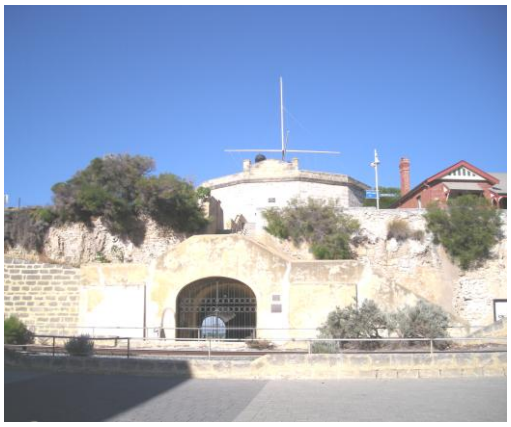
Sources of Resources – Teacher Notes



How a rock, sediment or mineral is made can control how and why we use it.

Limestone is a biogenic sediment. It formed from calcium carbonate in shells of marine organisms. Often it is further changed geochemically by groundwater.

The Roundhouse in Fremantle was built from Tamala limestone because it is soft and easy to carve into blocks using simple hand tools and man power provided by convicts. It was light, cheap and locally available.

Unfortunately these characteristics make it prone to weathering. Its porosity and permeability also makes rising damp a problem.

Material used	**Earth process which created it and why it is useful for this purpose**
Granite for use in kitchens, bathrooms and monuments.	Melting to form igneous rock. Interlocking hard crystals make it a hard impermeable rock which polishes into a smooth attractive surface. **Igneous rock (Felsic, intrusive)**
Sand for laying under cement as a house pad.	Weathering, erosion and deposition produces silica rich medium sized clasts. Sand is porous and permeable allowing water to drain away. It is easily shaped into the base on which to build a house. **Sediment**
Clay for pipes, roofing tiles, bathroom furniture and fittings.	Weathering, erosion and deposition of very fine alumina-silicate clasts (mud). The flat surfaces allow the clasts to be pressed together and moulded into different shapes before baking to become hard and reasonably impermeable. **Sediment**
Iron ore for structural steel.	Volcanoes erupt iron rich magma. This was weathered, eroded and deposited in ancient seas when there was little oxygen in the atmosphere to form BIF (Banded Iron Formations). This is dug up and sent to the foundry. Steel can be rolled into any shape required for frame construction. It is strong and reasonably resistant to weathering. **Mineral**
Marble for tiles and decoration.	Sedimentary limestone is taken down into the Earth and subjected to increased temperature and pressure (regional metamorphism). The rock partially melts and larger calcite crystals form. These crystals give marble its lustre. They are however relatively soft making the rock easy to carve and polish. **Metamorphic rock**

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Talc for toiletries and smoothing out paper.	Talc forms when an ultramafic (extremely rich in iron and magnesium) rock undergoes regional or contact metamorphism. Very flat platy crystals make talc the softest mineral in Mohs scale. The soft flat crystals make it an excellent lubricant. It is not soluble in water and is used to fill gaps in paper and smooth out creases in skin. **Mineral**
Pumice for polishing.	Pumice is a silica (quartz) rich and gas rich volcanic which is ejected from volcanoes . It chills instantly trapping the gas as "bubbles" within the solid rock. The rock is mostly silica, which is a hard and abrasive mineral. **Igneous rock (Felsic, extrusive)**
Quartz sands for glass making.	Igneous rocks are weathered, eroded and deposited. Often winds or the sea separates out the minerals leaving almost pure quartz sand. This is melted at high temperature and poured or rolled into glass. Quartz is a hard mineral, 7 on Mohs scale, and its transparency makes it useful for windows and clear containers. **Sediments**
Slate for roofing	Mudstone is regionally metamorphosed to form slate. The pressure aligns the minerals into plates which makes it fissile (able to be split into flat plates). Partial melting produces hard impermeable surfaces. **Metamorphic rock**
Dolerite for "road metal"	Dolerite is an intrusive igneous rock which forms dykes and sills. It has interlocking crystals which makes it hard and has a high percentage of iron and magnesium making it dense. You need less dolerite to pack into road fill or rail base than most other rocks. Being igneous, it weathers slowly. **Igneous rock (Mafic, intrusive)**
Sandstone for water holding aquifers	Weathering, erosion, deposition, compaction and sedimentation produce sandstone. Sandstone is both porous and permeable allowing rainfall to percolate down into it and collect for an aquifer (stored water resource). **Sedimentary rock**