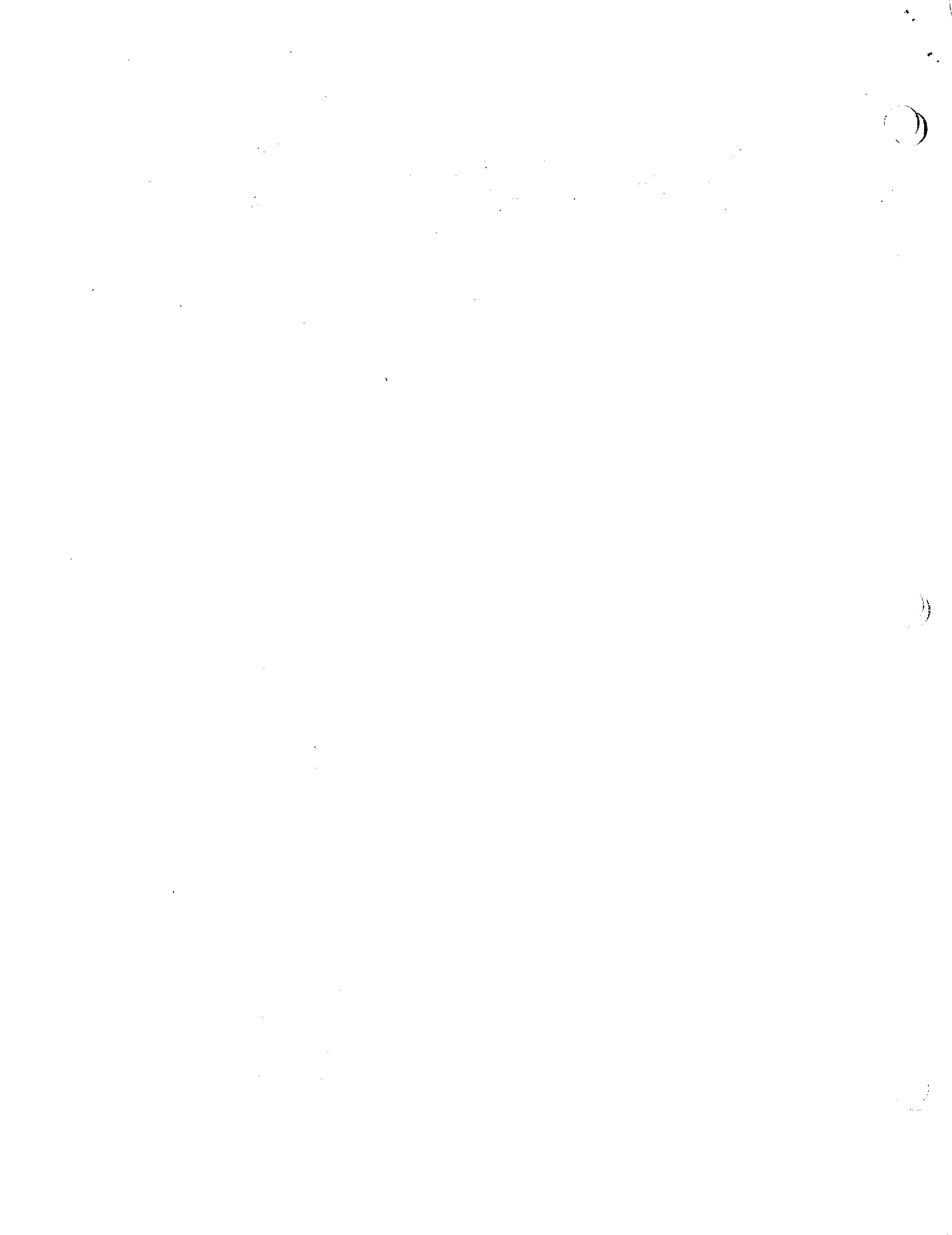


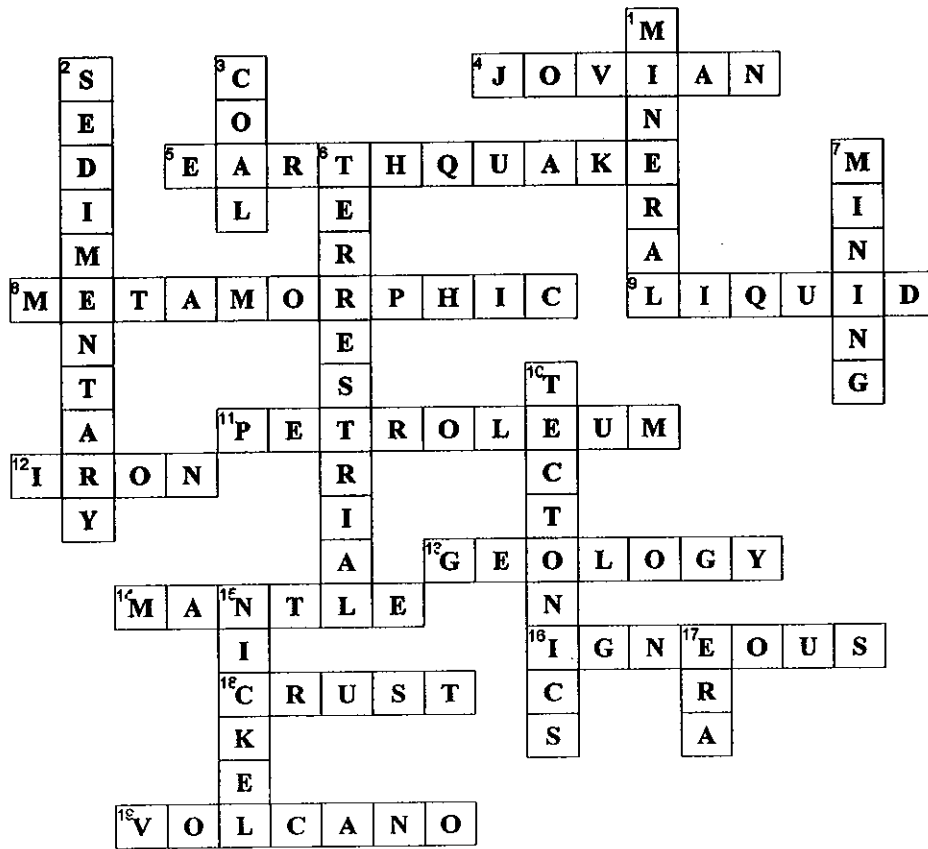
Geology 12

Crosswords

**Troy Boyd
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Fort St. John, BC
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Geology Introduction



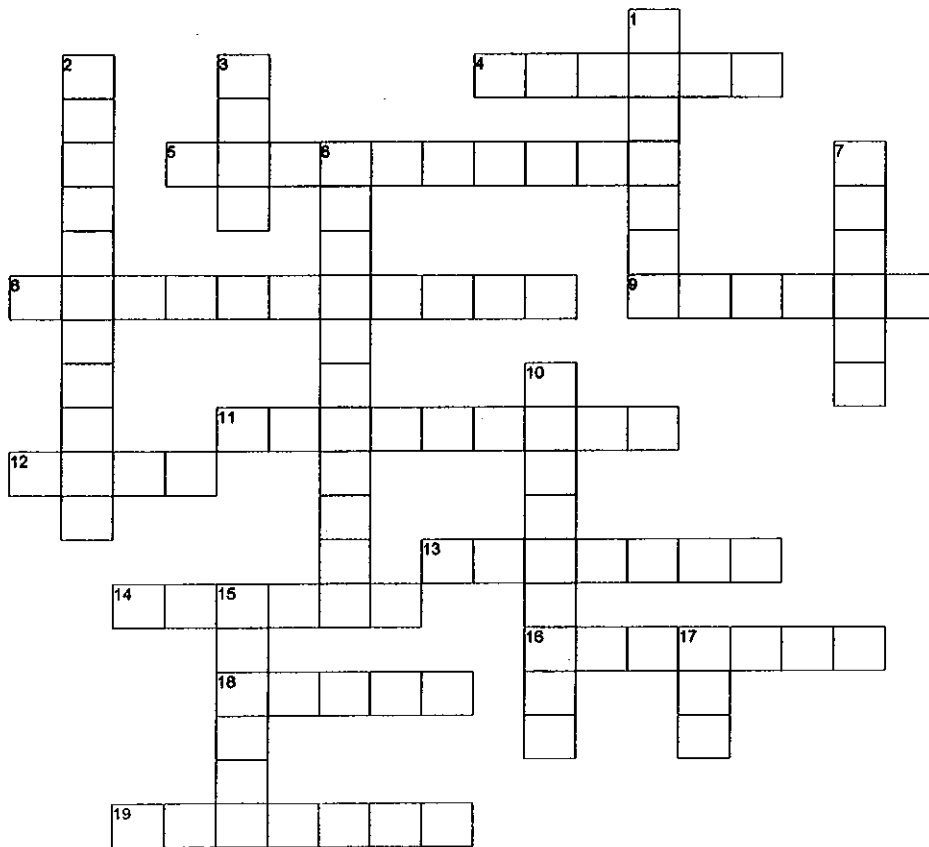
ACROSS

4. Outer planets, some of which are called gas giants
5. Shaking of the Earth due to cracking of the crust
8. Rock type that is altered by heat and or pressure
9. The outer core is _____.
11. Liquid fossil fuels
12. Another of the two main elements making up the core
13. The study of the Earth
14. Layer of the Earth above the core
16. Rock type that is solidified from molten rock
18. Layer of the Earth that continents are part of
19. Hawaii is one of the Earth's largest

DOWN

1. Naturally occurring solid with definite chemical composition and crystal form
2. Layered rock type that is either broken bits, or is precipitated from a concentrated solution
3. Solid fossil fuel
6. Inner group of four "rocky" planets
7. Process of taking useful minerals and rocks from the ground
10. The idea that the continents are moving
15. One of the two main elements making up the core
17. Really long period of time

Geology Introduction



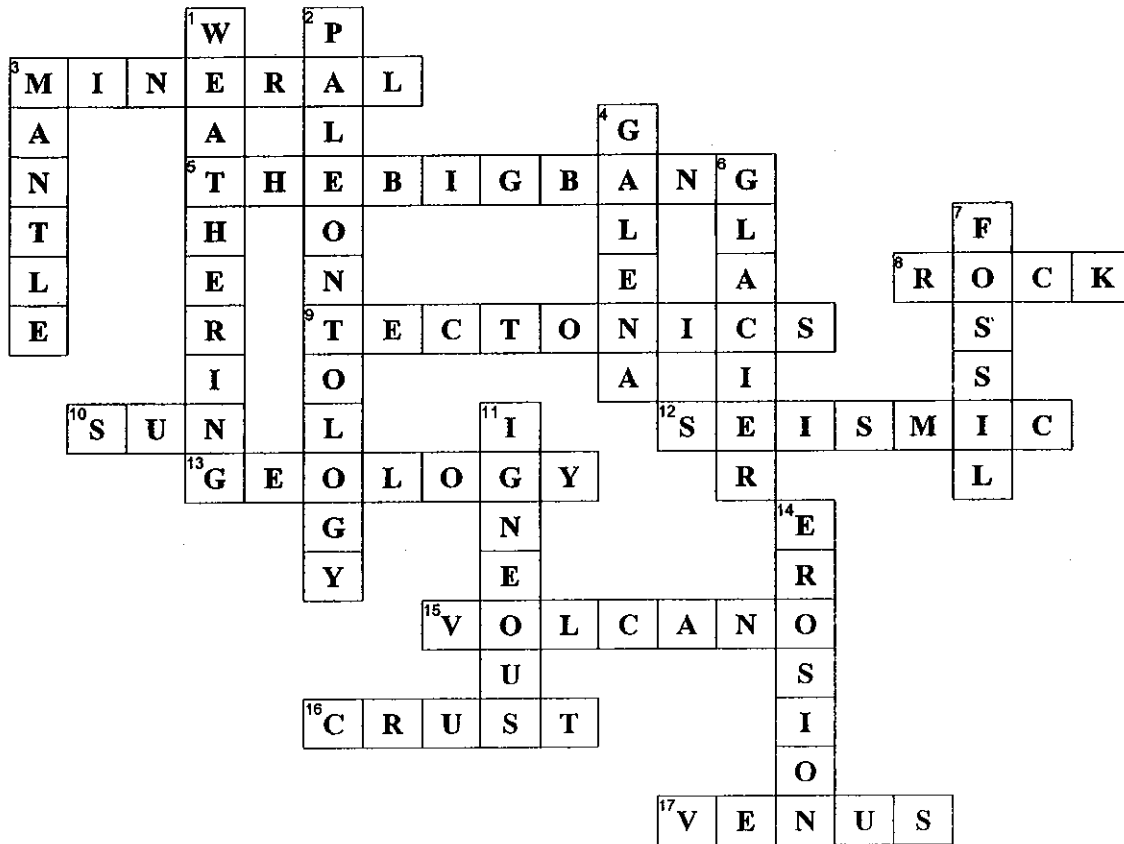
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Introductory Geology



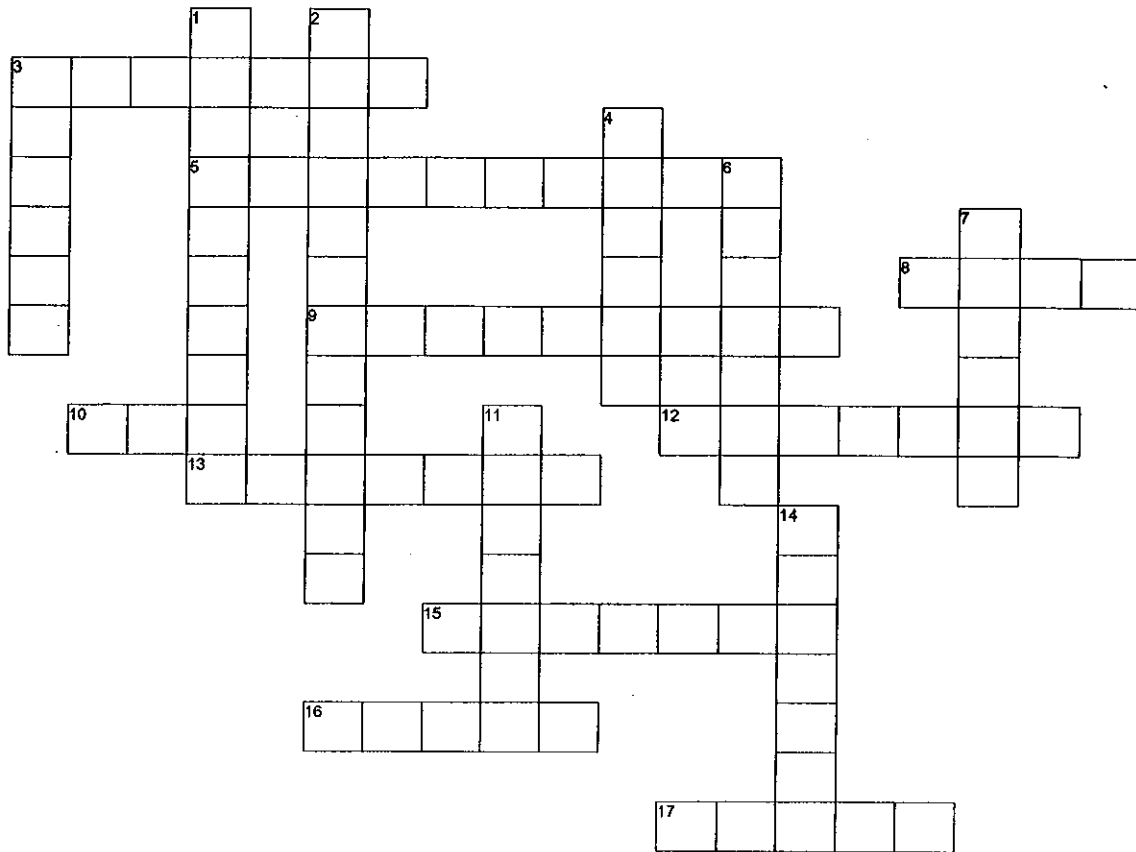
ACROSS

3. Naturally occurring, crystalline solid with definite composition and crystal form
5. Scientific theory of the origin of the Universe (3wds)
8. Group of mineral grains stuck together in a cohesive mass
9. Plate _____ is the idea that the surface of the Earth is broken into several floating pieces
10. The object at the center of our solar system
12. Type of geophysical survey used to look for oil and gas
13. Study of the Earth and it's processes
15. Mountain occurring where magma comes to the surface of the Earth
16. Layer of the Earth that is like the shell of an egg
17. Planet in our solar system, which is most similar to Earth

