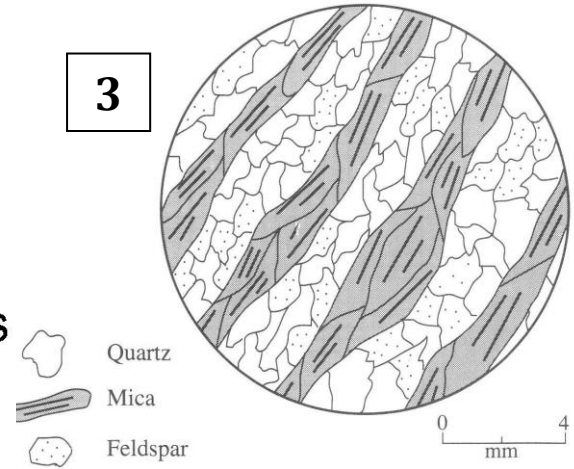
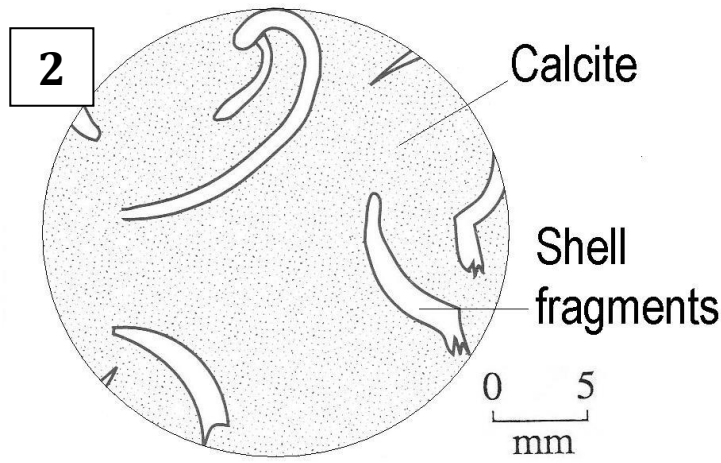
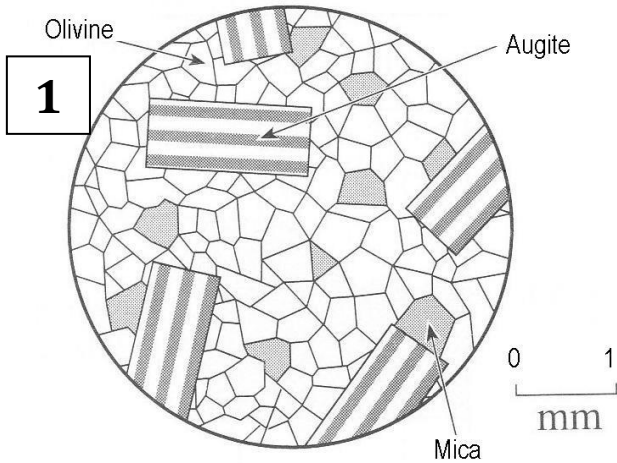


# AS Geology - Rock Types Revision

## Photomicrographs – views from a microscope slide

- 1) Describe the texture of each of the rocks below (Remember the three S's - Size, Shape and Sorting).
- 2) Interpret the environment and conditions of formation of each rock.



Texture: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Environment: \_\_\_\_\_

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Texture: \_\_\_\_\_

\_\_\_\_\_

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Environment: \_\_\_\_\_

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Texture: \_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

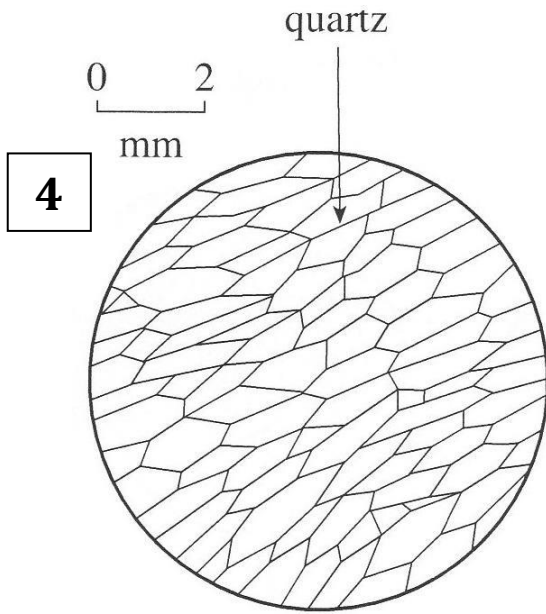
Environment: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

