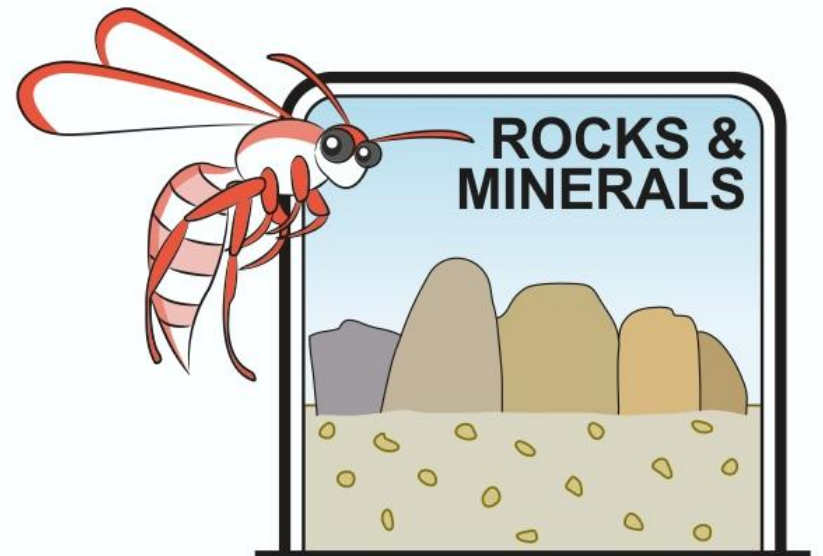
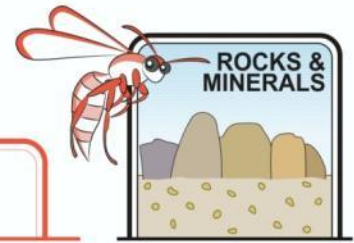


For the Year 8 WASP Package

THE ROCK CYCLE



Australian Curriculum



An initiative supported by Woodside and ESWA

Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales ([ACSSU153](#))

Elaborations

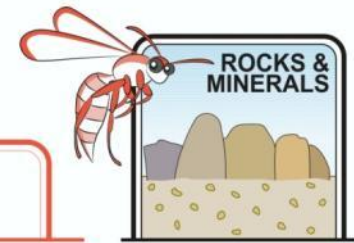
representing the stages in the formation of igneous, metamorphic and sedimentary rocks, including indications of timescales involved

identifying a range of common rock types using a key based on observable physical and chemical properties

recognising that rocks are a collection of different minerals

considering the role of forces and energy in the formation of different types of rocks and minerals

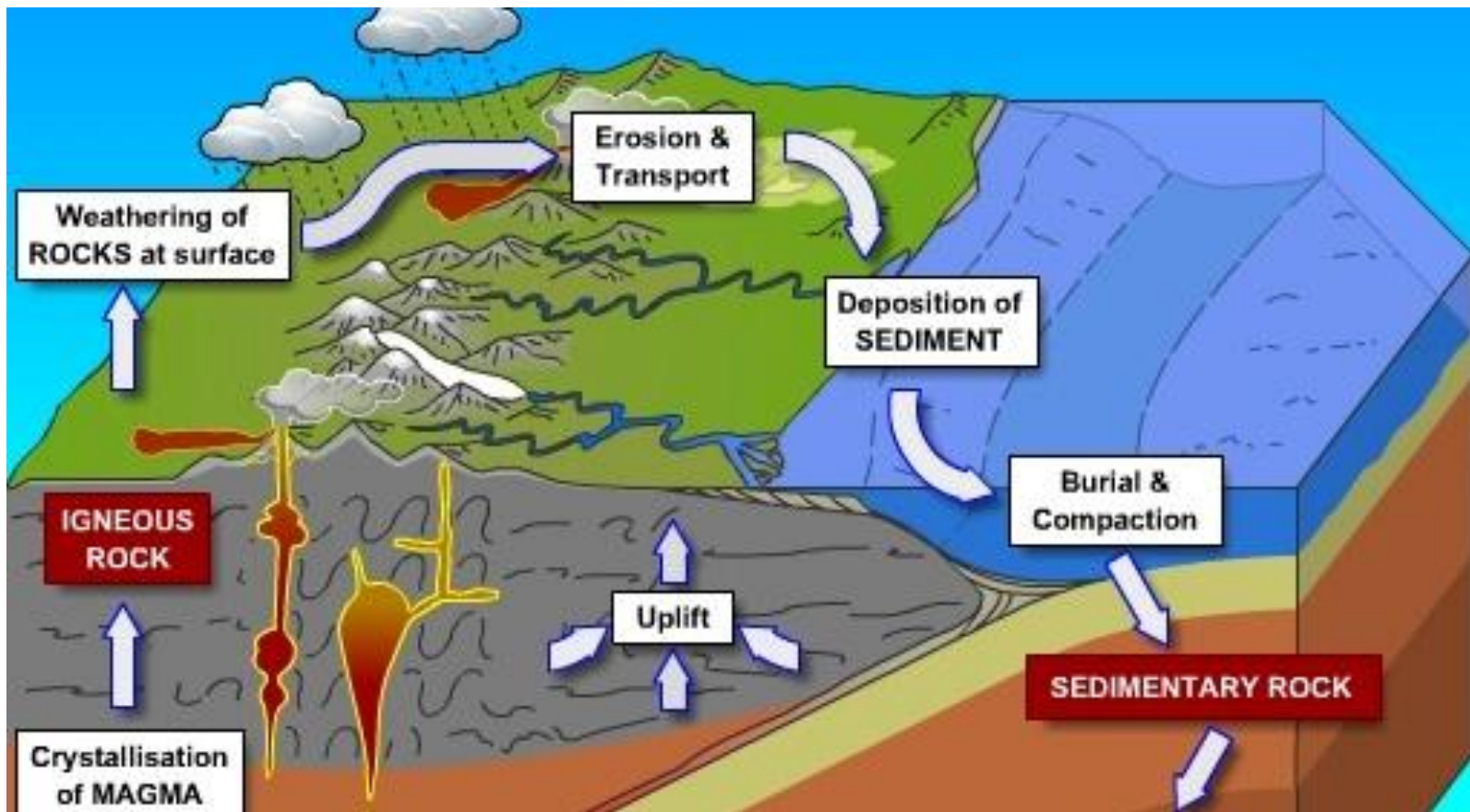
recognising that some rocks and minerals, such as ores, provide valuable resources

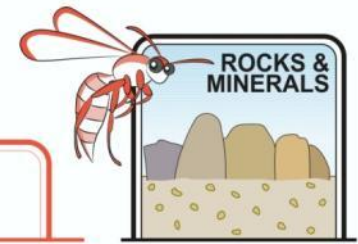


The Rock Cycle

An initiative supported by Woodside and ESWA

The ROCK CYCLE demonstrates the sequence of processes leading to the formation of different rock types





Weathering creates *clasts*

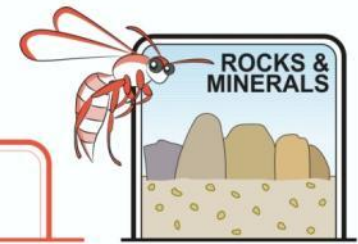
An initiative supported by Woodside and ESWA

Clasts are broken bits of rock



Chemical weathering of limestone

NB: Clasts do not move away from parent rock.