DOWN

1. Breakdown of rock into sediment by natural agents
2. The study of previously existing life
3. One of the four main layers of the Earth
4. Ore mineral of lead
6. Large mass of ice, which moves under its own weight
7. Remains, or evidence of previously existing life
11. Type of rock which has solidified from a melt (magma or lava)
14. Transportation of sediment by moving agents like water, wind or ice

Introductory Geology



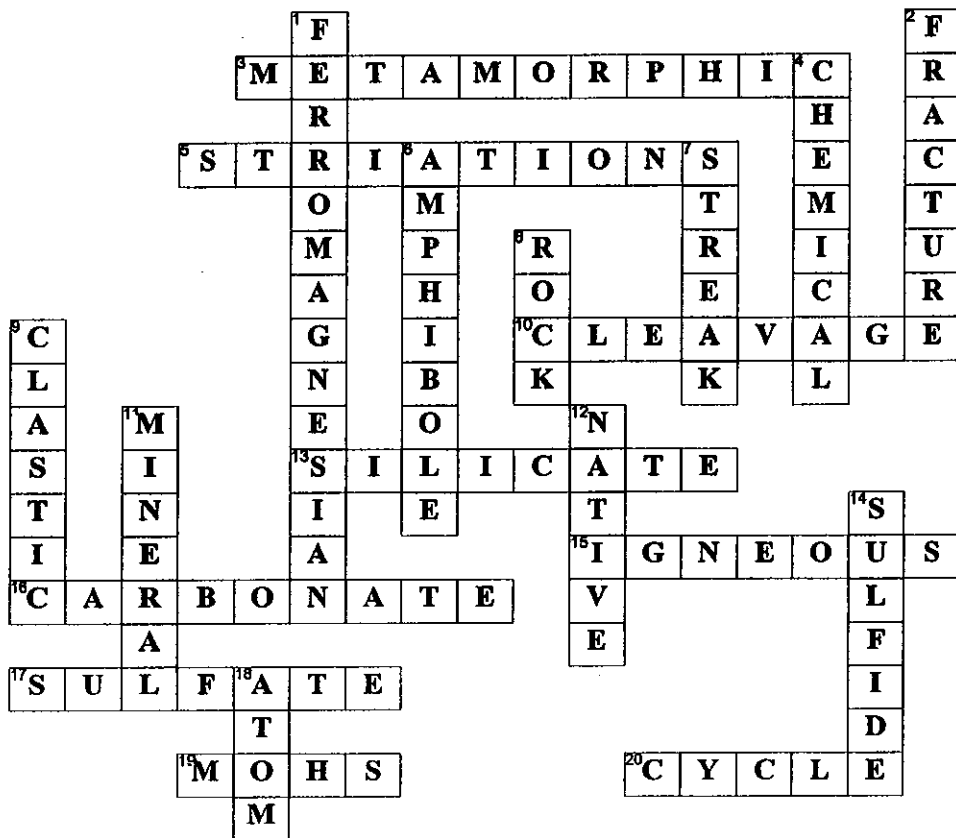
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Minerals



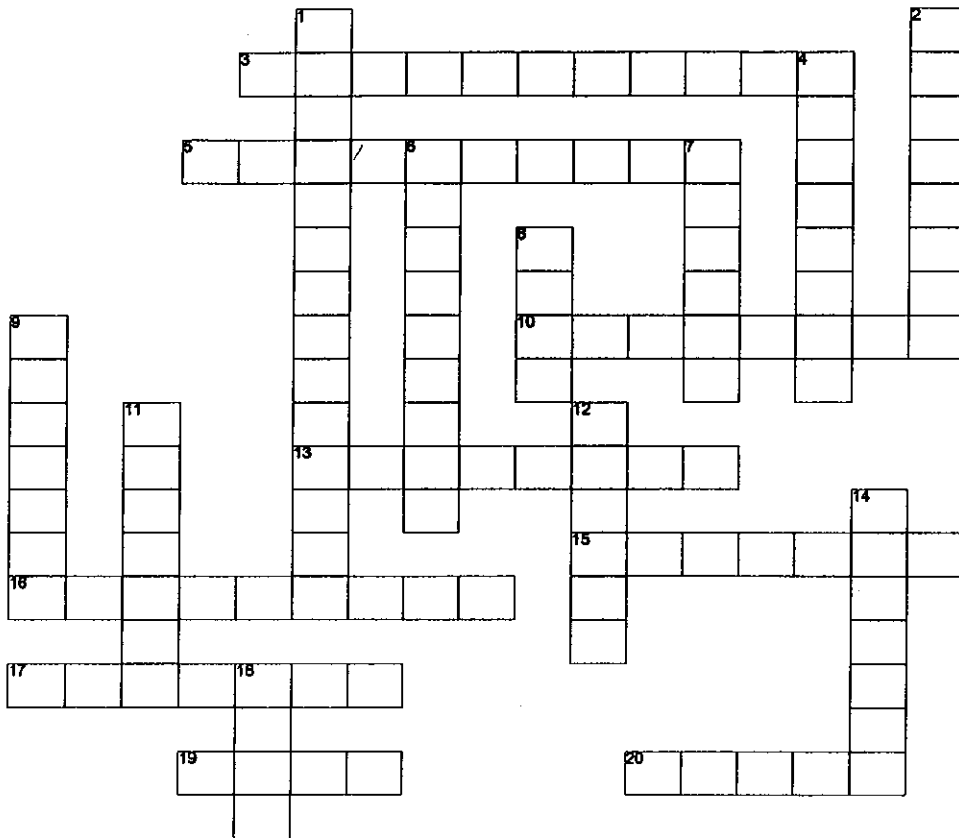
ACROSS

3. Rock formed by heat and pressure alteration of minerals in other rocks.
5. Parallel scratches on a cleavage surface.
10. Flat surface along which a mineral or rock breaks.
13. Minerals containing large amounts of silicon and oxygen.
15. Rock crystallized from a melt.
16. Minerals containing CO₃, reactive with acid. Calcite is the most common.
17. Minerals containing SO₄, often hydrothermal or evaporitic.
19. _____ hardness scale contains ten minerals of various hardnesses.
20. The Rock _____ shows the relationship between the three rock types.

DOWN

1. mineral containing iron and magnesium.
2. Non-cleavage breakage of minerals.
4. Type of sed. rock formed by precipitation from solution.
6. Mid temperature, black, glassy mineral with 60/120 cleavage.
7. Colour of powdered minerals.
8. Consolidated group of mineral grains, of one or more minerals.
9. Sed. rock formed from broken bits of minerals or rocks.
11. Naturally occurring, solid substance with definite composition and form.
12. _____ elements are minerals containing only one element.
14. Metallic ore minerals, like pyrite or galena.
18. Smallest part of an element having the same properties as that element.

Minerals



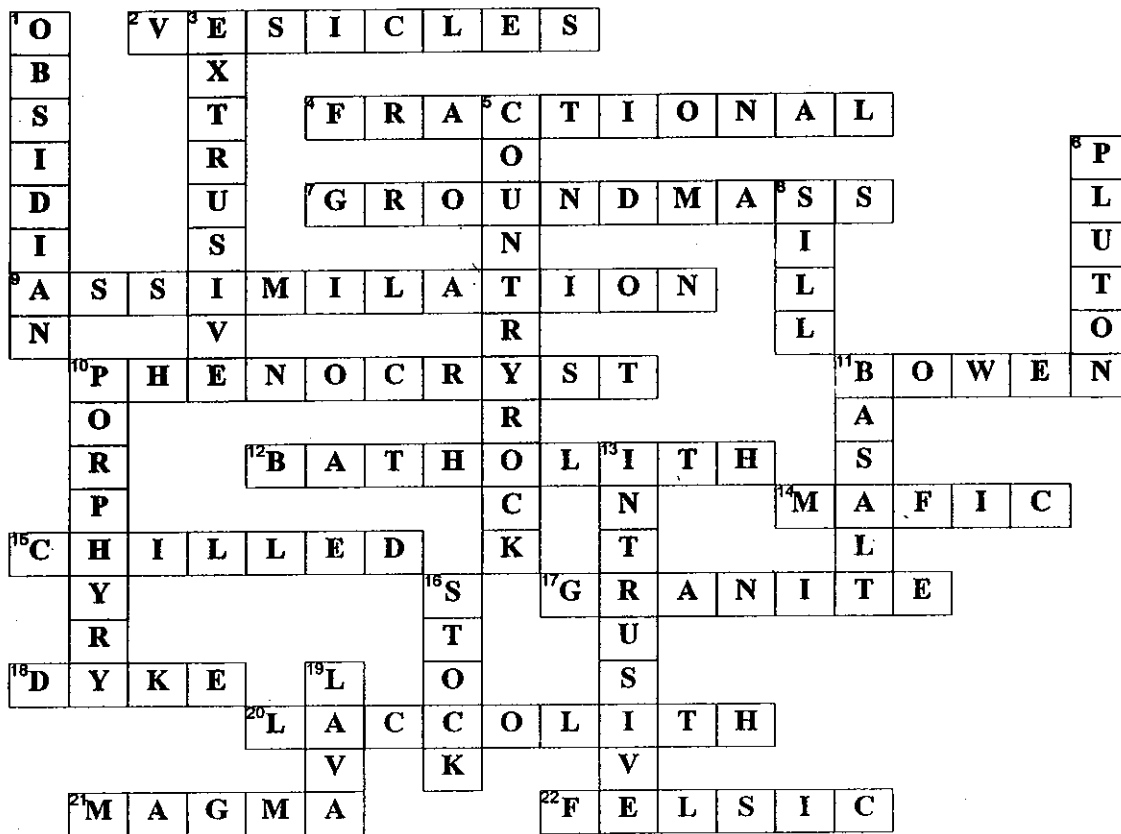
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Igneous Rocks



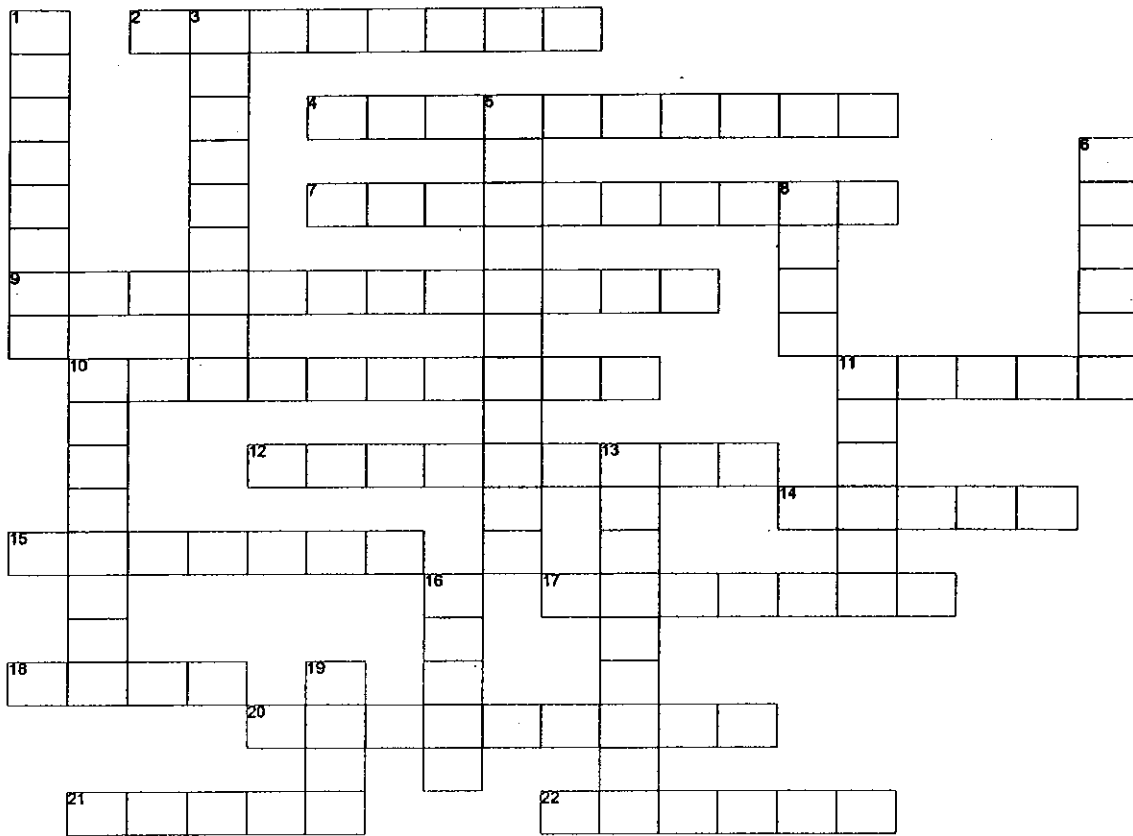
ACROSS

2. Bubbles in extrusive igneous rocks
4. Crystallization of minerals at different times based on their melting/freezing point
7. Fine grained background in a porphyry
9. Process of incorporating country rock into magma
10. Large crystal in fine grained igneous rock
11. Geologist who ordered igneous minerals based on their melting/freezing points
12. Large, body of intrusive igneous rock
14. Term for dark coloured igneous rocks
15. The margin of an igneous body where it contacts the country rock and has fine grained crystals
17. Igneous intrusive rock making up most of the continents
18. Cross cutting, discordant pluton (intrusive)
20. Intrusion that pushes the overlying layers of rock upwards
21. Intrusive molten rock
22. Term used to describe light coloured igneous rocks

DOWN

1. Volcanic glass
3. Type of igneous rock with very fine grains
5. Bedrock surrounding igneous bodies (2wds)
6. Any igneous intrusive body of rock
8. Concordant, slab-like pluton (intrusive)
10. Igneous rock with two distinct crystal sizes
11. Dark coloured extrusive rock that covers the ocean floor
13. Type of igneous rock with medium to coarse grains
16. Small batholith usually feeding other plutons more highly emplaced
19. Extrusive molten rock

Igneous Rocks



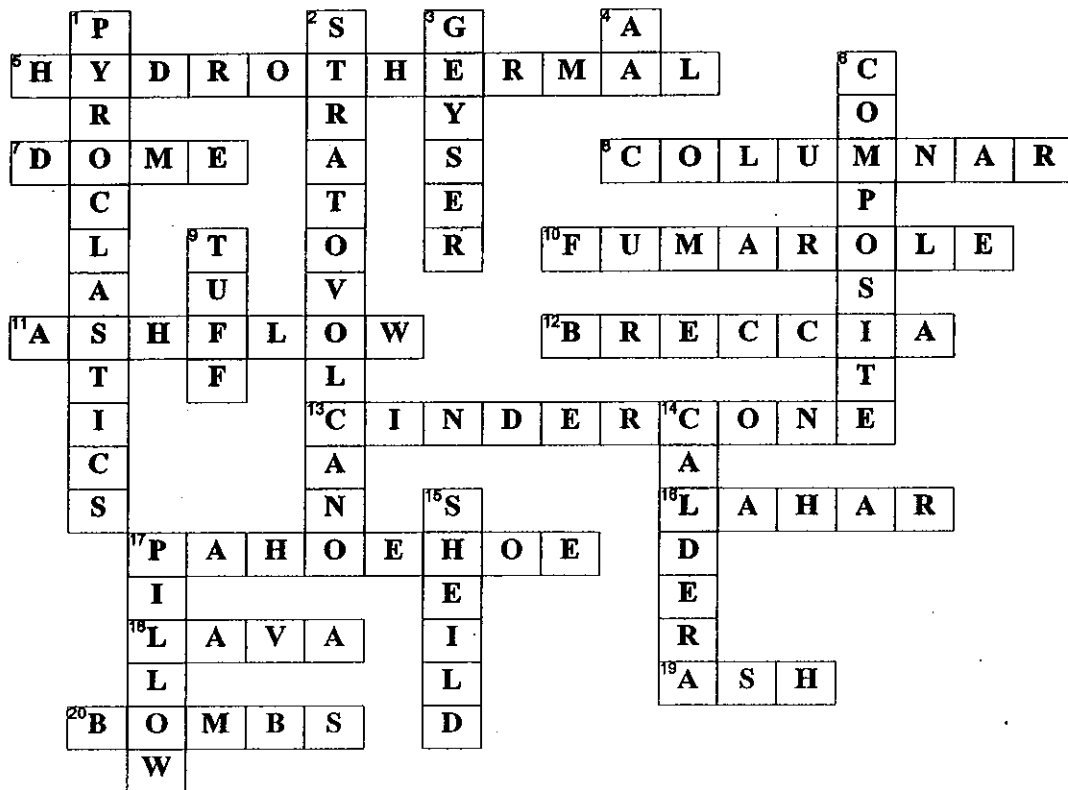
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Volcanoes