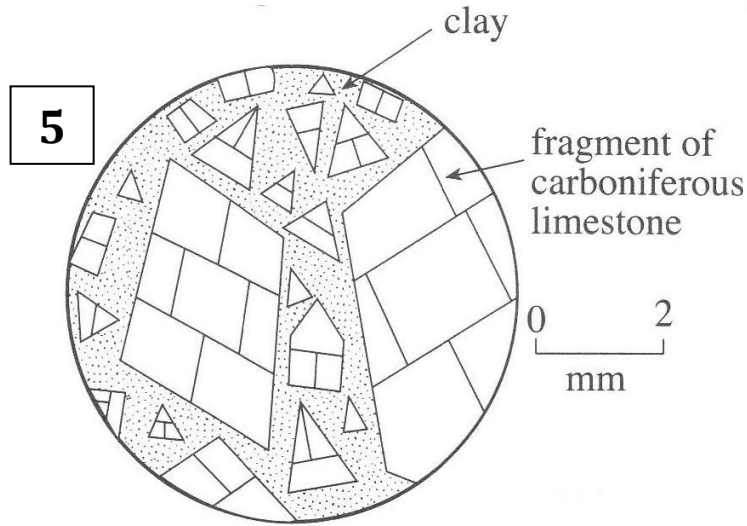
\_\_\_\_\_

\_\_\_\_\_



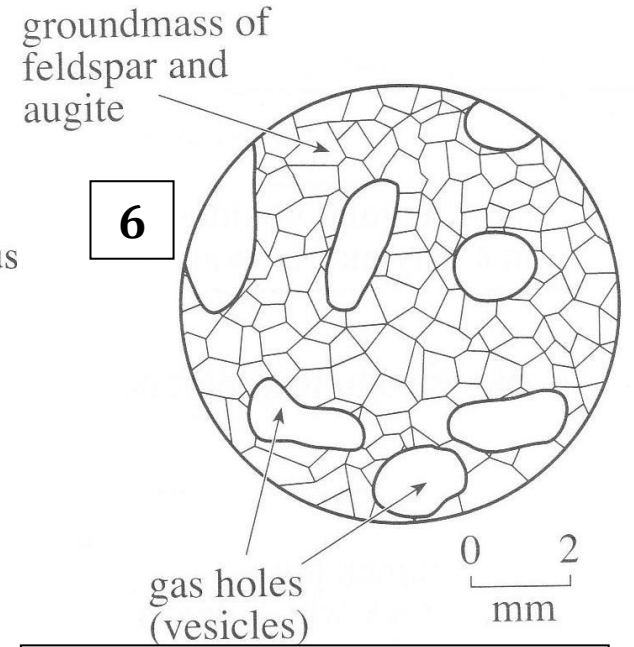
Texture: \_\_\_\_\_  
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Environment: \_\_\_\_\_  
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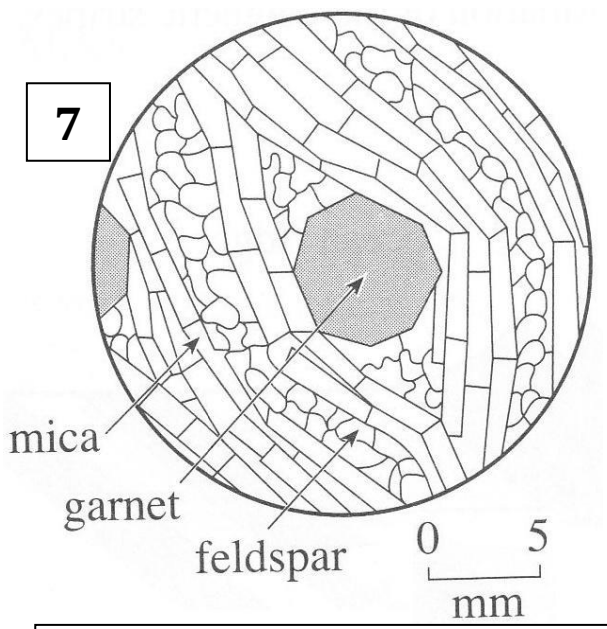
Texture: \_\_\_\_\_  
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Environment: \_\_\_\_\_  
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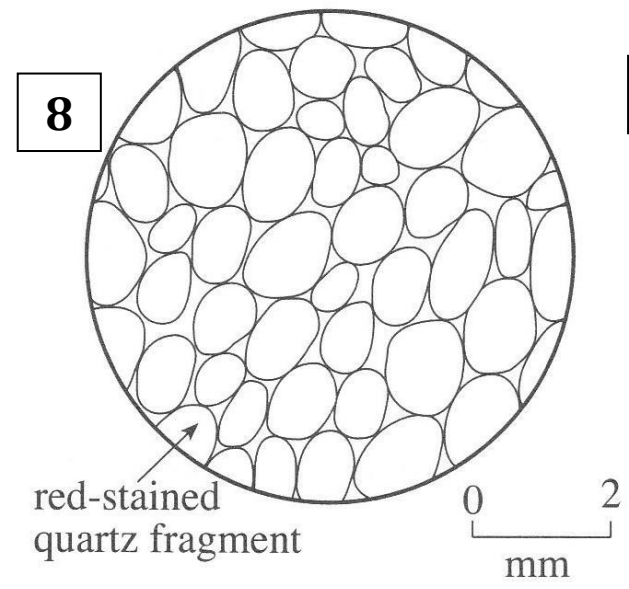
Texture: \_\_\_\_\_  
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Environment: \_\_\_\_\_  
