

UNIT LEARNING PACKS

FOCUS IN ACTION

Grade 7 Science Focus

Unit E - Planet Earth

'Focus in Action' UNIT LEARNING PACKS

These booklets are designed to provide Grade 7 students with all the resources needed to review or reinforce concepts, covered in the Alberta Science Curriculum, and included in the Grade 7 Science Final Exam in June. There are circumstances in which **an entire unit** may be missed and covering the concepts from that unit (for the final exam) can be difficult. This can happen for a number of reasons:

- Students – new to the school – register throughout the year (from other provinces, school jurisdictions or countries)
- Students may be ill or have surgery and often can miss one or more units
- Students have extended holidays throughout the year
- Transfers from another school, who have completed the units in a different order

For additional support, students are directed to the **Edquest Middle School Science Website** or, Scienceman Resource (www.scienceman.com/scienceinaction/pgs/hot_8u1.html)

Unit 5 – Planet Earth



- **Topic 1 Notes & Quiz**
- **Topic 2 Notes & Quiz**
- **Topic 3 Notes & Quiz**
- **Topic 4 Notes & Quiz**
- **Topic 5 Notes & Quiz**
- **Topic 6 Notes & Quiz**
- **Topic 7 Notes & Quiz**
- **Topic 8 Notes & Quiz**
- **Topic 9 Notes & Quiz**
- **Topic 10 Notes & Quiz**
- **Unit Summary**
- **Review Booklet**
(Covered in class, prior to the Final Achievement Exam)
- **Unit Test**
- **Answer Key for Section Quizzes and Unit Test**

Additional support will be provided, in the form of practice Achievement Test Questions, during the course review in June. Multiple Choice Questions and Numerical Response Questions will be reviewed, as these are the types that will make up the Science 7 Final Exam

Handouts and other activities, to reinforce the concepts covered in this Unit, will be made available based on need. If you require further information or resources, email Edquest directly: edquest@gmail.com.

Finding Solutions to Problems, instead of Making Excuses

Student Instructions for use of this Learning Pack

The purpose of this Learning Unit Pack is to provide you with the resources that will help you cover the material from the curriculum that will be tested on the Final Exam in June. Follow these steps to successfully complete this Unit Learning Pack:

Step 1 – Read the **Topic Notes**

Step 2 – Use a **highlighter** to identify the key words or phrases in the Topic Notes and reread the material again paying close attention to those words that you highlighted. If necessary, modify your highlights to make sure you understand the material in the notes.

Step 3 – Complete the **Topic Quiz**

Step 4 – Correct the Topic Quiz by **checking the answers** in the back of this Learning Pack.

Step 5 – Using your **textbook** and the **completed quiz**, find the page where the question and correct answer can be found and write it next to the question number in your Learning Pack.

Step 6 – **Repeat Steps 1-5** for each of the other Topics in this Unit.

Step 7 – Look over the **Unit Outline** to review the **Key Concepts** once you have completed all of the Topics.

Step 8 – Complete the **Unit Review**, using your **Learning Pack** and **Textbook**.

Step 9 – **Highlight** those sections of the Review that you had difficulty with and review those sections with your teacher prior to taking the Unit Test.

Step 10 – Take the **Unit Test** and correct it using the answer key provided in the back of the Learning Pack.

Step 11 – You should now be ready to answer any questions on the **Final Exam** related to this Unit.

Anything you still do not understand should be discussed with your teacher. Congratulations on your **Independent Study**, and Good Luck on the Final Exam. I hope you have made good use of this resource. Please provide feedback to your teacher, so that this resource can be improved.

Additional support is available in the form of practice Achievement Test Questions. **Multiple Choice Questions** and **Numerical Response Questions** will be made available on request, as these are the types that will make up the **Science 7 Achievement Exam**.

Handouts and other activities, to reinforce the concepts covered in this Unit may be acquired by visiting the Edquest Middle School Science Resource Website

<http://www.edquest.ca>

Topic 1 - MINERALS

Rocks contain naturally occurring, non-living minerals. Most minerals are rare and can be elements (pure substances) or compounds (combinations of pure substances). Minerals are not only found in rocks, but they are also found in your body.

Moh's Hardness Scale

- Friedrich Mohs developed a scale with 10 values of 'hardness' in 1812 (see Table 5.1 p. 355)
- Diamond is the hardest and talc is the softest (check the table to find out how hard common objects, like your fingernail)

Crystals

- Crystals are the building blocks of minerals. They occur naturally, having straight edges, flat sides and straight angles.
- There are 6 different crystal types: cubic, tetragonal, hexagonal, orthohombic, monoclinic and triclinic (Table 5.2 p. 355)

Identification of Minerals

- The properties that can be used to identify minerals are:
- **Lustre:** this refers to the 'shininess' of the mineral (how light is reflected off the surface)
- **Colour:** colour can vary even within the same mineral, like corundum (it can be white, blue or red), depending on what other elements are present.
- **Streak:** a streak is the color, of the powdered form, of the mineral. (it can be made by scratching a porcelain tile)
- **Cleavage and Fracture:** is the way a mineral breaks apart. If it breaks along smooth, flat surfaces or planes, it has cleavage. If it breaks with rough or jagged edges, it has fracture.
- **Transparency:** it can be **transparent** (see through), **translucent** (shadowy), **opaque** (non-see through).

Applications

- Iron and pyrite help the blood carry oxygen
- Kidneys produce crystals, called kidney stones
- Calcium and dolomite help regulate water in body cells
- Diamonds are used in surgery, razor blades, computers, dentistry, oil drilling and a glass-cutter's wheel has diamonds embedded in it.

Planet Earth: Topic 1 – MINERALS - Quiz

1. Minerals play an important role in your body's functions. Calcium, from calcite and dolomite, helps to regulate this in the body's cells ...
 - A oxygen
 - B blood
 - C water
 - D carbon dioxide
2. An example of growing crystals in your body is ...
 - A blood clotting
 - B urinalysis
 - C kidney stones
 - D liver oxygenation
3. Minerals can be identified by certain clues. The clue that identifies the color of the powdered form of the mineral is called its ...
 - A streak
 - B lustre
 - C color
 - D cleavage
4. Cubic, tetragonal, hexagonal, orthohombic, monoclinic and triclinic describe systems of ...
 - A mineral hardness
 - B crystal structure
 - C cleavage types
 - D synthetic models
5. There is a huge demand for perfect crystals in such things as electronic circuits, credit cards, machines, medicines and communication devices. Synthetic crystals are manufactured because natural crystals ...
 - A have impurities
 - B are rare
 - C are too soft
 - D are too expensive

Topic 2 – ROCKS AND THE ROCK CYCLE

Rocks are classified into 3 major groups

Igneous Rock

- forms when hot magma (or lava) cools and solidifies
- **Magma** is melted rock found below the Earth's crust
- Types of Igneous rock are:
 - **intrusive** (cooled and hardened magma below the Earth's surface)
 - **extrusive** (rock that forms when **lava** – *magma released during a volcanic eruption* - cools on the surface)
- Magma can contain **crystals**, their size depending on how quickly or slowly the rock cools (large crystals form when the rock cools slowly)
- Investigation 5-B Forming Crystals p.362-363

Sedimentary Rock

- is formed from sediment (loose material – rock, minerals, plant and animal remains - that is layered and **compacted** together by the pressure of the material above it)
- **stratification** is the visible evidence of the layers
- **cementation** - some of the minerals that dissolve with the addition of water, makes a natural cement that glues the pieces of sediment together.

