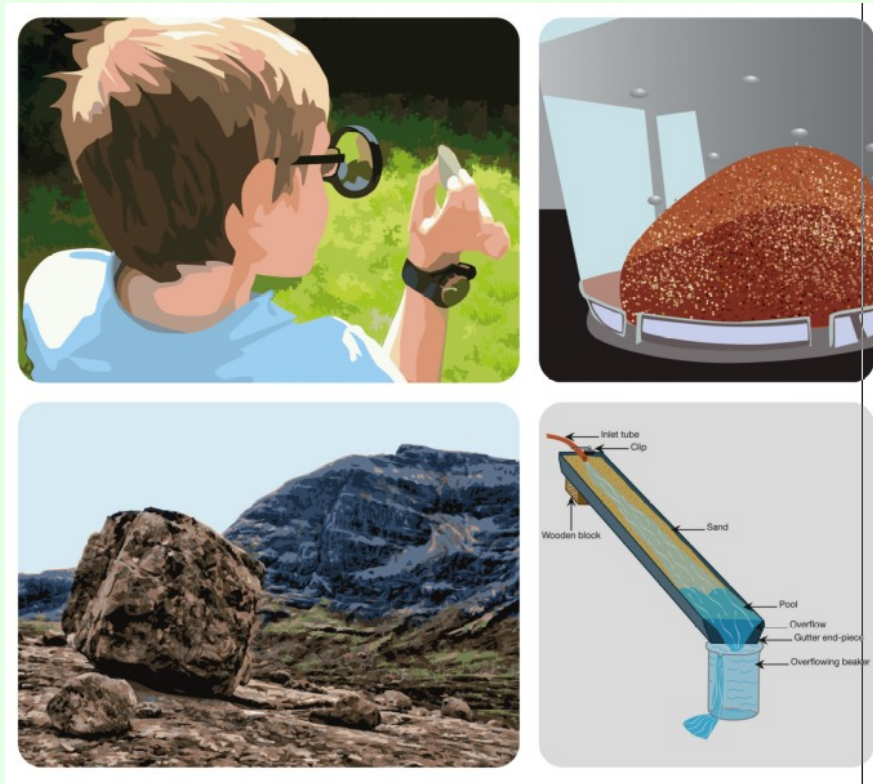


Earth's surface activity

- quick to very, very slow



**Geography
video
workshop
for ages 11 - 14**

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Earthlearningidea online video workshops

Purpose – ESEU background

- Most Earthlearningidea online video workshops are based, with permission, on workshops originally developed by the Earth Science Education Unit (ESEU)
- These were designed as interactive workshops for teachers and trainees, involving interaction, discussion and presentations by participants to others
- Global research into professional development workshops shows that these aspects are critical to success
- ESEU research shows that this workshop approach is highly successful in changing teaching in schools; evaluation feedback has also been very strong

Earthlearningidea online video workshops

Purpose – Earthlearningidea development

- The Earthlearningidea Team has developed the ESEU workshops into online video workshops for those unable to take part in face to face interactive workshops
- Each workshop is led by a PowerPoint presentation and has an accompanying booklet that contains all the activity background details, resource lists, risk assessments, etc.
- The individual workshop activities have been published for open access online at the website:
<https://www.earthlearningidea.com/>
- Each workshop activity has a question script and a video keyed into CASE principles, that can be accessed through the PowerPoint hyperlinks
- The aim is to facilitate online Earth science learning

Earth's surface activity – using CASE

Teaching Earth science using the Cognitive Acceleration through Science (CASE) approach

- The activities in this workshop are keyed into the CASE approach – to develop thinking skills while teaching key Earth science material
- If you are unfamiliar with the case approach, you can access a video introduction at:
<https://www.earthlearningidea.com/Video/CASE.html>
- An exemplar Earth science teaching activity with a question script using the CASE approach is at:
https://www.earthlearningidea.com/Video/Atmosphere_ocean.html

