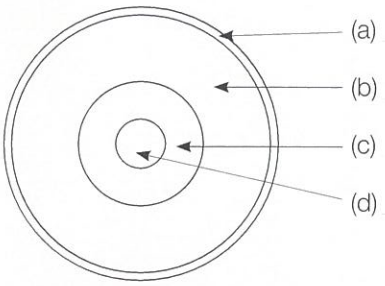
BASIC WORKSHEET

Layers of the Earth

1. Label this diagram of the Earth.



(a) CRUST
(b) MANTLE
(c) OUTER CORE
(d) INNER CORE

2. Describe the Earth's core in terms of content, state and temperature.

Very hot, solid and rich in iron.

3. Describe where the thickest part of the Earth's crust is. Explain your answer.

Underneath The Himalayan mountains. Tallest mountain range in the world & Their Thickness added to usual crust Thickness. underneath them.

4. Explain how the Earth's mantle is like golden syrup.

Very Thick, slow-moving liquid.

5. Describe the evidence supporting the idea that the crust of the Earth is not continuous but rather is cracked like a cracked hardboiled egg.

Earthquakes + volcanoes occur along plate boundaries. When these are plotted on a map of The earth outlines of tectonic plates are shown which resembles a cracked egg shell.

6. Explain, with reference to convection currents, how heat travels from the mantle to the crust.

particles heated from core become less dense and rise transfering heat to crust. cooler more dense particles replace them and the cycle continues. This is called convecti currents

7. Explain why the inner core is solid even though the outer core is liquid.

Extreme pressure from weight of mantle & crust maintains its solid form.

8. Explain how the phenomenon of sea floor spreading leads to new crust being made.

As plates move apart new crust is formed from magma beneath The crust's surface hence "spreading" The sea floor.

BASIC WORKSHEET

When plates meet – plate boundaries

1. Match each of these terms with its definition.

Term	Definition
Continental drift	(a) A current that occurs in gases and liquids where hot material rises, cools and then falls
Convection current	(b) Place where one plate dives under another plate
Convergent plate boundary	(c) Outdated theory that explained why continents had been joined and are now apart. Had the flaw of not giving the mechanism for continents moving apart
Divergent plate boundary	(d) Place where two plates collide towards each other
Subduction	(e) Place where two plates are moving away from each other

2. For each of the following statements, decide whether it is true or false. Circle your choice and give a reason for your answer.

(a) The continents of South America and Africa look like they are jigsaw pieces that can join up so they must have once been joined. (True)/False

T Fossils of same kinds of non-flying animals on them ∴ once were joined.

(b) Fossils of the same kind of ancient fern were found in South America, Antarctica, Australia and Africa so the fern must have lived in very hot and very cold regions at the same time. True/(False)

F Fern cannot adapt to all those environments. Related to jigsaw Theory instead.

(c) The middle of the Atlantic Ocean has a massive, deep sea trench that is pushing the two tectonic plates apart. This observation provided evidence for the theory of plate tectonics. (True)/False

T New crust being formed through seafloor spreading.

3. In your book, describe the evidence for the theory of continental drift.

→ continents once joined.
→ evidence: jigsaw puzzle fits together, fossils on multiple continents the same.

4. Describe a fault line.

Weakness in the Earth's Crust.

5. Answer these questions in your book.

(a) Explain what sea floor spreading is and how it drives plate tectonics.

→ New crust made where older crust moving apart.

(b) Explain how convection currents work to move the tectonic plates far above them in the Earth's crust.

hot particles rise, cooler more dense particles sink. takes plates with them.

BASIC WORKSHEET

How is heat cycled around the Earth?

1. Match each of the following terms to its definition.

Term	Definition
Convection	(a) The type of energy that carries heat from the Sun
Conduction	(b) A cycle of heat rising and then falling; it heats gases and liquids
Radiation	(c) Method of heat transfer in liquids and gases
Convection current	(d) Method of heat transfer in a vacuum
Electromagnetic radiation	(e) Method of heat transfer that needs particles to touch in order to transfer energy

2. Describe what the Earth's two sources of heat are.

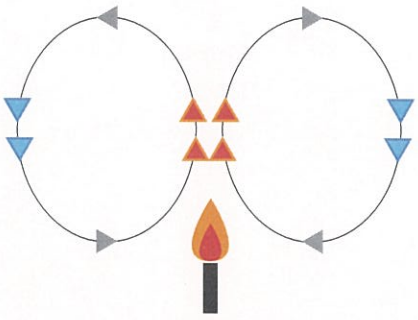
Sun + Earth's core.

