ACTIVITY GUIDE

Here are activities associated with the Planet Earth program at the Royal Tyrrell Museum.
Below is an activities-by-grade chart to help you decide which are the best activities for your class.

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2	Earth's Interior	●	●	●	
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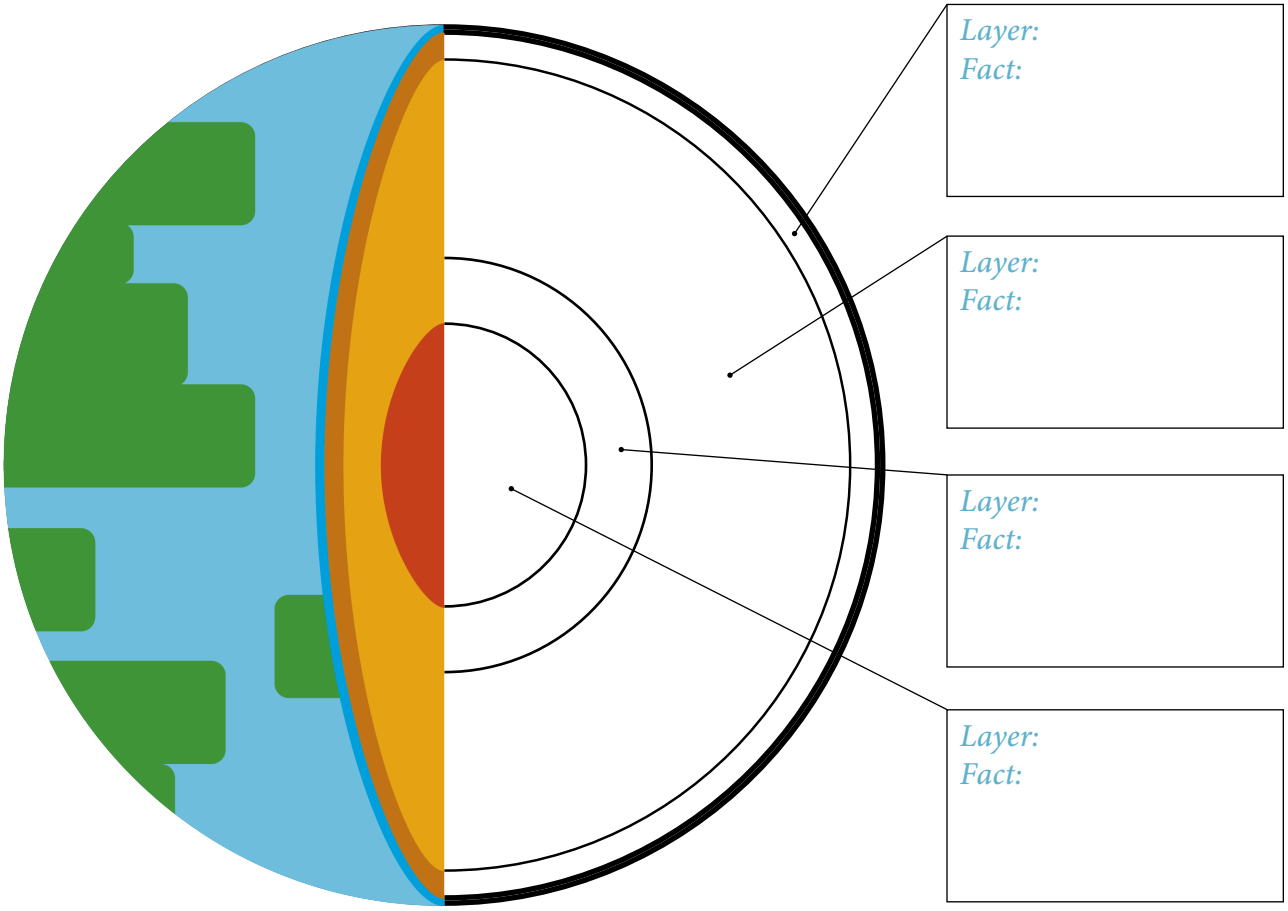
ACTIVITY 1

Earth's Interior

Recommended for grades 6 – 8

Our planet started to form 4.6 billion years ago, with molten rock colliding to create a large rocky body. As the elements within the rock started to separate, the heavier elements sank to the middle of our planet and the lighter ones rose to the surface. The internal structure of our planet has remained the same for around 4 billion years.

Label the internal layers of our planet and include a fact about each. Feel free to colour your diagram, and remember the layers get hotter as you move closer to the centre!