Earth's surface activity

Video run times	m	s
<i>Starter: What's the difference between weathering and erosion?</i>	8	19
1. A rocky look, touch, tell	16	10
2. Will my rock hold water?	10	42
3. Ice power - freezing water in a syringe to measure the expansion	6	36
4. Rock, rattle and roll - erosion	6	38
5. Flowing water - moving sand	10	45
6. Ice - grinding, gouging and depositing	7	30
7. The washing line of time	12	27
8. How long does it take? - quick to very, very, very slow	7	36
9. The toilet roll of time	6	30
<i>Plenary: From observation and testing to rock identification</i>	-	-
<i>Optional: Party time for volcanoes</i>	6	29
<i>Optional: Brickquake</i>	11	88

Earth's surface activity

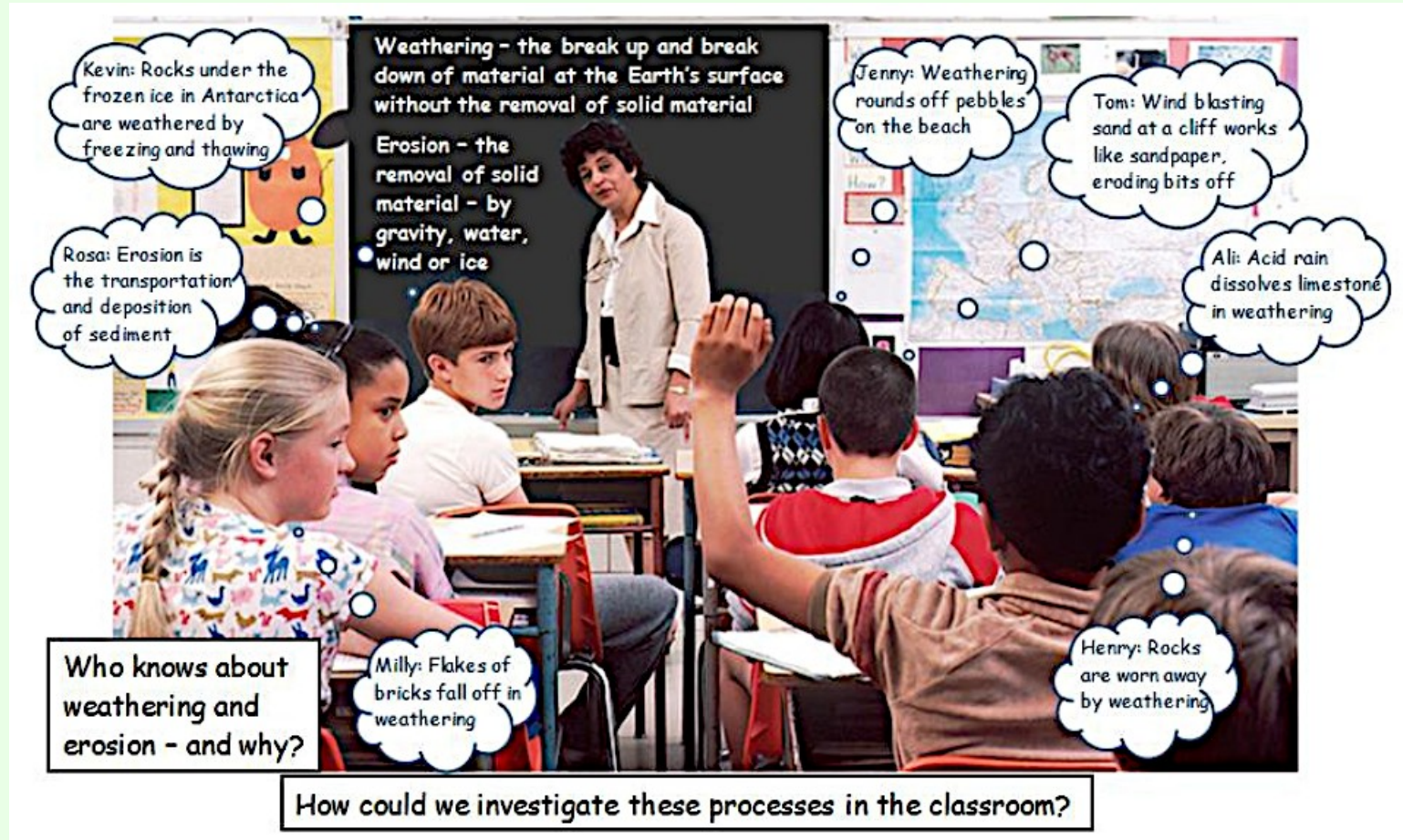
Workshop outcomes

The workshop and its activities provide the following outcomes:

- Insights into ways of distinguishing and identifying different rocks based on their properties.
- Demonstrations of how rock properties affect landscape formation.
- Focus on the key processes of weathering, erosion, transportation and deposition by both water and ice.
- Different approaches to considering geological time and the rate of geological processes.
- Discussions and demonstrations about the state (solid/liquid) of the layers.
- Means of addressing common Earth science misconceptions.
- Links to the geography and science of Earth processes.
- Guidance on how the elements of Earth science in the curriculum can be taught most effectively.

Earth's surface activity

What's the difference between weathering and erosion?



Go to: <https://www.earthlearningidea.com/Video/Geog0.html> hyperlink

Earth's surface activity

Circus activity 1: A rocky look, touch and tell



Go to: <https://www.earthlearningidea.com/Video/Geog1.html> hyperlink

Earth's surface activity

Circus activity 1: A rocky look, touch and tell

Sedimentary rocks

are usually made of grains that are stuck together and can often easily be scratched off

Crystalline rocks

are usually made of interlocking grains that are very hard to scratch off

Igneous rocks

are crystalline rocks made of different minerals scattered through them

Metamorphic rocks

are crystalline rocks with minerals in layers or bands or made of just one material

Earth's surface activity

Circus activity 2: Will my rock hold water?



Go to: <https://www.earthlearningidea.com/Video/Geog2.html> hyperlink

Earth's surface activity

Circus activity 3: Ice power



Go to: <https://www.earthlearningidea.com/Video/Geog3.html> hyperlink

Earth's surface activity

Circus activity 4: Rock, rattle and roll - erosion



Go to: <https://www.earthlearningidea.com/Video/Geog4.html> hyperlink

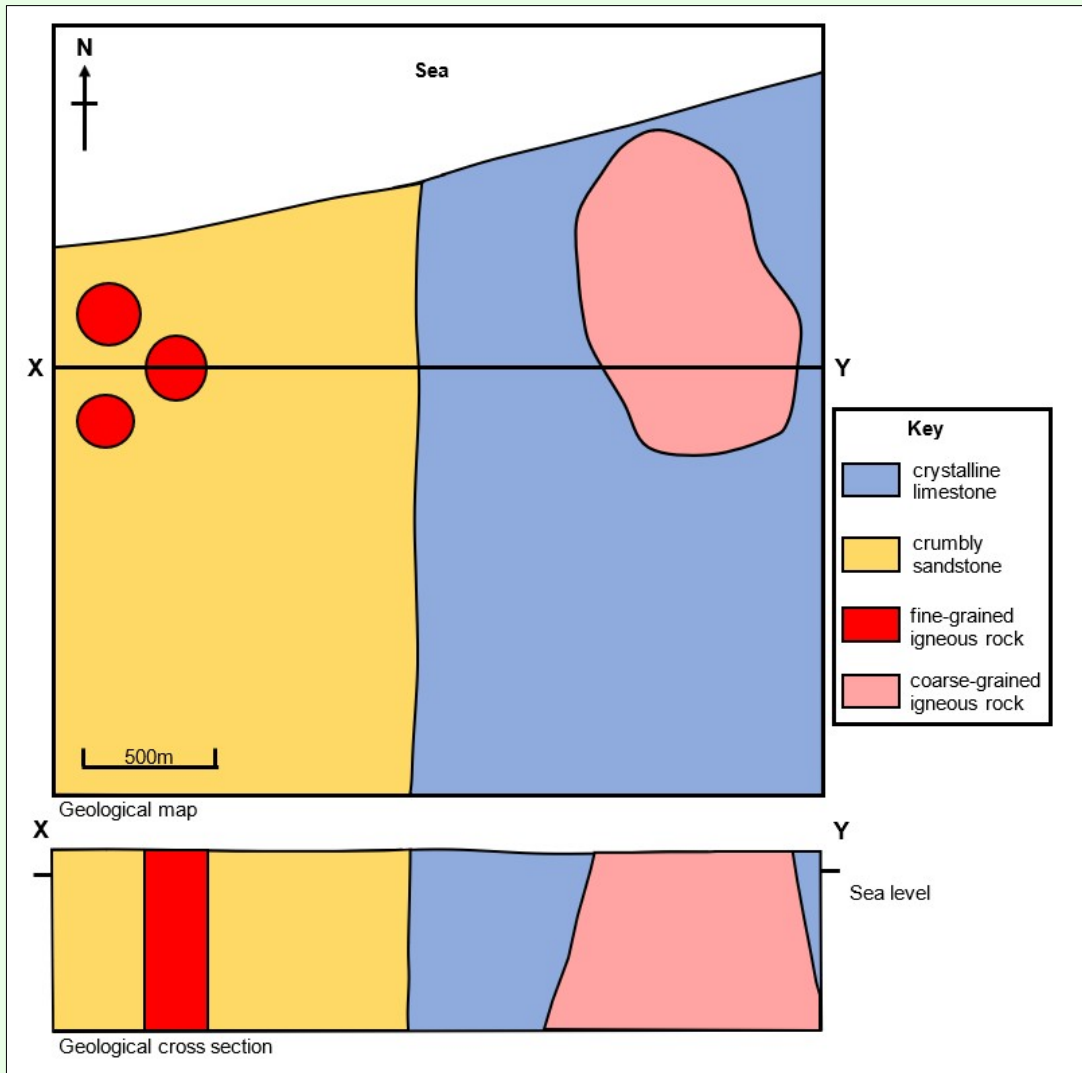
Earth's surface activity

Erosion – investigating the resistance of rock samples

This area formed of four
different rock types has a
straight coastline and a flat
surface.