Weathering creates *clasts*

An initiative supported by Woodside and ESWA

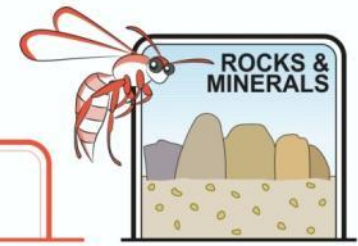
Clasts are broken bits of rock



Physical weathering of Banded Iron Formation

Frost shattering

NB: Clasts do not move away from parent rock.



Weathering creates *clasts*

An initiative supported by Woodside and ESWA

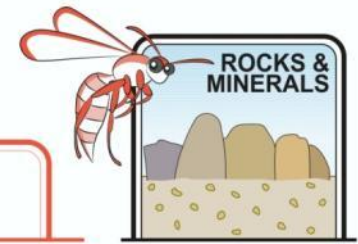
Clasts are broken bits of rock



Biological weathering

Root wedging

NB: Clasts do not move away from parent rock



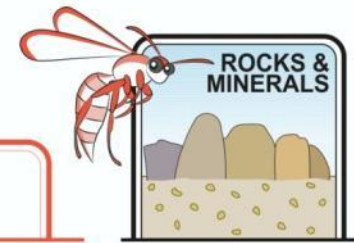
Weathering creates *clasts*

An initiative supported by Woodside and ESWA

Chemical weathering dissolves rock

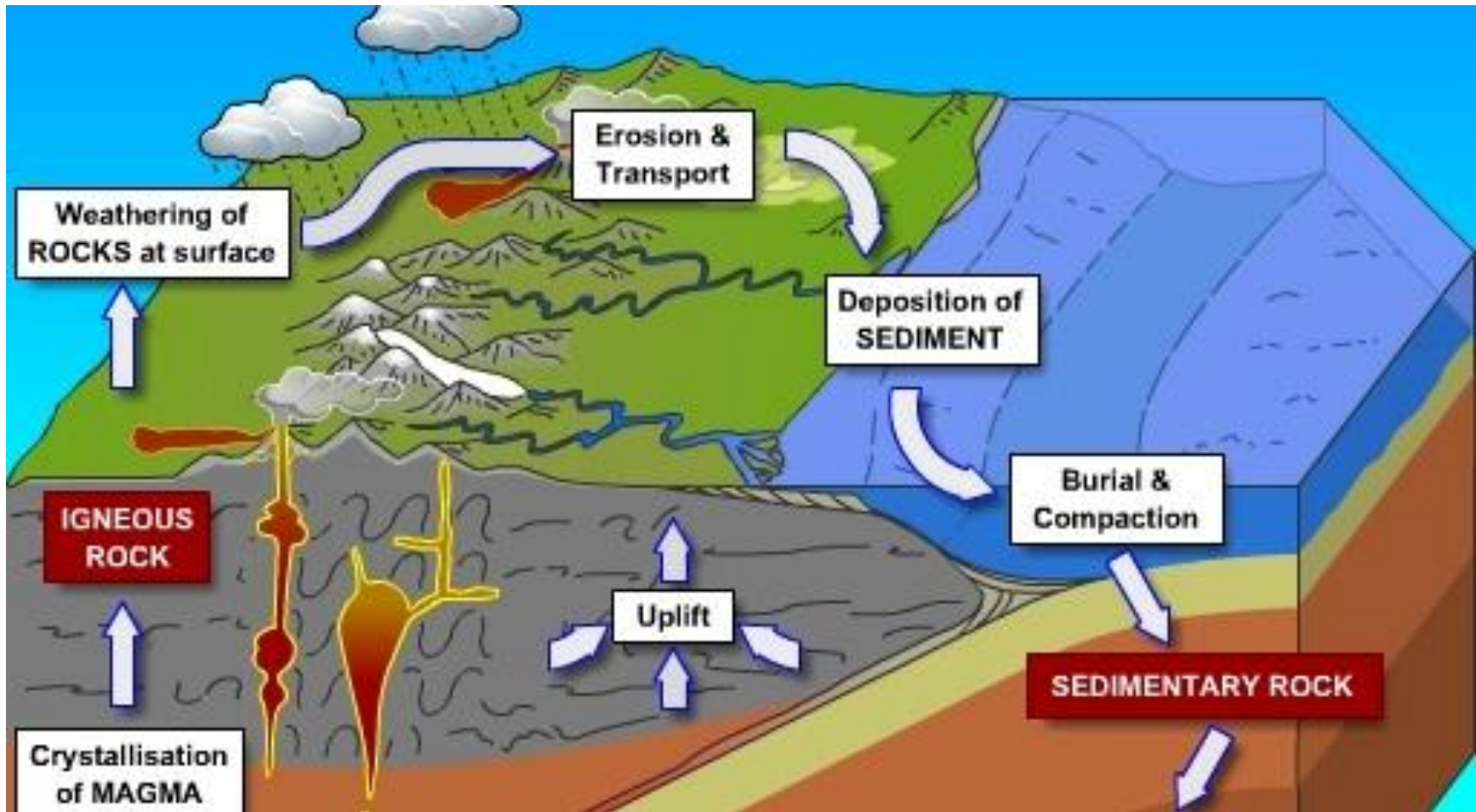


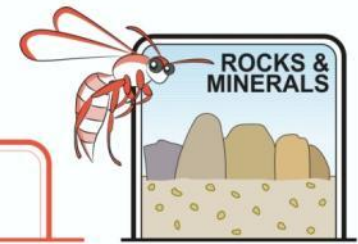
Vertical solution channels in Tamala Limestone



