

**What Are We Made Of?
Student Activity Sheet**

Elements

1. What are the elements that make up water?

2. What are some of the elements that make up Earth's atmosphere?

3. Why is carbon dioxide not an element?

4. Write a definition of an element using your own words.

**Elements of the Human Body**

5. Match the name of the element with the correct symbol.

C	Hydrogen
H	Nitrogen
O	Carbon
P	Iodine
K	Potassium
I	Phosphorous
N	Oxygen
S	Sodium
Ca	Chlorine
Fe	Iron
Mg	Magnesium
Na	Sulfur
Cl	Calcium

**Elements on Earth**

6. Use the following chart to answer questions a, b, & c.

Element	Symbol	Relative % on Earth's Crust
Oxygen	O	46.6
Silicon	Si	27.7
Aluminum	Al	8.1
Iron	Fe	5.0
Calcium	Ca	3.6
Sodium	Na	2.8
Potassium	K	2.6
Magnesium	Mg	2.1
Titanium	Ti	0.4
Hydrogen	H	0.1

- a. Which is the most abundant element found on Earth?
 - b. How does the amount of Iron compare with the amount of Aluminum?
 - c. Compare the amounts of Sodium and Potassium found on Earth.
7. How do you think we could determine the abundances of elements from an object in space, such as the sun?

Elements From the Sun

8. As directed by your instructor, obtain a sample from the container in your plastic cup. Count the number of each color in your sample and record your results in one of the group columns below. You will have an opportunity to complete the remaining group columns when the class shares their findings.

COLOR	ELEMENT	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	Material Reference #
Yellow	<i>Gold Collector Wafer</i>						
Orange	<i>Hydrogen (H)</i>						
Blue	<i>Helium (He)</i>						
Green	<i>Calcium (Ca)</i>						
Red	<i>Oxygen (O)</i>						
Total							

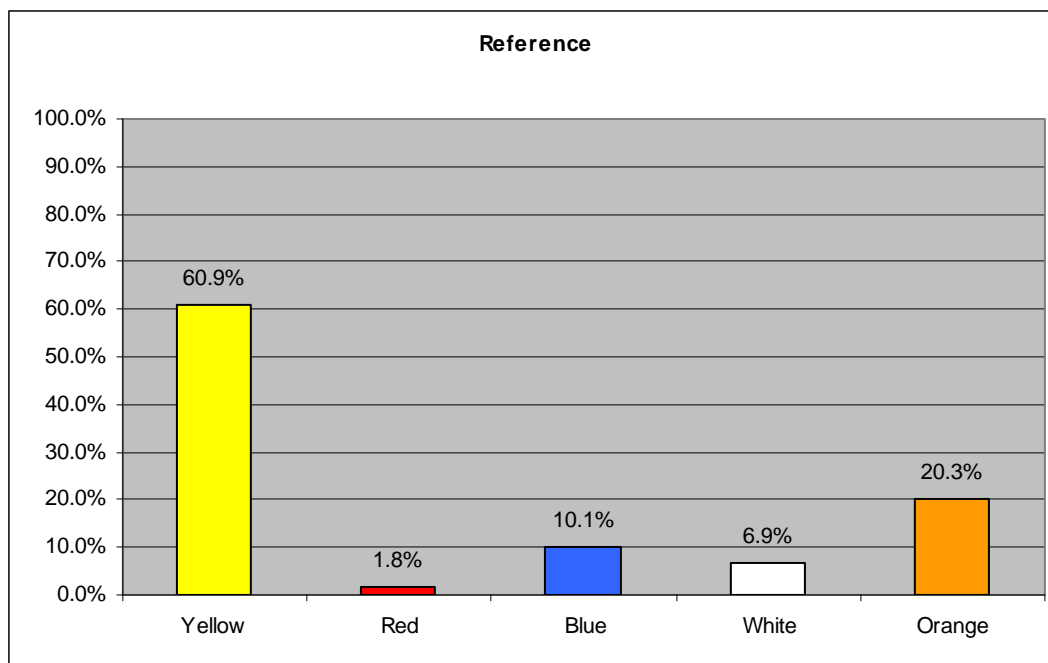
My Group's Percentage of Each Color Found in the Sample Extraction

100						
90						
80						
70						
60						
50						
40						
30						
20						
10						
0						
	Yellow	Orange	Blue	Green	Red	Other

- 9. Use the information from the data table that each student in your group recorded to make a graph showing their percentages. Then make a combined group graph using the total percentages.
- 10. Using the information in your table, contribute to a combined classroom graph and answer the following questions:



- a. How did each of your elemental abundances compare with other groups?
- b. Which graph do you think is a better representative sample of the solar wind in the wafer? Why?



This reference graph is based on the following totals:

- 2160 yellow representing the collector wafer materials (three large bags of 720) or 60.9 percent of total
- 720 orange representing hydrogen one large bag of 720) or 20.3% of total
- 360 blue representing helium (one half large bag of 720) or 10.1% of total
- 245 green representing calcium (one small bag of 245) or 6.9% of total
- 64 red representing oxygen or 1.8% of total

Your class reference might be different. Check with your teacher.

- c. What will the results from the Genesis mission science analysis tell us about our solar system? Hint: What did you do in the activity?