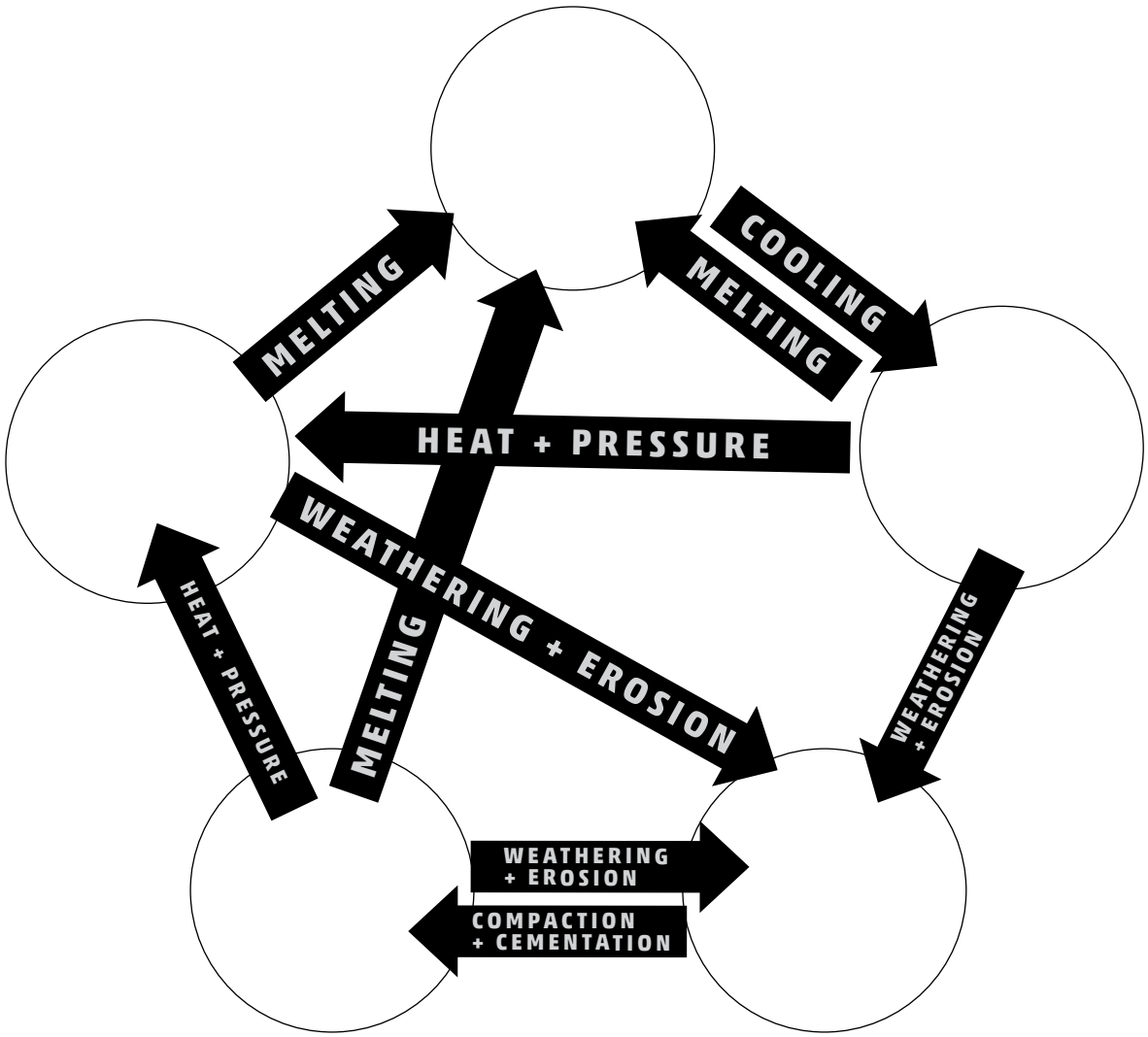


ACTIVITY 2

Rock Cycle Roundabout

Recommended for grades 6 – 8

Once the internal structure of our planet had been established, the molten rock began to cool and the rock cycle began. All of our planet's rocks are divided into three categories, although each one can be recycled into a different type. Complete the rock cycle below using your knowledge of geology, and your creativity to draw what each stage looks like!

