

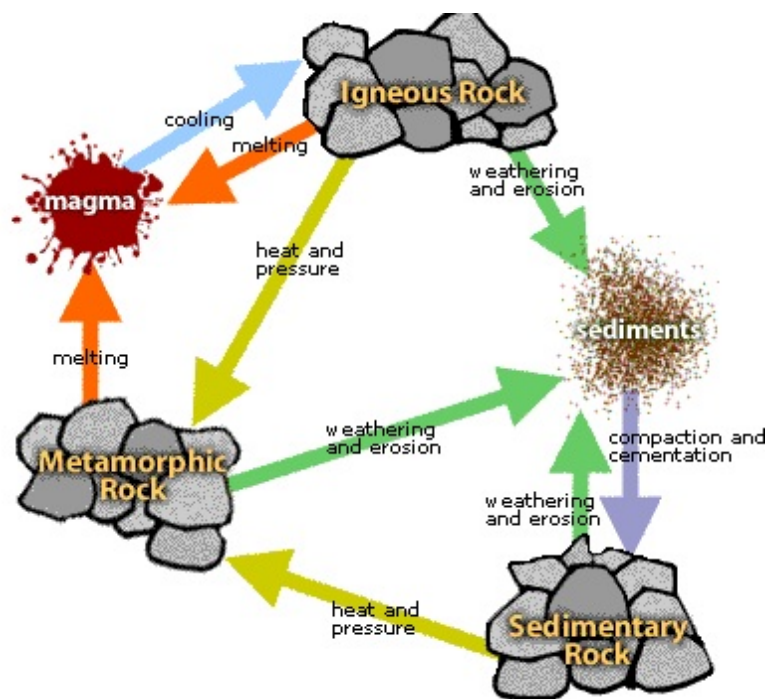
**Intermediate Science 7**  
**Unit 4: Earth Crust**  
**Topic 7: Rock Cycle**



Student Name \_\_\_\_\_

James Hutton (1727–1797), a 18th century farmer and founder of modern geoscience, created the concept of the **rock cycle**, which shows a relationship between igneous, sedimentary, and metamorphic rocks. The upper part of the earth (mantle, crust and surface) can be envisioned as a giant recycling machine; matter that makes up rocks is neither created nor destroyed, but is redistributed and transformed from one rock type to another.

The **rock cycle** states that over long periods of time, any part of the earth's crust may be transformed into any of the three families of rocks, 1) Igneous, 2) Sedimentary and 3) Metamorphic- depending on the conditions. Thus each family is linked to the others in a cycle. A diagram of the cycle is shown below:



Let us look at the rock cycle by starting at Magma. Any rock that is heated at depths may melt into magma, and later form igneous rock. Any rock that is exposed on the Earth's surface may be broken into sediments, and may later become sedimentary rock. It is the physical environment that determines what type of rock is formed. If the environment of a rock changes the rock also changes.

A rock may become so altered by a change in environment that it can no longer be classified in its original family. It has changed from one family to another. Over a long period time, a single piece of the Earth's crust may be transformed into all three families of rock. Each family is linked to others in a cycle.

Liquid (molten) rock material solidifies at depth or at the earth's surface to form IGNEOUS ROCKS. Uplift and exposure of rocks at the Earth's surface destabilizes these mineral structures. The minerals break down into smaller grains which are transported and deposited as sediments. The sediments are lithified (compacted and cemented), and SEDIMENTARY ROCKS are formed. Changes in temperature, pressure, and/or rock or fluid chemistry can allow igneous and sedimentary rocks to change physically or chemically to form METAMORPHIC ROCKS. At higher temperatures, metamorphic (or any other rock type) rocks may be partially melted, and crystallization of this melt will create igneous rocks. Uplift and erosion can expose all rock types at the surface, re-initiating the cycle.

## PART A: MULTIPLE CHOICE

*Instructions: Shade the letter of the correct answer on the computer scorable answer sheet provided.*

- Which of the following shows how rocks change from one type to another?
  - Formation of crystals
  - Lithification cycle
  - Melting process
  - Rock cycle
- The rock cycle indicates that each type of rock can \_\_
  - Be changed by forces at Earth's surface
  - Provide materials to make other rocks
  - Form other rocks
  - All of the above
- What is the rock cycle?
  - The earth moves in circles to move rocks from inside the earth to outside the crust
  - The water is pushed up from the inside the earth
  - Rocks ride a bicycle
  - Rocks have heat, pressure, or both placed on them and rocks change
- Which of the following processes is not involved in the rock cycle?
  - Compaction
  - Condensation
  - Erosion
  - Weathering
- The rock cycle shows each rock \_\_\_\_\_.
  - As it was millions of years ago
  - As it is in recent times
  - As it was originally formed
  - On a continuing journey
- Which statement best describes how rocks are classified as igneous, sedimentary, or metamorphic?
  - Rocks are classified by where they are found.
  - Rocks are classified by how old they are.
  - Rocks are classified by how they were formed.
  - Rocks are classified by their color.
- Which can occur in the rock cycle?
  - Igneous rock is eroded to form metamorphic rock.
  - Sedimentary rock is heated and squeezed to form metamorphic rock.
  - Metamorphic rock melts to form sedimentary rock.
  - none of the above

