**2nd Semester Biology Need to Know**

**9.12.L.2.1 Students are able to predict inheritance patterns using a single allele.**

**SWBAT identify the patterns of inheritance that Mendel’s Data revealed.**

1.) Mendel’s experiments led to his discovery of organisms inherit \_\_\_\_\_\_\_\_\_\_ copies of each gene, and one comes from each \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2.) Mendel was able to identify predictable patterns of heredity. He succeeded mainly because he chose to study traits that were what?

3.) When Mendel crossed plants that were purebred purple-flowered with plants that were purebred white-flowered, the resulting offspring all had purple flowers. When allowed to self-pollinate, this F generation gave rise to white-flowered plants as well as purple. As a result, Mendel determined that individual traits are passed as what?

4.) Mendel began his experiments with purebred pea plants. This approach enabled him to determine that variations among offspring were the result of

5.) Define biological trait:

Two examples of traits:

**SWBAT identify how genes influence the development of traits.**

1.) Define Genome:

2.) Define Genotype:

Define Phenotype:

3.) Compare and contrast the heterozygous and homozygous.

4.) Using the letter “T”, create allele pairs to represent: homozygous recessive, homozygous dominant, heterozygous.

**SWBAT describe monohybrid and dihybrid crosses while setting up Punnett Squares.**

1.) What do the letters used in a Punnett square represent?

2.) Cross a homozygous recessive parent with a heterozygous parent. What is the probability the offspring having a homozygous recessive genotype?

3.) Define Monohybrid and Dihybrid cross.

4.) Cross a heterozygous parent with a heterozygous parent. What is the phenotype ratio that is created?

**SWBAT relate complex patterns of inheritance through both autosomal and sex linked genes.**

1.) Traits expressed in a person’s phenotype are most often determined by which category of chromosomes, autosomal or sex chromosomes?

2.) Define carrier:

3.) Why are sex linked recessive disorders found on the X chromosome always expressed in males?

4.) We spend a lot of time crossing monohybrid traits meaning 1 trait. The truth of the matter is in nature most traits are produced by genes with…

5.) In the case of incomplete dominance, homozygous yellow flowers are crossed with homozygous blue flowers. What will the offspring flowers show for a phenotype?

6.) In the case of CO-DOMINANCE, homozygous green flowers are crossed with homozygous yellow flowers. What will the offspring look like?

7.) Define polygenic traits:

**SWBAT set up and correctly cross both a Monohybrid and Dihybrid cross using Punnett Squares.**

Monohybrid Cross:

Plant A has a genotype of (Dd) and is crossed with Plant B which has a genotype of (dd). Use a Punnett square to find the genotypic/phenotypic ratios possible in the offspring.

D=dominant Red flower

d=recessive blue flower

Possible Genotypes:

Possible Phenotypes:

Genotypic ratio:

Phenotypic ratio:

Dihybrid Cross:

Mom doggy has a genotype of (TtFF) and Dad doggy has a genotype of (ttFF). Use a Punnett square to find the genotypic/phenotypic ratios possible in the offspring.

T= dominant Brown fur

t= recessive Red fur

F= dominant perky ears

f= recessive droopy ears

Possible Genotypes:

Possible Phenotypes:

Genotypic ratio:

Phenotypic ratio:

**SWBAT DESCRIBE THE STRUCTURE OF DNA AND HOW DNA REPLICATION HAPPENS.**

1.) Name the 4 nitrogen containing bases found in DNA.

2.) State Erwin Chargaff’s findings. (What did he conclude?)

3.) State the base pairing rule of DNA. You need to be able to pick the correct complementary pair sequence on the test. (AATCGCGGATT)

4.) Watson and Crick discovered and made famous what fact about the DNA molecule?

5.) What type of bond holds the nucleotides together in DNA? What type of bonds hold the backbone of the DNA together?

6.) What is the name of the process that makes an exact copy of a strand of DNA?

7.) DNA Polymerase plays a very important role in replication. What is DNA Polymerase’s two main jobs during replication.