3. Explain how the core of the Earth heats the Earth's crust.

convection currents from mantle. hot less dense particles ↑ transferring heat to crust

4. Describe what is happening to the particles in this diagram as they are heated, rise and then fall again in a convection current.

less dense particles rise and move apart, lose energy, become more dense, sink. cycle continues.



5. Explain, in terms of convection, conduction and radiation, how the energy from the Sun travels to the surface of the Earth to heat it.

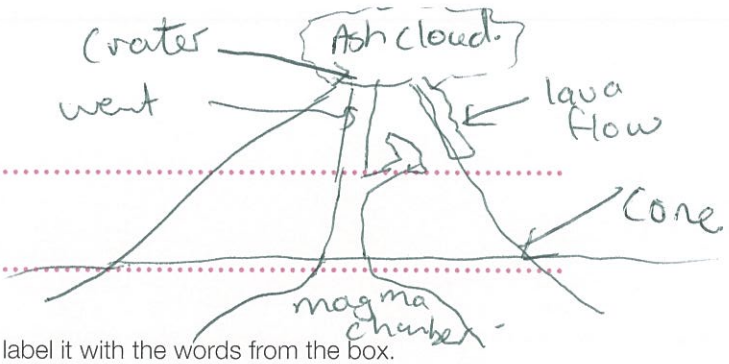
Energy travels to atmosphere via radiation through atmosphere via convection, to surface via conduction.

6. Great ocean currents such as the Gulf Stream keep northern oceans warmer than they should be as they move warm water from the equator north. Describe how this warm water is transported in the ocean.

warm water rises, wind moves it North. loses energy sinks, replenished by other water.

BASIC WORKSHEET

Volcanoes



1. In your book, create a picture of a "typical" volcano and label it with the words from the box.

crater	vent	magma chamber	cone	lava flow	ash cloud

2. Finish each of these sentences.

(a) An active volcano is a volcano that has had at least one eruption during past 10000 years

(b) A dormant volcano an active volcano not erupting but expected to erupt again.

(c) An extinct volcano not had an eruption for 10000 years not expected to erupt again.

3. Describe three warning signs that could mean a volcano is about to erupt.

Small earthquakes, sulfur-rich gas emission, crater lake heating up, steam coming out of vents.

4. Is each of the following statements true or false? Circle your choice then give a reason for your answer.

(a) Volcanoes can be located anywhere. True/(False)

Tend to be along plate boundaries of hot spots.

(b) Volcanoes erupt to keep the core of the Earth cool so the ground does not get too hot. True/(False)

Weakness in Earth's crust - nothing to do with temp of Earth

(c) Australia has no active volcanoes. (True)/False

Not on plate boundary & no hot spots.

(d) Volcanoes look the same everywhere. True/(False)

Many different types of volcanoes shape depends on lava erupted.

(e) Hot springs are an indicator of volcanic activity below the surface of the Earth. (True)/False

Have a heat source below ground indication of volcanic activity.

BASIC WORKSHEET

Earthquakes

1. Fill the gaps to complete this passage.

Earthquakes occur under the ground where massive amounts of energy are released as (a) P (primary) (b) S (secondary) and (c) L (Love) waves.
They can be measured by the (d) Richter scale, which is a scale out of 10 and measures how much (e) Energy is released by the earthquake.
Earthquakes can also be measured by the (f) Mercalli scale, which measures the effect the earthquake had on (g) the surroundings.

2. Match each of these terms with its definition.

Term	Definition
Focus	(a) A weakness in the Earth's crust
Epicentre	(b) How much energy is released by the earthquake as measured on the Richter scale
Aftershock	(c) The area of Earth's surface directly above where the earthquake started
Fault	(d) Lesser earthquake after the main shock of an earthquake
Magnitude	(e) The place inside the Earth where the earthquake originated

3. Draw two diagrams below: one of primary and the other of secondary earthquake waves.

Primary waves	Secondary waves
	

longitudinal

transverse

4. Explain why Australia has very few earthquakes each year in comparison with its close neighbour, New Zealand.

New Zealand is on plate boundary. Australia in middle of a plate.