Types of sedimentary rock include:

- shale (formed from fine clay or mud)
- sandstone (sand, made of quartz)
- conglomerate (pebbles and small stones cemented together)
- limestone (**organic sedimentary rock**, containing fossils - plant and animal remains)

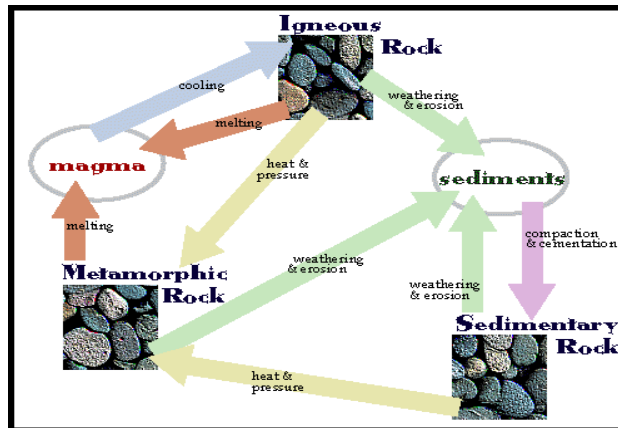
Metamorphic Rock

This type of rock has changed its form from what it was originally. It is formed below the Earth's surface by extreme pressure and heat

- the parent rock will become another type of rock depending on how much pressure and heat is used to change it
- example: **shale** → **slate** → **schist**

The Rock Cycle

Rocks are constantly changing. The Rock Cycle does not have a set order as they are weathered, consolidated, buried, melted and solidified



Visuals → <http://www.cotf.edu/ete/modules/mse/earthsysflr/rock.html>
<http://duke.usask.ca/~reeves/prog/geoe118/geoe118.001.html>

Techniques for Identifying Rocks

- appearance
- type of mineral/s present (viewed through a microscope)

Sediment and Soil

Some sediment becomes soil

- **soil formation** is determined by climate, type of rock present, amount of water, organic material, air spaces, living organisms in the soil.
- decaying material in the soil is called **compost**, when mixed with other matter, it becomes the dark-coloured portion of the soil called **humus**
- humus is rich in nitrogen, phosphorus, sulphur and potassium, which dissolve in water, making the soil **fertile** (supplying nutrients for plant growth)

Soil Profiles

Soil forms slowly over time.

It has been classified into layers, giving it a soil profile.

- **topsoil** (dark rich soil containing humus and small grains of rock)
- **subsoil** (lighter in colour with little or no humus – contains minerals that have been leached from the topsoil) **Leaching** is the removal of materials in the soil that can be dissolved in water.
- the bottom layer contains partly weathered rock and minerals leached from above and closely resembles the **parent rock** below it.

Applications

- Igneous derived from Latin *ignis*, meaning *fire*
- Building and road construction, pulp and paper and ornamentation uses limestone (which is easily cut and shaped) and sandstone (which is easily mined)
- Space rocks land on the surface from Meteorites – which are highly magnetic and similar to earth rocks
- **Granirex** (made from granite) is a building material that is only 1cm thick. Find out more at <http://www.granirex.com/>
- Also: this link provides details about the residential and commercial use of this product
- <http://www.cdkstone.com.au/granirex/gprodspc.htm>

Planet Earth: Topic 2 – ROCKS an the ROCK CYCLE - Quiz

1. Igneous rock, can be intrusive rock and extrusive rock. These rocks are all formed from ...
 - A crystals
 - B sediments
 - C magma or lava
 - D earth's crust

2. Allison and Rachel were investigating the banks of the river and discovered a large section had been eroded away. They could see layers of different soil types. These visible layers are called ...
 - A cementation
 - B sedimentation
 - C calcification
 - D stratification

3. Metamorphic rock is rock that has changed form. It is usually formed ...
 - A below the earth's surface
 - B on the earth's surface
 - C when rock is heated
 - D when rock is cooled

4. The formation of different types of rocks is described in the Rock Cycle. An important feature of this cycle is that it ...
 - A always forms rocks the same way
 - B cannot be reversed
 - C does not have a set order
 - D doesn't have any shortcuts or detours

5. A fertile soil is one that can supply nutrients for plant growth. To identify the different layers in a particular type of soil, a geologist would look at the ...
 - A soil profile
 - B parent soil
 - C humus content
 - D organic components

Topic 3 - EROSION

Erosion is the movement of rock and mineral grains from one place to another. **Weathering** (3 types) breaks down and wears away rock, creating sediment.

Mechanical Weathering

- the physical break-up or disintegration of rocks, caused by gravity, temperature change and frost wedging
- mechanical weathering 'wears away'
- sedimentation 'builds-up'

Chemical Weathering

- chemicals, present in the earth's surface or atmosphere, can be dissolved in water and react in the chemical decomposition of rocks and minerals (acid rain)

Biological Weathering

- living organisms (plants, animals, bacteria and fungi) can breakdown rock
- plant roots, acidic fluids produced by roots, bacteria, fungi and some insects and small animals can cause chemical reactions

The Changing Surface of the Earth

- agents of erosion include: glaciers, gravity, wind, and water
- changes can occur gradually (glaciers) or suddenly (flash floods, landslides, rock slides)
- large rocks caught up in a glacier and then left behind when the glacier recedes are called erratics
- sediment that is pushed away, as the glacier moves forward, are called moraines
- scratches, made in the bedrock, by glaciers carrying rocks are called striations
- gravity causes landslides and rock slides – eg. Frank Slide (a retaining wall can often be used to hold back unstable material – but this is not always the best protection)
- wind carries rock particles across the landscape, eroding the land by abrasion (planting vegetation, contour farming and reduced tillage can reduce the effects of wind erosion)

Water in Motion

- Water is one of the most powerful causes of erosion
- Sudden or incremental changes occur due to the movement of water - rivers, rain, ocean waves
- When a river becomes mature it begins to meander (curving its bed from side to side)

Applications

- Dinosaur Provincial Park (The Badlands)
- Road repair due to frost wedging
- Frank Slide Interpretive Centre
- Okotoks 'Big Rock' – an erratic
- Moraines in Banff national Park
- Athabasca River deepens the quartzite rock, making a canyon
- Caving – 'Discover what treasures the spaces hold' (especially the Castleguard Cave, near the Columbia Icefield (It is 18km long)

WRAP-UP p. 381

A good review of the first three topics in this Unit

Planet Earth: Topic 3 – EROSION - Quiz

1. Tony found that when he poured water into a crack in a rock sample and froze it, then allowed it to thaw, the crack was actually wider. The type of weathering he investigated was classified as ...
 - A chemical
 - B biological
 - C mechanical
 - D physical
2. Landslides and rock slides can have devastating effects on the landscape. The Frank Slide is one such example. To study these, scientists are using new technology and sound waves. One of the major forces besides an earthquake responsible for these types of sudden changes is ...
 - A wind
 - B frost
 - C gravity
 - D water
3. André tested the effects of water on the natural rock samples found in his schoolyard. He tested the rock samples with pure water (pH 6.8), rain water (pH 4.5) and tap water (pH 6.7). The type of weathering he investigated was classified as ...
 - A chemical
 - B biological
 - C mechanical
 - D physical
4. On a field trip to the foothills, the class was amazed, when their teacher pointed out a tree growing in a rock. The roots of the tree had worked their way into the cracks and split the rock in many places. The type of weathering they observed was classified as ...
 - A chemical
 - B biological
 - C mechanical
 - D physical
5. The field trip included a stop at the 'Big Rock' in Okotoks. This rock was left behind by a receding glacier. It is called ...
 - A an erratic
 - B a moraine
 - C a striation
 - D an abrasion
6. Allison and Rachel were investigating the effects of abrasion. To slow down the process they ...
 - A used a stronger fan
 - B used a sandy surface
 - C planted grass
 - D used more water

Topic 4 – THE MOVING CRUST

The Earth's Interior

<http://www.hcrhs.hunterdon.k12.nj.us/science/four.html>

The crust is the top layer of the Earth. Below it is the mantle, which is made of rock material (upper part is solid, lower part is partly melted). The upper mantle and crust are called the lithosphere. Below the mantle is the core. The outer core is made up of mainly liquid iron and nickel, while the inner core is solid.

