

Marvelous Meaningful Monthly Math

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Central Area Tech Prep, Mitchell Technical Institute, and Bridges

Science, Technology, Engineering and Mathematics December

Career – Biochemist

Math Activity

Imagine you're an associate professor working as a biochemist at a large research lab. Your research team is conducting a series of tests on the rate at which sugar is metabolized by enzymes in the body. The 1st step of the experiment is to carefully record the percentage composition of the sugar you're testing.

The chemical formula for sugar is: $C_{12}H_{22}O_{11}$

You want to know how much of each element (carbon, hydrogen and oxygen) is present. The number beside each element tells you how many of each is in the sugar. The weight of each element is given in the chart below.

So, simple sugar looks like this:

	No. of Atoms	Atomic Weight	Total Weight
Carbon	12	12	144
Hydrogen	22	1	22
Oxygen	11	16	176

<i>Molecular weight of sugar:</i>			342

You want to find the percentage of each element in sugar.

You get the total weight of each element by multiplying its atomic mass by the number of atoms present. Multiply that by 100 and then divide by the total molecular weight of the sugar compound. That will give you the percentage of each element.

Name _____ School _____ Teacher _____

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Solution

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Insert the appropriate numbers from the graph into the formula.

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Hydrogen	22	1	22
Oxygen	11	16	176

		<i>Molecular weight of sugar:</i>	342

$$\text{C} = 144 \times 100 / 342 = 42.10 \text{ per cent}$$

$$\text{H} = 22 \times 100 / 342 = 6.44 \text{ per cent}$$

$$\text{O} = 176 \times 100 / 342 = 51.46 \text{ per cent}$$

To get into the field of biochemistry, you'll have to study sciences, says Christine Collier, a clinical biochemist. As such, you'll have to be competent at math.