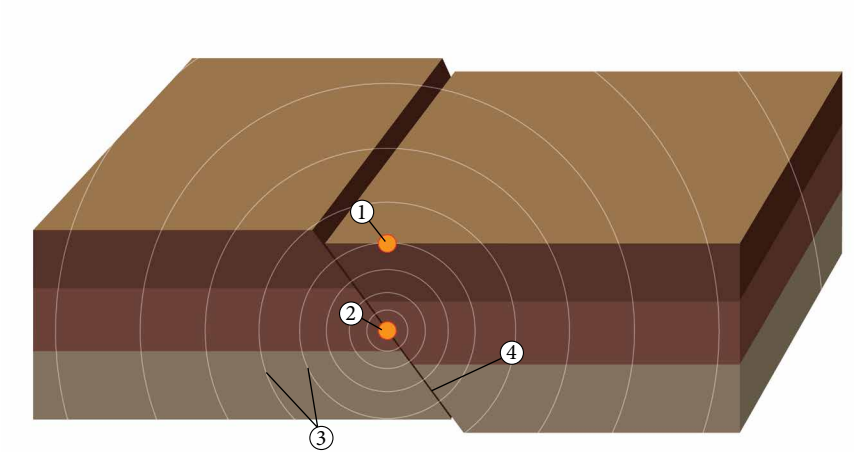


ACTIVITY 3

All Shook Up

Recommended for grades 6 – 9

Due to the movement of our planet's plates, the crust can release energy by rupturing and rebounding, causing vibrations known as earthquakes. There is a lot of technical jargon associated with earthquakes. Can you match up the terms to the diagram?



___ **Seismic Waves:** shock waves caused by an earthquake

___ **Fault:** large cracks in the rock caused by strong force

___ **Focus:** the point where an earthquake starts

___ **Epicentre:** the point on the surface directly above an earthquake disturbance

The Richter scale is used to measure the magnitude of earthquakes. The scale starts at zero and for each increase of 1 magnitude represents a force of 10x increase in ground motion. (e.g., Magnitude 2 earthquakes are 10x stronger than magnitude 1).

How much stronger would a 7 magnitude earthquake be compared to a 4 magnitude? _____

ACTIVITY 4

Disaster Debaters

Recommended for grades 8 – 9
Most of the geologic activity on our planet is the cause for major disasters across the globe. Have students form small groups and assign each of the groups one of the following Earth events. Students should research their event to understand what causes the event and reasons for why it is so impactful and damaging. Organize for students to present their findings to the class, then have students debate which of these events is most destructive.

Topics can include:

- Earthquakes
- Tsunamis
- Volcanic eruptions
- Landslides
- Sinkholes

Some guiding questions for each group can include:

- Where does this event take place the most on our planet?
- What sort of environmental impact does this event have?
- What strategies do we have for minimizing the impact of this event?
- How common is this event globally on an annual basis?
- What causes this event to happen in the first place?
- Are there human impacts that have increased the frequency of this event?

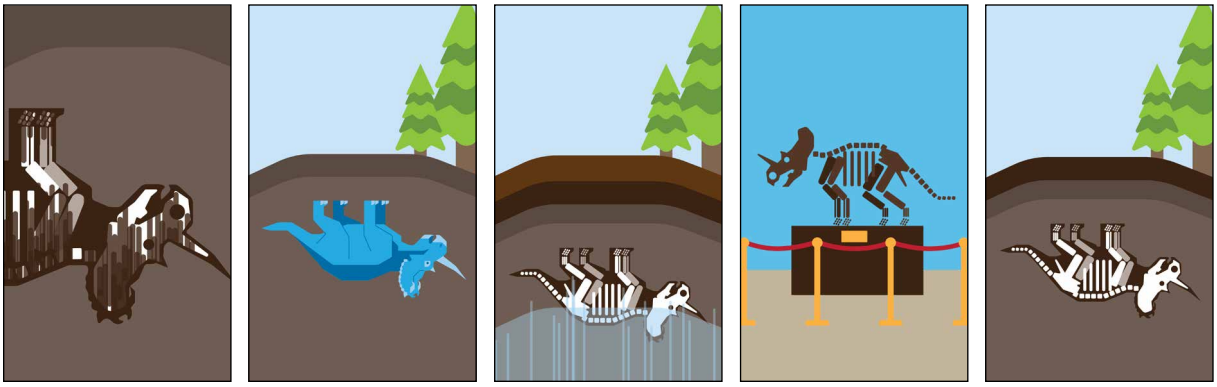
ACTIVITY 5

Fossilization Scramble

Recommended for grades 6 – 9

There are several ways that fossils can form, these can include permineralization, replacement, carbonization, impressions, etc. One of the most common ways for dinosaur bones to be preserved is through the process of permineralization. Below the process description is arranged in chronological order, but the illustrations of each step are scrambled. See if you can match the process description with the illustration that matches by connecting each one with a line.