Evidence for Continental Drift

Alfred Wegener

(<http://www.hcrhs.hunterdon.k12.nj.us/science/alfred.html>) collected evidence to explain the various shapes of the continents and how they were all together at one time.

Biological Evidence

- fossil evidence was found on different continents, like mesosaurus, kannemeyeri and lystrosaurus (see map on p. 383)
- along with the fossils and the interlocking shapes of the continents, Wegener concluded that the continents were joined together as one supercontinent pangea (pangea). (<http://www.hcrhs.hunterdon.k12.nj.us/science/pangea.html>)
- his explanation is called the Theory of Continental Drift.

Evidence from Rocks

- Mountain ranges were also compared:
- the Appalachian in North America and the range in Britain and Norway were made of the same kind and age of rock
- Trilobites in the Himalayas suggested that India was once part of Antarctica, which broke off and collided with Eurasia, putting the fossils of trilobites, from the bottom of the sea, high into the Himalayas.

Geological Evidence of Climate

- Coal provided more evidence, because in order for it to form, a rich tropical plant environment must have been present – coal is found in moderate to cold climates
- evidence of even greater climatic changes were found in places likely covered by glaciers (these places are now far too warm to support the presence of glaciers), this suggested that the continents may have once been part of the south pole.

Response to Wegener

- after his findings were published, in a book called The Origin of the Continents and Oceans, Wegener's ideas were rejected, because the scientific community did not agree with his assumptions and explanation that the moon might be responsible for the movement of the continents.
- after his death, advances in new technology and the work of a Canadian Scientist led to a new theory that explained Wegener's observations

Advances in New Technology

- sonar (sound wave technology) identified the Mid-Atlantic Ridge
- magnetometers (electronic instruments that detect the direction and strength of a magnetic field) the magnetic field in the Atlantic sometimes pointed south, instead of north (these were called reversal strips)
- igneous rock contains magnetite, which lines itself with the Earth's magnetic field, as the rock hardens on the surface, the mineral particles maintain their alignment with the magnetic field, indicating that the reversal strips must have formed at a different time
- the pattern of magnetic reversal strips along the Mid-Atlantic Ridge meant the sea floor was spreading, leading to the Theory of Sea Floor Spreading. (as new rock forms, it takes on the magnetic polarity of the the Earth at the time of formation)

Deep Sea Drilling

- confirmation of the theory of sea floor spreading was provided by the ship, Glomar Challenger, which brought drill samples up from the ocean floor (younger rock was closer to the ridge and older rock was closer to the continents)
- lava that cools very quickly on the ocean floor is called 'pillow lava'.

The Theory of Plate Tectonics

- All the evidence collected indicates that the Earth's crust is broken up into plates (see Figure 5.43, p. 390), which are moving on the Earth's mantle. The new theory is called the Theory of Plate Tectonics. Plates pushing together are called converging plates, whereas plates pulling apart are called diverging plates. Tuzo J. Wilson (a Canadian Scientist) helped form this new theory, by suggesting the plates slide past each other.

Convection Currents

- a convection current is the circular flow within a fluid that is caused by the rising of warmer particles and sinking of cooler particles
- scientists believe it is this action, within the mantle, which is causing the plates to move
- the plates that collide, or converge have one plate above and the other below (these places are called subduction zones)
- subduction zones occur where the convection currents, in the mantle, cool and sink

Applications

- a unifying theory is one which explains several different natural events and landforms (volcanoes, earthquakes and mountains)
- Sound Navigation and Ranging (SONAR)
- self-contained underwater breathing apparatus (SCUBA)
- Submersibles are small submarines that enable divers to go deeper, protecting them from the pressure of the water
- satellites and lasers are used to measure incremental change (change that happens slowly) in plate movements
- 'black smokers' are deep-sea (ocean floor) vents, where tube worms use the sulphur from the vents as an energy source

Planet Earth: Topic 4 – THE MOVING CRUST - Quiz

1. Compared to the other layers of the Earth, the crust, at a temperature of 50C is ...
 - A thicker than the upper mantle
 - B thinner than all the layers
 - C thicker than the lower mantle
 - D thicker than any other layer

2. Alfred Wegner determined that the continents at one time all fit together to form one large supercontinent, called Pangaea. Their interlocking shapes and other evidence helped him form the Theory of Continental Drift. The other evidence was ...
 - A discovery of land bridges connecting the continents
 - B similar trees on different continents
 - C fossil evidence indicating the continents has been joined
 - D lower ocean level with islands close together

3. Glaciers once existed in the southern hemisphere. The evidence Wegener found to prove this were the ...
 - A moraines found
 - B erratics found
 - C bedrock abrasions
 - D ice caves

4. Advances in technology helped to prove Wegener's theory long after his death. The patterns of magnetic reversals on the ocean floor lead scientists to the theory of sea-floor spreading. The instrument scientists used to detect the direction and strength of the magnetic field is called ...
 - A magnetometer
 - B magnetoscope
 - C radar
 - D sonar

5. When scientists discovered the ridges along the ocean floor, they also found lava coming out of the cracks in the sea floor. This type of lava is called ...
 - A sea-floor lava
 - B ocean lava
 - C salt water lava
 - D pillow lava

Topic 5 – EARTHQUAKES

Earthquakes occur when tectonic plates move suddenly

Measuring Earthquakes

- scientists called seismologists use a **seismograph** to record the intensity of an earthquake
- the seismograph must be attached to bedrock (the solid rock that lies beneath the soil and looser rocks) to feel the vibrations on the plate
- a marking pen, inside the seismograph, records the vibrations on a rotating drum (modern seismographs are electronic)
- the measurement scale used is called the **Richter scale** (table 5.3, p. 396)

Earthquake Waves

- **seismic waves** are the energy waves that travel outward from the source of the earthquake.
- **aftershocks** are actually smaller earthquakes

Types of Earthquake Waves

- **Primary** or **p waves** are the fastest and can push through solids, liquids and gases
- **Secondary** or **s waves** travel more slowly and can only pass through solids
- Surface waves are the slowest of all, but their rolling motion can be very destructive (like a ripple effect on water)
- primary waves are bent or refracted as they travel (the area where they do not come through the other side of the earth is called a **shadow zone** – Figure 5.52, p. 398)

Locating an Earthquake

- it is possible to determine the location of an earthquake by the interval between the p waves and the s waves (the farther apart they are, the further away the earthquake is)
- the source of an earthquake deep in the crust is called the **focus**, where the p waves and s waves originate
- the surface waves come from the **epicentre** (the location on the surface directly above the focus)

Earthquake Zones

Zones of greatest intensity (8 or more on the Richter scale) include: 1 off Canada's west coast, 8 in Mexico, and 8 in Alaska

Types of Rock Movement in Earthquakes

Where the plates meet, the rock is under great pressure, which can make it bend and stretch – when the pressure is too great, the rock breaks suddenly creating a fault

There are three types of movement, of the tectonic plates, along a fault (see Figure 5.54, p. 403):