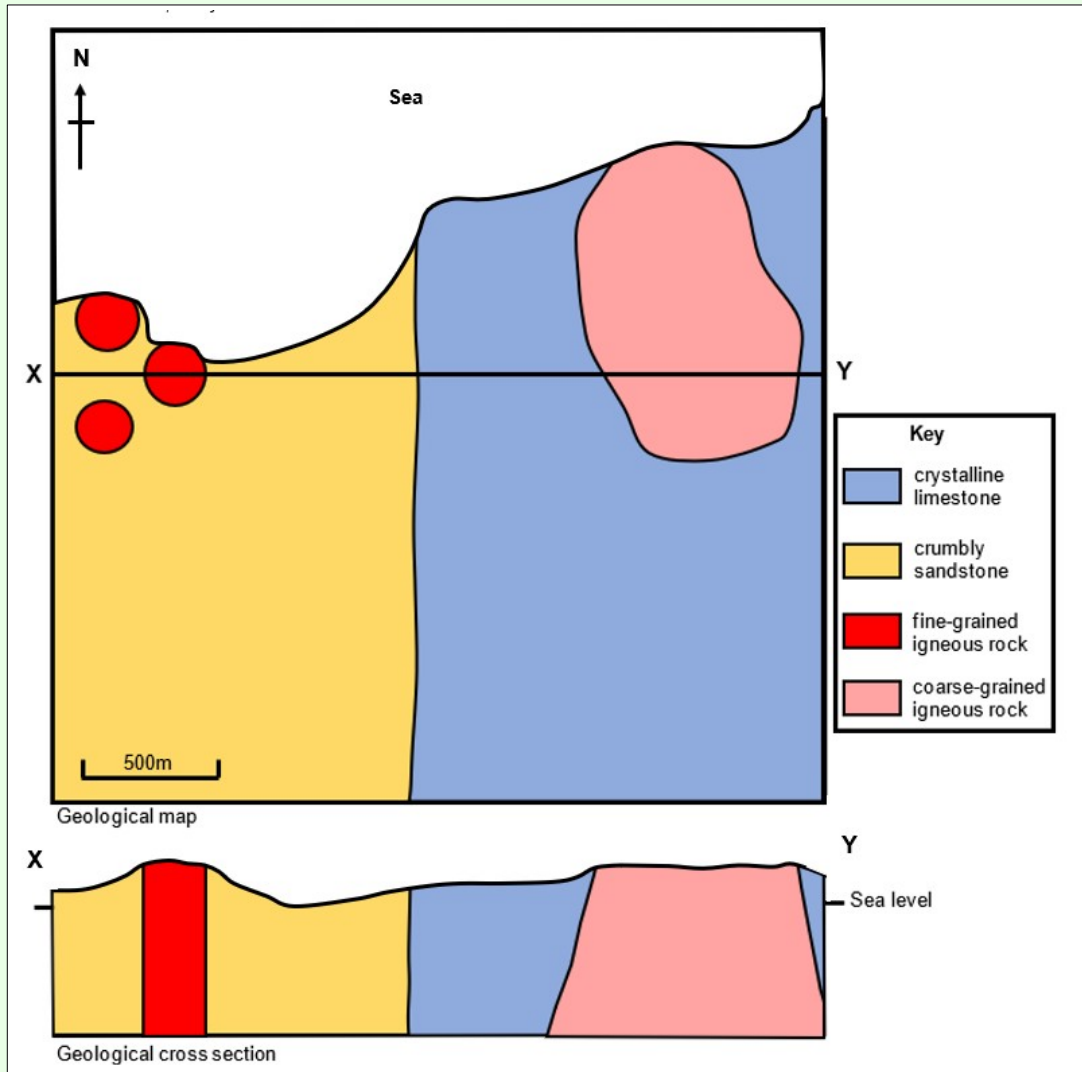
What will it look like in
10,000 years ?

Next slide shows the answer



Earth's surface activity

Erosion – investigating the resistance of rock samples



- Which rocks form headlands, hills? Which form bays, valleys?
- What does it mean when you walk uphill?