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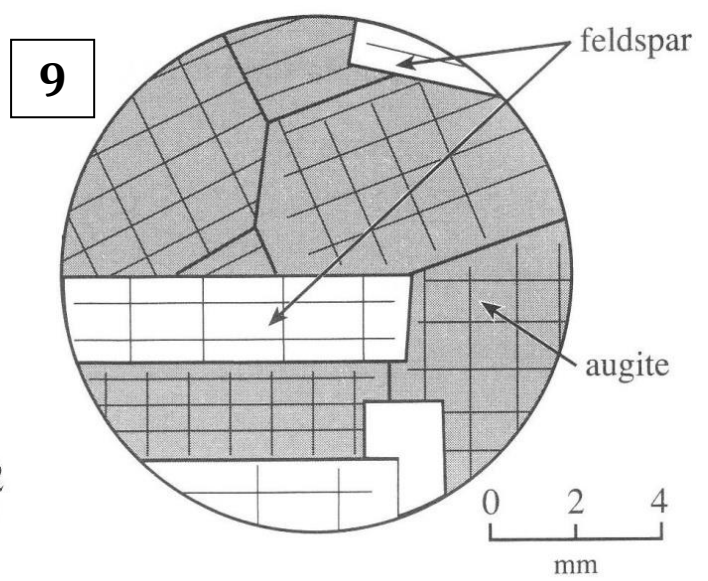
Texture: \_\_\_\_\_  
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Environment: \_\_\_\_\_  
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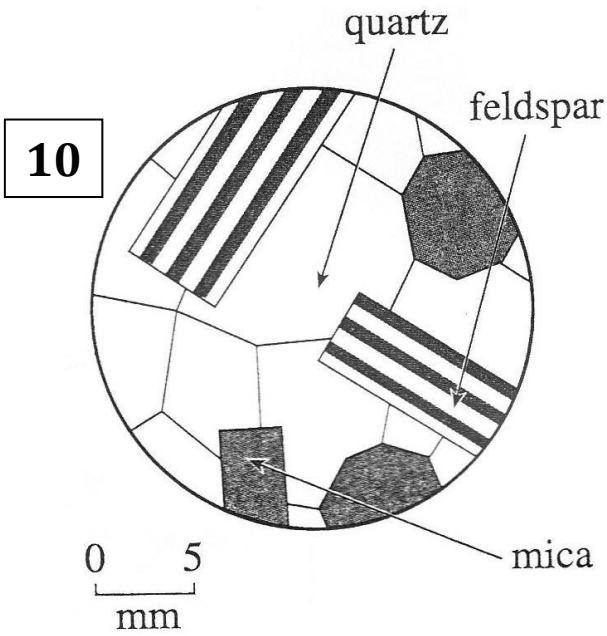
Texture: \_\_\_\_\_  
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Environment: \_\_\_\_\_  
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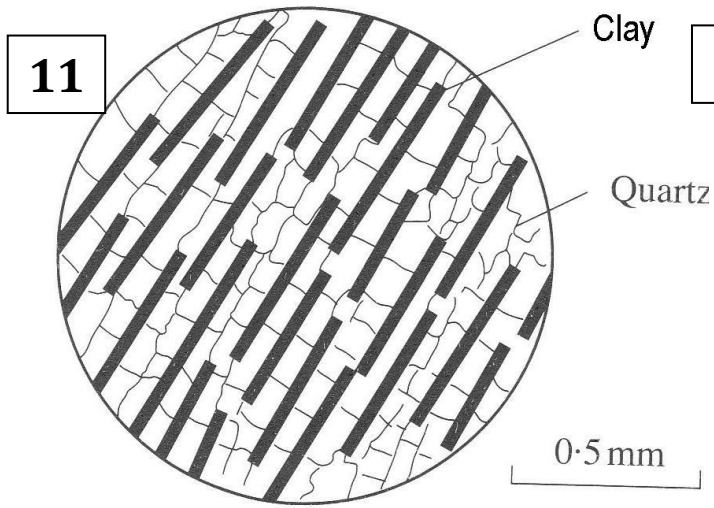
Texture: \_\_\_\_\_  
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Environment: \_\_\_\_\_  