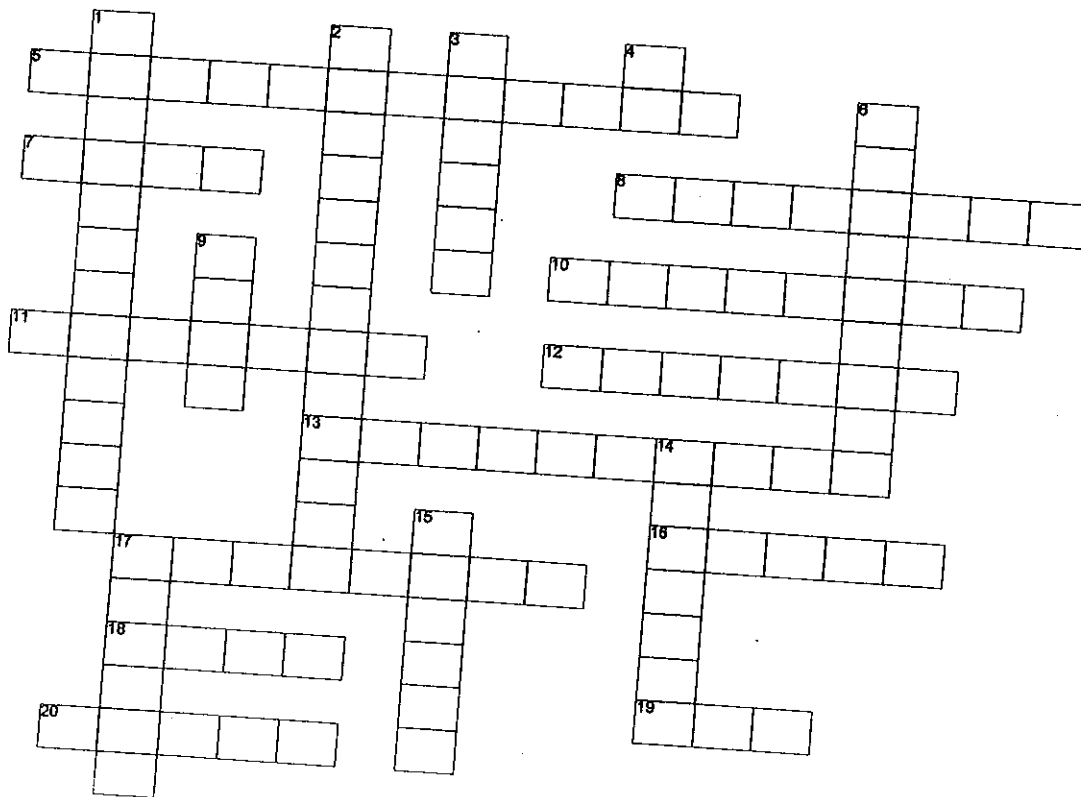
ACROSS

5. Term used to describe any feature related to hot water
7. Steep sided volcanic hill formed from felsic lava, slowly and quietly extruded like toothpaste
8. Type of jointing formed by the slow cooling of lava flows, looks like honey combs
10. Deposit formed where volcanic gases are escaping
11. Hot glowing cloud of volcanic ash that moves at great speeds, nuee ardente
12. Volcanic rock composed of larger pyroclastics
13. Well shaped volcano formed from intermediate, high viscosity lava
16. Deposit formed by wet volcanic ash (mud) flows
17. Ropey type of mafic lava
18. Extrusive molten rock or the cooled rock formed from it
19. Very fine volcanic dust
20. Larger bits of volcanic ejecta

DOWN

1. Broken bits of volcanic ejecta, can be any size
2. Another term for explosive volcano formed from interlayered lava flows and pyroclastics
3. Cavity from which volcanically heated water is emitted
4. Sharp, jagged and blocky type of mafic lava
6. Explosive volcano formed by felsic, high viscosity lava
9. Volcanic rock formed from ash or ash flows
14. Crater that forms when felsic volcanoes blow their tops, or collapse
15. Type of volcano formed by mafic, low viscosity lava
17. Mafic lava that forms under water

Volcanoes



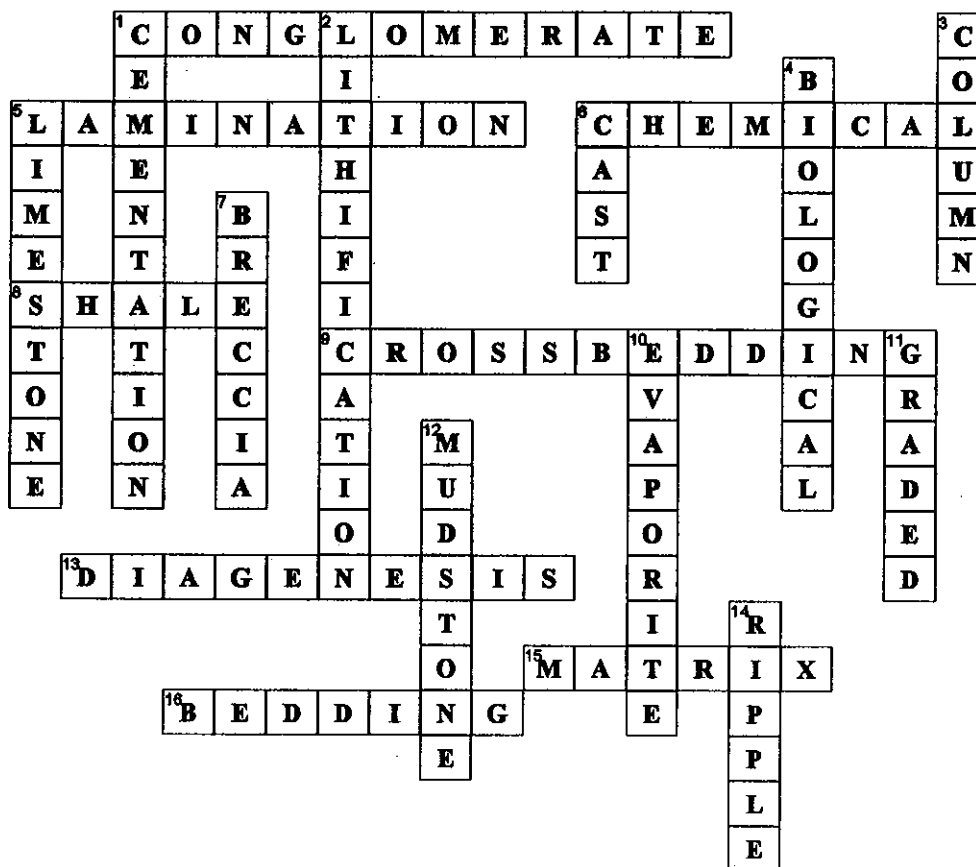
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Sedimentary Rocks



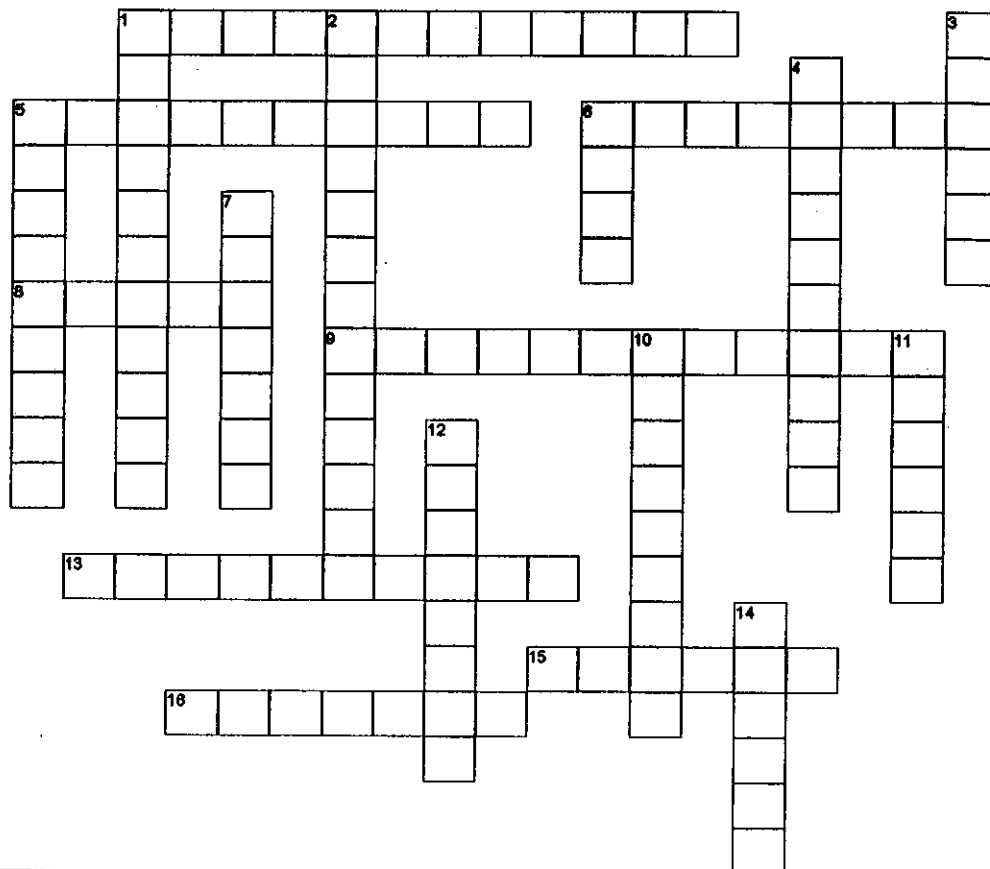
ACROSS

- | | |
|---|--|
| <p>1. Clastic sedimentary rock formed from large rounded fragments</p> <p>5. Very thin bedding of rock</p> <p>6. Type of sediment formed by the precipitation of minerals from solution</p> <p>8. Fine grained clastic rock that breaks in sheets due to alignment of clay minerals</p> <p>9. Concave-up laminations indicating up direction, caused by ripples and dunes</p> <p>13. Process of forming sedimentary rock by heat and pressure</p> | <p>15. Fine grained groundmass surrounding large fragments</p> <p>16. Parallel layers of rock greater than 1mm thick</p> |
|---|--|

DOWN

- | | |
|--|--|
| <p>1. "Glueing" together of clasts to form rock</p> <p>2. Formation of rock from sediment</p> <p>3. Term used to describe a stratigraphic sequence</p> <p>4. Type of sediment formed from or by biological organisms</p> <p>5. Chemical sedimentary rock composed of precipitated calcite, may be fossiliferous</p> <p>6. Fossil formed by the infilling of a cavity left by a decayed organism</p> <p>7. Clastic sedimentary rock formed from large angular fragments</p> | <p>10. Chemical sediment formed by the evaporation of solutions</p> <p>11. Type of bedding that indicates up direction</p> <p>12. Fine grained clastic rock with no internal structure</p> <p>14. _____ marks are miniature sand dunes</p> |
|--|--|

Sedimentary Rocks



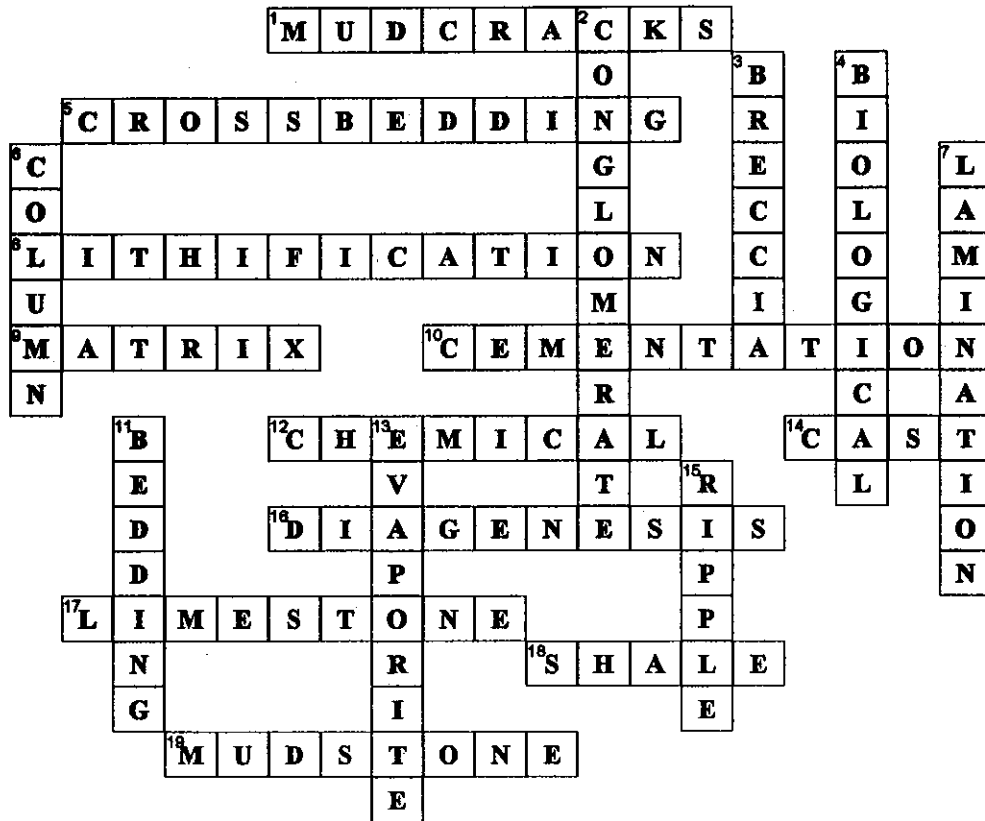
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|---|--|

