Fudgeous Rocks

**ON-LEVEL**

**Problem**: What happens to substances during igneous rock

(fudge) formation?

**Research**: Refer to Chapter 4, Section 2 (pgs. 98-101) in your text to review information about igneous rocks. Continued rise in temperature can eventually melt any rock until it is molten **(called magma).** When the molten rock cools it forms an igneous rock. All three main types of rock **(igneous, sedimentary, and metamorphic)** can be melted to form magma.

**Independent Variable: (I change…usually in procedure) 5 4 3 2 1**

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**Dependent Variable: (what I observe…answers the lab problem) 5 4 3 2 1**

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**Hypothesis**: (If + IV + then + DV) **20 15 10 5 0**

**If** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

**then**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Ingredients:**

* **1 1/2 cups granulated sugar**
* **2/3 cup (5 fl.-oz. can)** [**Evaporated Milk**](http://www.verybestbaking.com/products/carnation/evap/default.aspx)
* **2 tablespoons butter**
* **1/4 teaspoon salt**
* **2 cups miniature marshmallows**
* **1 1/2 cups (9 oz.)** [**Semi-Sweet Chocolate Morsels**](http://www.verybestbaking.com/products/tollhouse/morsels.aspx)
* **1 teaspoon vanilla extract**

**Procedure:**

**LINE** 8-inch-square baking pan with foil.  
  
**COMBINE** sugar, evaporated milk, butter and salt in medium, heavy-duty saucepan. Bring to a full rolling boil over medium heat, stirring constantly. Boil, stirring constantly, for 4 to 5 minutes. Remove from heat.  
  
**STIR** in marshmallows, morsels, and vanilla extract. Stir vigorously for 1 minute, or until marshmallows are melted. Pour into prepared baking pan; refrigerate for 2 hours or until firm. Lift from pan; remove foil. Cut into 48 pieces.

**Data: 30**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | **Dependent Variable**  **(y)** | |
| **Ingredient** | **Physical Properties**  (you MUST include solid OR liquid OR gas) | **Earth Ingredient**  (what real substance **under** the surface of the earth does this ingredient remind you of) | **Final Observation**  (what did the **original** ingredient look like in the end)  Did it change? HOW did it change?  (YES or NO) (MUST include phase NOW plus color NOW) | |
| **sugar** |  |  |  |  |
| **evaporated milk** |  |  |  |  |
| **butter** |  |  |  |  |
| **marshmallows** |  |  |  |  |
| **chocolate morsels** |  |  |  |  |

Answer the following questions. 10 5 0

1. What three (3) geological processes form igneous rock?
2. List the substances that ***melted***.
3. What is the texture of the final fudge specimen? ***(circle one)***

**coarse-grained (rough) OR fine-grained (smooth)**

1. What determined this texture?

**Conclusion:** (Complete the following sentence starters in your **OWN** paragraph) **30 20 10 0**

1. The data shows \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. My data \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (supports/does not support) my hypothesis.
3. (What happens to substances during igneous rock (fudge) formation)?

In conclusion \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

FINAL PARAGRAPH (you may complete on your own paper if needed):

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