Erosion moves clasts

An initiative supported by Woodside and ESWA



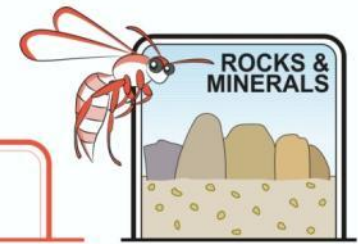


Erosion moves clasts

An initiative supported by Woodside and ESWA

Erosion by fresh water





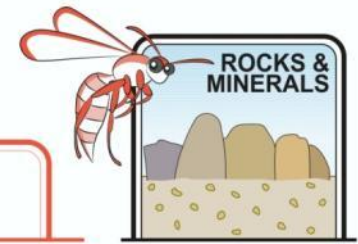
Erosion moves clasts

An initiative supported by Woodside and ESWA

Erosion by salt water

Notches



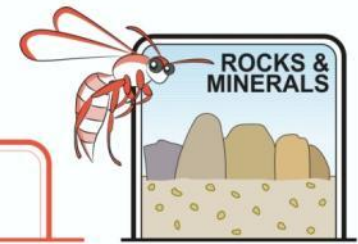


Erosion moves clasts

An initiative supported by Woodside and ESWA

Erosion by wind

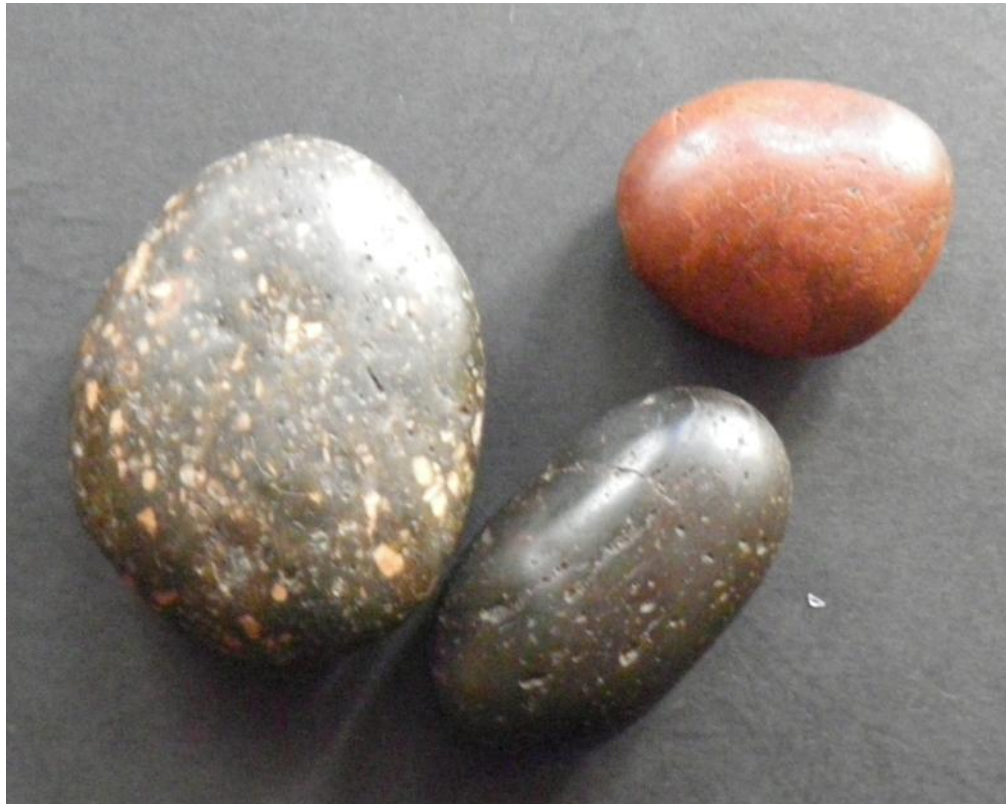




Erosion and clast shape

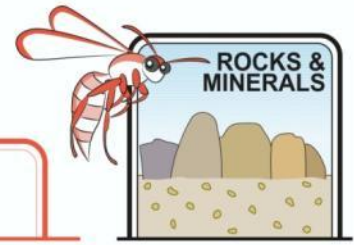
An initiative supported by Woodside and ESWA

