Worksheet 2

RELATIVE DATING WORKSHEET \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Sedimentary Layers – the Law of Superposition

Sedimentary rocks are formed from the weathering and erosion of other rocks – these can be other sedimentary rocks, igneous or metamorphic rocks. Therefore, sedimentary rocks provide evidence for changes in the Earth.

PRACTICAL – MAKING SEDIMENTARY LAYERS

Ingredients

Two colors of “sand” and Two cups – one upright, one at an angle of 45o

A. Into the upright beaker:-

(i) place several spoonful of one colored sand in the measuring cylinder

(ii) place several spoonful of another color sand on top of this

(iii) do these two layers once again so you have four layers

Draw the sequence and label the layers (A, B, C, D) – A being the bottom layer. The boundary of each change in color represents a bedding plane.

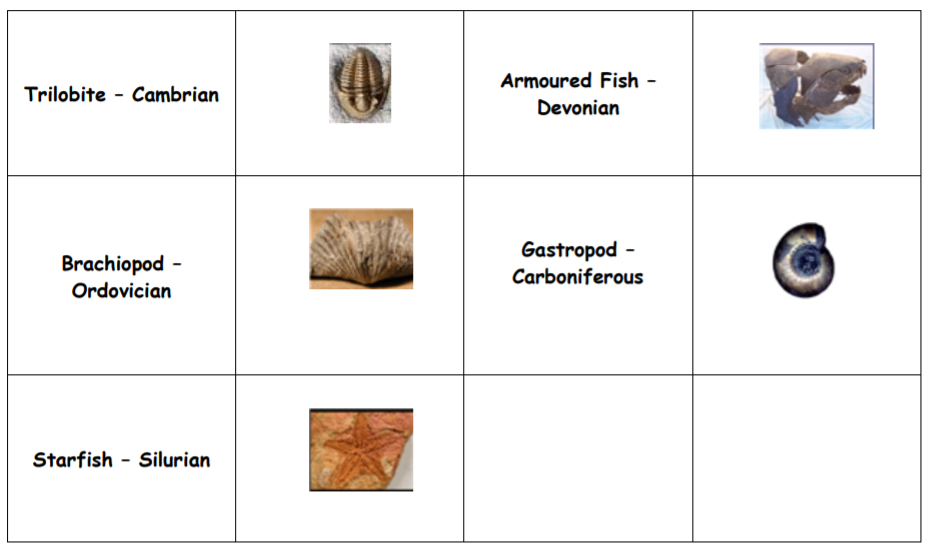
|  |  |  |
| --- | --- | --- |
| Labelled Drawing | | |
| a | Which layer went in first? |  |
| b | Which layer went in last? |  |
| c | Which layer is the “oldest” in the sequence? |  |
| d | What was the overall sequence of events if there was no disturbance (from oldest to youngest)? |  |

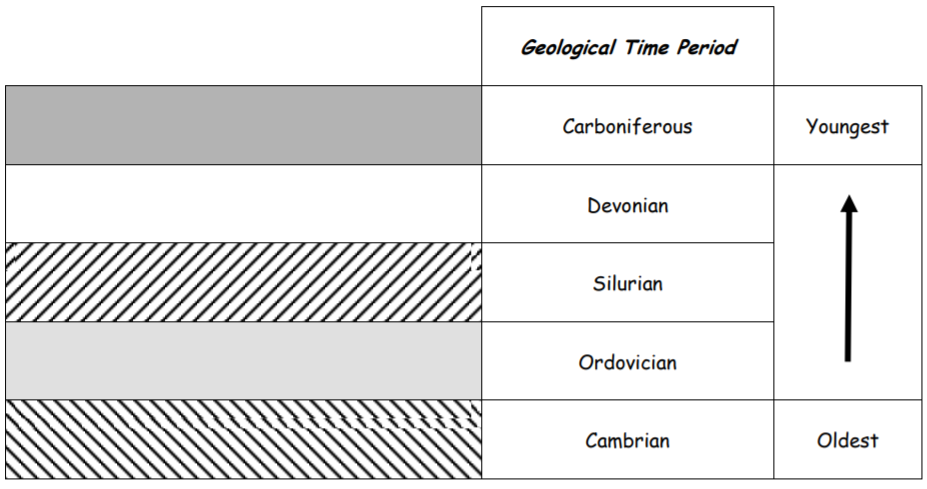
This is the law of Superposition.

2. THE USE OF FOSSILS – DATING

Fossils have been used to date rocks as they are time markers – many species lived at a particular time and later became extinct. As you saw from (1) above, the deepest rocks are usually the oldest, therefore the fossils found at the base of a rock sequence that has not been disturbed will be the oldest. Complete the following practical.

A. Place the fossils in the appropriate geological time period on the card.





|  |  |  |
| --- | --- | --- |
| a | Which fossil layer is the oldest (name the geological period)? |  |
| b | Which fossil layer is the youngest (name the geological period) ? |  |

We can use fossils to date rocks. Is this an absolute age (we know how many years ago the fossil lived?) or is it a relative date (we know one is older than the other, but not how old they are?).

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B. Place an extra Trilobite within the Ordovician, and an extra Starfish in the Devonian.

|  |  |  |
| --- | --- | --- |
| a | At the end of which geological time period did the Starfish become extinct ? |  |
| b | During which geological time period did the Starfish evolve and first appear ? |  |
| c | During which geological time period did the Trilobite evolve and first appear ? |  |
| d | At the end of which geological time period did the Trilobite become extinct ? |  |

How does knowing when a fossil lived and became extinct help us date rocks?

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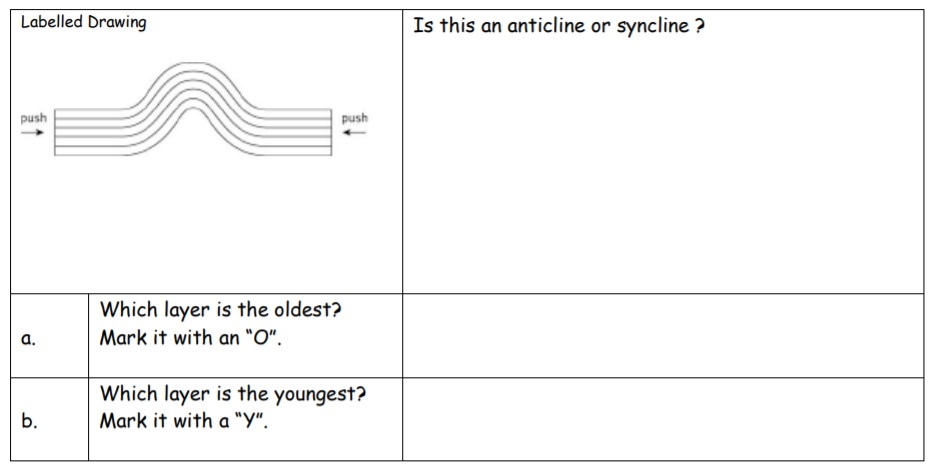
3. HOW DO ROCKS DEFORM and WHAT IS THE CONSEQUENCE FOR THE AGE OF THE LAYERS ?

Rocks can deform in two ways due to pressures and temperatures within the Earth: (1) soft (ductile) into folds; or (2) brittle – these are faults

Let us see the end result of ductile deformation.

Ingredients Three different coloured layers of plasticine

A. Push the plasticine with equal force from each side until it curves upwards like the drawing below - draw in colour and label the layers A, B, C from the oldest upwards.



B. Push the plasticine further until the fold is overturned as the drawing below – draw and label the layers as above marking the oldest with “O” and the youngest with “Y”.