- Normal Faults, (pulling action, which breaks rocks apart) – North Atlantic
- Reverse Faults (compression, where rocks are squeezed, causing them to bend and break) – Marianas Trench, near Japan
- Strike-Slip or Transform Faults (shear causes slipping, which makes the jagged edges break off) – Pacific Plate

Preparing for Earthquakes

Stabilize furniture, storage of heavier items close to the floor, earthquake-resistant designs (allow building to bend a little)

Other Effects of Earthquakes

- **Tsunamis** (Japanese word meaning 'harbour wave') are huge waves that happen when an earthquake occurs under the ocean
- Avalanches or rock slides occur in mountains as a result of an earthquake
- type of foundation upon which buildings are constructed can have an effect on the severity of the earthquake (liquefaction)

Applications

Ancient predicting device used a pot with eight dragon heads on it, with little balls inside the heads and frogs to catch the balls (the frog that caught the ball indicated the direction of the earthquake) p. 395

Animals: rabbits hop wildly for several minutes, deep-sea fish swim close to the surface, catfish jump out of the water, bees evacuate their hives, and mice are dazed before an earthquake

Planet Earth: Topic 5 - EARTHQUAKES - Quiz

1. It is likely that San Diego is able to get early warnings of possible earthquakes in the area because of this attraction ...
 - A San Diego Zoo
 - B San Diego Emergency Center
 - C San Diego Observatory
 - D Pacific Climatology Center

2. Seismologists use a special machine that measures earthquakes. The primary wave is the fastest of all three types of seismic waves and can pass through solids liquids and gases. A p wave effect would be ...
 - A buildings toppling
 - B overpasses crumbling
 - C dishes rattling
 - D cracks opening up in the street

3. An earthquake in Japan registers on a seismograph in Winnipeg, Manitoba. This occurs because ...
 - A seismographs anywhere will record all earthquakes
 - B the earth's crust is solid, allowing the surface waves to be recorded anywhere
 - C the inner core of the earth is liquid
 - D the outer core of the earth is liquid

4. The source of an earthquake can be determined by recording the interval time between the p waves and s waves. The source deep below the surface in the crust, where the earthquake begin is called the ...
 - A focus
 - B foci
 - C epicenter
 - D shadow zone

5. The pressure under the earth's crust can cause it to move in different ways. A fault that is caused by a compression force is called a ...
 - A normal fault
 - B reverse fault
 - C strike-slip fault
 - D transform fault

Topic 6 - VOLCANOES

A volcano is an opening in the Earth's crust that releases lava, steam and ash when it erupts (becomes active). The openings are called vents. When volcanoes are not active, they are called dormant.

Famous Volcaoes

- the most active volcano on the Earth is Kilauea in Hawaii (Loihi is a new volcano forming beside the main island in Hawaii – creating a new island)
- Krakatau, in Indonesia (blast was heard 4800km away and tsunamis waves were 30 m high)
- Mount St. Helens, in Washinton (sideways and vertical eruptions)
- Mount Vesuvius, in southern Italy (City of Pompeii was buried – it is due for another large eruption because it is sealed with a 'rock plug' that could blast 1.5 km upwards)
- Mount Pinatubo, in the Phillipines (ash circled the globe and cooled temperatures around the world)

Current Volcano update:

http://volcano.und.nodak.edu/vwdocs/current_volcs/current.html

Volcanoes that form a circle around the Pacific Ocean are called the Ring of Fire (derived from the circle of volcanoes that pour out red hot lava, fire and steam)

Applications

- Volcanoes on Io, one of Jupiter's moons have been photographed using Vidicon – a type of TV camera mounted on the Voyager spacecraft, using an electron gun and photoconductor
- those on Mars and our moon have been extinct for millions of years, while those on Venus may still be erupting
- the largest volcano found in our universe is the extinct Olympus Mons on Mars

Planet Earth: Topic 6 - VOLCANOES - Quiz

1. Volcanoes erupt when they become active. Until an eruption occurs, volcanoes are described as ...
 - A stagnant
 - B dormant
 - C extinct
 - D plugged

2. There are a number of volcanoes that border the Pacific Ocean. These volcanoes are known as the Ring of Fire. The name comes from the fact that these volcanoes erupt with red hot lava, fire and steam. Most volcanoes in the Ring of Fire occur at ...
 - A subduction zones
 - B abduction zones
 - C conduction zones
 - D compression zones

3. One of the most dangerous side effects of an erupting volcano is a ...
 - A lava flow
 - B ash plume
 - C ash layer
 - D tsunami

4. Vesuvius has been a dormant volcano since 1944, but is due for a major eruption. An added danger, besides the major build-up of magma beneath the peak is the discovery of a rock ...
 - A bulge
 - B plume
 - C vent
 - D plug

5. Volcanoes can cool temperatures around the world. Despite the hot temperatures and fiery destruction they can create, the lowering of world temperatures can be caused by ...
 - A a rapid lava flow into the ocean
 - B an ash plume causing mudflows
 - C an ash layer in the atmosphere
 - D a large number of tsunamis

Topic 7 - MOUNTAINS

Mountain building takes many years.
Cordillera is Spanish for mountain range.

Mountain Formation and Distribution

- most mountains are large areas that have uplifted due to the movement (converging, diverging or sliding) or heating of tectonic plates, where the build up of heat and pressure can cause folding and faulting
- sedimentary rock under slow, gradual pressure can fold (bend like plastic because they are made soft by the heat) or break – and can be changed to metamorphic rock in the process
- the upward, or top part of folded rock is called anticline, the bottom is called syncline
- rock that is too brittle to fold under heat and pressure, will break, called thrust faulting
- when older rock ends up on top of younger rock as a result of thrust faulting, the result is the formation of fault block mountains
- movement of rock along a fault can be vertical or horizontal and can be traced by the location of the 'basement rock' on both sides of the fault (see Figure 5.68, p. 413)
- mountains can be formed by the convergence of continental and oceanic plates (the Continental plate is lighter and rides over the Oceanic plate) a combination of processes creates complex mountains

Ages of Mountains

- mountains that are jagged at the top are 'young' mountains, while those that are more rounded (due to erosion and weathering) are 'old' mountains

Applications

- subduction of the Juan de Fuca plate (off the west coast of North America) has caused folding, faulting and uplifting, as well as magma has created volcanoes.
- the Himalayas are the youngest mountain range with the highest mountains (and still growing)
- one of the oldest ranges is the Laurentian Mountains, in Quebec (they are being worn down)

Wrap-up p. 417 (for review)

Planet Earth: Topic 7 - MOUNTAINS - Quiz

1. Different action acting on the rocks of the Earth's surface can cause different types of mountains to form. Most mountains are large areas that have been ...
 - A uplifted
 - B compressed
 - C folded
 - D faulted

2. When older rock ends up on top of younger rock the mountains formed are called ...
 - A thrust mountains
 - B fault mountains
 - C block mountains
 - D fault block mountains

3. When sedimentary rock is squeezed from the sides and is too brittle to fold, it can break and form into slabs that move up and over each other. This is an example of ...
 - A diverging fault
 - B thrust fault
 - C sliding fault
 - D folded layering

4. This factor might be the best way to determine the age of a mountain.
 - A kinds of rocks
 - B type of fault
 - C shape of peak
 - D difference between syncline and anticline

5. Mountain formations that undergo more than one process are called ...
 - A complex
 - B compound
 - C multi-faulted
 - D transform

Topic 8 - FOSSILS

Fossils are preserved impressions in rock that tell us when, where, and how living organisms lived and behaved millions of years ago.