The further clasts move the rounder they become



*Doubly weathered and eroded
Devonian pebbles*

Erosion, clast size & shape

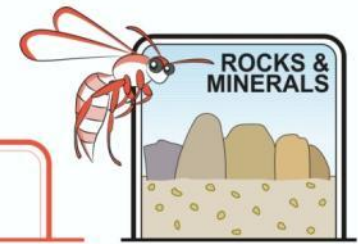


An initiative supported by Woodside and ESWA

With increasing distance from source rock

1. clast size decreases

2. clast roundness increases

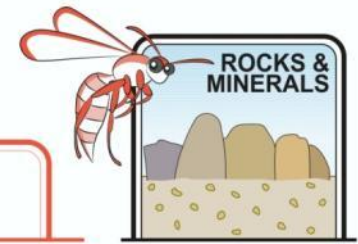


Decrease in water flow means decrease in clast size

An initiative supported by Woodside and ESWA

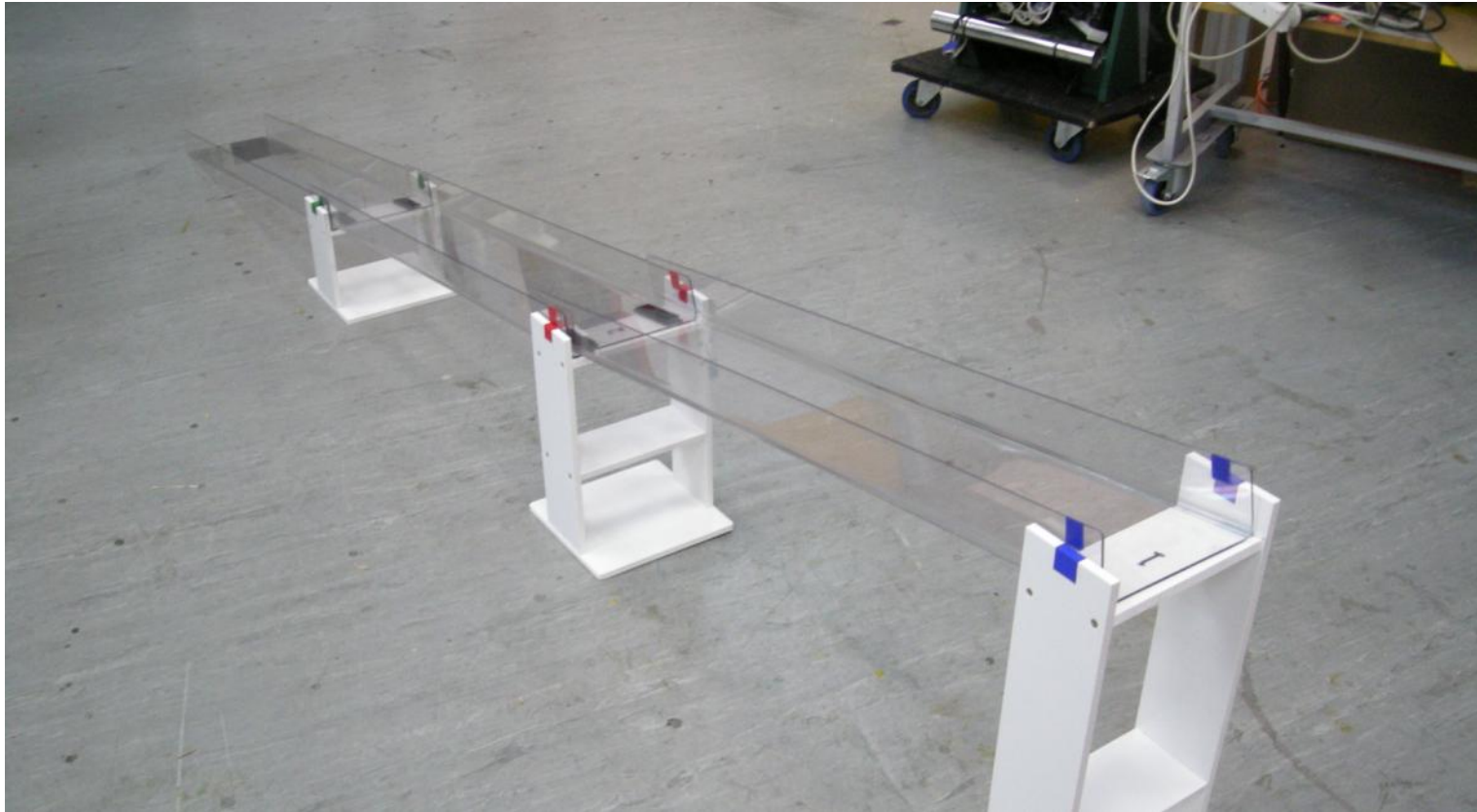


Graded bedding = clast size decreases upwards.



Artificial river valley

An initiative supported by Woodside and ESWA

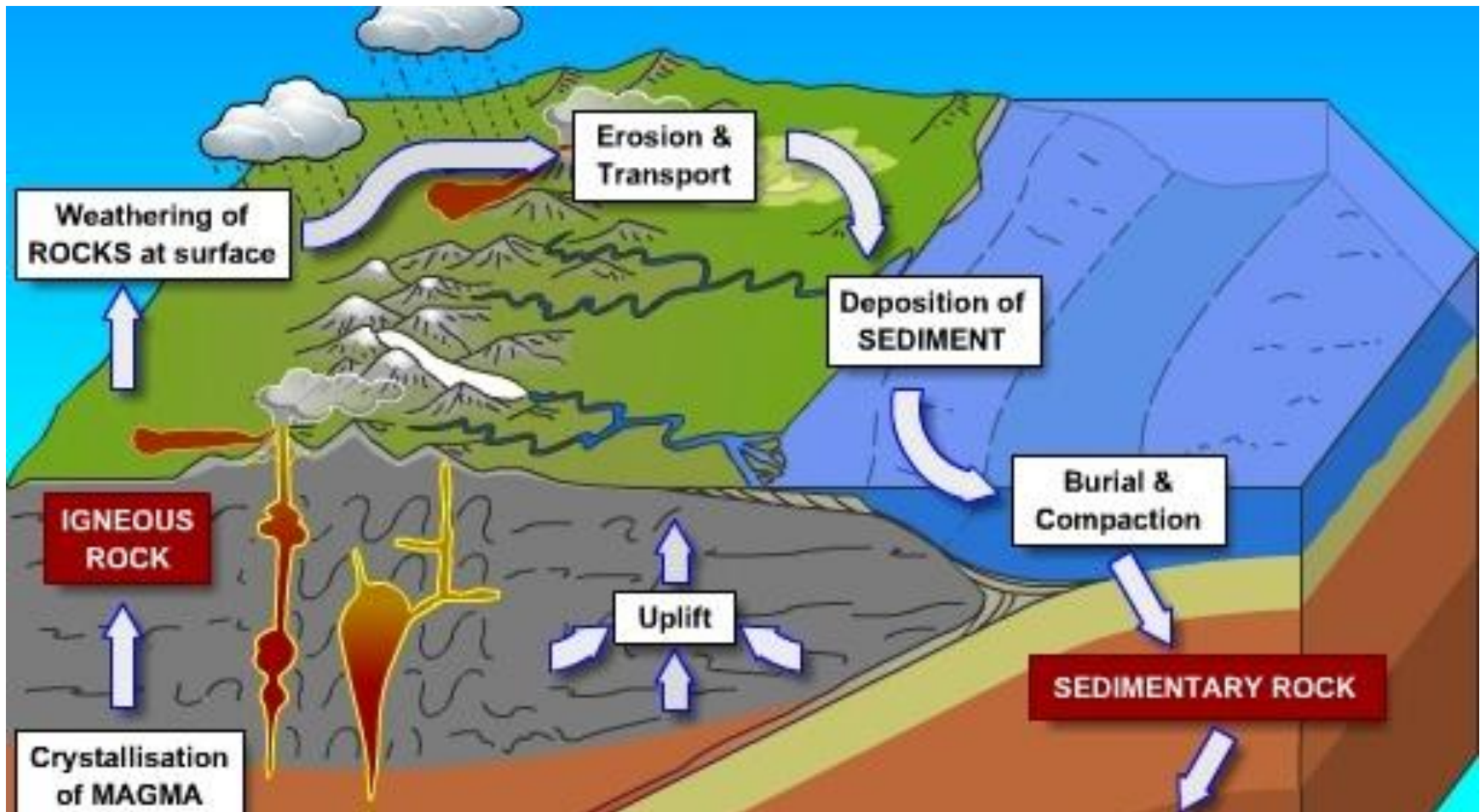


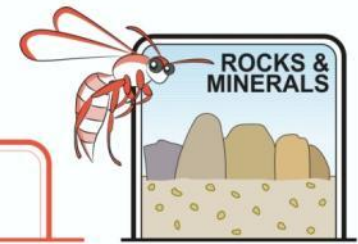
Flume tube

Compaction & Cementation

An initiative supported by Woodside and ESWA

Sediment becomes rock





An initiative supported by Woodside and ESWA

Sedimentary rocks (clastic)

Breccia

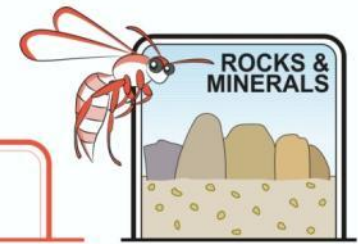
Angular unsorted large clasts in a mixed matrix
Scree from cliffs and hills
Clastic