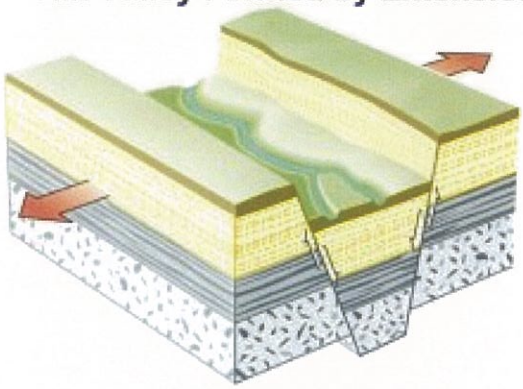
5. In the first major earthquake in Canterbury, New Zealand in 2010, many residents were woken by a rumbling noise before they felt the first P wave. Explain why this is a common phenomenon.

Sound caused by ground moving travels faster than P & S waves.

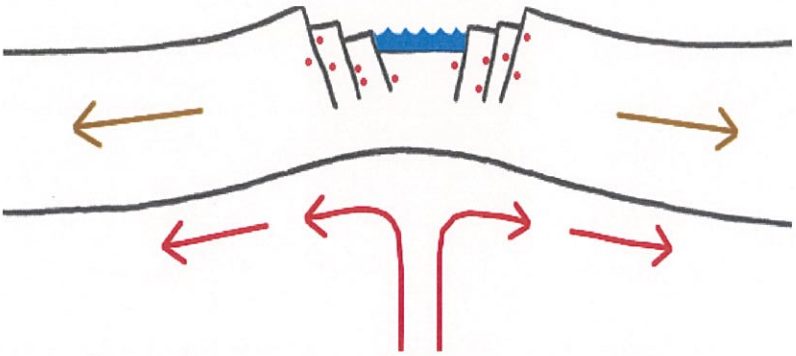
FAULTS AND FOLDS

IN PLATE TECTONIC BOUNDARIES.

Rift Valley Formed by Extension



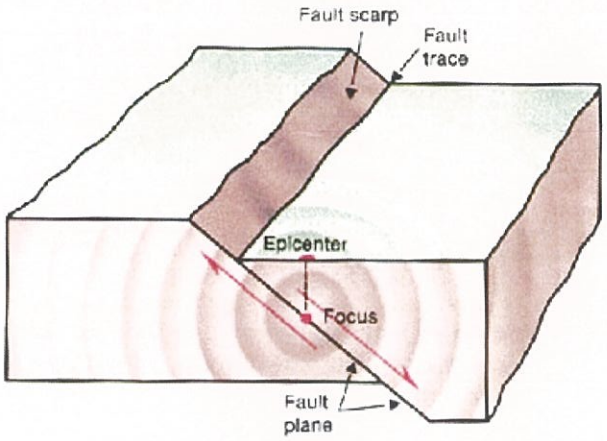
Normal Faults occur typically in Rift valleys where continents are being pulled apart due to an upwelling convection current.



The continent is placed under tension. Eventually the pulling forces causes the rock to crack along planes called fault planes.

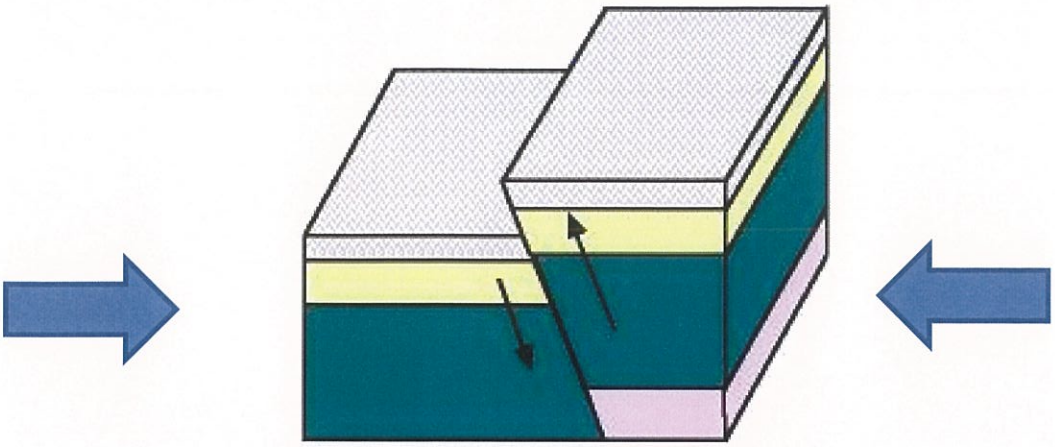
As the plate moves apart, the blocks slide down the fault plane, pulled down by gravity.

