Student Page

Title: How to make a universe

Introduction: This is a backwards lab…you are going to start with the data, and write out the procedures that you needed to use to get that data. Your analysis of the data will be much easier if you graph it or put it into a comparison chart using excel (or on paper) Once you've done that, you'll write your conclusions of what your data tells you about the origin of the universe and the abundance of the elements in the universe. In your conclusions, you will need to specifically talk about:

- What does the data mean…how does it inform your conclusions?
- Are earth and the rest of the universe composed of the same or different elements? What is your evidence?
- Are the elements that are present both on earth and in the rest of the universe present in the same, or different, amounts?
- Specifically talk about the heavier elements (those with higher atomic mass). How does their presence on earth and in the rest of the universe compare to the occurrence of the lighter elements?

Prediction/Hypothesis
If _____,
                                                          [state hypothesis]
Then by changing _____ and measuring
                                        [INDEPENDENT VARIABLE]
_____, I predict that
                                        [DEPENDENT VARIABLE]
_____.
              [Prediction of results. Be specific. Do not simply state that there will be an effect]
Because _____
_____
_____.
              [Scientific phenomenon to support your prediction. Cite evidence from your textbook.]

Procedures:
1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Data

Table 2. Estimated Abundance of Elements (in relative atomic %)

Earth		Earth's crust		Earth's Atmosphere	
Oxygen	50	Oxygen	47	Nitrogen	78
Iron	17	Silicon	28	Oxygen	21
Silicon	14	Aluminum	8.1	Argon	0.93
Magnesium	14	Iron	5.0	Carbon	0.03
Sulphur	1.6	Calcium	3.6	Neon	0.0018
Nickel	1.1	Sodium	2.8	Helium	0.00052
Aluminum	1.1	Potassium	2.6		
Universe		**Sun**		**Humans**	
Hydrogen	92.47	Hydrogen	90.99	Hydrogen	61
Helium	7.40	Helium	8.87	Oxygen	26
Oxygen	0.06	Oxygen	0.078	Carbon	10.5
Carbon	0.03	Carbon	0.033	Nitrogen	2.4
Nitrogen	0.01	Neon	0.011	Calcium	0.23
Neon	0.01	Nitrogen	0.010	Phosphorus	0.13
Others	0.01	Magnesium	0.004	Sulphur	0.13

Analysis

Conclusion: