Name_____ Today's Date_____

Biotechnology Ag Mag - Vocabulary
Identifying Unknown Words

Directions: Read each item. Choose the correct word to complete the blank.

1

A _____ is a scientist who studies genes and how traits are inherited.

A Agronomist
B Geneticist
C Chemist
D Nutritionist

2

The scientist who studies chemicals is a _____.

A Geneticist
B Nutritionist
C Entomologist
D Chemist

3

A _____ studies the vitamins and minerals people need to be healthy.

A Nutritionist
B Geneticist
C Toxicologist
D Entomologist

4

This scientist who studies agriculture is called a _____.

A Geneticist
B Agronomist
C Criminologist
D Toxicologist

Name_____ **Today's Date**_____

Biotechnology Ag Mag - Vocabulary
Identifying Unknown Words

Directions: Read each item. Choose the correct word to complete the blank.

5

An _____ studies insects and their entomology.

A Nutritionist
B Geneticist
C Entomologist
D Agronomist

6

A _____ works with others to define and perform analysis of databases and statistics.

A Nutritionist
B Geneticist
C Agronomist
D Biostatistician

7

A _____ is a scientist who studies the toxic effects of chemicals on living organisms.

A Entomologist
B Nutritionist
C Toxicologist
D Chemist

8

The scientist who studies criminal behavior and types of crime is a _____.

A Criminologist
B Geneticist
C Agronomist
D Nutritionist

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Biotechnology Ag Mag - Math
Analyzing Algorithms

Directions: Use the algorithms below in each example box to choose the best answer.

One algorithm for converting mixed numbers to fractions is:
1. Multiply the whole number and the denominator.
2. Add the numerator to the sum to find the new numerator.
3. Place the new numerator over the original denominator.

Example: To convert $8\frac{4}{5}$ to a fraction,

1. Multiply the whole number and the denominator: $8 \times 5 = 40$
2. Add the sum to the numerator: $40 + 4 = 44$
1. Place the new numerator over the original denominator: $\frac{44}{5}$

1

$$11\frac{2}{3} =$$

A $\frac{22}{3}$ C $\frac{35}{3}$

B $\frac{33}{3}$ D $\frac{35}{2}$

2

$$4\frac{5}{9} =$$

A $\frac{20}{9}$ C $\frac{41}{5}$

B $\frac{36}{5}$ D $\frac{41}{9}$

3

$$9\frac{3}{4} =$$

A $\frac{16}{4}$ C $\frac{39}{3}$

B $\frac{39}{4}$ D $\frac{16}{3}$

4

$$7\frac{4}{5} =$$

A $\frac{16}{5}$ C $\frac{39}{5}$

B $\frac{16}{4}$ D $\frac{39}{4}$

Name_____ Today's Date_____

Biotechnology Ag Mag - Math
Analyzing Algorithms

Directions: Use the algorithms below in each example box to choose the best answer.

One algorithm for multiplying two numbers is:
1. Break down one of the numbers into a simpler equation.
2. Multiply the first number by the new second number.
3. Multiply the result by the new third number.

Example: To multiply , 13×16
1. Break down one of the numbers into a simpler equation: $13 \times 2 \times 8$
2. Multiply the first number by the new second number: $13 \times 2 = 26$
3. Multiply the result by the new third number: $26 \times 8 = 208$

5

$16 \times 14 =$

A 64
B 224
C 112
D 134

6

$11 \times 15 =$

A 165
B 55
C 33
D 115

7

$12 \times 19 =$

A 190
B 138
C 386
D 228

8

$24 \times 15 =$

A 360
B 300
C 77
D 125

Biotechnology Ag Mag - Reading Passage

Taken from *AgriScience Explorations* by Morgan, Chelewski, Lee and Wilson

Biotechnology is using science to change living organisms. New products may be obtained. New ways of making products may be developed. Much of the work involves the tiny building blocks of organisms known as cells.

The word biotechnology, tells a lot about what is involved. First, is "bio" or biology. This includes life processes and the structure and functions of cells in living organisms. Secondly, "technology" is used to change organisms. Technology may be used to make the environment for the organism more favorable. Other times, the genetic material of an organism may be altered. Changing genetic material is a complex process.

Organismic biotechnology is simple. It is using living things—organisms—as they are. They are not altered. Their heredity material is not changed except for that which occurs naturally. The organisms are used as they are with life made better. New breeding methods may be used to improve the traits of offspring. This kind of biotechnology has been used a long time. Plant and animal producers use it nearly every day. It is as simple as using fertilizer to help plants grow.

Molecular biotechnology is changing the genetic makeup of an organism. It is often called genetic engineering. Cell structures are changed. Genetic information is modified by moving genetic material from one organism to another. This is done in the tiny DNA of a cell. An organism with new traits results. These new traits have useful benefits.

The new organism is said to be transgenic. A transgenic organism is one that has new genetic material combined from two widely varying organisms. It heredity has been changed. This is done to get an organism, such as a crop plant, that has desired traits. Several transgenic plants are now grown on farms.

One example is tomatoes. Fresh tomatoes do not keep very long in a refrigerator. A tomato that could be kept in a refrigerator longer would be more valuable. The MacGregor tomato was developed for this purpose. A gene from a flounder (a fish) was moved into the genetic material of a tomato. The resulting MacGregor tomato can be kept in the refrigerator longer without spoiling. The benefits have proven to be good.

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Biotechnology Ag Mag - Reading Passage

Directions: Read each question and choose the best answer.

1 What is biotechnology?

A Chemical messengers that carry information.
B Provides the body with energy.
C Changing living organisms using science.
D Organic materials that were once alive.

2 How can genetic engineering (molecular biology) help agriculture?

A Helps to change animal Behavior.
B Helps to create crops that are resistant to pests.
C Helps to improve machinery function.
D Helps to produce analgesic organisms.

3 Most of the work done utilizing biotechnology focuses on which part of an organism?

A Cell
B Stem
C Heart
D Organ

4 Based on the passage, how has biotechnology improved plant production?

A Plants are engineered to produce less fruit.
B Plants are engineered to produce longer-lasting fruit.
C Plants are engineered to grow longer.
D Plants are engineered to die earlier.

Name_____ Today's Date_____

Biotechnology Ag Mag - Reading Passage

Directions: Read each question and choose the best answer.

5

The study of life processes and the structure and functions of cells in living organisms is called _____.

A Biotechnology
B Technology
C Zoology
D Biology

6

Transgenic organism means_____.

A An organism with unchanged hereditary material.
B An organism which utilizes new breeding methods.
C An organism that has new genetic material combined from two widely varying organisms.
D An organism that is not genetically altered.

7

It takes a hen how long to make the shell of an egg?

A 20 hours
B 3 hours
C 24 hours
D 1 hour

Extended Response—BIOTECHNOLOGY

There are always improvements being made to processes that involve agriculture. Discuss how the manipulation of genes through biotechnology helps to make improvements in agriculture. Remember to consider improvements in crops, environment, careers, and animals.