Sedimentary Rocks 2



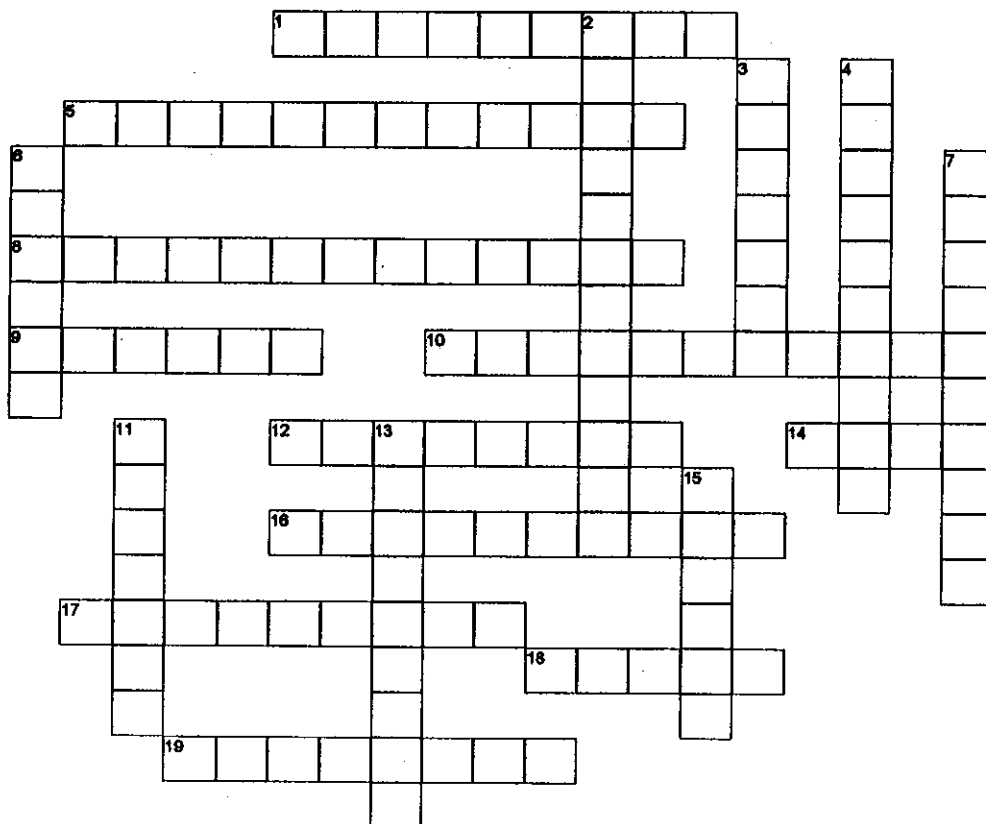
ACROSS

- | | |
|---|--|
| <p>1. Drying feature similar to columnar jointing (2 wds)</p> <p>5. Concave-up laminations indicating up direction, caused by ripples and dunes</p> <p>8. Formation of rock from sediment</p> <p>9. Fine grained groundmass surrounding large fragments</p> <p>10. "Glueing" together of clasts to form rock</p> <p>12. Type of sediment formed by the precipitation of minerals from solution</p> <p>14. Fossil formed by the infilling of a cavity left by a decayed organism</p> | <p>16. Process of forming sedimentary rock by heat and pressure</p> <p>17. Chemical sedimentary rock composed of precipitated calcite, may be fossiliferous</p> <p>18. Fine grained clastic rock that breaks in sheets due to alignment of clay minerals</p> <p>19. Fine grained clastic rock with no internal structure</p> |
|---|--|

DOWN

- | | |
|---|---|
| <p>2. Clastic sedimentary rock from large rounded fragments</p> <p>3. Clastic sedimentary rock from large angular fragments</p> <p>4. Type of sediment from biological organisms</p> <p>6. Term used to describe a stratigraphic sequence</p> <p>7. Very thin bedding of rock</p> <p>11. Parallel layers of rock greater than 1mm thick</p> <p>13. Chemical sediment formed by the evaporation of solutions</p> | <p>15. ___ marks are miniature sand dunes</p> |
|---|---|

Sedimentary Rocks 2

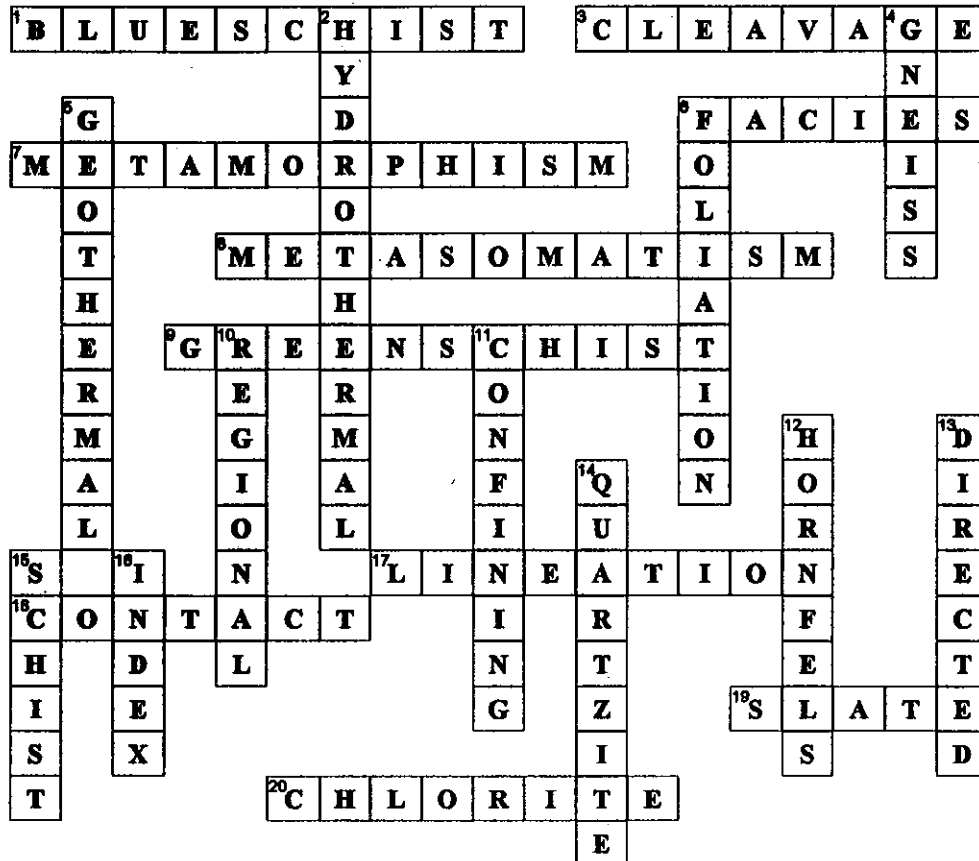


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Metamorphic

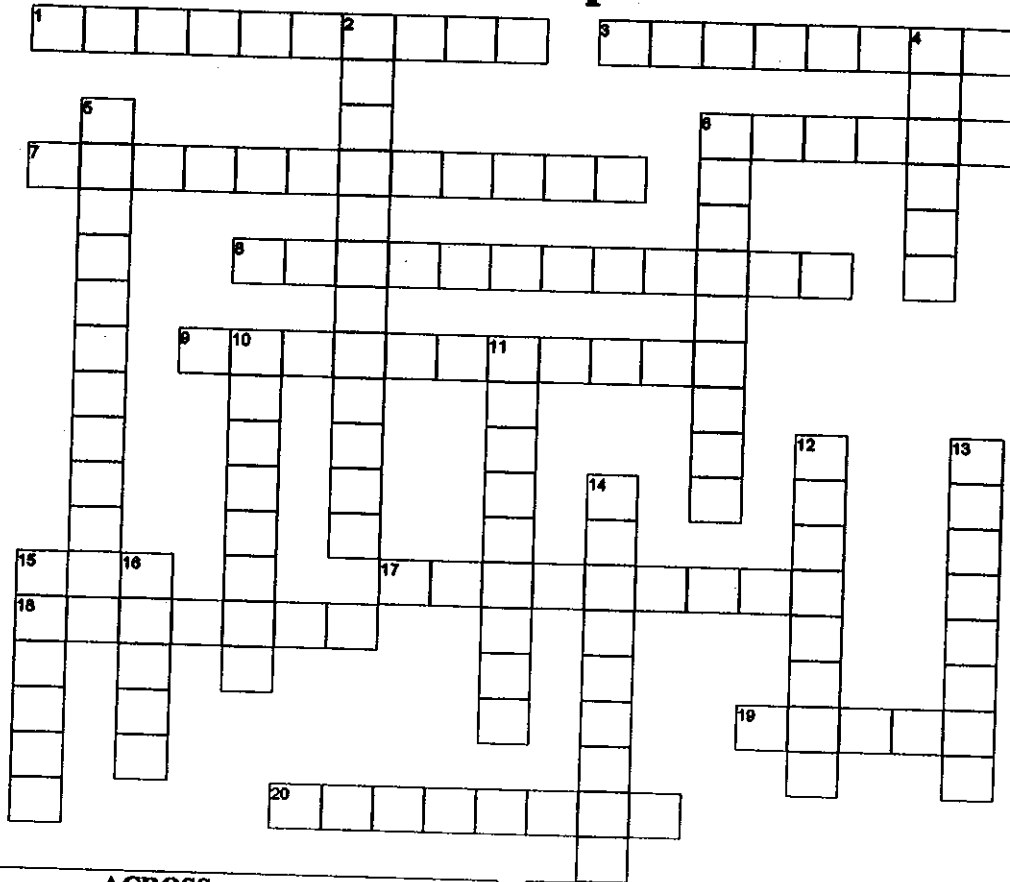


ACROSS

DOWN

- | | | | |
|--|---|---|--|
| <p>1. Facies containing low temperature, high pressure, blue minerals</p> <p>3. Planes on which a rock breaks, due to alignment of clay minerals</p> <p>6. Group of rocks from the same metamorphic conditions</p> <p>7. The changing of composition, mineralogy, texture or structure of a rock</p> <p>8. Chemical reactions brought about by ions dissolved in hydrothermal fluid</p> <p>9. Low grade metamorphic facies containing chlorite</p> | <p>17. Alignment of elongated mineral grains like a bundle of pencils</p> <p>18. Type of met. caused by proximity to an igneous body</p> <p>19. Low grade, foliated rock with little sheen. Used for shingles and pool tables</p> <p>20. Green, low grade index mineral</p> | <p>2. Solution of hot water and dissolved ions</p> <p>4. Foliated rock exhibiting compositional banding</p> <p>5. _____ gradient is the increasing temperature due to depth in the crust</p> <p>6. Alignment of platy mineral grains caused by directed stress</p> <p>10. Type of met. caused by directed stress</p> <p>11. Type of pressure due to depth, comes from all directions</p> <p>12. Medium to high grade facies containing hornblende or pyroxene</p> | <p>13. Type of stress caused by non-uniform pressure</p> <p>14. Non-foliated met. equivalent of quartzose sandstone</p> <p>15. Medium grade, foliated rock with recognisable mineral grains</p> <p>16. _____ minerals indicate metamorphic grade</p> |
|--|---|---|--|

Metamorphic



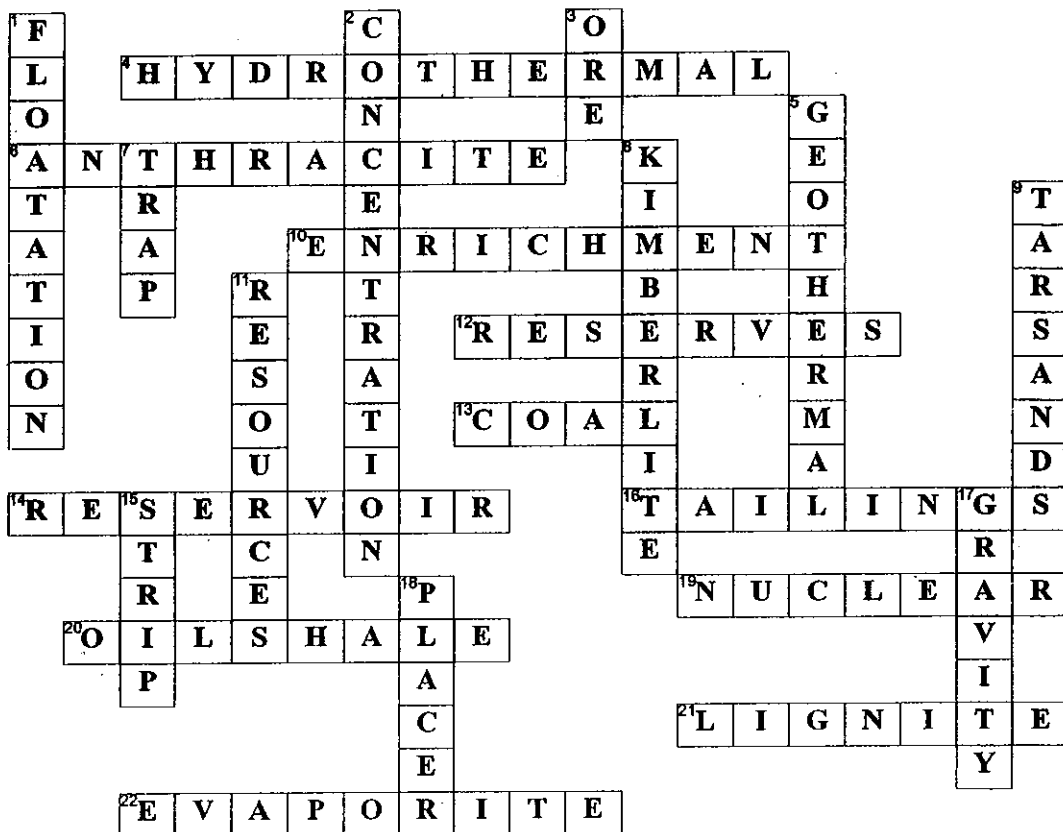
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Economic Geology



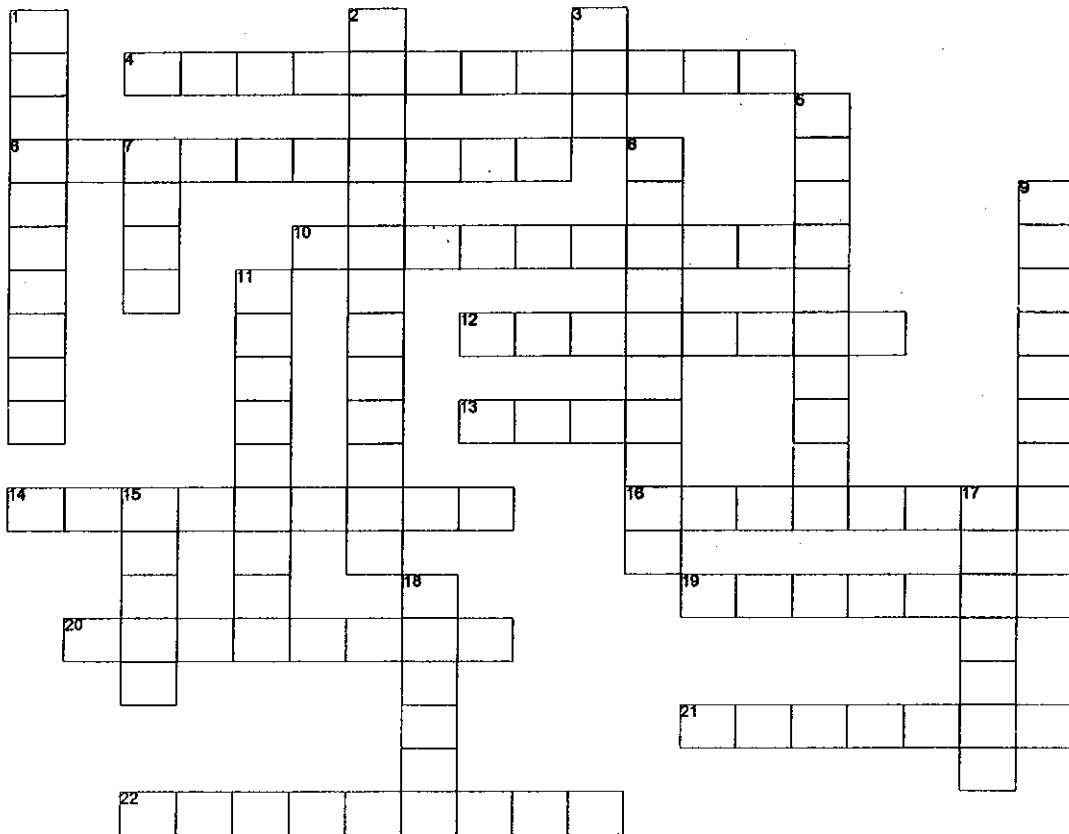
ACROSS

4. Type of deposit formed by the cooling of hot water which is laden with dissolved minerals
6. Highest grade of coal
10. Process by which the concentration of elements is increased in certain rock units or settings
12. Economically extractable material
13. Solid fossil fuel
14. Permeable rock layer containing oil and gas
16. The sand remaining after ore is crushed and the desired minerals are extracted
19. Alternative fuel source from radioactive decay
20. Fine grained rock saturated in waxy fossil fuel (2wds)
21. Very low grade coal
22. Type of deposit formed when shallow oceans evaporate