8. Sedimentary rocks are changed to sediments by \_\_\_\_.
- (A) Cementation and compaction
  - (B) Heat and
  - (C) Pressure melting and cooling
  - (D) Weathering and erosion
9. How do sedimentary rock change to metamorphic rocks?
- (A) Cementation and compaction
  - (B) Heat and pressure
  - (C) Melting and cooling
  - (D) Weathering and erosion
10. How do metamorphic rocks change to igneous rock?
- (A) Cementation and compaction
  - (B) Heat and pressure
  - (C) Melting and cooling
  - (D) Weathering and erosion

**PART B: WRITTEN RESPONSE**

1. What is the rock cycle?

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2. How do igneous and metamorphic rocks become sedimentary rocks?

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3. How do igneous and sedimentary rocks become metamorphic rocks?

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4. How do metamorphic rocks become igneous rocks?

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5. How are igneous and sedimentary rocks related?

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6. How are sedimentary and metamorphic rocks related?

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7. How are metamorphic and igneous rocks related?

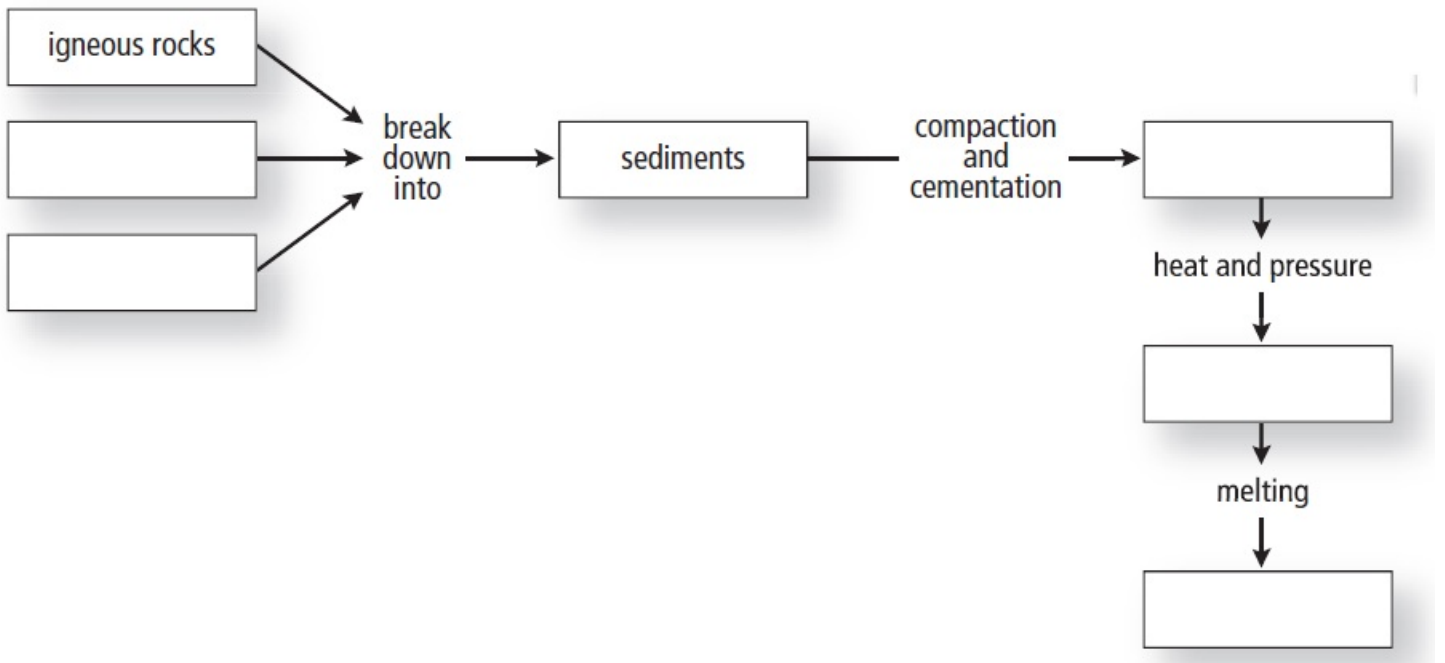
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8. This flow chart shows part of the rock cycle. Copy and complete the chart in your notebook.





**PART B : MATCHING****[5]**

Match each thermometer on the left with the best Descriptor on the right. Each Descriptor may be used only once. Place your answer on the scantron

<u>Term</u>	<u>Descriptor</u>
11. ___ Element	A. It is a combination of two or more pure substances - that are NOT chemically combined.
12. ___ Compound	B. It is used to classify an element or compound.
13. ___ Pure Substance	C. A pure substances that contain two or more elements combined in fixed proportions.
14. ___ Chemistry	D. It is the study of matter, its properties, and the changes or chemical reactions that matter can undergo.
15. ___ Mixture	E. A pure substances that cannot be broken down into simpler substances.