Scree in Karijini



Breccia at Tom Price



An initiative supported by Woodside and ESWA

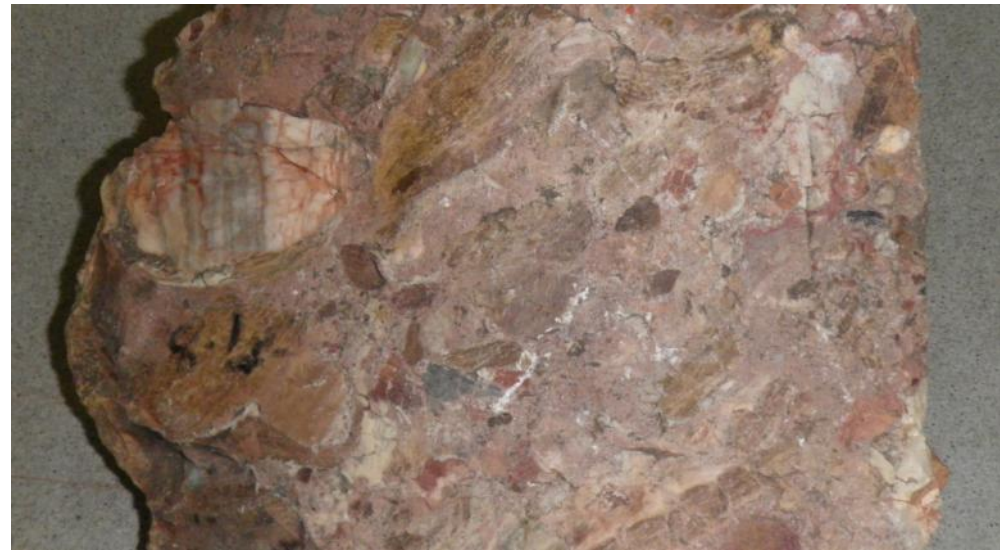
Sedimentary rock (clastic)

Conglomerate

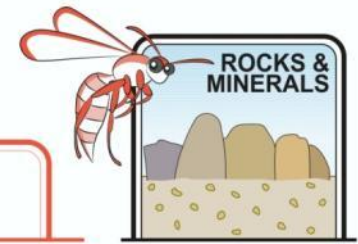
Rounded large clasts in a mixed matrix
Rivers and lakes
Clastic



Water rounded pebbles Scotland



Conglomerate Mt Russell E of Wiluna



Sedimentary rock (clastic)

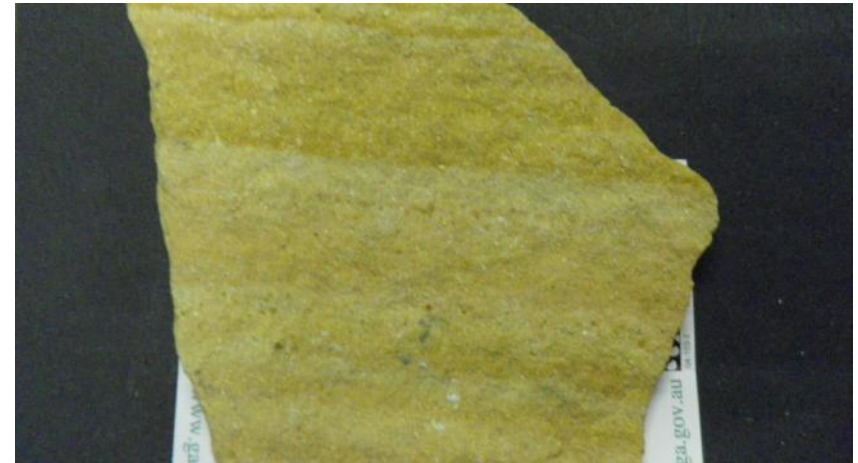
An initiative supported by Woodside and ESWA

Sandstone

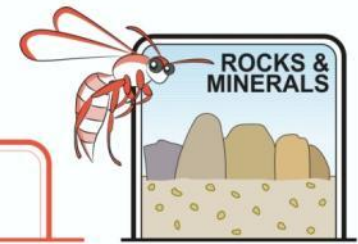
Well sorted medium grain sands
Bedding obvious
Clastic



Sand dunes behind Rockingham



Donnybrook sandstone

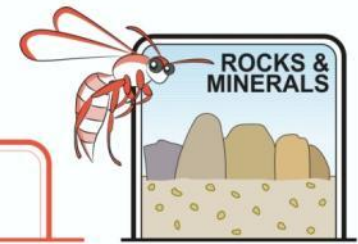


Mock rocks

An initiative supported by Woodside and ESWA



NB: Not compacted!



Sedimentary rock (clastic)

An initiative supported by Woodside and ESWA

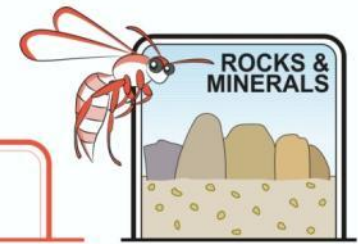
Mudstone

Fine grained

Marine, lacustrine, swamp

Clastic





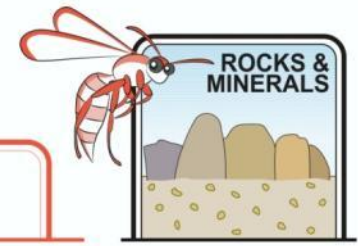
Sedimentary rocks (biogenic)

An initiative supported by Woodside and ESWA

Limestone

Chemical or biogenic





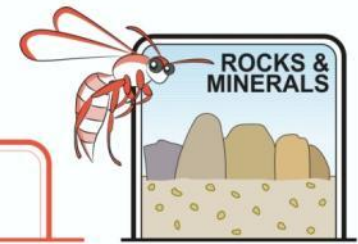
Sedimentary rocks (biogenic)

An initiative supported by Woodside and ESWA

Spongelite

Biogenic





Sedimentary rocks (biogenic)

