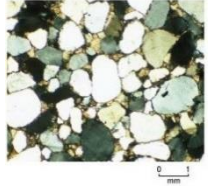


Properties of minerals:  
 Colour  
 Hardness  
 Lustre  
 Cleavage  
 Acid reaction  
 Density  
 Streak

The main 10 minerals:	
Galena	Haematite
Mica	Quartz
Feldspar	Halite
Calcite	Garnet
Augite	Olivine

How do minerals form?  
 Hydrothermal:  
 Evaporites:

Describing rock texture:  
 Size:  
 Shape:  
 Sorting:



**IGNEOUS ROCKS**

**Intrusive:**  
 Crystal size:  
 Features;  
 Formation (where?):

**Extrusive:**  
 Crystal size:  
 Features;  
 Formation (where?):

**Earth Materials**

GCSE minerals

Rock texture

What are the features of **sedimentary rocks**?

What are the features of **igneous rocks**?

What are the **main rock types** and how/where do they form?

**Clues about their formation:**  
Weathering and Erosion to form sediment

Grain size  
 Grain shape  
 Colour  
 Sorting  
 Fossils

**Sedimentary structures:**  
 Cross bedding  
 Ripple marks  
 Graded bedding  
 Desiccation/Mud cracks

**Metamorphic rock formation**

Parent Rock =

**Contact/Thermal:**  
 Effects are? HEAT

**Regional:**  
 Effects are? HEAT  
 PRESSURE

Main features are:  
 Aureole Cleavage  
 Foliation  
 Re-crystallisation

<b>Igneous</b>	Granite	Basalt
	Peridotite	Andesite
<b>Sedimentary</b>	Conglomerate	Coal
	Sandstone	Red (desert) sandstone
	Breccia/Till	Limestone
	*Turbidites	
<b>Metamorphic</b>	Slate	Schist
	Metaquartzite	Marble

**Volcanic Hazards:**  
 Primary:  
 Secondary:

<b>Volcanoes:</b>	Cone	Shield
Magma:		
Eruption:		
Danger:		

Structure of the Earth

Plate boundaries - Diagram/  
 description/ landforms for...

**Earthquake Hazards:**  
 Primary  
 Secondary

What are the tectonic hazards and dangers

What are plate boundaries and how does plate movement generate a variety of landforms?

Destructive (Ocean/Continent)-Chile

Types of landslide and case study: Vargas Mudslides

**Plate Tectonics and Hazards**

What are the main case studies for a volcano, earthquake, and tsunami?

Destructive (Ocean/Ocean)-Japan

What are the benefits of living near volcanoes? Examples:

How can these hazards be monitored?

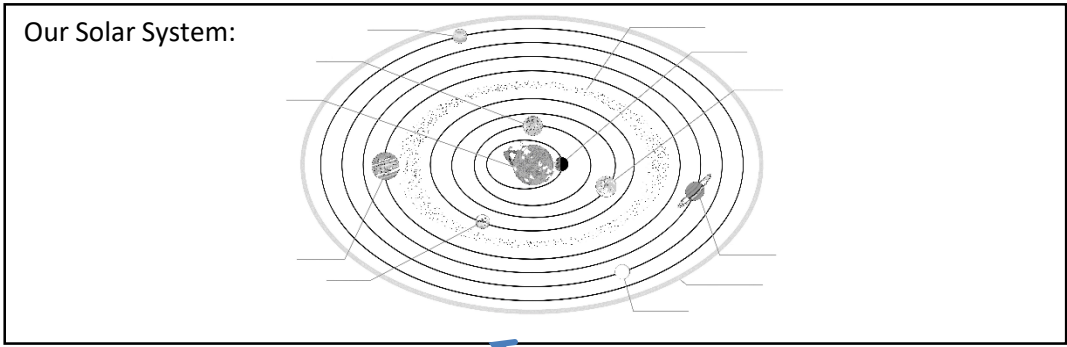
*Volcano Case Study: Mt Pinatubo, Philippines*  
 Background info:  
 Hazards:  
 Effects:  
 Three P's:

*Earthquake Case Studies: Kobe and Japanese Tsunami*  
 Background info:  
 Hazards:  
 Effects:  
 Three P's:

Collision boundary-Himalayas

<b>The three P's (Prediction, Preparation and Protection):</b>	Earthquakes	Volcanoes	Landslides
Prediction?			
Protection?			
Preparation?			

