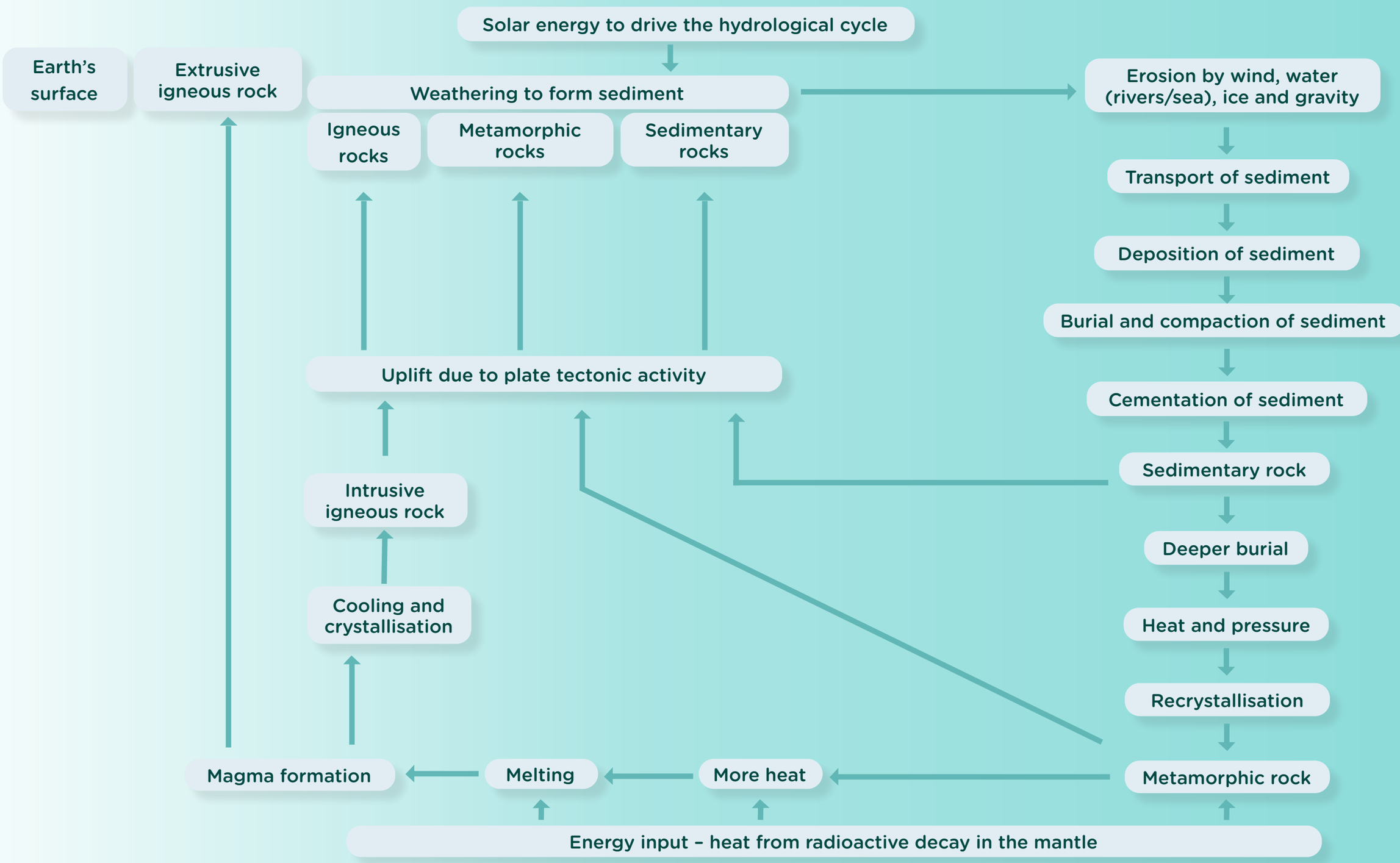
GCSE Geology 2.1: The rock cycle

Igneous, sedimentary and metamorphic rocks and processes are linked by the rock cycle. Energy transfer occurs over geological time through an interaction between the hydrological cycle (sedimentary rocks and processes) and the plate tectonics cycle (igneous and metamorphic rocks and processes).



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Rock cycle processes take place at different rates – ranging anywhere from just a few seconds to tens or even hundreds of millions of years.

Catastrophic processes are those that take place relatively quickly, can be observed directly and have an immediate effect on the Earth.

Gradualistic processes are those that take place very slowly, cannot always be observed directly and only have an effect on the Earth over a considerable period of time.

Some continental areas of the Earth may be stuck in one part of the rock cycle for billions of years. Parts of Northern Canada are made up of regional metamorphic rocks which date back to almost 4 billion years old.

Catastrophic processes	Duration of event	Gradualistic processes	Duration of event
Meteorite impact	Seconds	Glacial erosion	Thousands of years
Earthquake	Seconds to minutes	Coastal erosion	Thousands of years
Landslide	Minutes	River erosion	Thousands/millions of years
Pyroclastic flow	Minutes/tens of minutes	Formation of schist	Millions of years
Tsunami	Hours	Mountain chain formation	Tens of millions of years
Explosive volcanic eruption	Hours to days	Ocean basin formation	Up to 200 million years
Flooding	Hours to days	Supercontinent formation	Up to 300 million years