This movement causes earthquakes.



Reverse (Thrust) Faults occur when continents are being compressed together by tectonic forces.

The Compressional forces cause continental rocks to crack along planes called fault planes.

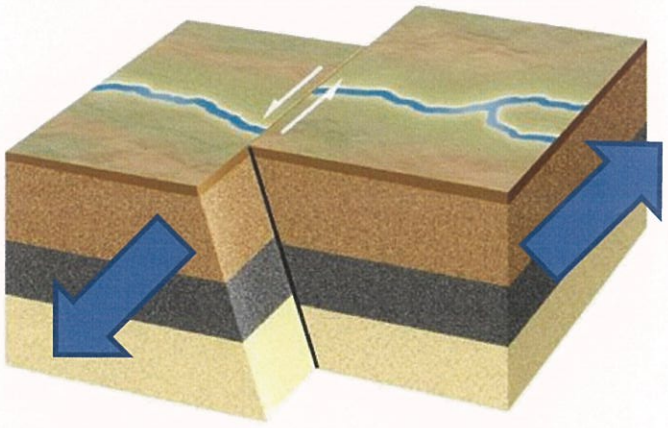


The force thrust these blocks up the slope of the fault plane. Movement along the fault plane causes earthquakes.

Thrust or reverse faults can be found in convergent plate boundaries. Eg Indian continent colliding into the Asian continent.

Strike- Slip Faults occur when the forces are parallel to the strike of the fault line.

Transform faults at Mid Ocean Ridges are **Strike Slip** faults.



The famous **San** Andreas **Fault** in California is a strike slip fault. The Cities of San Francisco and Los Angeles are built on this fault!

Why is this cause for concern? A lot of houses built here.

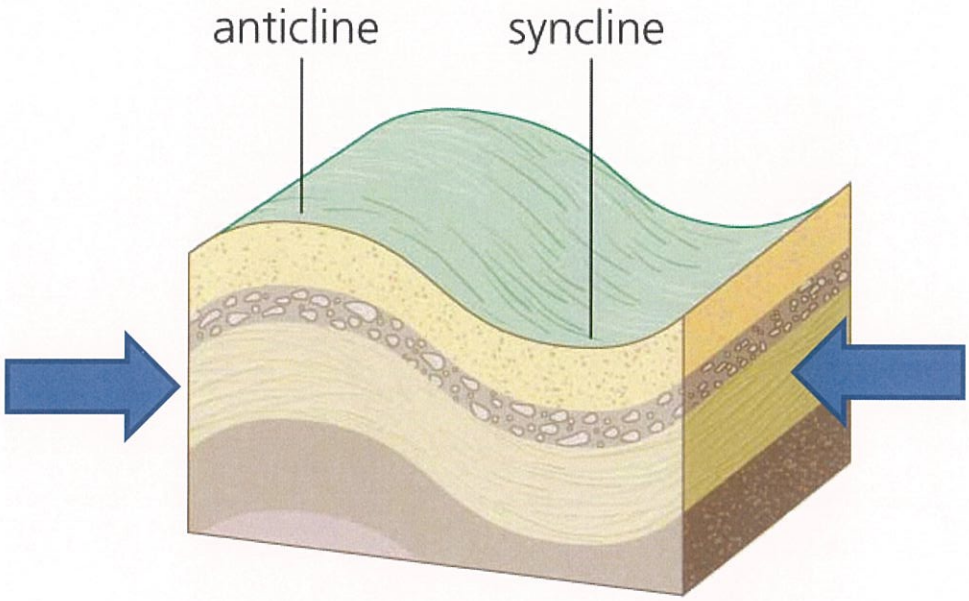
Movement along these faults can cause mountains to be made along the length of the fault line.

Folds occur in when the compressional plate tectonic forces cause sedimentary layers to buckle and bend.

The sedimentary rocks are more plastic and bend rather than crack and break.

The layers deform into folds.

A downward fold is called a syncline. An upward fold is called a anticline.