Earth's surface activity

Circus activity 5: Flowing water – moving sand



Modelling river processes:-



Small-scale sedimentary processes:-



Go to: <https://www.earthlearningidea.com/Video/Geog5a.html> hyperlink

Earth's surface activity

Circus activity 6: Ice – grinding, gouging and depositing



Go to: <https://www.earthlearningidea.com/Video/Geog6.html> hyperlink

Earth's surface activity

Circus activity 7: The washing line of time



Images for the cards can be found in the workshop booklet

Go to: <https://www.earthlearningidea.com/Video/Geog7a.html> hyperlink

Earth's surface activity

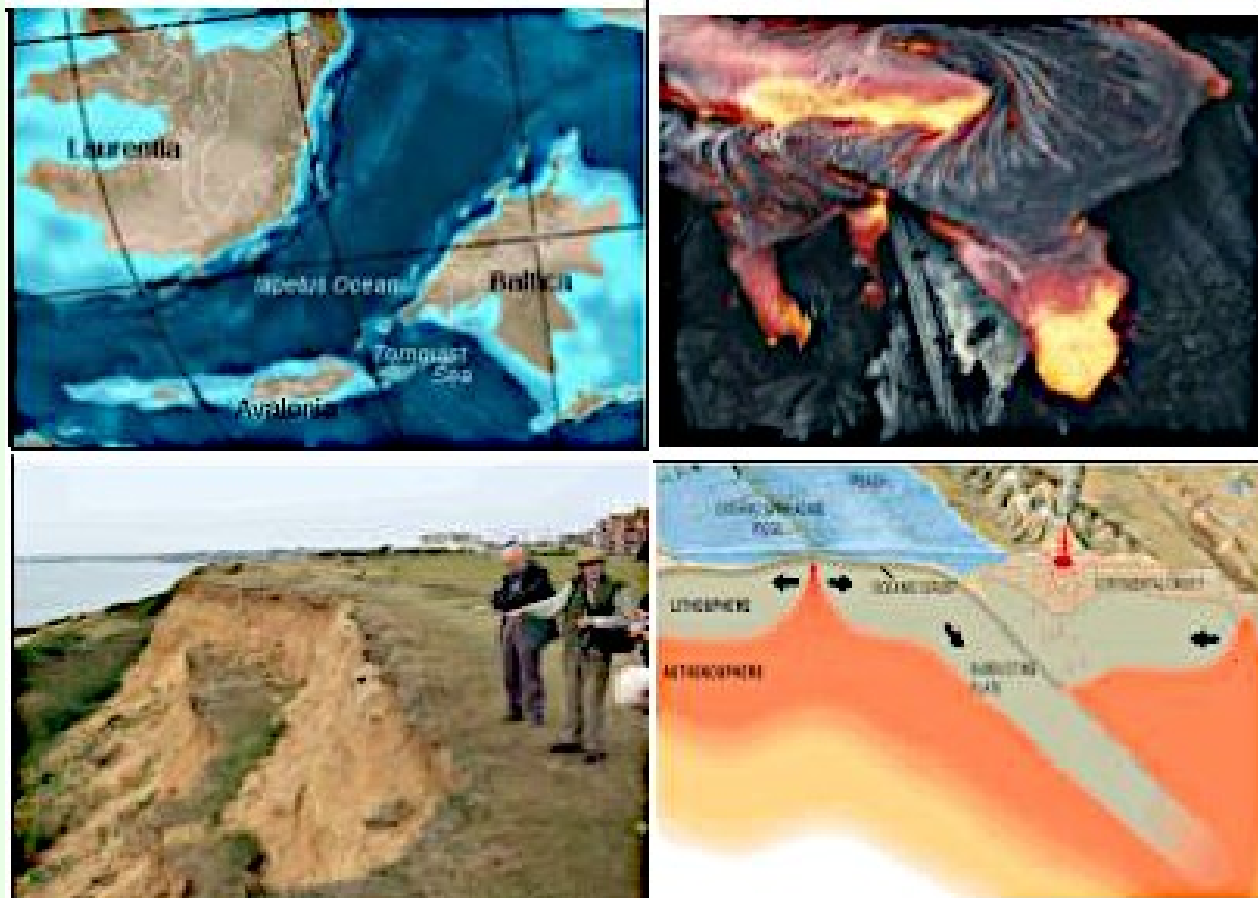
Circus activity 7: The washing line of time

The table below provides dates and distances for a 4.6 metre washing line (1 million years = 1 mm).

Event	Millions of years ago (Ma)	Distance from 'present day' (cm)
First humans (genus Homo)	2	0.2
First grasses	55	5.5
K-T boundary mass extinction	65	6.5
First flowering plants	130	13
First birds	150	15
First mammals	220	22
First dinosaurs	225	22.5
The 'Great Dying' mass extinction	251	25.1
First reptiles	325	32.5
First plants with seeds	360	36
First amphibians	360	36
First plants on land	420	42
First animals with hard parts	545	54.5
First multicellular organisms	1200	120
First eukaryotes	2000	200
First bacteria	3500	350
The origin of the Earth	4567	460

