Text

Description automatically generatedName Geology 12 - 2023

TA

**LG #5: Igneous Rocks**

**BIG IDEA**: Minerals, rocks, and earth materials form in response to conditions within and on the Earth’s surface and are the foundation of many resource-based industries.

**Fundamental Knowledge (I know):**

* Processes of igneous rock formation:
  + Bowen’s reaction series
  + relationships between texture and rate of crystallization in extrusive (volcanic) and intrusive (plutonic) igneous rocks (e.g., cooling rate, flow behaviour)
  + classification of igneous rocks according to texture (e.g., vesicular, glassy) and composition (e.g., felsic, intermediate, mafic)
  + properties of common igneous rocks (e.g., granite, andesite, tuff, rhyolite, basalt, obsidian, pumice, porphyry)
  + volcanic and intrusive features (e.g., lava, pyroclastic flow, batholiths, sills, dikes)

**Curricular Competencies (I can)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Proficiency Scale Teacher and Student self assessment**  **(Circle one)** | **Example** | **Evidence**  **(How do you know?)** |
| Use knowledge of scientific concepts to draw conclusions that are consistent with evidence.  Analyze cause-and-effect relationships. | **Emerging (C-/C)**  **Initial Understanding** | Completed Activities #1 & #2 – Journal with fundamental knowledge and vocabulary (in your words). |  |
| **Developing (C+/B) Partial/Near Complete Understanding** | Completed Activities #1 & #2 – Journal with fundamental knowledge and vocabulary (in your words with details).  Completed the suggested learning activities below (Activities #3 & #4) |  |
| **Proficient (B+/A)**  **Complete Understanding** | Completed Activities #1 & #2 – Journal with fundamental knowledge and vocabulary (in your words, with examples and diagrams, connecting to the main ideas).  Suggested activities (Activities #3 & #4) are thoroughly completed, provide details, use vocab that is related accurately, use good sources. |  |
| **Extending (A+) Sophisticated Understanding** |  |  |

**Student Signature: Teacher Signature: Date:**

Resources can be found at www.THSSscience.com

User: THSS

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LG 5 Igneous Rocks

**Suggested Learning Activities:**

**RESOURCES**

1. Text: **Physical Geology & the Environment**

2. Online Resources: Videos - <https://www.youtube.com/watch?v=PrN7jygu4cQ> , <https://www.youtube.com/watch?v=yqjsd9ZR2Sg>, <https://www.youtube.com/watch?v=CHssmd6W6HY>

<https://www.thoughtco.com/about-igneous-rocks-1438950>

**Activity #1: Journal**

1. Refer to your text Physical Geology & the Environment Ch. 6 Igneous Rocks, Intrusive Activity, and the Origin of Igneous Rocks. Read pages 153 – 173.

*Alternatively, you can check out the online resources listed above and/or find your own to help research the definitions below.*

2. In your journal, define the following terms: *igneous rock, magma, lava, intrusive (or plutonic), extrusive (or volcanic), country rock, xenoliths, chill zones, fine grained rocks, coarse grained rocks, porphyritic, mafic, felsic, intermediate, ultra-mafic, volcanic neck, dike, sill, stock, & batholith.*

3. In your journal, describe the following:

a) how igneous rocks form

b) the difference between intrusive (plutonic) and extrusive (volcanic) igneous rocks

c) the difference between mafic and felsic rocks

d) sources of heat that can melt rock

e) Bowen’s Reaction Series

**Activity #2 : Journal**

1. Refer to your text Physical Geology & the Environment Ch. 7 Volcanism and Extrusive Rocks. Read pages 174 – 201.

*Alternatively, you can check out the online resources listed above and/or find your own to help research the definitions below.*

2. In your journal, define the following terms: *pyroclasts, vesicles, blocks, bomb, vent, crater, caldera, columnar jointing, and pillow basalt.*

3. In your journal, compare and contrast the following volcanic eruptions: shield volcano, cinder cone, composite cone, volcano dome, plateau basalt, submarine eruptions.

**Activity #3: Igneous Rocks Worksheet**

1. Complete the worksheet found on the next page.



Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ TA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_­­\_\_\_\_

Igneous Rocks **- Use your Igneous Reference Sheet to answer the questions below**.

*Read each statement. Determine whether you agree or disagree with the statement. If you do not agree, correct it by writing the evidence that makes it an “agree” statement.*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Statement** | **Agree/Disagree** | **Evidence supporting your claim** |
| 1 | Igneous rocks that cool inside the Earth are called Extrusive Igneous rocks. |  |  |
| 2 | Extrusive Igneous Rocks cool very slowly and form large crystals. |  |  |
| 3 | There is no difference between lava and magma at all. |  |  |
| 4 | Igneous Rocks are rocks that form when melted rock inside the Earth cools. |  |  |
| 5 | Examples of Extrusive Igneous Rocks are Basalt and Rhyolite |  |  |
| 6 | Examples of Intrusive Igneous Rocks are Granite and Gabbro |  |  |
| 7 | Igneous Rocks are classified by how they form. |  |  |
| 8 | There are no rocks that can float on water. |  |  |
| 9 | 95% of the Ocean floor is made up of Granite. |  |  |
| 10 | Extrusive Igneous Rocks form coarse grain minerals. |  |  |

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Description automatically generated**Activity #4: Volcano Research Project**

1. Research a volcanic eruption that occurred in the last 100 years. In your write-up of the volcano, discuss the following:

* Where and when did the volcanic eruption occur?
* What plate setting is involved in the formation of the volcano?
* What type of plate boundary is it?
  + Discuss the geological situation that led to the volcano occurring.
* What type of volcano is it?
* What were the impending signs of the eruption before it occurred.
* What was the nature of the eruption? What was the composition of the lava?
* What effect did the volcano have on the people?
* Include a map and diagrams to support your information.