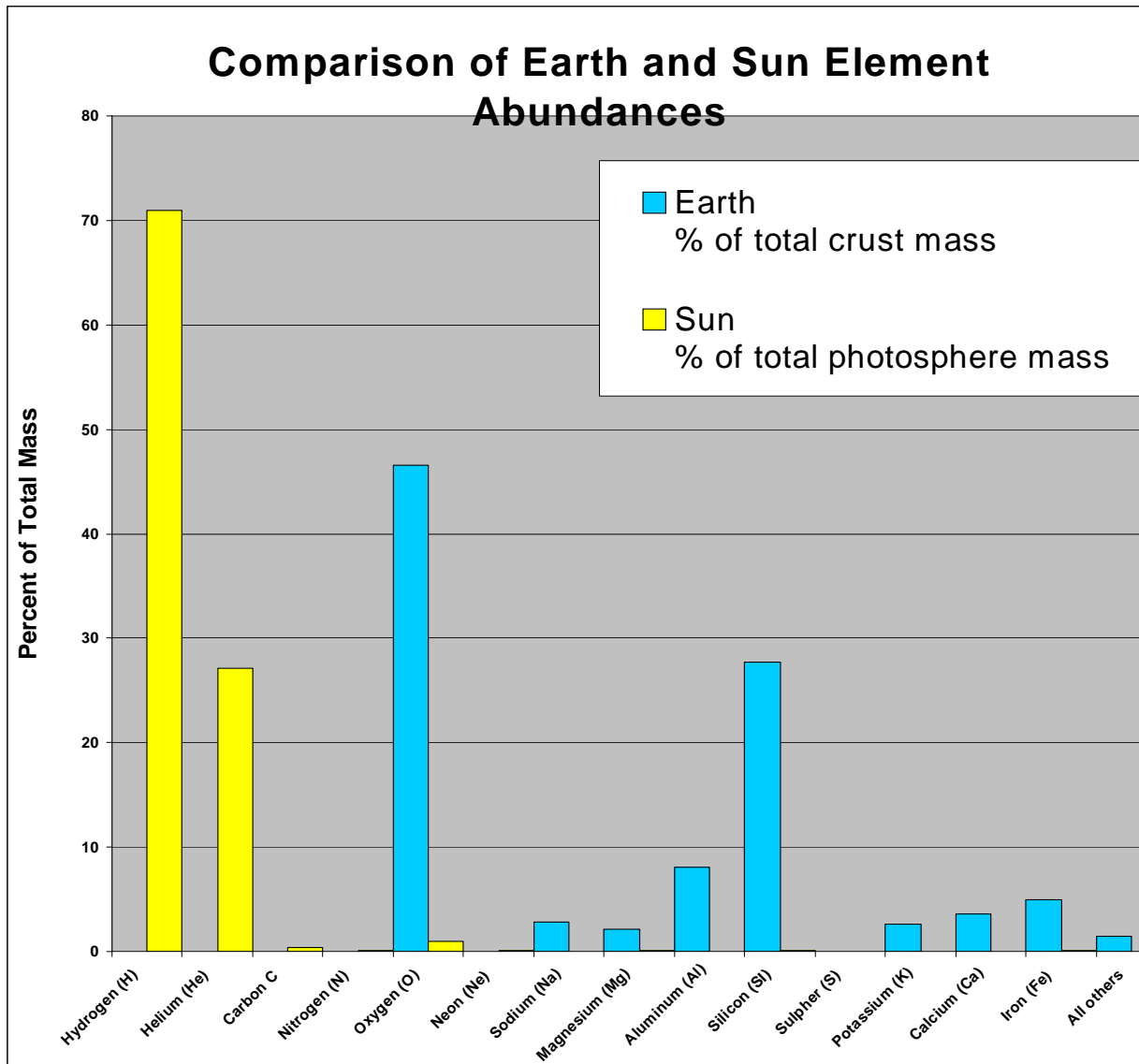


Comparing Earth to Sun

The following table of elements shows a comparison of the elements found in the Earth's crust and the photosphere of the Sun. The solar percentages were constructed from an analysis of the solar spectrum, which comes from the **photosphere** and **chromosphere** of the Sun. It is thought to be representative of the entire Sun with the exception of the **core**. Study the table and graph below, then answer the questions that follow.

Element	atomic number	Earth % of total crust mass	Sun % of total photosphere mass
Hydrogen (H)	1	*	71.000
Helium (He)	2	*	27.100
Carbon (C)	6	*	0.400
Nitrogen (N)	7	*	0.096
Oxygen (O)	8	46.600	0.970
Neon (Ne)	10	*	0.058
Sodium (Na)	11	2.800	*
Magnesium (Mg)	12	2.100	0.076
Aluminum (Al)	13	8.100	*
Silicon (Si)	14	27.700	0.099
Sulfur (S)	16	*	0.040
Potassium (K)	19	2.600	*
Calcium (Ca)	20	3.600	*
Iron (Fe)	26	5.000	0.140
All others		1.500	0.021
Total		100.000	100.000

* trace amount included in "All others"



11. On the graph above, lighter elements are on the left and heavier elements are on the right. Compare the percentage of elements in the sun's photosphere with the percentage of elements in the Earth's crust. Why do you think this is so?



12. The table and graph above shows percentages of each element in the Sun's photosphere and the Earth's crust. Which body has a larger variety of elements?

13. If Earth originated from the same solar gas and dust as the Sun, why is learning the amounts of each element in the sun important to understanding the solar system?