Earth's surface activity

Circus activity 8: How long does it take?
- quick to very, very, very slow

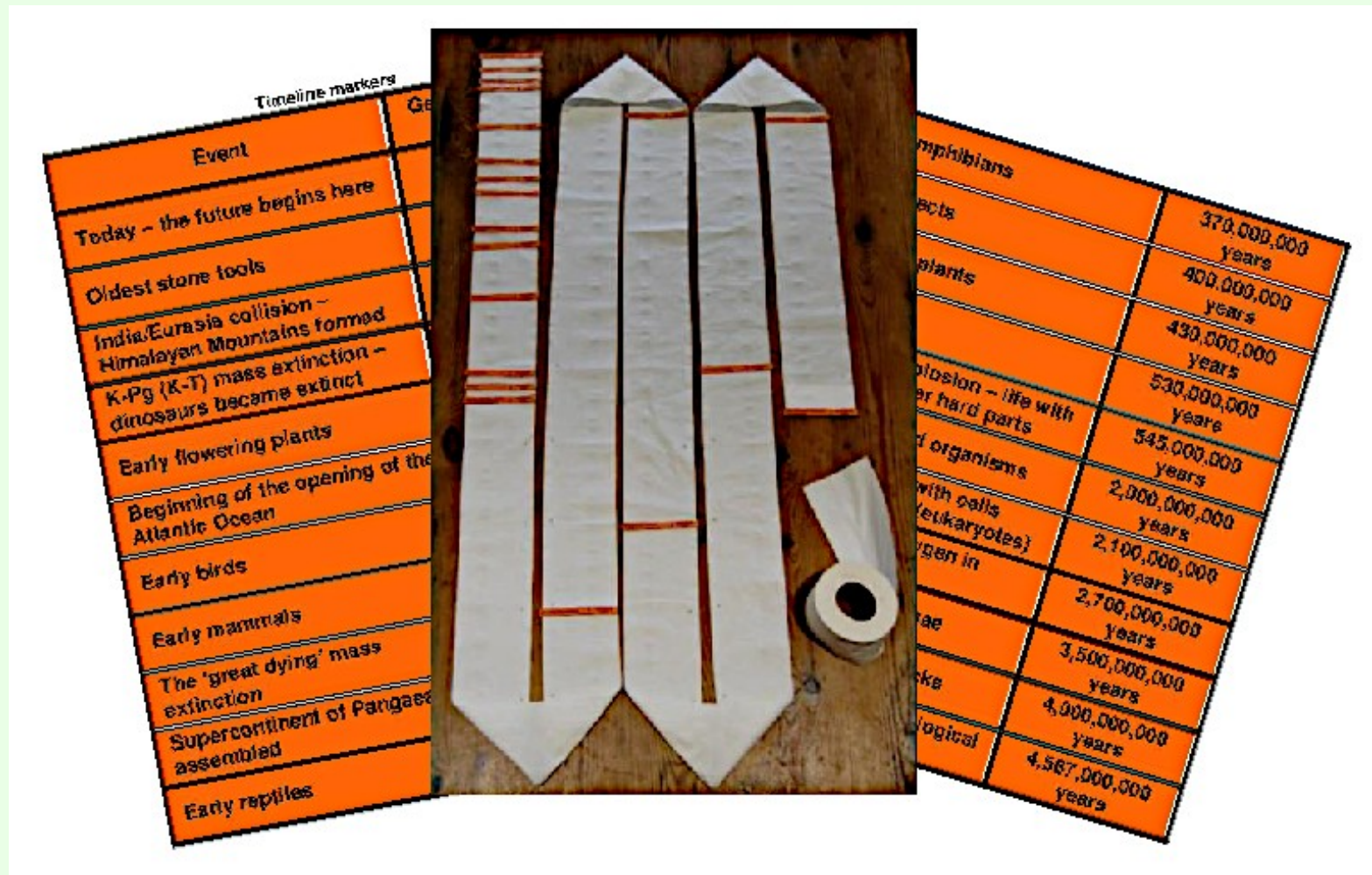


Timing Earth events cards can be found in the workshop booklet

Go to: <https://www.earthlearningidea.com/Video/Geog8.html> hyperlink

Earth's surface activity

Circus activity 9: The toilet roll of time



Go to: <https://www.earthlearningidea.com/Video/Geog9.html> hyperlink

Earth's surface activity

Plenary: From observation and testing to rock identification

Give the pupils a selection of rock specimens and ask them to use the methods from activities, 'A rocky, look, touch, tell' and 'Will my rock hold water?'