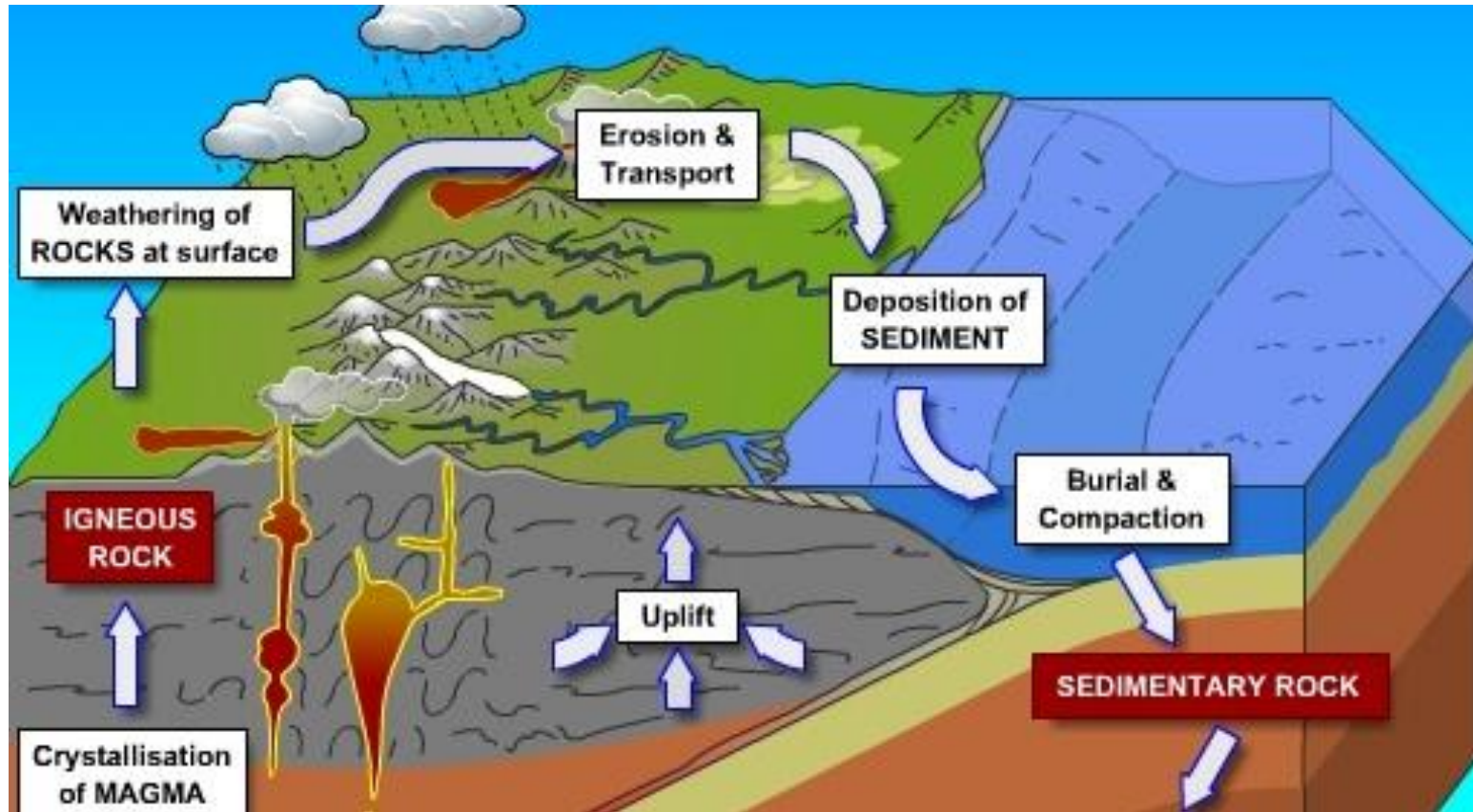
An initiative supported by Woodside and ESWA

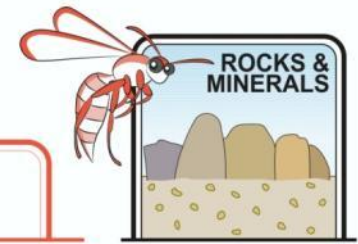
Coal



Melting and crystallisation create igneous rock

An initiative supported by Woodside and ESWA

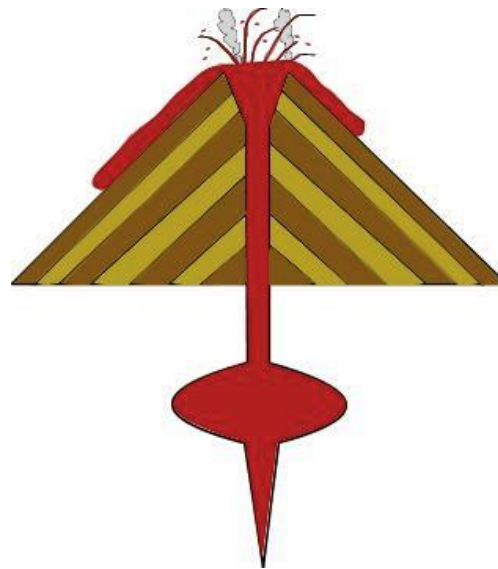




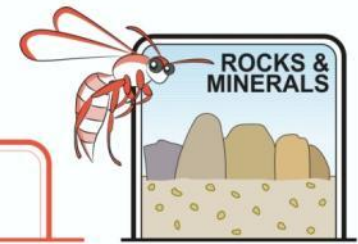
Igneous rocks

An initiative supported by Woodside and ESWA

1. Extrusive or intrusive - *Where did they crystallise?*



2. Felsic or mafic - *Silica rich or silica poor?*



Igneous rocks

An initiative supported by Woodside and ESWA

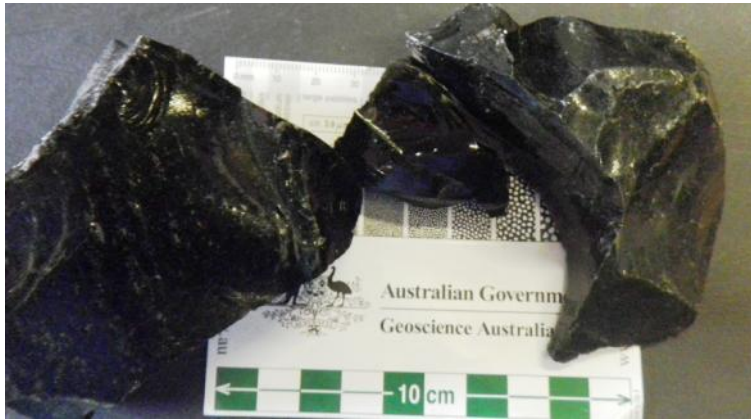
	Mafic	Intermediate	Felsic
Volcanic Extrusive (very small crystals)	Basalt Obsidian Pumice	Andesite	Rhyolite Obsidian Pumice
Intermediate (eye/magnify)	Dolerite	X	X
Plutonic Intrusive (Large crystals)	Gabbro	Diorite	Granite