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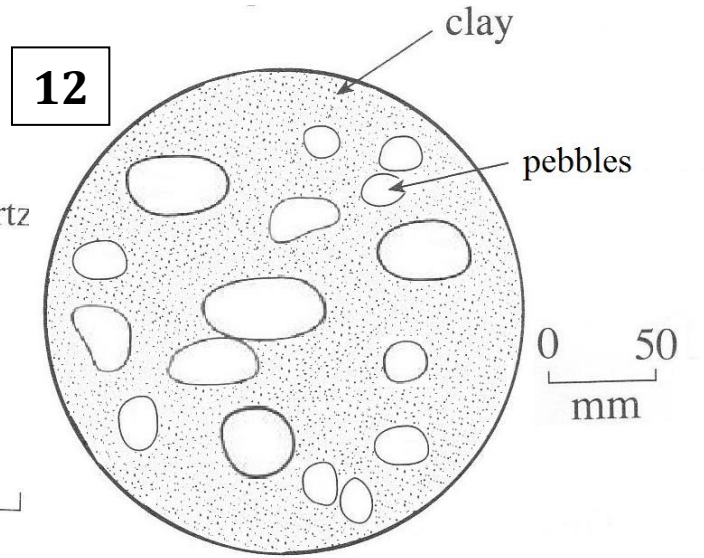
Texture: \_\_\_\_\_  
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Environment: \_\_\_\_\_  
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Texture: \_\_\_\_\_  
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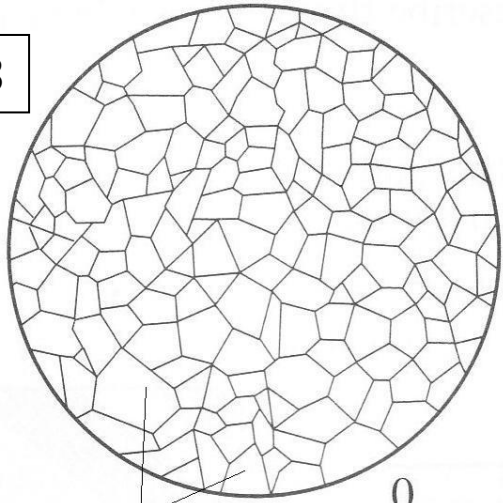
Environment: \_\_\_\_\_  
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Texture: \_\_\_\_\_  
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Environment: \_\_\_\_\_  
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**13**