Types of Fossils

Remains of dead plants and animals that have been protected from scavengers can become fossilized in a number of ways:

- petrified (rock-like) fossils preserve the bones of dead animals by using silica
- an outline or impression from the carbon residue on rock surfaces can provide a carbonaceous film
- original remains may be preserved in tar, amber or peat bogs
- trace fossils are evidence of animal activity, like worm holes, footprints, and burrows

Dinosaur Finds

(Dinosaur Provincial Park is a world UNESCO Heritage site, where over 36 species of Dinosaur have been found – nearby, Burgess Shale in B.C. is also renowned because of the rich deposits of fossilized marine animal soft-body parts)

- Trilobites date back before the dinosaurs roamed the Earth
- Ammonites are common fossils found in Alberta
- Oviraptor (when a clutch of eggs were found with a fossil of this dinosaur, it was thought it was a scavenger, but further evidence indicates it was likely an overprotective parent)
- Gigantosaurus, found in Argentina is heavier than Tyrannosaurus Rex, a carnivore.
- Seismosaurus, a huge plant eater, was found in Mexico (its tail could move faster than the speed of sound)
- Bambiraptor, a dinosaur, found by a 14 year old boy in Glacier National Park, Montana, may help to provide the link between birds and dinosaurs

Fossil Mould and Cast Formation

An animal dies in mud and gets covered by more sediment. The body dissolves, leaving a mould, which is then filled with more sediment and hardens into rock, making a cast of the original animal.

Planet Earth: Topic 8 – FOSSILS - Quiz

1. The preserved remains (even the soft parts) of a plant or animal can likely be found in ...
 - A amber
 - B sediment
 - C gemstones
 - D Burgess Shale

2. Trilobites are one of the most famous groups of fossils. They are now extinct. They lived in ...
 - A Gobi Desert
 - B Antarctic Tundra
 - C Fresh water lakes
 - D Warm ocean water

3. Bambiraptor fossils were discovered by a 14 year-old boy in Glacier National park, Montana. This was an important discovery, because it provides evidence that dinosaurs ...
 - A were warm blooded
 - B became extinct as a result of a comet
 - C were related to birds
 - D were attentive parents

4. When an organism is buried under many layers of sediment, pressure and heat build up, leaving a thin film of carbon residue on the rock surfaces. This residue forms the outline of the organism and is called ...
 - A petrified residue
 - B carbonaceous film
 - C carbon-dated remains
 - D trace fossil residue

5. When an organism falls into soft sediment, like mud, its hard parts dissolve leaving a cavity called a ...
 - A trace layer
 - B cast
 - C mould
 - D chamber

Topic 9 – GEOLOGICAL TIME

The **principle of superposition** states that in undisturbed layers of rock, the oldest layers are always on the bottom and the youngest layers are always on the top.

As new layers of sediment form sedimentary rock, the layers can be identified. This layering is called **strata**.

Geologists use a technique called **relative dating**, to find the order in which events occurred. The relative age of the rock is determined by its position within the strata. Fossils found in a layer can help to identify the age of the rock. If the fossil was on the Earth for a short time and widespread then it is called an index fossil.

Clues from Technology

Over billions of years, some elements will change into other elements – uranium is such an element - in 4.5 billion years, half of the uranium will change into lead (which will not change). The uranium is called the parent element. This time period is called the half-life of uranium. By measuring the amounts of change in a sample, scientists can calculate the absolute age of the rock. This is called **radiometric Dating** <http://pubs.usgs.gov/gip/geotime/radiometric.html>

Scientists also use a process called **radiocarbon dating** (which uses carbon-14, a rare form of carbon, as its parent material) <http://www.cs.colorado.edu/~lindsay/creation/carbon.html>

All organisms take in carbon-14 to build cells and tissue. The carbon-14 changes to nitrogen gas (when the animal dies) in a half-life of 5730 years. The amount of carbon-14 left in the tissue allows scientists to determine the age of the remains

Geological Time Scale

The geological time scale is a division of Earth's history into smaller units based on the appearances of different life forms. (see Figure 5.87, p. 426)

The largest divisions are called eons, which are divided into eras and then further divided into periods.

Rodinia (Figure 5.85) was the first supercontinent and Pangaea (Figure 5.86) was the second supercontinent (Ref. p. 425)

Planet Earth: Topic 9 – GEOLOGICAL TIME - Quiz

1. Layers of sedimentary rock stay in their original position, with the newest layers on the top and the older layers on the bottom. These layers of rock are called ...
 - A indexing
 - B parent rock
 - C rock strata
 - D superimposed

2. Scientists studying rock layers were mystified to find fossils that helped to determine the relative age of the layer of rock they were studying. These fossils are called ...
 - A petrified fossils
 - B intensified fossils
 - C parent fossils
 - D index fossils

3. Daughter material and parent material refer to the half-life parts remaining, in the process of radiometric dating, to calculate the absolute age of rocks. If the daughter material is 87.5% and the parent material is 12.5%, the rock has undergone ...
 - A 1 half-life
 - B 2 half-lives
 - C 3 half-lives
 - D 4 half-lives

4. Radiometric dating and radiocarbon dating are related because ...
 - A radiometric dating is a form of radiocarbon dating
 - B radiocarbon dating is a form of radiometric dating
 - C half-life is the same for carbon and uranium
 - D traces of carbon-14 can also be found in radiometric dating

5. In the Geologic Time Scale, dinosaurs appeared during this period.
 - A Cretaceous
 - B Jurassic
 - C Triassic
 - D Permian

Topic 10 – FOSSIL FUELS

Petroleum is a naturally occurring mixture of **hydrocarbons**, such as bitumen, coal, oil and gas.

It is found in sedimentary rock basins, which were formed from the sediments of tiny plants and animals deposited in the mud and silt.

The soft parts of these organisms were transformed into solid, liquid or gas hydrocarbons called fossil fuels. (Coal is usually formed from plants that grew on the land, oil from water-based plants and animals and natural gas from land-based or water-based plants and animals)

Another theory suggests that fossil fuels were trapped inside the Earth, at the time of its formation, and have been slowly rising to the surface.

Finding and Mining Fossil Fuels

(Western Canada Sedimentary Basin)

Surface rock is studied and samples from deep below the surface to identify traps where oil and gas have accumulated within rock formations

Bitumen is a heavy, almost solid form of petroleum. Some deposits can be mined (because they are close to the surface – like, in the Athabasca Tar Sands - sometimes using steam, or hot water to separate the oil and the sand)

There are three ways that oil and gas can be trapped (see Figure 5.91, p. 429):

- A ... thrust fault
- B ... normal fault
- C ... reef

WRAP-UP p. 433

Planet Earth: Topic 10 – FOSSIL FUELS - Quiz

1. Bitumen, coal, oil and gas are most often found in sedimentary rock basins. These basins were formed from the sediments of tiny plants and animals deposited in the mud and silt. Naturally occurring mixtures of hydrocarbons are called ...
 - A oil sands
 - B oil wells
 - C petroleum
 - D petrochemicals
2. Different locations require different techniques for recovery of Bitumen. In Northern Alberta, the tar sands are scooped up and dumped into large trucks. The oil is separated from the sand using ...
 - A a petrochemical filter
 - B steam
 - C hot water
 - D vibroseis
3. A sample of the layers of rock and soil beneath the surface are analyzed in government laboratories. The samples that are analyzed are called ...
 - A core samples
 - B strata findings
 - C bitumen samples
 - D till and fault samples
4. Large vibroseis trucks are used along with a satellite-based global positioning system to locate pockets of bitumen. To locate the deposits, the trucks create seismic waves underground by sending ...
 - A ventricular oscillations
 - B energy waves
 - C diamond drills
 - D steam
5. Most drilling operations would not be possible unless these types of drills were used.
 - A diamond
 - B forged steel
 - C tungsten
 - D carbon

Planet Earth Review

Focusing Questions:

What do we know about the Earth we live on -about its surface and what lies below.