DOWN

1. Method of separating minerals by gravity or density
2. Factor which indicates how many times more of an element is in ore than in "normal" rock
3. Rock with a concentration of metal that is economically extractable
5. Type of energy generated by the earth's heat
7. Oil and/or gas deposit confined by impermeable rock
8. Magmatic deposit formed by upwelling of mantle, sometimes carries diamonds
9. Sediment saturated in thick petroleum (2wds)
11. Total amount of material, may or may not be economically extractable
15. Surface mine
17. Concentration mill based on mineral density
18. Type of sedimentary deposit of resistant and/or dense minerals

Economic Geology



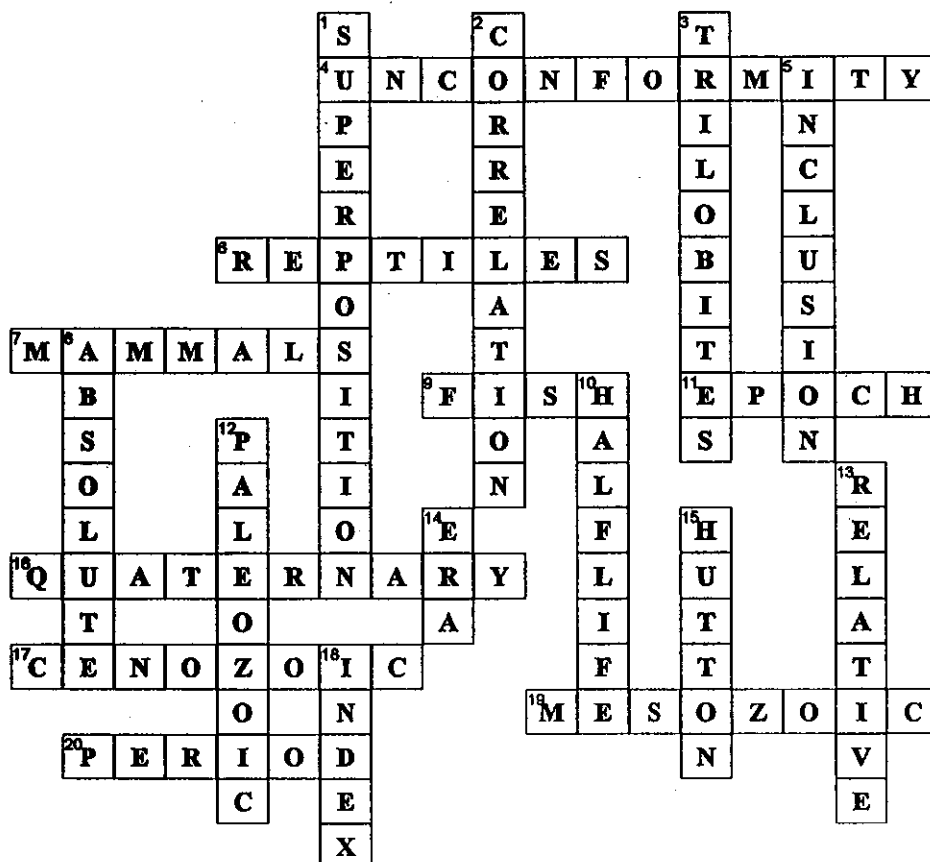
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Geologic Time



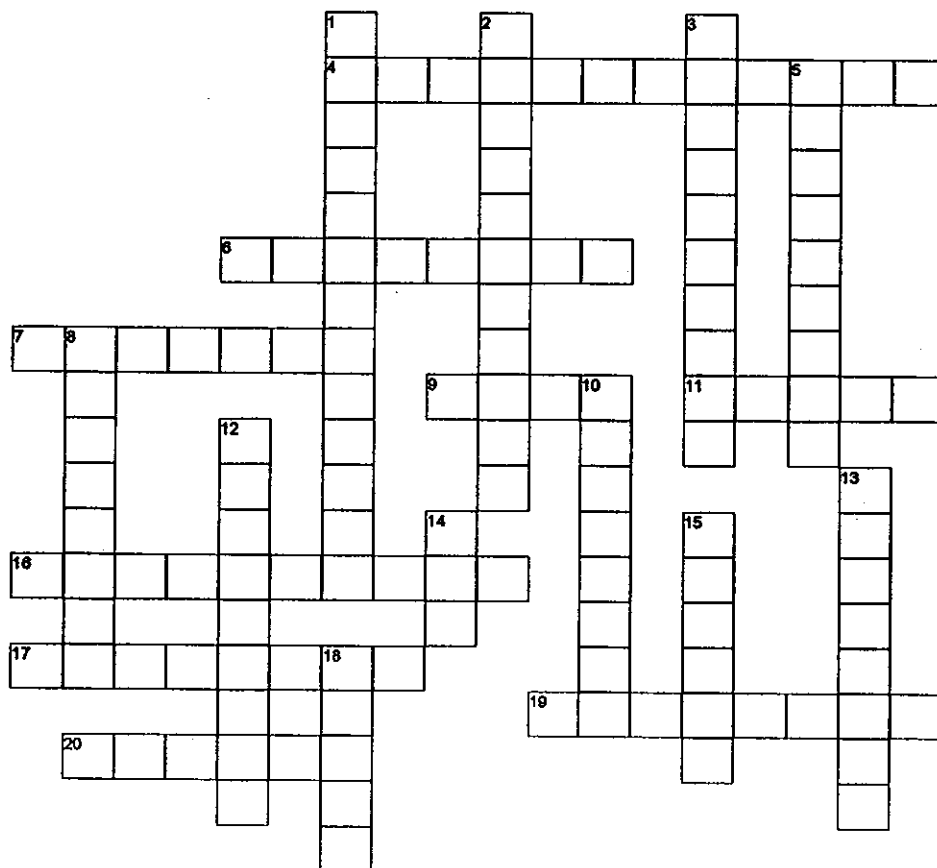
ACROSS

4. Time gap in a stratigraphic column
6. Critters common in the Mesozoic
7. Critters common in the Cenozoic
9. Critters common in the Silurian and Devonian periods
11. Small scale division of geologic time
16. Period in which we live
17. Era in which we live
19. Era of dinosaurs
20. Unit of geologic time based on arrival of critters or plants

DOWN

1. Principle stating that younger beds are above older beds
2. Relationship between two or more stratigraphic columns from different places
3. Critters common in the Cambrian period
5. Principle that says included fragments are older than the unit containing them
8. Type of dating using radioactive isotopes
10. Time required for half of an isotope to decay (2wds)
12. Era prior to land animals
13. Type of dating where the sequence is determined, not the exact age
14. Large unit of geologic time based mainly on extinction events
15. Geologist who developed the idea of uniformitarianism
18. Type of fossil that indicates the age of a sedimentary layer

Geologic Time



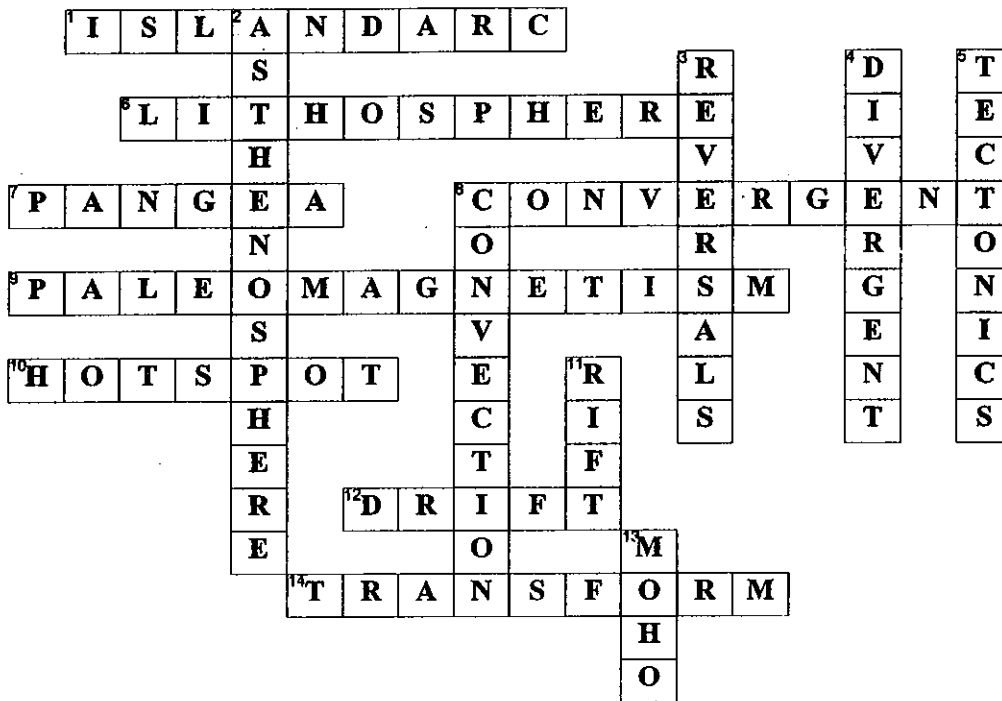
ACROSS

4. Time gap in a stratigraphic column
6. Critters common in the Mesozoic
7. Critters common in the Cenozoic
9. Critters common in the Silurian and Devonian periods
11. Small scale division of geologic time
16. Period in which we live
17. Era in which we live
19. Era of dinosaurs
20. Unit of geologic time based on arrival of critters or plants

DOWN

1. Principle stating that younger beds are above older beds
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Plate Tectonics



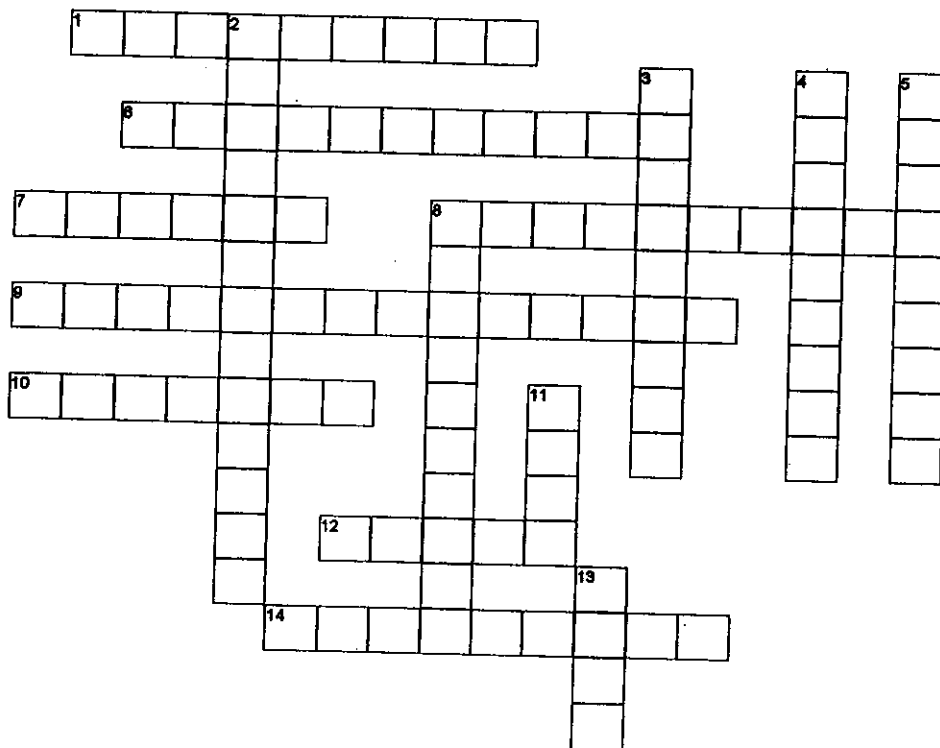
ACROSS

1. String of islands formed where oceanic plates collide (2wds)
6. The crust and upper mantle which are solid, or rocky in nature
7. The super continent formed and broken up during the Mesozoic Era
8. Type of boundary where plates collide
9. Earth's magnetic field recorded in igneous rocks
10. Location of volcanic activity not associated with plate boundaries
12. Term used to describe the movement of continents
14. Boundary formed by two plates sliding past each other

DOWN

2. Lower part of the mantle that is like plastic or maybe ice cream
3. Magnetic _____ cause symmetrical stripes across spreading centres
4. Type of boundary where plates move apart
5. Theory of movement of large "plates" of the earth's crust
8. Currents in the asthenosphere driven by the earth's internal heat
11. Valley between paired mountain ranges at a spreading center
13. The Mohorovicic discontinuity, or boundary between lithosphere and asthenosphere

Plate Tectonics



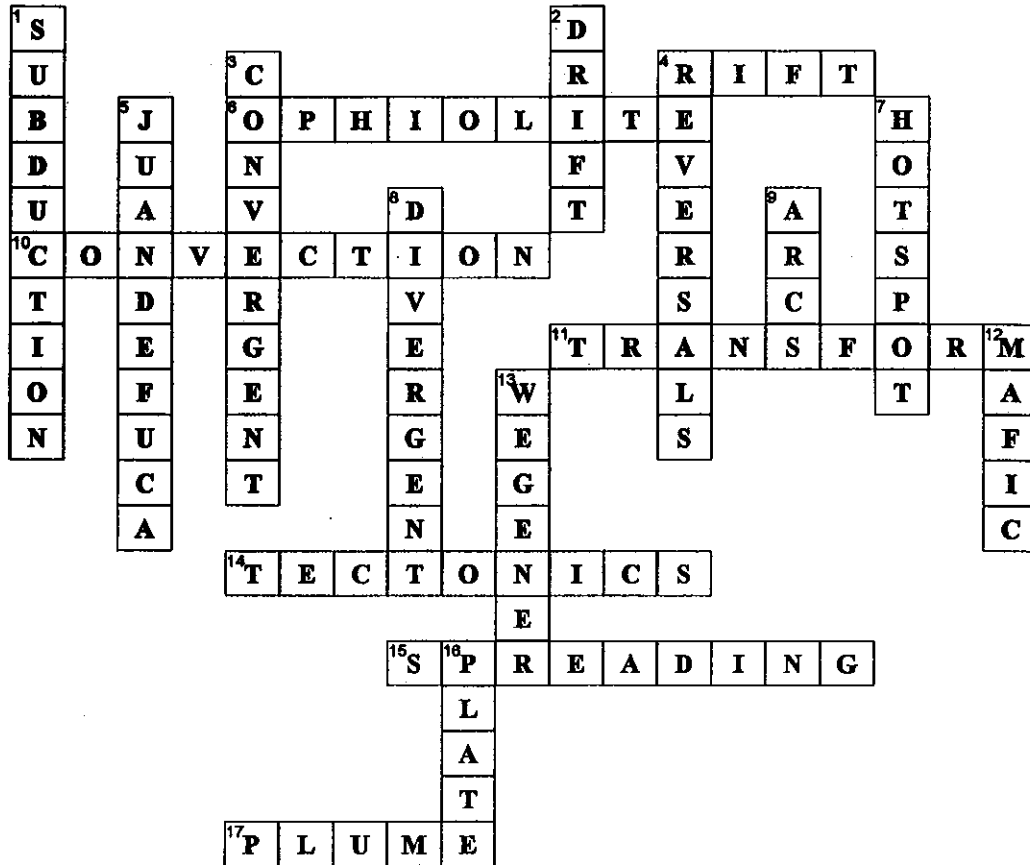
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Tectonics



ACROSS

- 4. Failed _____ is the arm of a spreading centre that is no longer active
- 6. Oceanic crust thrust up onto the continent during collision
- 10. Current caused by hot material rising and cooler material sinking
- 11. Boundary where plates slide past each other
- 14. Plate _____ is the theory that the lithosphere is broken into large plates that move slowly
- 15. _____ centres form where plates move away from each other