Lighter in colour



Felsic igneous rocks

An initiative supported by Woodside and ESWA



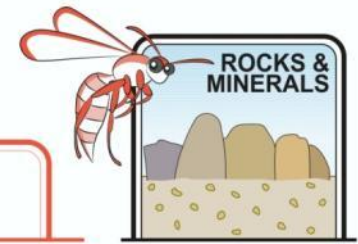
Obsidian



Pumice

Granite

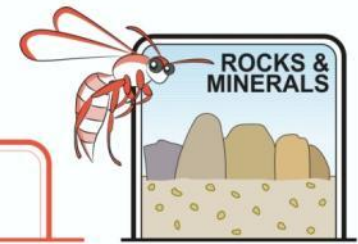




Mafic igneous rocks - Dolerite dykes

An initiative supported by Woodside and ESWA





Mafic igneous rocks

An initiative supported by Woodside and ESWA

Basalt



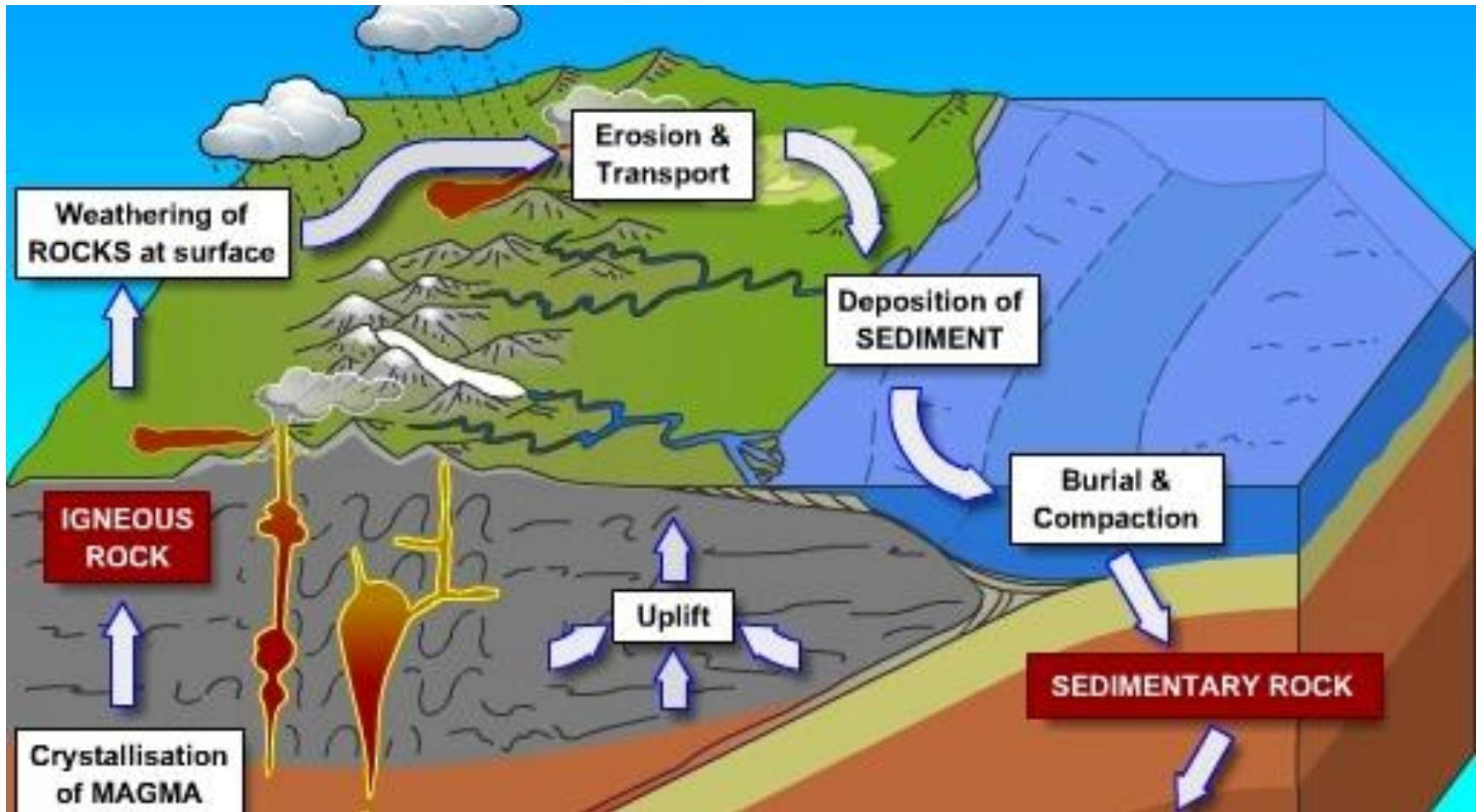
Dolerite

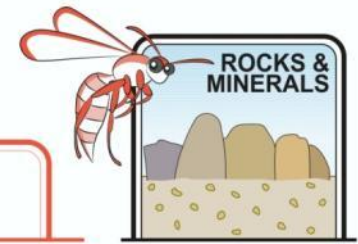


Gabbro

Metamorphic rocks - Partial melting

An initiative supported by Woodside and ESWA



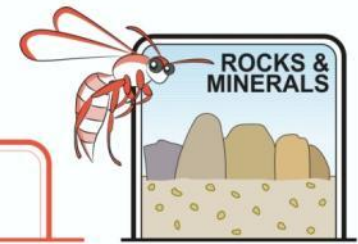


Metamorphic rocks - Partial melting

An initiative supported by Woodside and ESWA

Limestone changes to marble. Traces of fossils remain

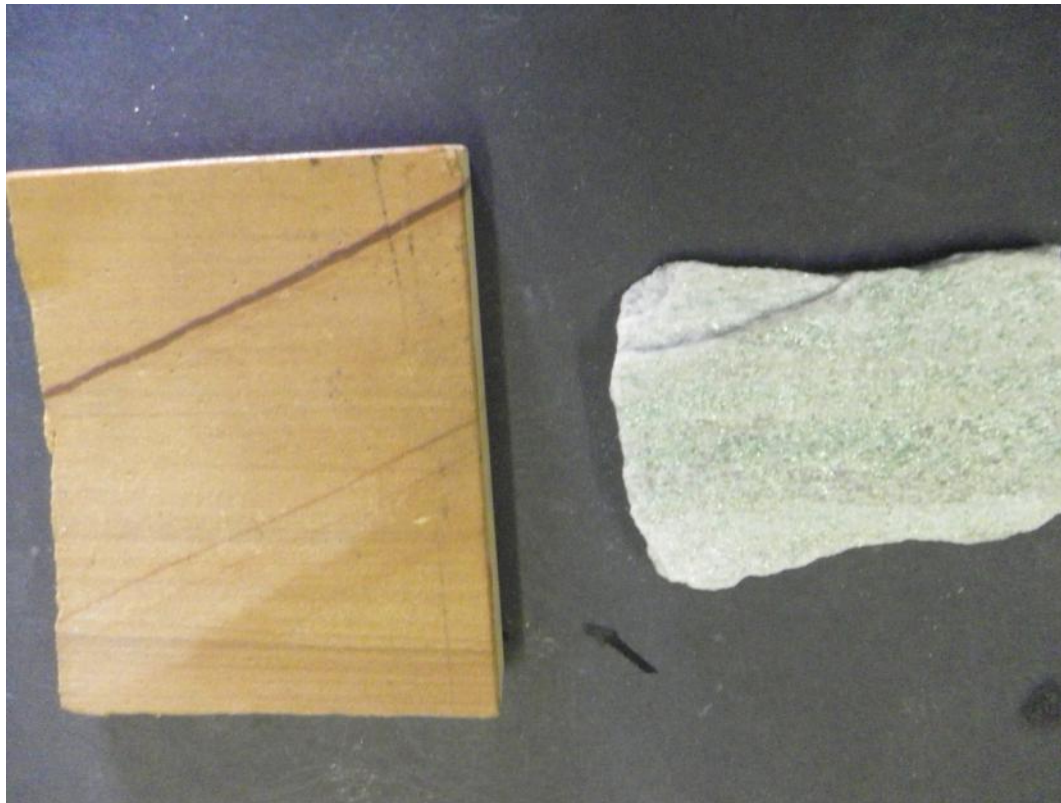


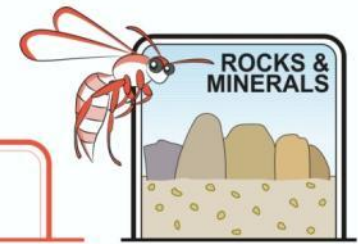


Metamorphic rocks - Partial melting