What evidence do we have, and how do we use this evidence in developing an understanding of the earth and its changes?

Topic 1 - Elements (pure substances) - Properties of minerals

What are **minerals**?

How is the **hardness** of a mineral determined?

What are the **6 major crystal types**?

What **properties of minerals** enable us to identify them?

How can rocks be identified?

What is a **soil profile**?

**Topic 3 - Erosion - Types of weathering - biological, mechanical and chemical - (slowly) –
Glaciers - (quickly) - Flash Flooding**

Explain the differences between mechanical, biological and chemical weathering, giving examples of each.

Type of Weathering	How it happens	Examples
Mechanical		
Biological		
Chemical		

What are some examples of **incremental** and **sudden changes** of **erosion**?

Incremental (slow) _____

Sudden erosion _____

Give operational definitions for erratics, moraines, striations and meandering.

Erratic _____

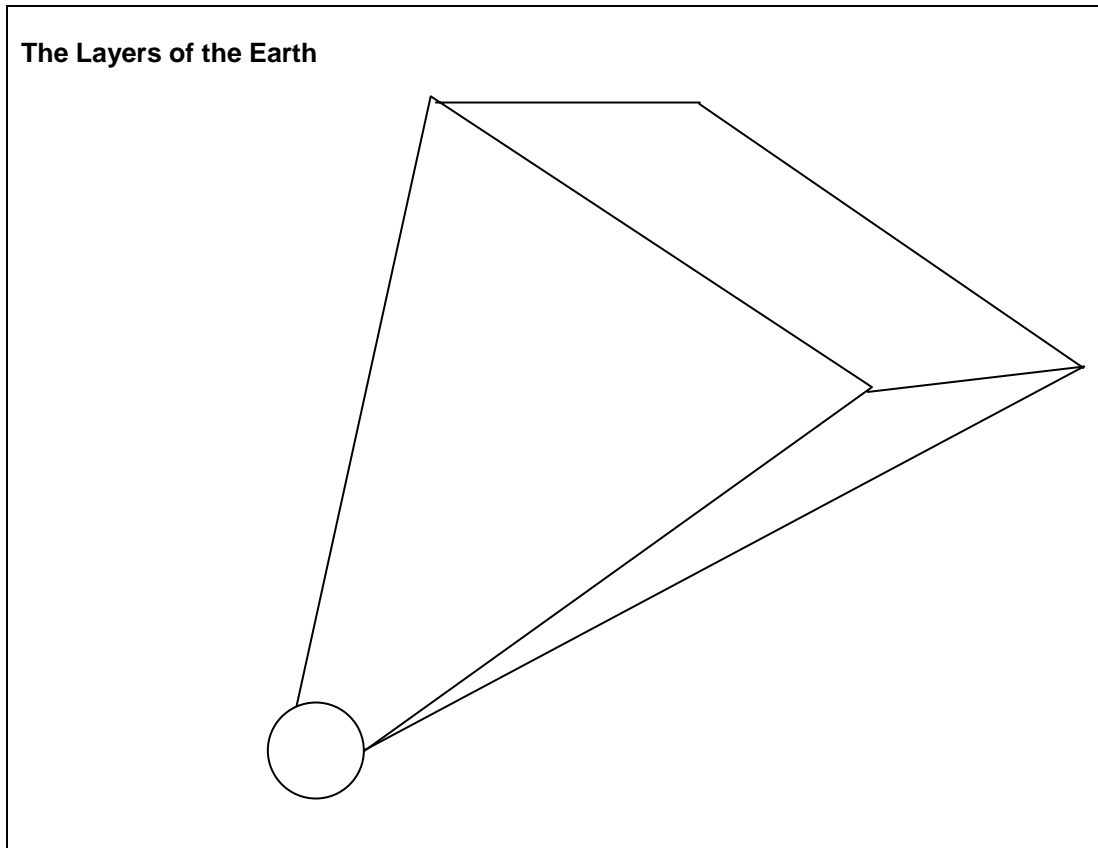
Moraine _____

Striation _____

Meandering _____

Topic 4 - Layers of the Earth - Theory of Continental Drift - Theory of Plate Tectonics - Evidence for these theories - Convection currents and plate zones

Draw and label a scientific illustration showing the layers of the Earth



Explain the **Theory of Continental Drift** and the evidence that was collected to support this theory.

Explain the **Theory of Plate Tectonics** and the technologies used to gather evidence to support this theory.

Describe what forms convection currents in the mantle.

Explain the difference between diverging and converging continental plates and the zones these create.

Topic 5 - Earthquakes - Measuring force and magnitude - Locating epicenter - Earthquake zones and faults - Tsunamis

What causes earthquakes?

How are earthquakes measured (intensity and magnitude)?

Describe the three types of earthquake waves and their effects.

p wave _____

s wave _____

surface wave _____

Identify the steps needed to locate the **'focus'** (epicenter) of an earthquake.

Identify the **different types of rock movement** causing an earthquake.

What is a **tsunami**?

Topic 6 - Volcanoes and the Ring of Fire

Identify the main types of volcanoes and provide some examples of some current or famous volcanoes.

Type of Volcano	Illustration	Examples

What is the **Ring of Fire**?

Where else in the universe can volcanoes be observed?

Topic 7 - Mountain formation, age and types

How are **mountains formed**?

What **types of mountain formations** are common in particular parts of the world?

How is the **age of a mountain range** determined?

Topic 8 - Types of fossil - Moulds and casts

Identify the **different types of fossils** that have been found and classified.

Describe and illustrate the **formation of a fossil (mould and cast methods)**

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Topic 9 - Radiometric and radiocarbon dating - Geological Time Scale

What is the principle of **superposition**?

Explain the **relative dating technique**, used to identify the age of a fossil.

Explain the techniques and differences, between **radiometric** and **radiocarbon dating**.

Briefly review the **geological time scale**, noting how the time scale is divided into **eons**, **eras** and **periods**.

Topic 10 - Locating fossil fuels

What is **petroleum** and how is it located?

