Flat As A Flapjack: OL

**Problem**: What are the key changes to substances during metamorphic rock (flapjack) formation?

**Research**: Refer to Chapter 4, Section 4 (pgs 106 – 111) in your text to review information about metamorphic rocks. \*\*Metamorphic rocks are formed from sedimentary, igneous, or other metamorphic rocks. ***These rocks are subjected to intense heat and intense pressure***. The heat and pressure is not quite enough to melt the rock, but it does cause the minerals in the rock to ***change their size, shape, or even combine with other minerals*** to form new or bigger minerals. In order to answer the problem above, I will need the following variables:

**Independent Variable:(I the scientist will change…usually in procedure) 5 3 0**

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**Dependent Variable:(what I observe, data...this answers the lab problem)5 3 0**

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

If\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_then\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**Ingredients:**

* **1 cup Hungry Jack Easy Pack Pancake Mix**
* **3/4 cup water**
* **Spray oil for griddle**
* **1 tablespoon of 2 or 3 assorted foods** 
  + **m&ms or chocolate chips, raisins, marshmallows**

**Procedure**: **10pts**

**1) Heat** griddle to medium-high or 375°.

**CAUTION: The griddle will become very hot!**

**2) Combine** pancake mix (dry) and water(wet)in mixing bowl. **Holding the bowl**, stir just until the large lumps disappear.

**3) Gently fold your measured,** assorted foods into the batter. (Batter should be lumpy).

**4) Using the ¼ cup measuring tool, Pour** slightly less than ¼ cup batter for each pancake onto hot griddle.

**5) Heat** 1 to 1 ½ minutes. Bubbles will begin to pop. Flip pancake and cook another 1½ minutes.

**6) Press** pancake between griddle and spatula (add intense pressure) until both sides are golden brown. Sorry- No fluffy pancakes!

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| --- | --- | --- | --- | --- |
| **Data: 30pts** | **3 bullets each** |  | **Dependent Variable**  **(y)** | |
| **Ingredient** | **Physical Properties**  (include the phase of matter) | **Earth Ingredient**  (What real substance **under the surface** of the earth does this ingredient remind you of **& why!)** | **Final Observation**  (what did the ingredient look like in the end)  Did it change? HOW did it change?  (YES or NO) (Disappear? Melt? include color and phase) | |
| **pancake mix** | **-**  **-**  **-** |  |  |  |
| **water** | **-**  **-**  **-** |  |  |  |
| **raisins** | **-**  **-**  **-** |  |  |  |
| **marshmallows** | **-**  **-**  **-** |  |  |  |
| **chocolate morsels** | **-**  **-**  **-** |  |  |  |

1. What two geological processes are required for **earth-made** metamorphic rock to form?
2. Based on #1 above, what did the griddle represent?
3. Based on #1 above, what did the spatula represent?
4. Before: After: