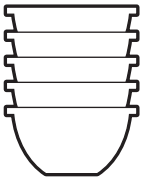
Sample test questions

ALGEBRA 1

The diagram below shows 5 identical bowls stacked one inside the other. The height of 1 bowl is 2 inches. The height of a stack of 5 bowls is 5 inches. *[Student's answers, below, earned 4 of 4 possible points]*



A. Write an equation using x and y to find the height of a stack of bowl based on any number of bowls.

Equation: $y = .75x + 1.25$

$\frac{5-2}{4} = .75$

$5 - 5(.75)$

$5 - 3.75 = 1.25$

B. Describe what the x and y variables represent.

x-variable: *The number of bowls (how many)*

y-variable: *The height (how tall) of the bowls stacked*

C. What is the height, in inches, of a stack of 10 bowls?

$y = .75(10) + 1.25$

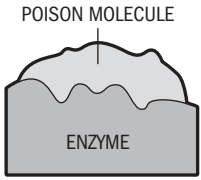
$= 7.50 = 1.25$

$= 8.75$

Height: 8.75 inches

BIOLOGY

The diagram models how a poison bonds to the active site of an enzyme. Which function is the enzyme most likely unable to perform because of the attachment of the poison molecule?



A. The release of stored chemical energy
B. The donation of electrons to the substrate
C. The supply of activation energy for a reaction
D. The catalysis of the reaction with the substrate

Correct answer:

D. Most enzymes react with only one reactant, so when a poison blocks the active site, the enzyme can no longer bond with the substrate, causing the chemical reaction to stop.

Proteins are a major part of every living cell and have many different functions within each cell. Carbohydrates also perform numerous role in living things. *[Student's answers, below, earned 3 of 4 possible points]*

PART A. Describe the general composition of a protein molecule.

Proteins are made of carbon, hydrogen, oxygen, nitrogen and some have sulfur. These elements form amino acids. Amino acids form proteins.

PART B. Describe how the structures of proteins differ from the structures of carbohydrates.

Carbohydrates are in long chains formed by sugars that are bonded together. Proteins can be in sheets or folded shapes. Carbohydrates only have carbon, hydrogen and oxygen in them.

PART C. Describe how the functions of proteins differ fromt he functions of carbohydrates.

Proteins make up the enzymes that speed up the reactions in living things. Proteins also make antibodies. Carbohydrates give us energy (starch) and make plant cell walls (cellulose).

Source: Pennsylvania Department of Education James Hilston/Post-Gazette