Petroleum is _____

It is located in _____

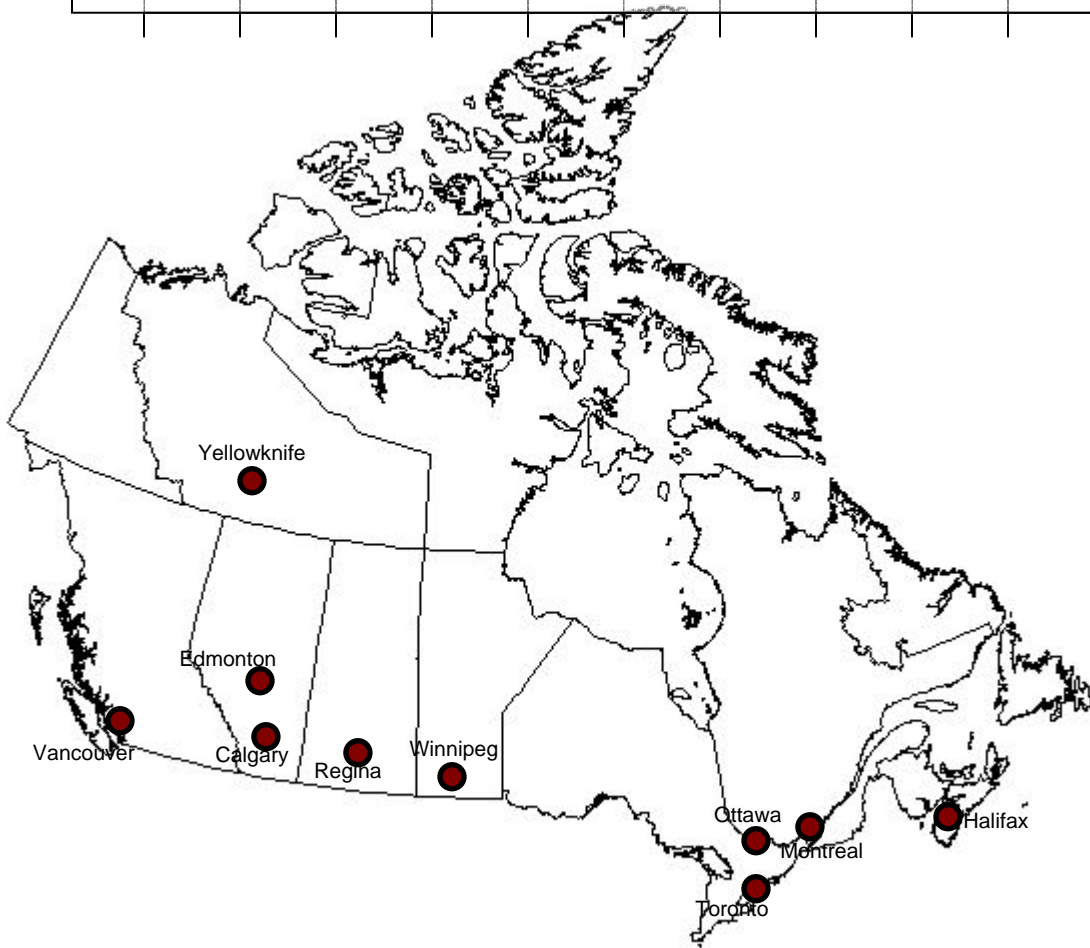
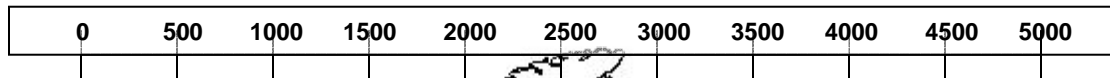
Illustrate how oil is found and the drilling techniques used to recover it.

PLANET EARTH UNIT TEST



Identify the **epicentre** of an earthquake in Canada using the following information. You will need to use your protractor to complete this question (Worth 5 marks)

<i>Location</i>	<i>Vancouver</i>	<i>Yellowknife</i>	<i>Ottawa</i>
Distance from Epicentre	800 km	1200 km	2600 km



The **epicentre** of this earthquake - recorded by the cities in the table above - was

PLANET EARTH UNIT TEST

1. Minerals play an important role in your body's functions. Water is regulated in the body's cells by ...
 - A. **bauxite and sulphur**
 - B. **calcite and dolomite**
 - C. **sulphur and quartz**
 - D. **molybdenum and potassium**

2. Kidney stones are examples of
 - A. **mineral deficiency**
 - B. **vitamin deficiency**
 - C. **lack of calcium in the bones**
 - D. **growing crystals in your body**

3. Minerals can be identified by certain clues. The clue that identifies the way the mineral breaks is called its ...
 - A. **cleavage**
 - B. **lustre**
 - C. **colour**
 - D. **streak**

4. Cubic, tetragonal, hexagonal, orthorhombic, monoclinic and triclinic describe systems of ...
 - A. **mineral hardness**
 - B. **synthetic models**
 - C. **crystal structure**
 - D. **cleavage types**

5. Synthetic crystals are manufactured for such things as electronic circuits, credit cards, machines, medicines and communication devices, because natural crystals ...
 - A. **are too expensive**
 - B. **have impurities**
 - C. **are too soft**
 - D. **are rare**

6. Metamorphic rocks formed as a result of ...
 - A. **high temperature and pressure**
 - B. **extreme temperature fluctuations**
 - C. **lower pressure and moisture**
 - D. **rapidly decreasing temperatures**

7. Allison and Rachel were investigating the banks of the river and discovered a large section had been eroded away. They observed stratification, which identifies ...
 - A. **fossils embedded in the rock**
 - B. **petroleum traces in the soil**
 - C. **visible layers of different soil types**
 - D. **soil minerals that have leached**

8. Sedimentary rock is a type of rock that....
- A. forms below the earth's surface**
 - B. has changed form**
 - C. is only found near a volcano**
 - D. forms in layers**
9. The formation of different types of rocks is described in the Rock Cycle. An important feature of this cycle is that it ...
- A. cannot be reversed**
 - B. does not have a set order**
 - C. always forms rocks the same way**
 - D. doesn't have any shortcuts or detours**
10. A fertile soil is one that can supply nutrients for plant growth. To identify the different layers in a particular type of soil, a geologist would look at the ...
- A. soil profile**
 - B. humus content**
 - C. mineral content**
 - D. organic components**
11. Tony found that when he poured water into a crack in a rock sample and froze it, then allowed it to thaw, the crack was actually wider. The type of weathering he investigated was classified as ...
- A. chemical**
 - B. biological**
 - C. physical**
 - D. mechanical**
12. The Frank Slide in the Crowsnest Pass is an example of how weathering forces can be responsible for a sudden changes. When water gets in cracks and expands the rock can break away. This form of weathering is called ...
- A. frost wedging**
 - B. water deposition**
 - C. winter weathering**
 - D. gravitational thrust**
13. André tested the effects of acidic water on the natural rock samples found in his schoolyard. The type of weathering he was investigated is classified as ...
- A. chemical**
 - B. biological**
 - C. physical**
 - D. mechanical**
14. On a field trip to the foothills, the students noticed a tree's roots growing through rock. This type of weathering is classified as ...
- A. chemical**
 - B. biological**
 - C. mechanical**
 - D. physical**

15. The same field trip included a stop at the 'Big Rock' in Okotoks. A receding glacier left behind this rock, which is called ...
- A. an abrasion
 - B. a moraine
 - C. a striation
 - D. an erratic
16. Compared to the other layers of the Earth, the crust is ...
- A. thinner than all the layers
 - B. thicker than any other layer
 - C. thicker than the lower mantle
 - D. thicker than the upper mantle
17. Alfred Wegner's Theory of Continental Drift determined that the continents at one time all fit together to form one large super continent, called Pangaea.. His evidence was their interlocking shapes and ...
- A. discovery of land bridges connecting the continents
 - B. similar fossil remains found on different continents
 - C. lower ocean level with islands close together
 - D. different trees on different continents
18. Wegener proved that glaciers once existed in the southern hemisphere. His evidence were the ...
- A. ice caves
 - B. erratics found
 - C. moraines found
 - D. bedrock abrasions
19. Advances in technology, like the magnetometer, led scientists to develop the theory of sea-floor spreading because of the....
- A. behavioural patterns of whales
 - B. radar and sonar waves
 - C. magnet reversals on the ocean floor
 - D. magnetic variations at the surface
20. When scientists discovered the ridges along the ocean floor, they also found lava coming out of the cracks. This type of lava is called ...
- A. pillow lava
 - B. ocean lava
 - C. saltwater lava
 - D. sea-floor lava
21. The San Diego Zoo is able to get early warnings of possible earthquakes because ...
- A. they have the best seismic equipment
 - B. scientists believe this area will be hit first
 - C. they are directly over the most active fault
 - D. animals can sense the start of an earthquake