An initiative supported by Woodside and ESWA

Sandstone changes to quartzite (Toodyay stone).





Metamorphic rocks - Partial melting

An initiative supported by Woodside and ESWA

Mudstone changes to slate and then schist



Metamorphic rocks - Partial melting

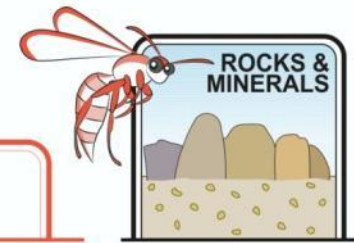
An initiative supported by Woodside and ESWA



Dolerite dyke through granite

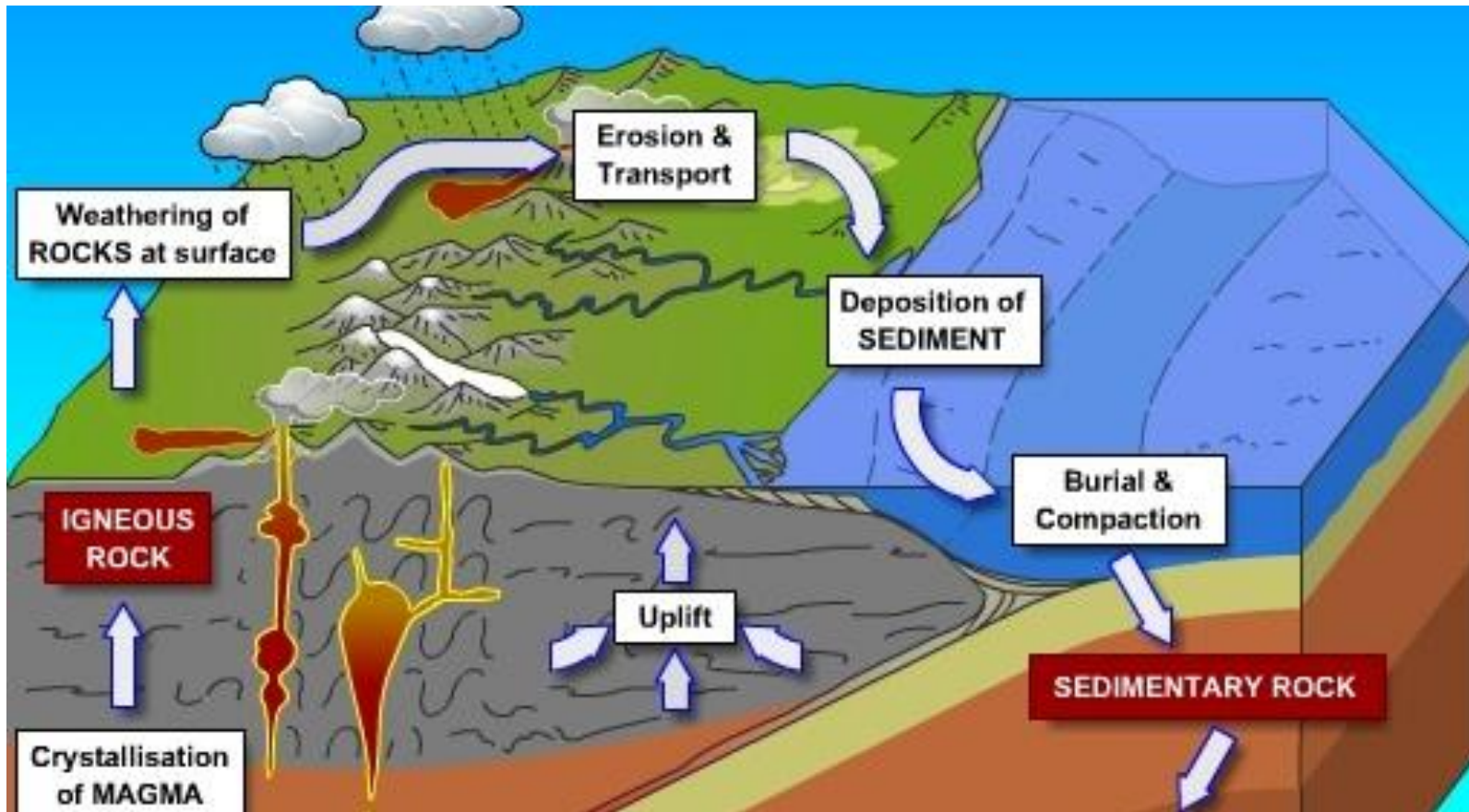
to

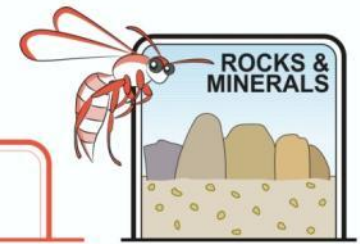
Gneiss



Uplift due to tectonic movement

An initiative supported by Woodside and ESWA

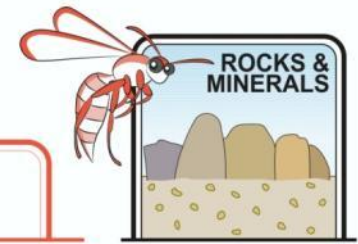




Uplift

An initiative supported by Woodside and ESWA





More Resources

An initiative supported by Woodside and ESWA

This presentation can be freely downloaded from www.wasp.edu.au under Year 8 Resources – Rock Cycle. Further resources can also be found here.