1. The dinosaur is buried quickly by sediments, protecting it from scavengers and slowing the decay process.	*2.* The soft parts of the body decay away, leaving behind the hard skeleton.	*3.* Groundwater carries dissolved minerals down into the rock layer containing the skeleton.	*4.* The minerals fill the spaces within the tissue, depositing in place and hardening.	*5.* The organic tissues decay away, leaving a hard fossil behind.



ACTIVITY 6

Riddle What Remains

Recommended for grades 7 – 9

Palaeontologists rely on the preservation of ancient remains in order to understand the past. The mysteries of ancient organisms can be teased out of the rock through careful examination. Examine the riddles below and see if you can determine the type of fossilization for each organism.

Fossilization Types:

Permineralization	Amber	Carbonization
Replacement	Mummification	Trace Fossil

1. _____

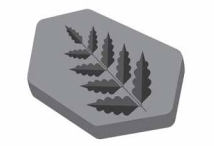
"Look at my colour for it is gold,
calculate my age for it is old,
take a close look and you may see,
a bug is trapped inside of me!"

2. _____

"Fearsome beasts stepped in the mud,
they left no bones, teeth or blood,
instead you'll find a secret clue,
about their movement - two by two."

3. _____

"The perfect way to find a bone,
minerals completely turned it to stone,
every cell has been made new,
a perfect copy ready for review."



4. _____

"Although I once was fresh and green,
only carbon is left to be seen,
my soft plant tissues fell away,
a fine black etching here to stay."

5. _____

"Alive at a time when Earth was cold,
the permafrost kept away the mold,
the body shriveled up and froze,
this ancient creature with a trunk-like nose."

6. _____

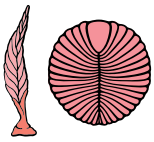
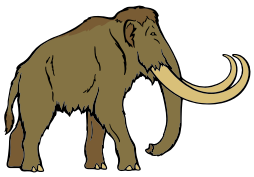
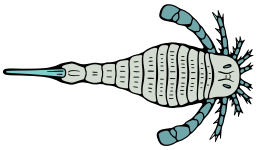
"A slow and steady mineral flow,
inside the empty spaces below,
once the tissues are all gone,
internal structures have been drawn."

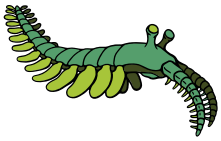
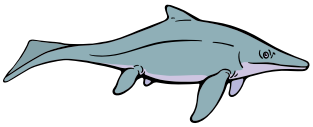
ACTIVITY 7

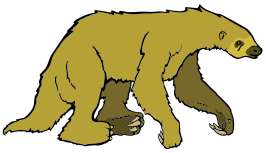
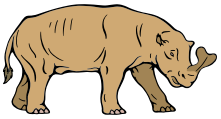
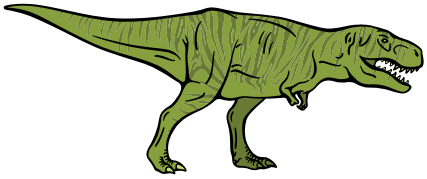
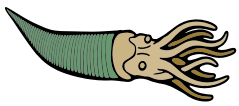
Making Time

Recommended for grades 6 – 9
Through the collaboration of palaeontologists and geologists around the globe, time has been divided into chronological units based on the organisms that lived during each period, as well as the large scale changes to our planet.

In order to understand how these times are arranged, cut out the segments below and order the time scale with the oldest starting at the bottom, and youngest rock layers on top. Match each organism icon to the corresponding period in which they lived.

PRECAMBRIAN
4.6 billion – 541 million years ago

ORDOVICIAN PERIOD
485 – 444 million years ago

JURASSIC PERIOD
201 – 145 million years ago

QUATERNARY PERIOD
2.6 million years ago – present

PERMIAN PERIOD
299 – 252 million years ago

SILURIAN PERIOD
444 – 419 million years ago

PALAEOGENE PERIOD
66 – 23 million years ago

CRETACEOUS PERIOD
145 – 66 million years ago

CARBONIFEROUS PERIOD
359 – 299 million years ago

DEVONIAN PERIOD
419 – 359 million years ago

NEOGENE PERIOD
23 – 2.6 million years ago

TRIASSIC PERIOD
252 – 201 million years ago

CAMBRIAN PERIOD
541 – 485 million years ago

GEOLOGIC TIME SCALE