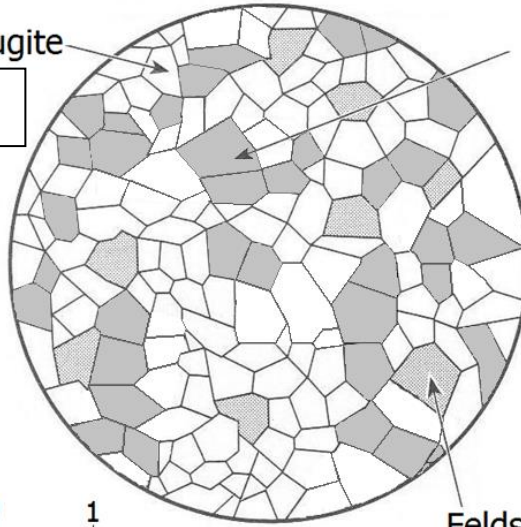
Calcite

0 5  
mm

Texture: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
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Environment: \_\_\_\_\_  
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**14**



Augite

Olivine

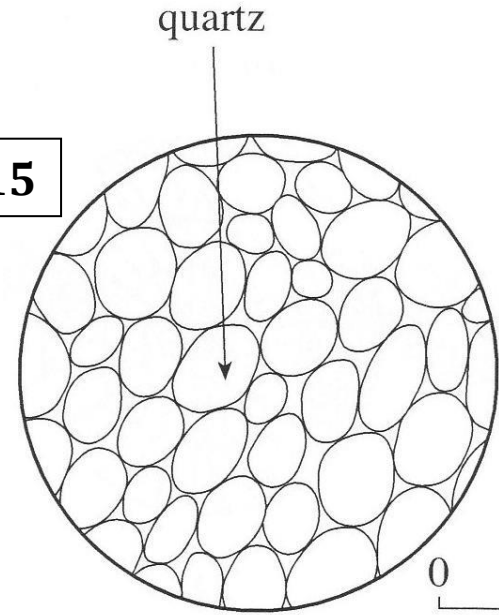
Feldspar

0 1  
cm

Texture: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Environment: \_\_\_\_\_  
 \_\_\_\_\_  
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 \_\_\_\_\_  
 \_\_\_\_\_

**15**



quartz

0 2  
mm

Texture: \_\_\_\_\_  
 \_\_\_\_\_  
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 \_\_\_\_\_

Environment: \_\_\_\_\_  
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## Igneous

<b>Extrusive (form on the surface)</b>		
<b><i>Rock</i></b>	<b><i>Texture</i></b>	<b><i>Environment</i></b>
<b>Basalt</b>	Random, interlocking fine crystals less than 1mm – cooled rapidly. Equicrystalline often with vesicles	Formed at constructive plate boundaries in lava flows from shield volcanoes.
<b>Intrusive (form inside the Earth)</b>		
<b>Dolerite</b>	Random, interlocking medium crystals 1-5mm, visible, mostly equicrystalline	Cooled quite quickly in small intrusions (dykes and sills).
<b>Gabbro</b>	Coarse crystals over 5mm. Green/grey colour. Porphyritic texture (large and small crystals)	Mafic magma cooling in large intrusions (plutons) near constructive boundaries. Similar composition to basalt.
<b>Granite</b>	Coarse crystals over 5mm. Made up of feldspar, mica and quartz. Porphyritic texture (large and small crystals)	Formed from magma cooling in large intrusions (plutons) near destructive plate boundaries.
<b>Peridotite</b>	Coarse crystals over 5mm. Made up of olivine and augite. Dense, dark green/grey colour.	Originates from mantle material forced up through volcanoes.

