**Unit 05 Cellular Division**

1. Give three reasons why cells divide.
2. What is a chromosome?
3. Chromosomes come in sets. The number of chromosomes in a set is also known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This is abbreviated by the letter N.
4. Cells that have only one set of chromosomes (1N) are known as? Give two examples.
5. Cells that have two sets of chromosomes (2N) are known as? Give two examples.
6. What does it mean to be homologous?
7. What are the two major phases of the cell cycle?
8. What happens in each stage?
9. What are the three phases of Interphase?
10. What happens in each stage?
11. What are the two phases of M- Phase?
12. What happens in each stage?
13. What are the four phases of Mitosis?
14. What happens in each stage?
15. Describe the difference between Mitosis and Cytokinesis.
16. What’s the difference between asexual reproduction and sexual reproduction?
17. What do we call it when a sperm and egg cell come together?
18. What is created when a sperm and egg cell come together?
19. Is it diploid and haploid? How do you know?

**Unit 06 Genetics**

1. Describe the difference between a gene, an allele, and a trait.
2. A genotype is the combination of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that a person has inherited.
3. Where do you get your alleles from?
4. What is a phenotype?
5. What is the law of dominance?
6. What would be the genotype and phenotype of these stars if they displayed dominance?

**AA Aa aa**Genotype: Genotype: Genotype:
Phenotype: Phenotype: Phenotype:

1. What is a Punnett Square and what does it predict?

A parent has a genotype of Aa for a trait. The other parent has the genotype Aa for a trait. Using the principle of segregation, show me how to set up a Punnett square for Complete Dominance.

**Aa x Aa**

1. What is the genotypic ratio for this Punnet square: \_\_\_:\_\_\_:\_\_\_
2. What is the phenotypic ratio for this Punnet square: \_\_\_:\_\_\_

A parent has a homozygous dominant genotype. The other parent has a homozygous recessive genotype. Cross their genotypes together using a Punnet square to find out their offspring’s genotypes for Complete dominance.

1. Write down the cross: \_\_\_\_x\_\_\_\_
2. What is the genotypic ratio for this Punnet square? \_\_\_:\_\_\_:\_\_\_
3. What is the phenotypic ratio for this Punnet square? \_\_\_:\_\_\_
4. What is the rule of incomplete dominance?
5. What would be the phenotype of these stars if they displayed incomplete dominance?
 BB BW WW

Genotype: Genotype: Genotype:
Phenotype:Phenotype: Phenotype:

1. What is the rule of Co-dominance?
2. What would be the phenotype of these stars if they displayed Co-dominance?

 BB BW WW

Genotype: Genotype: Genotype:
Phenotype: Phenotype: Phenotype:

1. Explain why men are more likely to inherit colorblindness over women.
2. What is a pedigree and what can it tell us?

**Unit 07 DNA**

1. DNA and RNA are considered to be what kind of macromolecules.
2. Describe the relationship between a polymer and a monomer.
3. DNA and RNA strands are made up of repeating units (monomers) called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Draw and label the three parts of a nucleotide.

1. What are the four bases of DNA and how do they base pair?
2. What is DNA replication?
3. Describe the importance of DNA replication to living things?
4. In what phase of the cell cycle, does DNA replication occur.
5. Explain what it means to be and why we consider DNA replication semiconservative.
6. Name three differences between DNA and RNA.
7. RNA has the ability to fold in on itself to create three dimensional forms. This allows for there to be many types of RNA. Fill in the information for the three types of RNA that we learned about.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Full Name | Function | Location |
| mRNA |  |  |  |
| tRNA |  |  |  |
| rRNA |  |  |  |

1. What is a codon and where can it be found?
2. What is an anticodon and where can it be found?
3. How many types of amino acids are there?
4. The information in genes are used to make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. In what organelle are proteins made?
6. What is the Central Dogma of Biology?
7. DNA 🡪 RNA = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ RNA 🡪 Proteins = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. Why do we need RNA?
9. Explain how 64 codons can code for only 20 amino acids.

**Unit 08 Evolution**

1. Give a brief biography of Darwin and his voyage on the Beagle.
2. Evolution consists of two main ideas:
	1. Common Ancestry:
	2. Descent with modification:
3. What is a population?
4. What is a gene pool?
5. Define gene frequency.
6. What is a mutation?
7. Define Natural Selection.
8. What three things are needed for natural selection to occur?
1. 2. 3.
9. Variation within a population is caused by what three things?
1. 2. 3.
10. Define Fitness.
11. Who is more fit, the woman who participated in a triathlon or the mother with 6 kids.
12. What is an adaptation?
13. Give three examples of an adaptation.
14. Define and given an example of artificial selection.
15. Define and give an example of sexual selection.
16. Define Gene flow/migration.
17. Define Genetic Drift.
18. What are two examples of Genetic Drift?
19. What is a bottleneck event?
20. Give some possible examples of a bottleneck event?
21. The four pieces of evidence for Evolution are?
1. 2. 3. 4.
22. Homologous, analogous, and vestigial structures are all part of what type of evidence for evolution.
23. What is a homologous structure?
24. What is an analogous structure?
25. What is a vestigial structure?
26. Describe the difference between a homologous structure and an analogous structure.
27. What is a fossil?

Kingdom Monera

Kingdom Protista

Kingdom Fungi

Kingdom Plantae

Kingdom Animalia

**Unit 09 Taxonomy and Classification**

1. Define Taxonomy.
2. What are the two types of taxonomy?
3. Who created the taxonomy where organisms are classified based on shared characteristics mainly form and structure.
4. What is Binomial Nomenclature?
5. What are the rules for binomial nomenclature?
6. What is a taxa/taxon?
7. List the taxa from broadest to most specific.
8. What is a dichotomous key?
9. What are the three domains and how are they different?
10. Describe the five kingdoms.

**Unit 10 Ecology**

1. Ecology is the study of:
2. List and define the levels of organization from smallest to largest.
3. Where does the energy for life come from?
4. Define producers/autotrophs.
5. Define consumers/heterotrophs.
6. List the different types of consumers and determine if they are primary or secondary consumers.
7. Describe the 10% rule and how it contributes to ecological pyramids.
8. What is a food web? Be able to read a food web.
9. Describe the difference between biotic and abiotic factors.
10. What is an ecological niche?
11. List three ways living things can interact with one another in an ecosystem.
1. 2. 3.
12. What is competition?
13. Describe the competitive exclusion principle.
14. What is symbiosis?
15. List define and give an example of the three types of symbiosis.

|  |  |  |
| --- | --- | --- |
| List | Define | Example |
|  |  |  |
|  |  |  |
|  |  |  |

1. What three factors can affect population size
2. When will exponential growth occur in a population?
3. When will logistic growth occur in a population?
4. What is a population’s carrying capacity?
5. What is a limiting factor?