Student Sheet Name_____

Title: Elements in the Universe

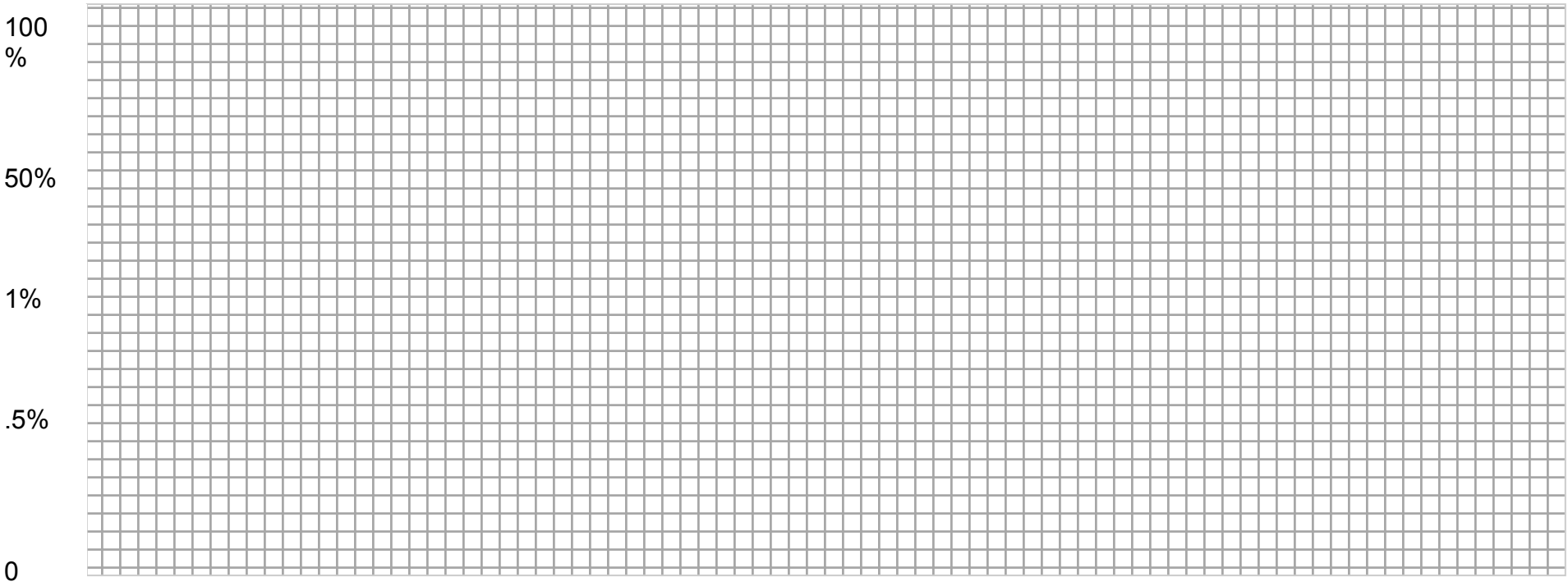
Introduction: We are familiar with the elements commonly located on Earth. Most of us know that water is composed of hydrogen and oxygen and that water is a very common substance on Earth. Hydrogen and oxygen must be common elements. Few of us know which elements are most common in the entire universe. An obvious problem is that people have only traveled to our very closest neighbors in space to know what they are composed of. Asteroids and rocks brought back from the Moon missions are our only solid clues to outer space. How do scientists know what the rest of the Universe is made of? Think back to your 9th grade Earth Systems class. What do stars send us that can be analyzed? You remember, light and other forms of radiation are the messengers that tell us what all the "stuff" in the Universe is. In this activity you will analyze the information from stars and discover the relationship between the mass of atoms and their abundance.

Materials: Periodic table

Procedure:

1. Use the graph on the back of this paper and label the x-axis with the atomic masses. The y-axis has been scaled for you. Notice that it is not an incremental scale. Place the symbol of the element next to its point on the graph. The atomic number indicates the number of protons in the nucleus of the atom and reflects its mass. Do these elements:

Name		% Mass
H	hydrogen	75
He	helium	23
O	oxygen	1
C	carbon	0.5
Ne	neon	0.13
Fe	iron	0.11
N	nitrogen	0.10



Analysis:

1. Which two elements are most abundant?

2. What do they have in common?

3. How does the abundance of all the other atoms compare?

4. Based on the trends of the table, what is the relationship between the mass of atoms and their abundance in the universe?

Conclusion: Astronomers think heavier elements form from lighter ones in stars. How does this graph support the star theory?