Introduction to Sedimentology (GL1101 and GL1900)

Geology is often used to reconstruct how the Earth looked in the past. From deserts to deep seas, sedimentology allows us to paint a picture of these past landscapes

Sedimentology is the study of the processes of formation, transport, and deposition of material that accumulates as sediment in continental and marine environments.

When we examine a sediment there are key textures to look out for to help with our interpretation. N.B. This is a basic guide – remember that lots of factors can affect the texture of a sediment

Colour:

Black to Dark Grey	**Green to Light Grey**	**Orange, Red, Purple**
Indicates organic matter	Green suggests glauconite	Indicates ferric iron staining
Environment: Deep water	Environment: Shallow water	Environment: Terrestrial
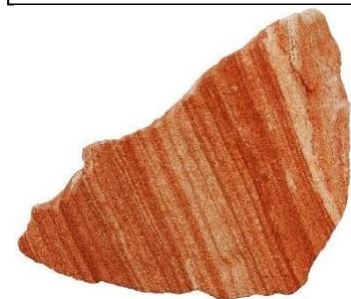
Grainsize:

We use the Udden-Wentworth scale (measured in Φ) to describe grain size. It grades from clay to conglomerate.

| **Clay**	**Sandstone**	**Conglomerate**
Indicates: low energy	Indicates: Medium energy	Indicates: High energy

Clast-Matrix Relationships:

Matrix-Supported Conglomerate
Clasts do not touch
Environment: E.g., debris flow

Clast-Supported Conglomerate
Clasts touch
Environment: E.g., River

Roundness:

Roundness looks at how smooth a clast is used as an indicator of transport distance. The more rounded a clast, the further it has travelled

| Angular | Sub-Angular | Sub-Rounded | Rounded | Well-Rounded |

Increasing Erosion (time)
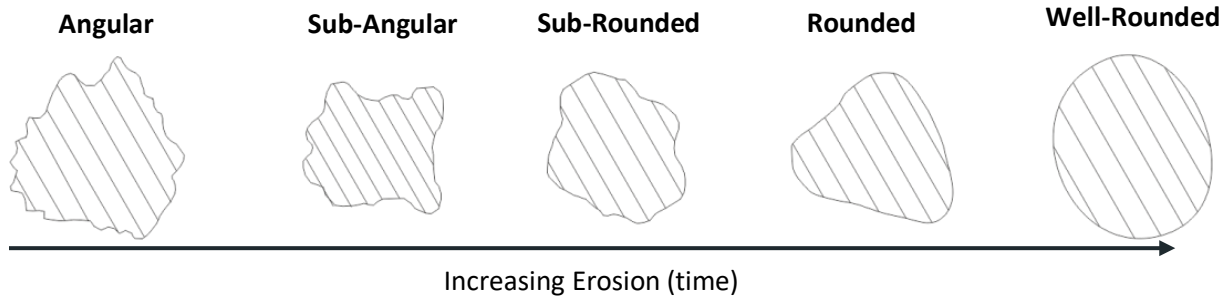
Sphericity:

Sphericity looks at how close a clast is to a perfect sphere. It is a function of lithology and structure.

| Bladed: | Oblate: | Prolate: | Equant: |

Sedimentary structures can also tell us a lot about the process of deposition. A few of these are outlined below:

Grading:

Normal Grading:
Coarser sediment at the base fines upwards. Usually represents flow decreasing in energy over time

Reverse Grading:
Finer sediment at the base coarsens upwards. Usually represents granular convection

Cross Stratification:

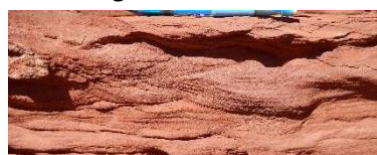**Planar Cross Stratification**
Forms due to moving dunes or ripples

Trough Cross Stratification
Moving sinuous bedforms

Herringbone Cross Stratification
Suggests a tidal environment

Want to Learn More? We recommend the book 'Sedimentology and Stratigraphy' Nichols. Wiley-Blackwell

Try your hand at using the above information to match the sedimentary rock to the depositional environment:

Draw tie-lines to connect the rock to the environment. The first one has been done for you as an example