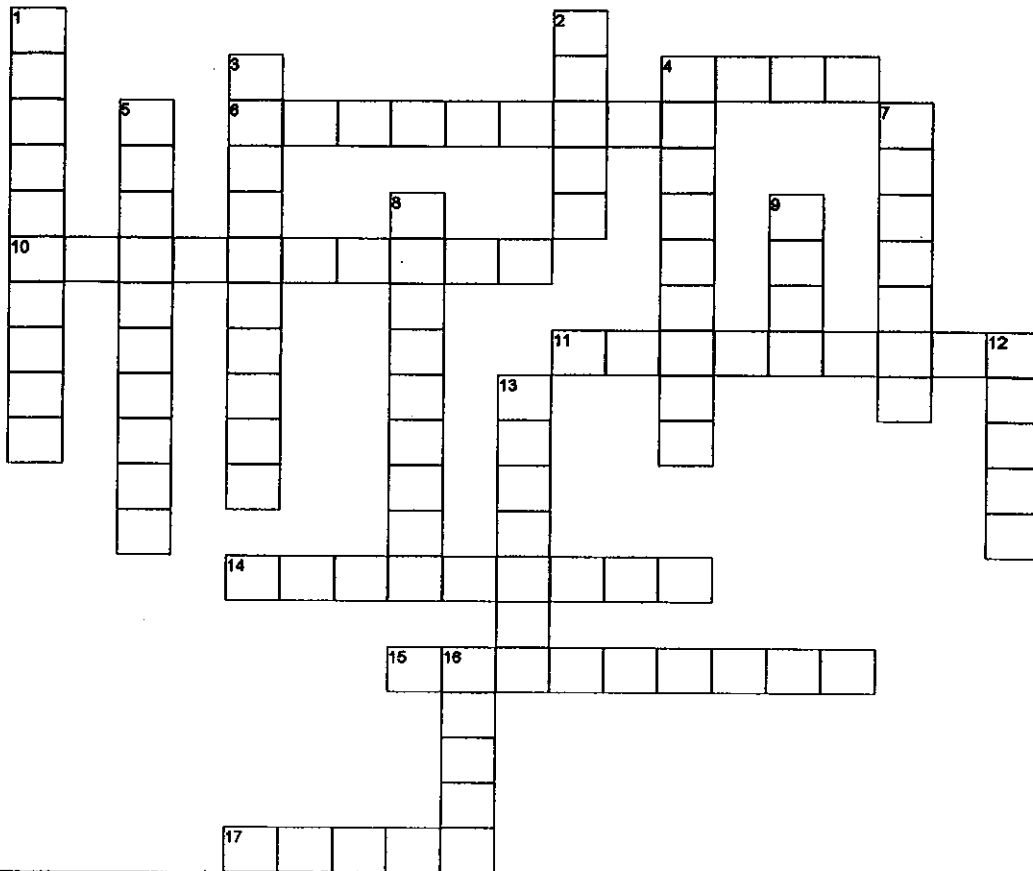
DOWN

- 17. The upwelling of mantle material is called a mantle _____

DOWN

- 1. Movement of one plate diving under another
- 2. Continental _____ is the theory that the continents are moving around on the surface of the earth
- 3. Boundary where two plates are colliding
- 4. Magnetic _____ are used as evidence for sea floor spreading
- 5. Name of the plate boundary off shore of Vancouver (3wds)
- 7. Point of upwelling under present day Hawaii
- 8. Boundary where plates are moving away from each other
- 9. Island _____ form when two pieces of oceanic crust collide
- 12. Type of magma formed at a spreading centre
- 13. Geologist credited for the theory of continental drift
- 16. Section of lithosphere that moves as one piece

Tectonics

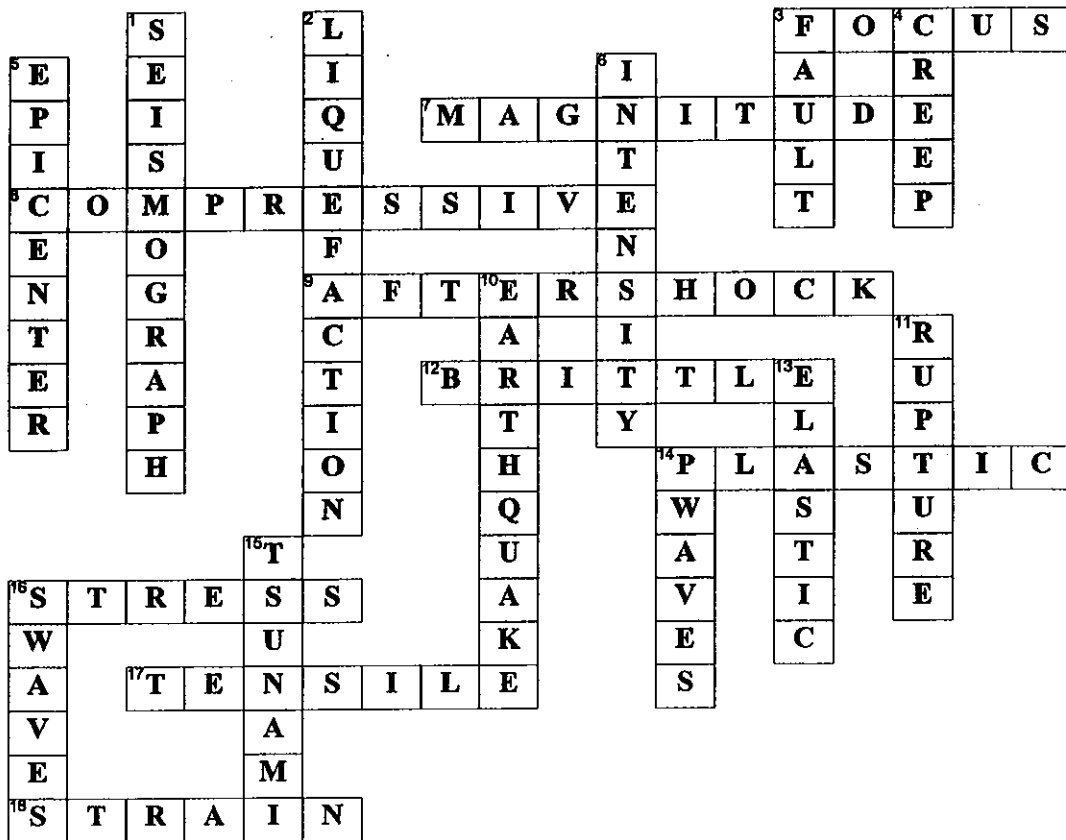


ACROSS

DOWN

- | | |
|--|--|
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Earthquakes



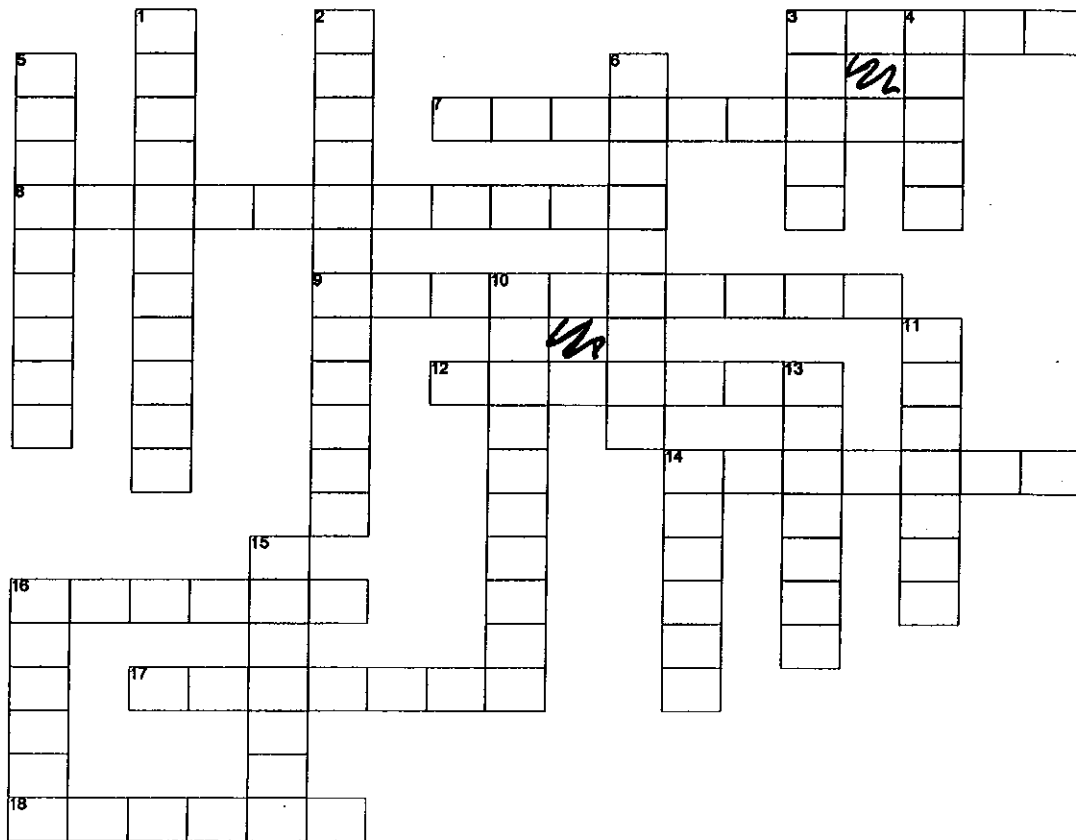
ACROSS

3. Site of origin of earthquakes, may be shallow or deep
7. Measure of the vertical movement of the crust during earthquakes
8. Squeezing type of stress
9. Small quake after the main one
12. Shattering response to stress, type of strain
14. Type of deformation that stays that way after the stress is gone
16. The force applied to rock
17. Pull apart type of stress
18. Response to stress, deformation

DOWN

1. Instrument for recording arrival times of seismic waves
2. Quakes cause moist earth to liquefy like quicksand
3. Fracture in bedrock with displacement from side to side
4. Slow, steady movement along a fault plane
5. Spot on the surface immediately above the origin of the quake
6. Measure of the destructive effects of earthquakes
10. Vibration in the earth caused by the release of strain
11. When rock breaks under stress
13. Type of deformation that returns to normal after stress
14. Compressive wave that travels through anything
15. Tidal wave
16. Longitudinal wave that only travels through solids

Earthquakes



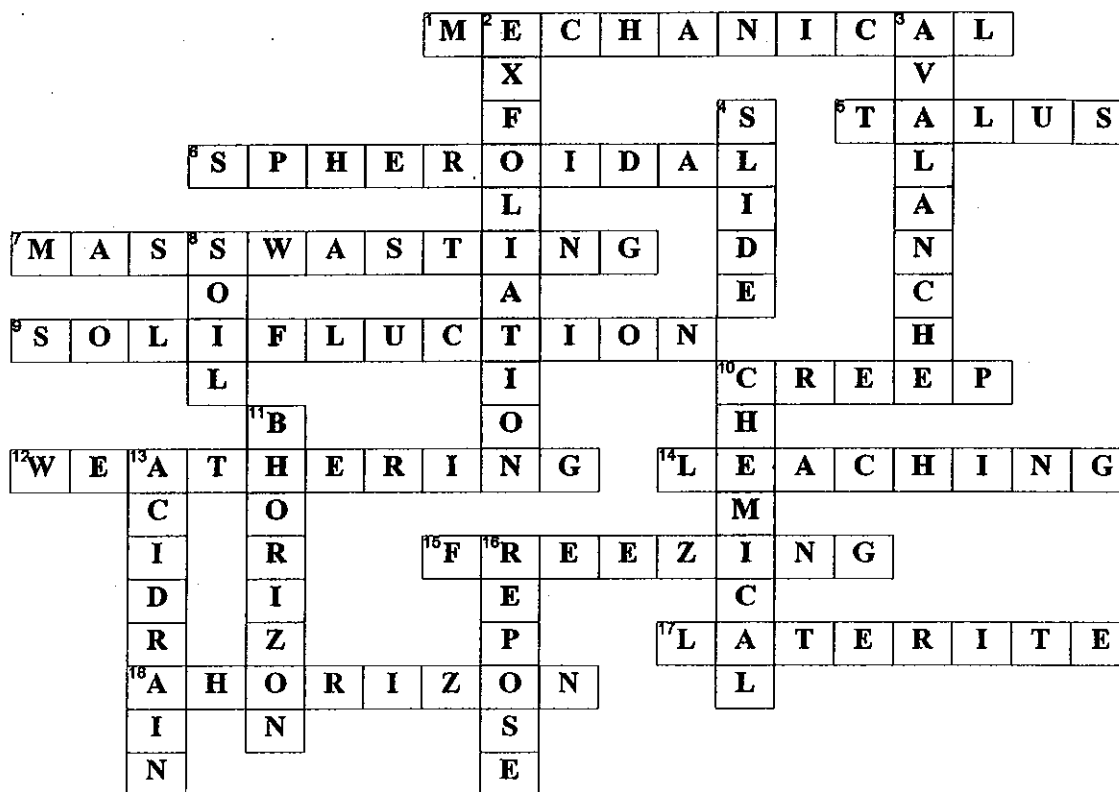
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Weathering and Erosion



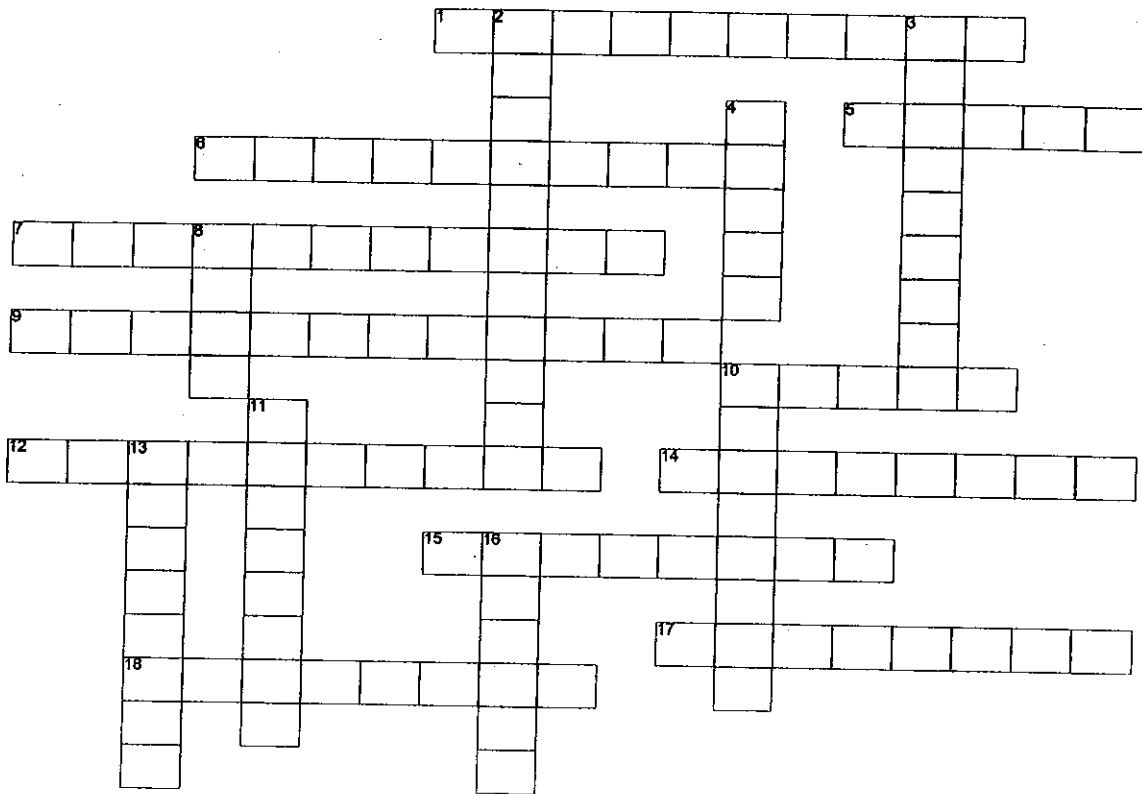
ACROSS

1. Another term for physical weathering
5. Broken rock and debris at the foot of a cliff
6. Weathering from the outside in
7. Down hill movement of large amounts of material
9. Mass wasting of sodden material over frozen ground
10. Slow movement of ground due to gravity
12. Breakdown of in place, no transportation
14. Removal of ions and clay by rainwater
15. Process responsible for most physical weathering
17. Strongly weathered, leached, soil
18. Zone of leaching in soil

