# **Science 9 Achievement Exam Review**

## **Unit A: Biological Diversity**

Answer each question in complete sentences. For the true/false questions, correct the false statement to make them correct.

1. Define Diversity
2. Define Species
3. Variation is a key concept to understand when discussing biological diversity. What is the difference between discrete variation and continuous variation? Provide an example of each.
4. Define Speciation
5. Who was Charles Darwin? What theory is he credited with formulating?
6. Define adaptation
7. Scientists often classify adaptations into 3 categories: behavioral, structural, and life-cycle. Construct a tree map that includes these categories and provides an example of each type of adaptation.
8. Describe why variation is important for species survival.
9. True or False: A large diversity index number means there is a great variation in the different types of organisms found in a particular area.
10. Define

a)niche

b) extirpated

c) extinct

1. Sally claims that competition only occurs amongst members of a single species. John claims that competition for resources only occurs between members of different species. Dan claims that competition for resources can occur within a particular species and between different species. Who is most correct? Why?
2. You discover a brand new species of insect in the Tropical rainforest. This particular insect probably occupies a \_\_\_\_\_\_\_\_\_\_\_\_\_ (narrow/broad) niche and is

present in relatively \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (large/small) numbers.

1. Define Symbiotic relationship.
2. Construct a tree map that illustrates the 3 types of symbiotic relationships, defines each type, and provides an example of each.
3. Construct a double bubble map that compares and contrasts asexual and sexual reproduction.
4. Construct a tree map that contains the following terms: reproductive strategies, binary fission, asexual reproduction, asexual spores, sexual reproduction, bacterial conjungation, budding, vegetative growth in plants, zygospores, sexual reproduction in plants, sexual reproduction in animals. For each, provide an example or a description of what occurs.
5. a) The female reproductive structure in a plant is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and contains the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and the \_\_\_\_\_\_\_\_\_\_\_\_.

b)The male reproductive structure in a plant is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and contains the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 c) What is the difference between angiosperms and gymnosperms?

1. Describe in detail how fertilization of a plant occurs.
2. Construct a double bubble map that compares and contrasts self-fertilization and cross fertilization.

b) When would it be advantageous to self-pollinate? Cross-pollinate?

1. Describe the difference between a gamete and a zygote. Provide an example of each.
2. Describe the difference between recessive and dominant genes. If both genes are present, which one will show up?
3. Describe the difference between a gene, an allele, a trait, and a chromosome.
4. What plays a larger role in determining who you are: nature, or nurture? Defend your answer.
5. Imagine that a set of twins were separated at birth, and 30 years later they are reunited. Amazingly, they are VERY similar. They have similar interests, jobs etc. Which side of the nature vs nurture debate would this support? Why?
6. What is the name of the molecule that forms the basis for why each human (other than twins etc) is unique?
7. Strands of DNA form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which are contained in a cell’s nucleus. Most humans have \_\_\_\_\_\_ pairs of chromosomes, meaning that we have a total of \_\_\_\_\_\_\_\_\_ chromosomes.
8. DNA molecules are shaped like a spiral ladder. The edges of the ladder are made up of alternating \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, while the rungs of the ladder are pairs of nitrogen bases. The four types of nitrogen bases are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_.
9. True or False: A gene is a section of DNA that codes for a specific protein.
10. True of False: Each gamete has 46 chromosomes in it and each normal cell has 23 chromosomes in it.
11. True or False: A normal cell is also referred to as a somatic cell.
12. Complete the following chart.

MITOSIS MEOISIS

|  |  |  |
| --- | --- | --- |
| # of cell divisions |  |  |
| Type of cell produced  |  |  |
| # of chromosomes in each cell at start of process |  |  |
| # of chromosomes in each cell at end of process |  |  |

1. In terms of chromosomes, what is the difference between human females and males?
2. From a genetics viewpoint, what is meant by a mutation?
3. True of False: The main advantage of sexual reproduction is that it allows for the recombination of both parents’ genetic material. This leads to greater variation in the offspring.
4. True or False: The main advantage of asexual reproduction is that is an efficient way of transferring characteristics from the parent to the offspring.

35. True or False: Blue eyes are dominant to brown eyes.

36. The process that involves moving pieces of DNA from one cell to another is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

37. Identify the characteristics in the chart that are heritable (i.e. transmit from parent to offspring)

TRAIT Heritable (H), Lifestyle (L), or both (B)

|  |  |
| --- | --- |
| Eye color |  |
| Mother’s broken leg  |  |
| Weight |  |
| scars |  |
| Height |  |

1. Define aquaculture.
2. State 1 advantage and 1 disadvantage of transgenic practices.
3. The theory of natural selection can be summed up in four statements. List them here.
4. In natural selection, who/what determines if an organism will survive?
5. State and describe 2 human activities that may threaten earth’s biodiversity.
6. Define Bio-indicator species.

45. State and describe 2 major global programs whose goal is to help preserve earth’s biodiversity.

46.. There are 5 kingdoms that all organisms are grouped into: animals, plants, insects, bacteria, fungi. Which kingdom contains the greatest number of species and total number of organisms?