22. Seismologists use a special machine that measures earthquakes. The fastest of all three types of seismic waves are the p waves. They are called ...
- A. **principal waves**
 - B. **primary waves**
 - C. **pretty waves**
 - D. **pin waves**
23. An earthquake in Japan registers on a seismograph in Winnipeg, Manitoba. This occurs because ...
- A. **the outer core of the earth is liquid**
 - B. **the inner core of the earth is liquid**
 - C. **seismographs anywhere will record all earthquakes**
 - D. **the earth's crust is solid, allowing the surface waves to be recorded anywhere**
24. The source of an earthquake can be determined by recording the interval time between the p waves and s waves. Where the earthquake starts from is called the ...
- A. **foci**
 - B. **focus**
 - C. **epicentre**
 - D. **shadow zone**
25. The pressure under the earth's crust can cause the plates to move in different ways. A fault that causes plates to move sideways is called a ...
- A. **transfer fault**
 - B. **reverse fault**
 - C. **strike-slip fault**
 - D. **normal fault**
26. Volcanoes erupt when they become active. Until an eruption occurs, volcanoes are described as ...
- A. **extinct**
 - B. **stagnant**
 - C. **dormant**
 - D. **plugged**
27. There are a number of volcanoes that border the Pacific Ocean and are known as ...
- A. **Ring of Fire**
 - B. **Hell's Kitchen**
 - C. **Rapid Change Zone**
 - D. **Circle of Fire and Ice**
28. An earthquake or an erupting sea-floor volcano can cause a 'Tsunami'. In *Japanese* it means ...
- A. **lava flow**
 - B. **ash plume**
 - C. **shaking ground**
 - D. **harbour wave**

29. Vesuvius has been a dormant volcano since 1944, but is due for a major eruption. An added danger, besides the major build-up of magma beneath the peak is the discovery of a rock ...
- A. **bulge**
 - B. **plug**
 - C. **vent**
 - D. **plume**
30. Despite the hot temperatures and fiery destruction they can create, volcanoes can also lower world temperatures with ...
- A. **a rapid lava flow into the ocean**
 - B. **an ash plume causing mudflows**
 - C. **an ash layer in the atmosphere**
 - D. **a large number of tsunamis**
31. When older rock ends up on top of younger rock the type of mountains formed are called ...
- A. **thrust mountains**
 - B. **fault mountains**
 - C. **block mountains**
 - D. **fault block mountains**
32. When sedimentary rock is squeezed from the sides and is too brittle to fold, it can break and form into slabs that move up and over each other. This is an example of ...
- A. **diverging fault**
 - B. **folded layering**
 - C. **sliding fault**
 - D. **thrust fault**
33. This factor might be the best way to determine the age of a mountain.
- A. **shape of peak**
 - B. **kinds of rocks**
 - C. **syncline**
 - D. **anticline**
34. Mountain formations that undergo more than one process are called ...
- A. **transform**
 - B. **complex**
 - C. **multi-faulted**
 - D. **compound**
35. The preserved remains (even the soft parts) of a plant or animal can most likely be found in ...
- A. **amber**
 - B. **sediment**
 - C. **Burgess Shale**
 - D. **gemstones**

36. Trilobites are one of the most famous groups of fossils. They are now extinct. They lived in ...
- A. Gobi Desert
 - B. Antarctic Tundra
 - C. warm ocean water
 - D. fresh water lakes
37. An important discovery in Glacier National Park, Montana, provided evidence that dinosaurs were related to birds. The 14 year-old boy found a ...
- A. Velociraptor
 - B. Bambiraptor
 - C. Albertosarus
 - D. Trilobite
38. When an organism is buried under many layers of sediment, pressure and heat build up, leaving a thin film of carbon residue forming the outline of the organism on the rock surface. This residue is called ...
- A. petrified residue
 - B. trace fossil residue
 - C. carbon-dated remains
 - D. carbonaceous film
39. When an organism falls into soft sediment, its hard parts dissolve, leaving a cavity called a ...
- A. cast
 - B. mould
 - C. chamber
 - D. trace layer
40. Scientists studying rock layers were mystified to find fossils that helped to determine the relative age of the layer of rock they were studying. These fossils are called ...
- A. petrified fossils
 - B. parent fossils
 - C. index fossils
 - D. intensified fossils
41. Daughter material and parent material refer to the half-life parts remaining, in the process of radiometric dating, to calculate the absolute age of rocks. If the daughter material is 75% and the parent material is 25%, the rock has undergone ...
- A. 2 half-lives
 - B. 4 half-lives
 - C. 1 half-life
 - D. 3 half-lives
42. Radiometric dating and radiocarbon dating are related because ...
- A. half-life is the same for carbon and uranium
 - B. radiometric dating is a form of radiocarbon dating
 - C. radiocarbon dating is a form of radiometric dating
 - D. traces of carbon-14 can also be found in radiometric dating

43. According to the Geological Time Scale, dinosaurs appeared in this period.
- A. Permian
 - B. Jurassic
 - C. Triassic
 - D. Cretaceous
44. Bitumen, coal, oil and gas are most often found in sedimentary rock basins. These basins were formed from the sediments of tiny plants and animals deposited in the mud and silt. Naturally occurring mixtures of hydrocarbons are called ...
- A. oil sands
 - B. oil wells
 - C. petrochemicals
 - D. petroleum
45. A sample of the layers of rock and soil beneath the surface are analyzed in government laboratories. The samples that are analyzed are called ...
- A. till and fault samples
 - B. bitumen samples
 - C. strata findings
 - D. core samples

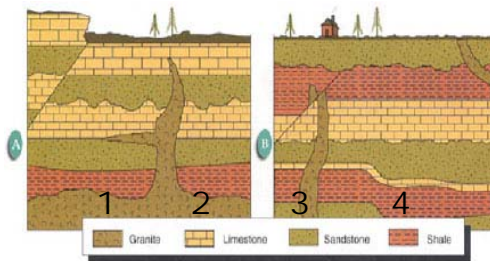
NR1 - Which category of **rock family** belongs with which rock type described?

- 1 Igneous
- 2 Sedimentary
- 3 Metamorphic
- 4 Magma

- _____ melted rock
- _____ layered rock
- _____ crystallized rock
- _____ changed rock

	.	.	
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

NR2 - Using the **principle of superposition**, number the layers of rock in the correct order, beginning with the oldest.



_____ _____ _____ _____
 oldest --- → --- → --- youngest

	.	.	
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Planet Earth Topic Quiz – Answer Keys

Science Focus 7 Topics	1.	2.	3.	4.	5.	6.
1- Minerals	C	C	A	B	A	
2- Rocks and the Rock Cycle	C	D	A	C	A	
3- Erosion	C	C	A	B	A	C
4- Crust	B	C	C	A	D	
5- Earthquakes	A	C	D	A	B	
6- Volcanoes	B	A	D	D	C	
7- Mountains	A	D	B	C	A	
8- Fossils	A	D	C	B	C	
9- Geologic Time	C	D	C	B	C	
10- Fossil Fuels	C	C	A	B	A	

Planet Earth Unit Test – Answer Key

Earthquake epicenter – Edmonton

1	B	12	A	23	A	34	B	45	D
2	D	13	C	24	B	35	A	NR1	4213
3	A	14	B	25	C	36	C	NR2	1432
4	C	15	D	26	C	37	B		
5	B	16	A	27	A	38	D		
6	A	17	B	28	D	39	B		
7	C	18	D	29	B	40	A		
8	D	19	C	30	C	41	A		
9	B	20	A	31	D	42	B		
10	A	21	D	32	D	43	C		
11	D	22	B	33	A	44	D		