DOWN

2. Physical weathering due to unloading of pressure (onion skins)
3. Mass wasting of snow
4. Rapid mass wasting of coherent material
8. Sediment capable of sustaining plant growth
10. Type of weathering due to reactions
11. Zone of accumulation in soil
13. Type of rain responsible for chemical weathering
16. The maximum angle sediments will rest at

Weathering and Erosion



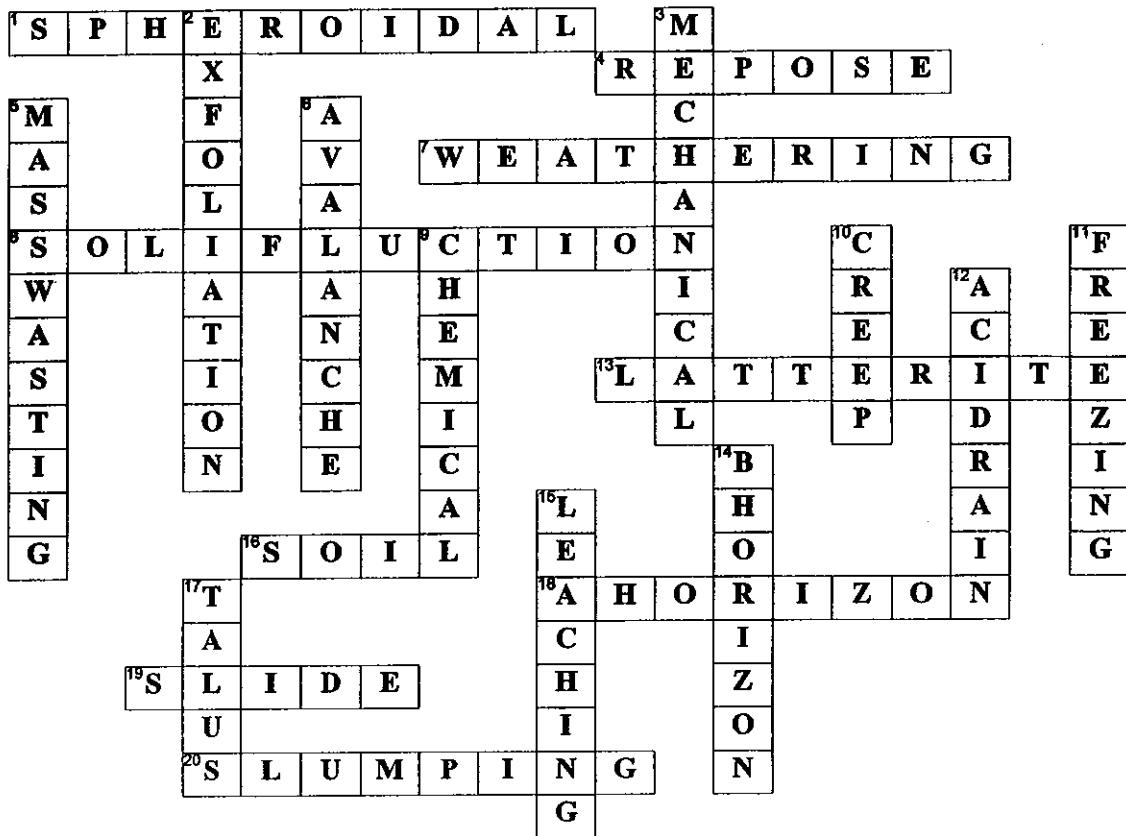
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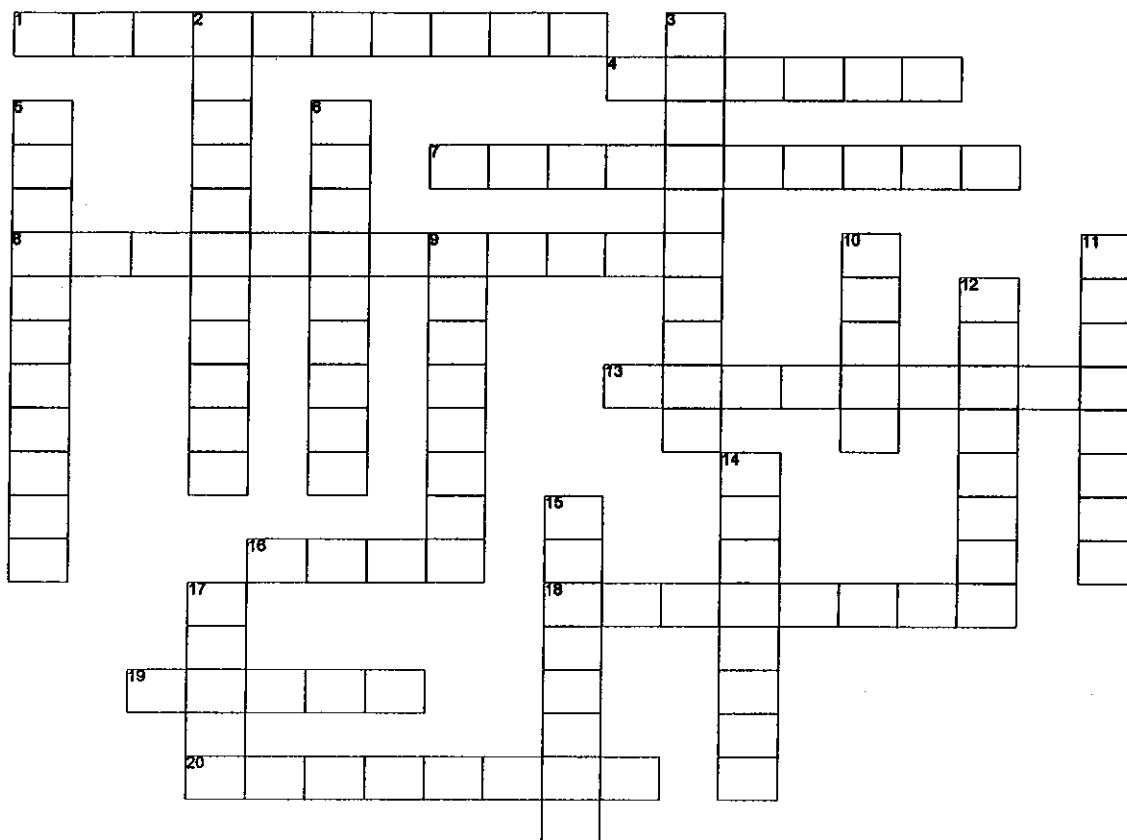
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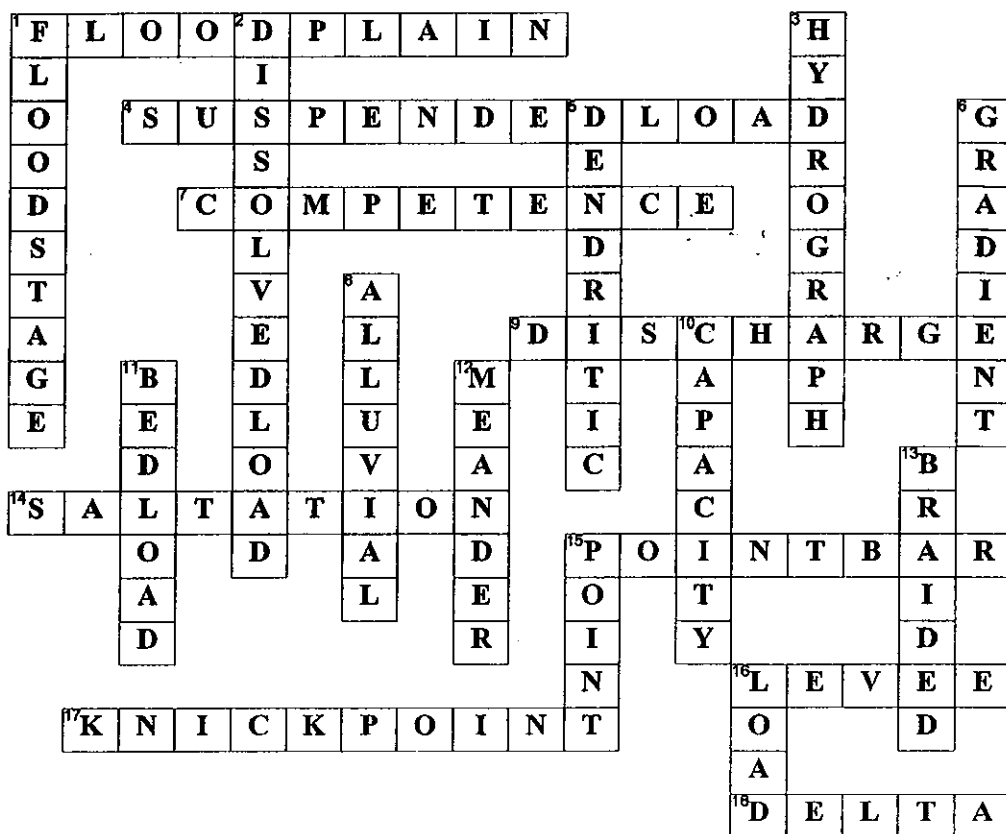
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Streams



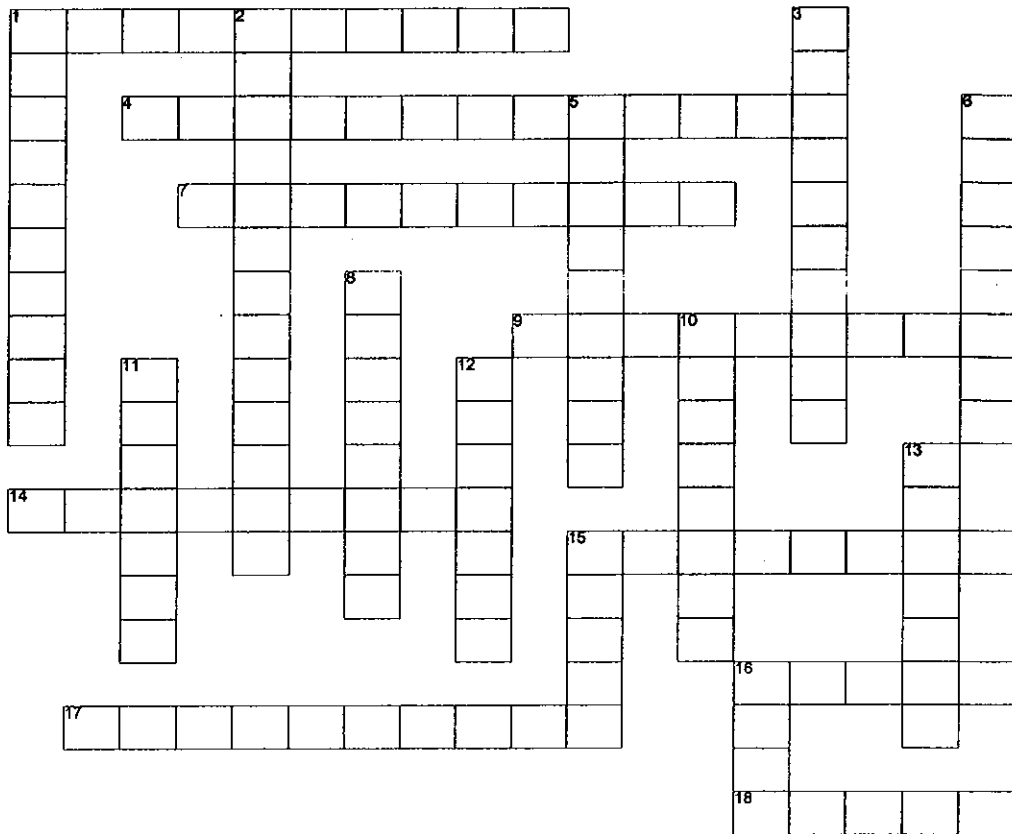
ACROSS

1. Flat land surrounding stream channel
4. Sediment load where particles are suspended (2wds)
7. The largest particle size that can be moved in the bed load
9. Volume of water flowing past a point in a given time
14. Type of sediment movement with short hops
15. Sediment deposit on the inner bank (2wds)
16. Natural ridge along stream banks
17. waterfall or steep drop in elevation
18. Sediment fan where stream enters standing water

DOWN

1. Water level at which stream overflows it banks
2. Sediment movement of dissolved particles (2wds)
3. Instrument for measuring water level
5. Drainage pattern resembling tree roots
6. Steepness or slope of stream channel
8. Type of sediment fan deposited by water
10. The total amount of sediment that can be moved by a stream
11. Heaviest sediments carried on stream bed (2wds)
12. Bend in the river channel
13. Type of stream with intertwining channels
15. Outward bend in stream bank
16. Total quantity of sediment transported by a stream

Streams



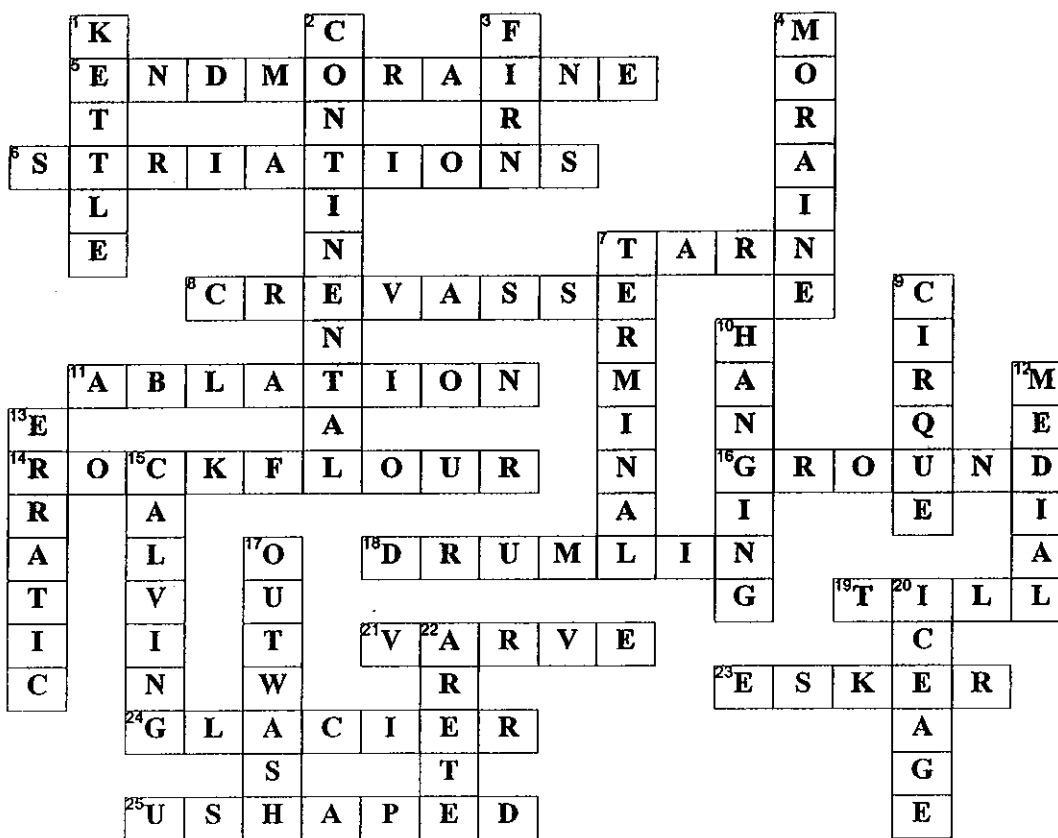
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Glaciers