Conservative-San Andreas fault/Haiti



**Lunar Landforms and Rocks:**

Craters:

Rolling features:

Igneous rocks (Basalt):

What types of objects make up our solar system?

What makes up or solar system?

**Planetary Geology**

The 'Present is the key to the past' – in SPACE.

**Martian Rocks and Features:**

Red sandstone:

Conglomerate:

Cross bedding:

Desiccation cracks:

Asteroids	Meteoroids	Comets
Description:	Description:	Description:
Effects of impacts:	Stony:	Tail:
	Iron:	
Example:	Meteor:	
	Meteorite:	
Effects of Impacts:		
Positive:		
Negative:		

Impacts in Space:

Better preserved impacts on moon or Mars than Earth – Why?

**Martian landforms:**

Impact craters:

Slope streaks:

Deserts?:

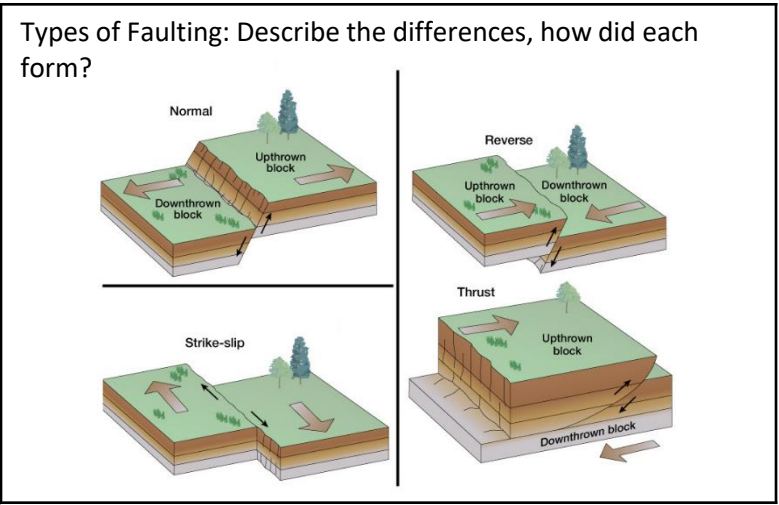
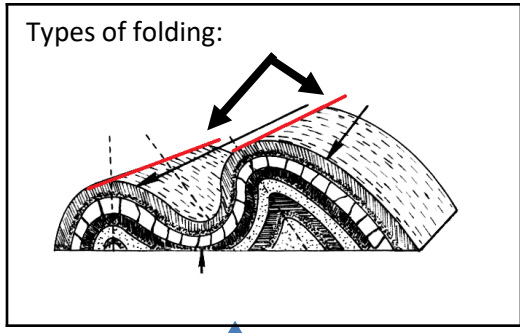
Valleys:

Rivers?:

What causes rocks to be deformed?

What is **folding**?

What is **faulting**?



How do we interpret the geology from a map?

How are rock layers deformed?

Map symbols	Features on maps
<ul style="list-style-type: none"> <li>Horizontal beds</li> <li>Dip of beds <math>\Delta_{45}</math></li> <li>Vertical feature</li> <li>Axial plane trace (synform)</li> <li>Axial plane trace (antiform)</li> <li><math>F_1</math> — <math>F_1</math> Fault</li> <li>Metamorphic aureole</li> <li>Rock unit B</li> <li>Rock unit A</li> </ul>	
<p>Scale</p> <p>0 500m</p> <p>North</p>	

**Geological Structures and Maps**

How do we work out the order that rock layers formed in?

What is an unconformity?

Formation:

Working out a geological history:

Clues from block diagrams or maps: e.g.

Way up evidence: Explain each of these:-

- Superposition (rocks on top)
- Cross cutting relationships
- Included fragments

Sedimentary structures that can tell way-up:

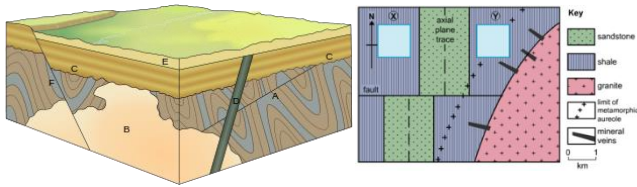
Mud cracks

Graded bedding

Ripple marks

Cross bedding

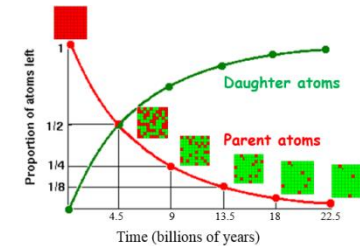
Using block diagrams or maps:



**Relative dating:** How do we put rocks in order?  
Cross cutting  
Included fragments

Unconformities  
Metamorphism

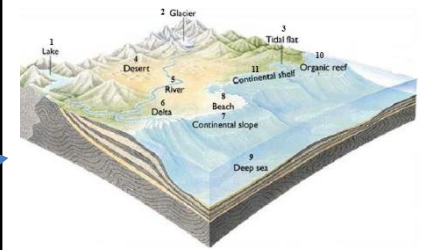
**Absolute (radiometric) dating:** How does it work?



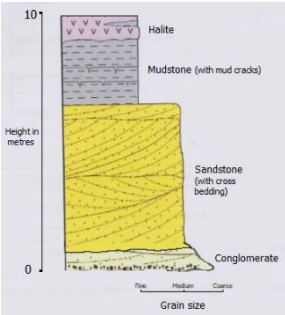
How did early life form?  
Conditions needed:

Likely environments:

Preservation potential – what are the chances?



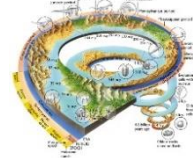
Interpreting evidence (logs)



Review of Geological histories?

Britain changing over time?

Earth History/Future



How did life form and get fossilised?

Climate Change over time

Clues include: **Fossils**

**Rock types** (Grain size and shape)

**Metamorphic and Igneous rocks**

**Structures** (folds and faults)

Major fossil groups and their features

Trace fossils

Usefulness:



Plants

Usefulness:



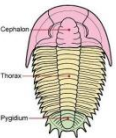
Reef building corals

Usefulness:



Trilobites

Usefulness:



Graptolites (Simpler)

Stipe and theca:

Other:

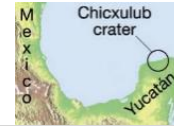
Usefulness: Zone fossils

Good zone fossils must have:

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_
- 4) \_\_\_\_\_
- 5) \_\_\_\_\_

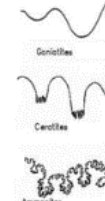
K/Pg Mass extinction

Causes:  
Effects:



Cephalopods (Complex)

Suture lines:  
Evolution:



Usefulness: Zone fossils

Icehouse vs Greenhouse

Effect of global warming on sea-level

Positive and Negative controls:  
Albedo effect      Carbon cycle

Where are Greenhouse gases from?

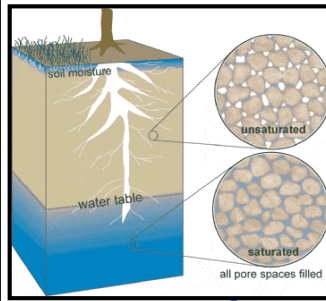
Reducing impacts – SEQUESTRATION

## Prospecting for minerals

Geophysical techniques:

- Magnetic surveys
- GPR (Radar)

Geochemical techniques:



How is water stored inside rocks?

Groundwater:

To make an aquifer a rock must be:

Permeable:

Porous:

What is the **water table**?

Major resources

Haematite :

Uraninite:

Limestone:

Finding mineral resources

Hydrogeology

What makes a good dam/reservoir site?

**Earth Resources and Engineering**

The Oil Industry

Landfill and waste

How is waste managed in a landfill site?  
What is the correct Geology?

Finding Oil: a) Seismic surveys b) Boreholes (Forams)

**Carbon sequestration**

Leachate:

Methane:

Lining and cap:

Formation of oil and gas?

Porosity and permeability – rock types

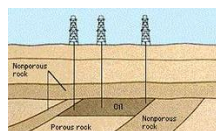
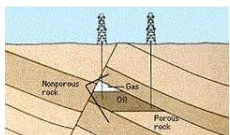
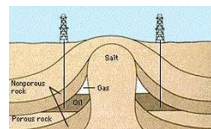
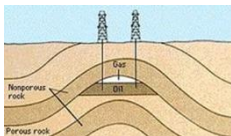
Environmental issues with oil production

Oil traps: **Reservoir** and **cap** rock

How is hazardous waste managed?

## TRAPS

What are they?



## Fracking

How?

Good or bad?

What are **reserves** vs **resources**?