## Sedimentary

<b>Clastic (formed from deposited grains or clasts)</b>		
<b><i>Rock</i></b>	<b><i>Texture</i></b>	<b><i>Environment</i></b>
<b>Breccia/Till</b>	Coarse, angular fragments. Till often more coarsely grained from glaciers. Both very poorly sorted	Formed on scree slopes or from glacial deposition (Till).
<b>Conglomerate</b>	Coarse grained >2mm, rounded fragments with finer matrix, poorly sorted.	High-energy conditions in a river or on a beach, formed from large pebbles and finer sediment.
<b>Sandstone</b>	Visible particles, medium grained 1-2mm. Rounded grains, well sorted. Quartz rich.	Moderate energy conditions. River or beach. Often with ripples marks.
<b>Red Sandstone</b>	Visible particles, medium grained 1-2mm. Rounded grains, well sorted. Stained red with haematite.	Moderate energy conditions. Often with ripples, cross beds, wind-blown. Deserts or semi-arid (dry) environments.
<b>Shale/Clay</b>	Very fine grained <0.01mm, fragile, very well sorted, laminated.	Very low-energy conditions in the deep ocean/lake.
<b>Greywacke</b>	Medium grained, with finer matrix. Can be poorly sorted.	Turbidity currents in the ocean. Graded bedding.

<b>Arkose</b>	Medium grained 1-2mm sandstone with over 25% feldspar. Well sorted.	Formed in granite rich areas on beaches, in rivers.
<b>Accumulation of organic material</b>		
<b><i>Rock</i></b>	<b><i>Texture</i></b>	<b><i>Environment</i></b>
<b>Limestone</b>	Fine grained, made from shells and coral fragments. Mostly calcite rich. Grey colour, well sorted.	Formed in shallow, tropical seas by the accumulation of calcite and shell fragments.
<b>Oolitic limestone</b>	Medium grained, rounded ooliths of calcite.	Formed from movement or rolling of sediment in shallow, tropical sea.
<b>Chalk</b>	Fine grained, made from coccolith shells, calcite rich, white colour.	Shallow, clear, tropical seas.
<b>Coal</b>	Dark rock, carbon rich, fine grained.	Accumulation of plants in marshes, bogs and swamps.
<b>Biochemical Precipitates</b>		
<b><i>Rock</i></b>	<b><i>Texture</i></b>	<b><i>Environment</i></b>
<b>Evaporites</b>	Evaporation of water to produce salt minerals (Halite, Gypsum).	Evaporation in salt lakes or lagoons, also dripstone in caves.



## Metamorphic

<b>Thermal (Cooked near to an igneous intrusion)</b>		
<b>Hornfels</b>	Randomly orientated crystals of andalusite/chiasmolite. Cutting across original layers of rock.	Recrystallisation of shale near to an igneous intrusion such as a pluton (High T). Inside metamorphic aureole.
<b>Marble</b>	Random, regular crystals of calcite. Mostly visible and equicrystalline.	Recrystallisation of limestone or chalk (High T). Inside metamorphic aureole.
<b>Metaquartzite</b>	Random, regular crystals of quartz, equicrystalline.	Recrystallisation of sandstone (High T). Inside metamorphic aureole.
<b>Regional (Buried deeply under high temperature and pressure conditions)</b>		
<b>Slate</b>	Parallel foliation forms very fine layers. Rock breaks along cleavage planes.	Low P and T conditions, forms from shale which is deeply buried.
<b>Schist</b>	Foliated, wavy crystals of mica sometimes with larger crystals of garnet.	Quite high P and T conditions recrystallisation and foliation of shale/slate when deeply buried.
<b>Gneiss</b>	Broad banding of minerals into distinct layers. Usually coarse grained. Can have mica and garnet layers	High P and T conditions forcing crystals into bands deeply buried for millions of years. Parent rock is shale.

Increasing pressure and temperature