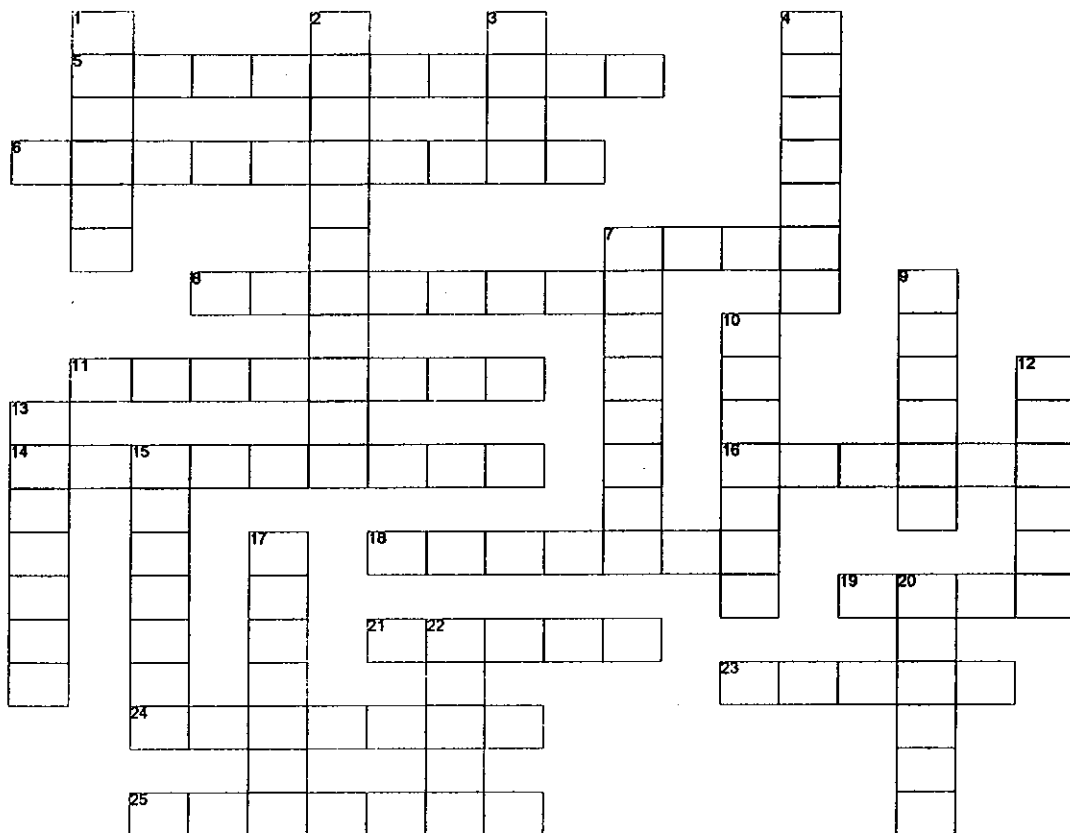
ACROSS

5. Till deposit at the end, or toe, of a glacier (2wds)
6. Scratches in bedrock indicating direction of glacial movement
7. Small lake found at the head of a glacial valley
8. Deep crack in the surface of a glacier due to tensional forces
11. Melting, or receding of a glacier
14. Very fine sediment causing pale blue colour in glacial waters (2wds)
16. broad moraine with irregular outline
18. Depositional bed feature shaped like an egg on its side
19. Poorly sorted glacial sediment
21. Alternating layers of sediment, indicating summer and winter deposition, in glacial lakes
23. Snake-like till feature deposited by sub-glacial stream
24. Mass of ice moving under its own weight
25. Shape of glacial valleys

DOWN

1. Lake formed by large melting chunk of ice
2. Glacier forming large ice caps or ice sheets
3. Not fresh snow, but not yet solid ice either
4. Till or gravel deposited by a glacier
7. Moraine that tells you how far the glacier got
9. Rounded valley at the head of a glacier
10. Type of valley created by tributary glaciers
12. Moraine formed where two glaciers meet
13. Large boulder of foreign rock deposited by glaciers
15. Icebergs falling off the front of a glacier into water
17. Gravel carried by glacial rivers
20. Name of the last period of glaciation (2wds)
22. Sharp ridge between glacial valleys

Glaciers



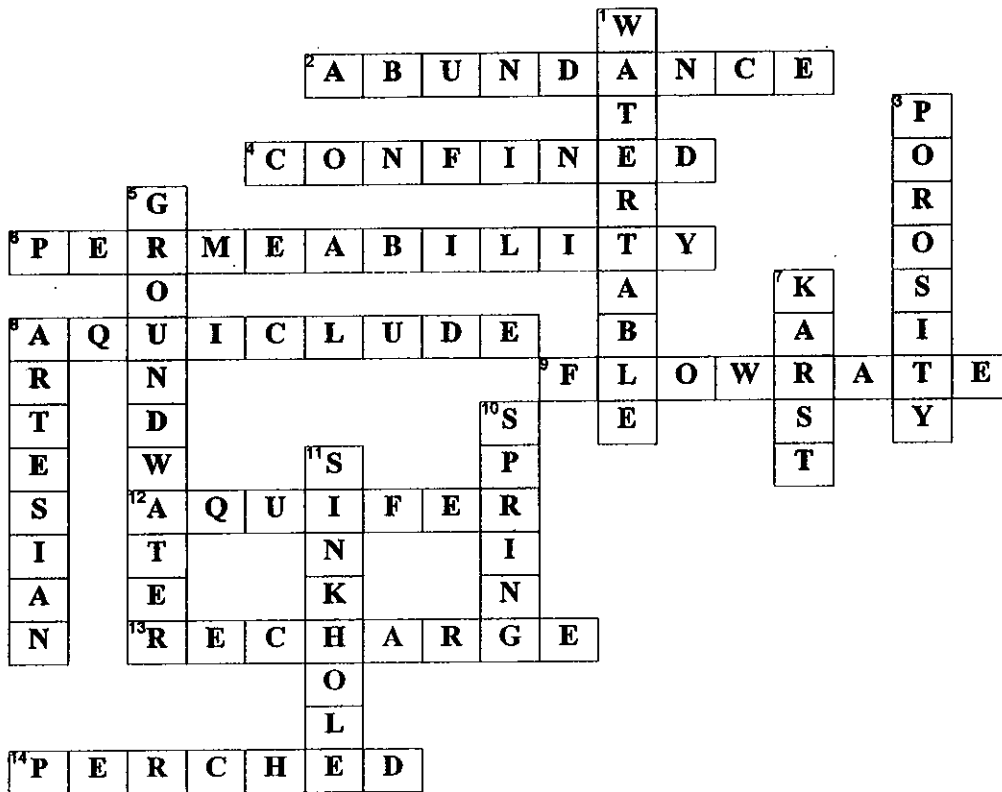
ACROSS

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Ground Water



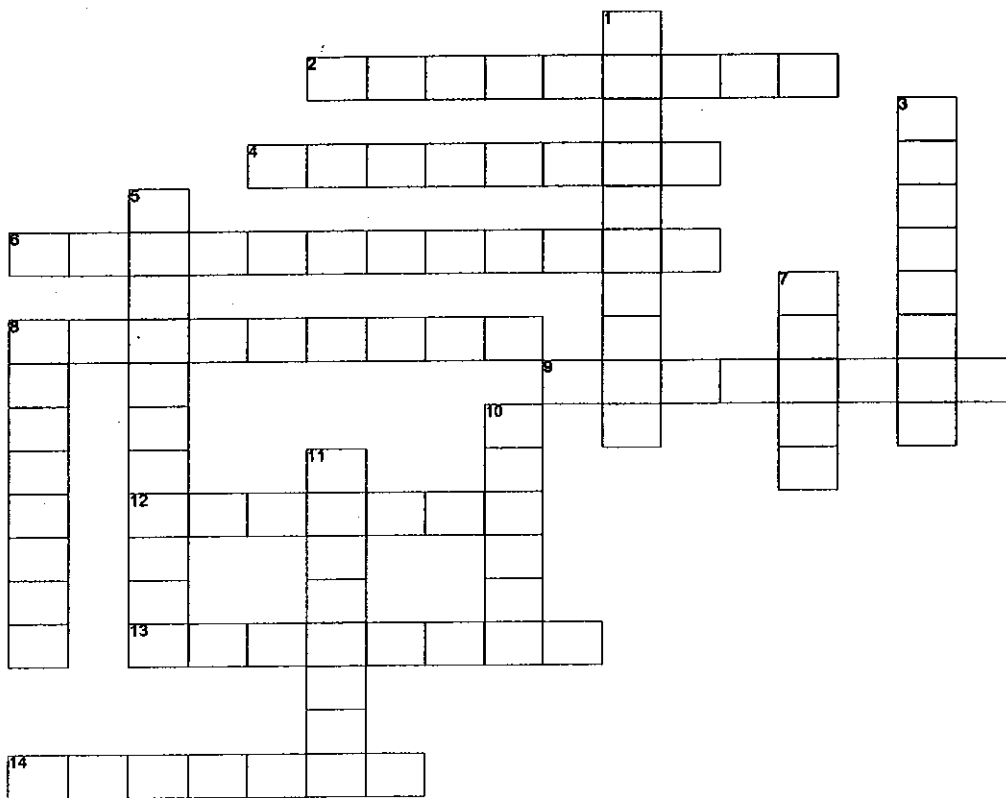
ACROSS

2. Amount of water present in an aquifer
4. Type of aquifer trapped between two impermeable layers
6. measure of a rocks ability to transmit water from pore to pore
8. Impermeable rock layer
9. Measure of the ability of a well to recharge
12. Permeable rock or soil, capable of storing and transmitting water
13. A well does this after removal of water
14. Type of water table that is above the surrounding water table

DOWN

1. The upper surface of the zone of saturation (2wds)
3. The amount of pore space in rock or soil
5. Water stored and/or flowing under the surface of the earth
7. Type of topography created by groundwater dissolving limestone, related to caves and sinkholes
8. Water from a confined water table, that flows up under its own pressure once released
10. Where the water table meets the surface of the earth
11. Vertical hole where limestone has been dissolved away

Ground Water



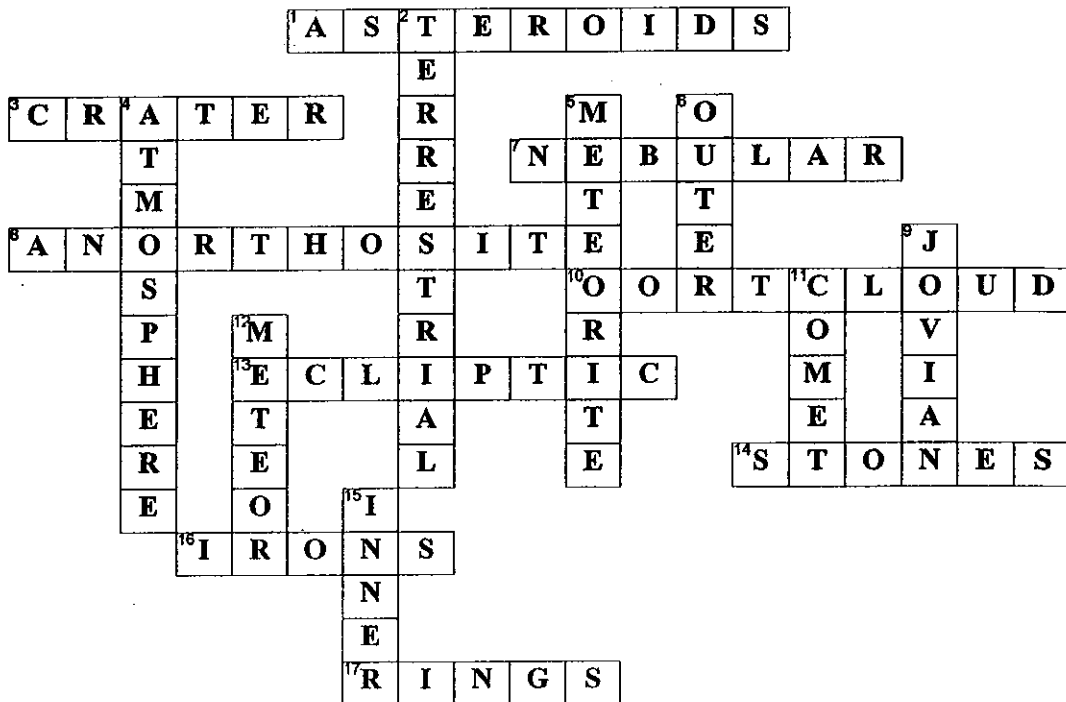
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Planets



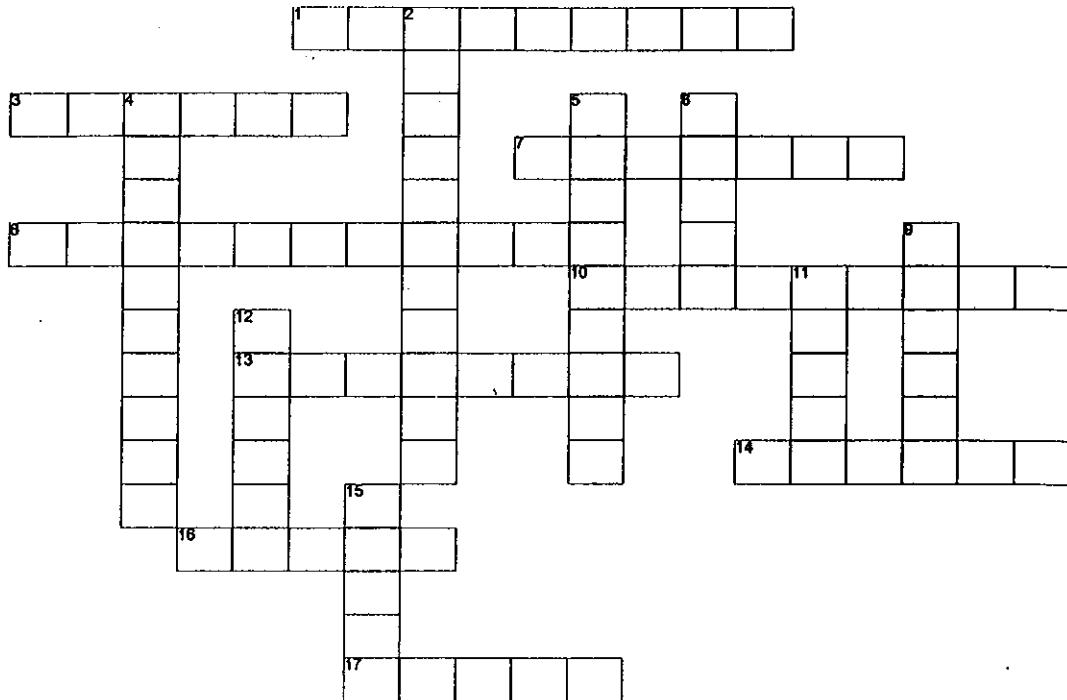
ACROSS

1. Remains of the planet between Mars and Jupiter
3. The effect of a meteor, or comet impact with a planet or moon
7. Model of the origin of the solar system
8. The rock type making up the majority of the crust of Earth's moon
10. Place of origin of comets
13. Plane on which most planets orbit, except Pluto
14. Meteorites composed mainly of silicate minerals
16. Meteorites composed mainly of iron and nickel
17. Lines of rock and ice debris orbiting a planet or moon

DOWN

2. Rocky planets, somewhat similar to Earth
4. The layer of gases surrounding most planets and moons
5. A bit of interplanetary matter that has reached the surface of Earth
6. Group of planets including Jupiter, Saturn, Uranus, Neptune and Pluto
9. Gaseous planets (the outer planets)
11. A "dirty snowball" of up to 10km radius from a very remote origin and on a long elliptical orbit
12. An asteroid that has entered the atmosphere of a planet or moon
15. Group of planets including Mars, Earth, Venus and Mercury

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