BASIC WORKSHEET

Rocks and minerals

1. Match each of these terms with its definition.

Term	Definition
Minerals	(a) A way of showing the true colour of a mineral
Lustre	(b) The substances that rocks are made up of
Habit	(c) 10-point scale on which diamond is a 10
Cleavage plane	(d) The way that a mineral reflects light
Mohs hardness scale	(e) A quality showing the mineral is rich in iron
Streak test	(f) The way a crystal will split to give a flat surface
Magnetic	(g) The way that crystals grow together

2. Complete the table by writing each substance from the box in the correct column.

~~granite~~	~~diamond~~
~~gold~~	~~limestone~~
~~slate~~	~~coal~~
~~marble~~	~~sandstone~~
~~quartz~~	~~calcite~~

Rock	Mineral
limestone marble slate coal granite sandstone	diamond gold quartz calcite.

3. Check whether each statement below is correct. If it is, then put a tick next to it. If you find mistakes, rewrite it in your book so that it is a correct statement.

(a) It is a myth that diamond is the hardest substance known to humanity as titanium has now taken this status. ✗ diamond is hardest substance know. Titanium not as hard

(b) Gold is valued because it is unreactive and easy to find as itself. ✗
Gold is valued because it is rare.

(c) ✓ Iron pyrite is called fool's gold because it looks like gold but when you do the streak test on it, the streak is dark – not yellow like gold's streak.

(d) The outback of Australia is full of iron ore because it is the same colour as iron. ✗ same colour.
Rich in iron ore but not because

4. Explain how gold panning succeeds in swirling the water and the non-gold material away from the gold in the pan.

Gold is dense so sinks to bottom.
less dense material removed by swirling.

Churchlands Senior High School

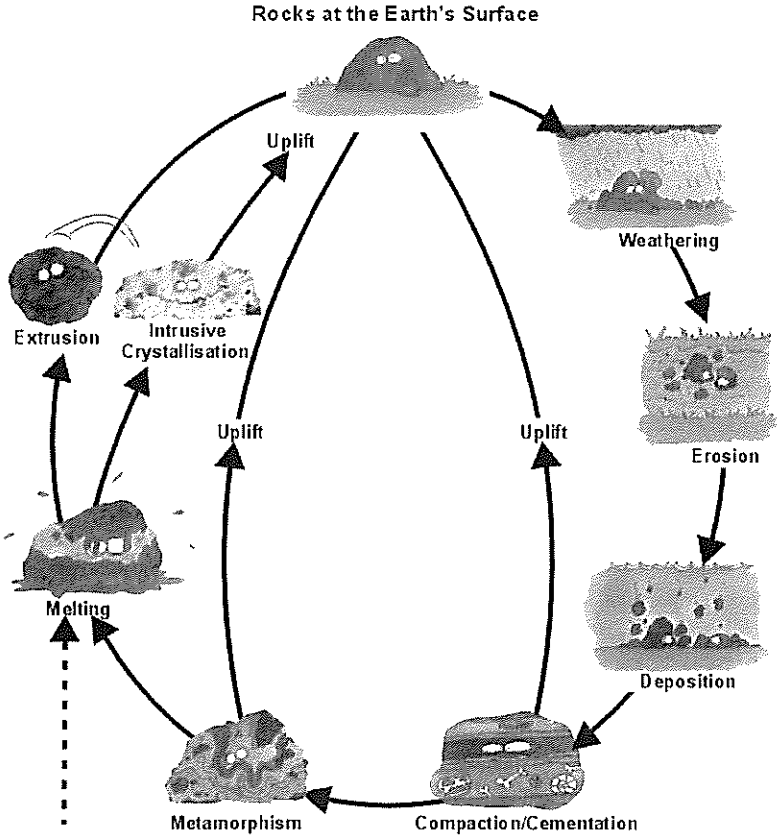
Year 8 Earth and Space Sciences

Mid-topic Test Revision

Visit the following link and then complete the following paragraphs.

http://www.oum.ox.ac.uk/thezone/rocks/cycle/index.htm

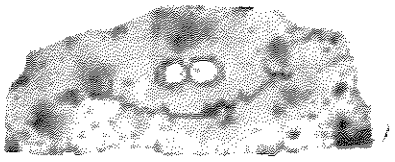
Start here by exploring the rock cycle ...



