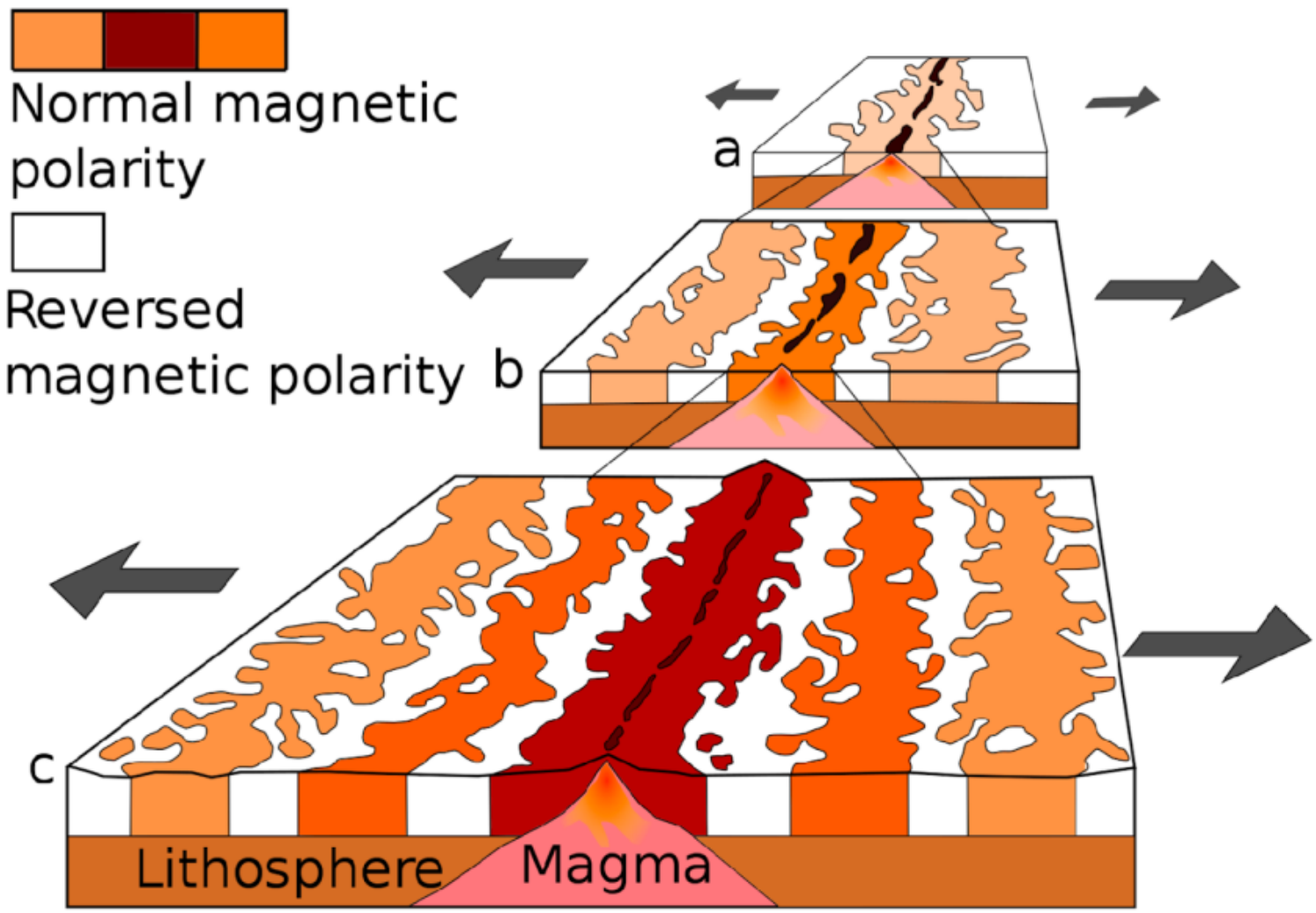
Exhibit E1: Seafloor Evidence Magnetic Stripes



Source: US Geological Survey

The earth's magnetic field can reverse. When magma cools at the ridge it assumes the magnetic properties of the earth's magnetic field at that time. Scientists have discovered that there are matching symmetrical "magnetic stripes" on either side of the ridge. This supports the theory of continental drift.

Build your case based on the evidence above. You must explain the evidence above to the jury and make sure they understand how important this evidence is. Make notes in your defense pack.

EXHIBIT E2

SEAFLOOR EVIDENCE
AGE OF ROCKS

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Exhibit E2: Seafloor Evidence
Age of Rocks

Seafloor Evidence

As the plates move away from each other hot magma rises up to fill the space left behind. This quickly cools and forms ridges. We would expect the rock at the ridge to be younger than rock further away if the plates are moving apart.

Can you prove that this is the case? The data shown here comes from the Deep Sea Drilling Project. Make a graph of the age of the rock (x-axis) against the distance from the ridge (y-axis) to help support your case in your defense pack.

Age (millions of years)	Distance (km)
11	191
24	380
26	506
33	643
40	727
49	990
67	1270