To sort the rocks into:

- **Crystalline** – made of interlocking grains and so usually impermeable and tough
- **Sedimentary** – made of grains subjected to compression and compaction and so
- usually permeable and weak

Then ask them to further subdivide the crystalline rocks into:

- **Igneous** – crystalline rocks made of randomly oriented grains
- **Metamorphic** – crystalline rocks usually made of aligned grains



Suitable rock specimens for identification

Earth's surface activity

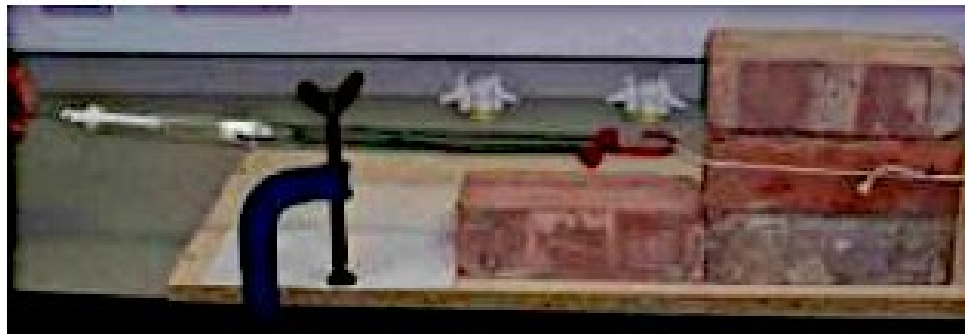
Optional: Party-time for volcanoes



Go to: <https://www.earthlearningidea.com/Video/Geog10.html> hyperlink

Earth's surface activity

Optional: Brickquake



Go to: <https://www.earthlearningidea.com/Video/Geog11a.html> hyperlink

Earth's surface activity

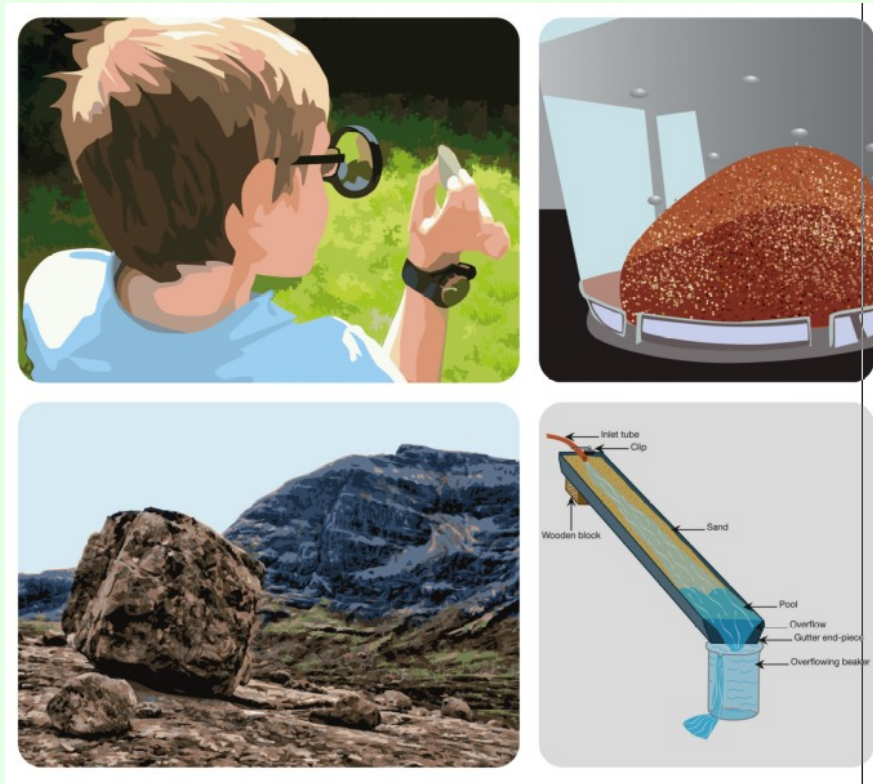
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