Melting

It can get quite hot deep in the Earth's crust. In fact, it can get so hot that the rocks that make up the crust can actually begin to _melt_. This molten material is called _magma_. It is less dense than the surrounding rock so it tends to move _up_ through the crust. Magma also comes from _deep_ below the Earth's crust – the mantle. This new material rises up from the mantle and adds to the magma produced from the _melting_ crust.

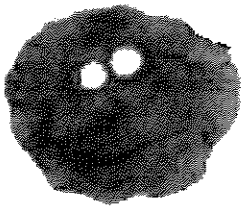
Intrusive Crystallisation



Molten rock can sometimes form huge reservoirs called magma Chambers within the Earth's crust. Left undisturbed over many hundreds of thousands of years this magma will cool and Crystallise to form intrusive igneous rocks. Intrusive igneous rocks like granite and gabbro have some things in common. Like:

1. Both are large grained – magma cools very slowly beneath the Earth's surface so the crystals in the rock have a long time to form.
2. Both are made up of large interlocking crystals.

Extrusion



Sometimes magma can force itself through a crack or Fault in the rock at the Earth's surface. It pours out over the Earth's surface in a volcanic eruption. This process is called extrusion.

The rocks that form from extruded magma are called extrusive igneous rocks. Basalt and pumice are extrusive igneous rocks. The type of rock that forms depends on the magma it came from, but generally extrusive rocks:

1. Are very fine grained – lava cools very quickly when it erupts onto the Earth's surface and the crystals in the rock don't have much time to form.
2. May contain volcanic gas vesicles.

Now try the following web site for more revision.

http://www.oum.ox.ac.uk/thezone/minerals/index.htm

Now complete the following minerals quiz ...

Mineral Practice Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

D 1. A mineral is inorganic, which means that it contains
   a. compounds.
   b. materials made by humans.
   c. parts of living things.
   d. no materials that were once part of living things.

A 2. The color of a mineral's powder is called its
   a. streak.
   b. luster.
   c. density.
   d. hardness.

A 3. If you broke a mineral into tiny pieces, each piece would
   a. still show the same crystal structure.
   b. have the same shape.
   c. be roughly the same size.
   d. be metallic.

B 4. Magma that cools very slowly deep beneath the surface forms minerals with what type of crystals?
   a. small
   b. large
   c. very hard
   d. cubic

A 5. The repeating pattern of a mineral's particles forms a solid called a(n)
   a. crystal.
   b. element.
   c. compound.
   d. rock.

C 6. What is the hardest known mineral?
   a. talc
   b. quartz
   c. diamond
   d. gold

B 7. Most minerals do NOT split apart evenly. Instead, they have a characteristic type of
a. cleavage.
(b) fracture.
c. crystal.
d. luster.

___ 8. What crystal shape does halite have?
a. cubic
b. monoclinic
c. hexagonal
d. glassy

B 9. The softest mineral on the Mohs hardness scale is
a. quartz.
(b.) talc.
c. apatite.
d. gypsum.

Modified True/False

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

F 10. Minerals come from organic materials. inorganic

F 11. Halite crystals form when a solution of water and salt condenses. evaporates.

T 12. A mineral that does not split apart evenly has the property of fracture.

T 13. The faster magma cools, the smaller the mineral crystals form.

Completion

Complete each statement.

14. A mineral is always a(n) solid because it has a definite volume and shape.

15. The atoms of a mineral are arranged in a repeating pattern to form a solid called a(n) crystal.

16. One way to identify a mineral is to rub it against a piece of unglazed tile to observe its streak.

17. The process by which atoms are arranged to form a material with a crystal shape is called Crystallisation

18. Shiny minerals, such as galena, are said to have metallic lustre.

Short Answer

Use the diagram to answer each question.

Mohs Hardness Scale

Mineral	*Hardness*
Talc	*1*
Gypsum	*2*
Calcite	*3*
Fluorite	*4*
Apatite	*5*
Feldspar	*6*
Quartz	*7*
Topaz	*8*
Corundum	*9*
Diamond	*10*

19. What would happen if you rubbed a piece of fluorite against a piece of feldspar? The fluorite would break apart/ scratch

20. What would you expect to happen if you rubbed a mineral of hardness 7.5 against a piece of quartz? scratch quartz

21. If an unknown mineral has a hardness between 5 and 9, what could you do to the mineral to find out more about its hardness? Rub it against quartz. If it scratches quartz its harder than 7 if it doesn't it's less than 7.

22. Which minerals in the table will scratch quartz?

Topaz, corundum, diamond.