8.) What happens right after DNA Polymerase unzips the DNA molecule?

9.) DNA replication is considered semiconservative because it does one thing to save energy and time. What takes place that makes it semiconservative?

**Objective: SWBAT DESCRIBE THE STRUCTURE OF RNA AND THE ROLE RNA PLAYS IN THE PROCESS OF TRANSCRIPTION.**

10.) State and then explain the Central Dogma of Biology:

11.) What is the base pairing rule for RNA? (You will need to match complementary sets for RNA on the test) GTAGTCA

12.) What is the main function of tRNA?

13.) RNA Polymerase needs to find the start signal of a gene. After it does what happens first?

14.) The major difference between replication and transcription would be that transcription takes place…?

15.) You need to know how to read the chart on page 244. Look up the amino acids the following codons code for: CAG, GUC, & AUG. What is unique about AUG?

16.) How many start codons are there? How many stop codons are there?

**SWBAT** **summarize the process of protein synthesis and how mutations contribute to an organism's phenotype**

17.) Define Codon:

18.) The number and type of amino acids possible is the same for all organisms. How many amino acids are possible?

19.) Methionine is the name of a special codon. Why is this codon special?

20.) Define/Explain Translation:

21.) Mutations that affect just a single gene most often occur during what process?

22.) Define Frame shift mutations:

What causes frame shift mutations?

23.) Explain the meaning of a silent mutation.

24.) Where would a mutation have to occur to have an impact on an organism’s offspring (What type of cells)?

25.) Define Mutagen:

Three Examples of Mutagens:

16.) Clumps of cancer cells are called \_\_\_\_\_\_\_\_\_\_.

🡪\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are tumors that stay clumped together.

🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are tumors that metastasize and for tumors in new spots.

**Objective: SWBAT identify the different processes of asexual reproduction in both prokaryotes and eukaryotes.**

17.) Most prokaryotes reproduce asexually, this process is called what?

18.) Binary fission and mitosis are almost identical, but what is the main difference between the two? (HINT: what types of organisms do each happen in)

19.) A downfall of asexual reproduction would be that the offspring would be…..?

20.) Some eukaryotes do carry out asexual reproduction. What types of asexual reproduction can these simple eukaryotes carry out? Give an example for each…..

**Objective: SWBAT Identify how specialization in cells takes place, and the three types of stem cells.**

21.) List the order of complexity starting with individual cells.

\_\_Cells\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_

22.) Why are stem cells so important to the development of multicellular organisms?

23.) What are three types of stem cells found in multicellular organisms? Explain what each could develop into!

1.)

2.)

3.)

24.) Groups of same types of cells that work together forms \_\_\_\_\_\_\_\_\_\_.

25.) An egg fertilized with a sperm would be considered to be what type of stem cell?

**Evolution/Natural Selection**

1.) Who is the “father” of evolution? (10.2)

2.) What did Darwin learn from the fossils he found? (303)

3.) When humans are involved in crossing organisms for specific traits what is it called? (304)

4.) What is Natural Selection? What are the limiting factors that drive natural selection? (305)

5.) The beneficial changes caused by natural selection are called? What does this lead to in a population over a long period of time? (302)

6.) Define the term Fitness: (307)

**Classification of Organisms**

7.) Define: Taxonomy (518)

8.) Define: Taxon (518)

9.) Who was the creator of the classification system so widely used today? (518)

10.) What is the Linneaus Classification system based on? (521)

11.) What are the 7 divisions in the correct order from most general to most specific? (520)

12.) Define: Binomial Nomenclature (519)

13.) How does Binomial Nomenclature have to be written? (519)

14.) *Panthera leo* and *Panthera tigris* are both real organisms. What can we assume just by their scientific names?

**Cladistics**

15.) Compare and contrast Linneaus classification system with Cladistics. (Notes from Class)

21.) Define: Derived Characters (525)

22.) Where do the Derived Characters get put on the cladogram? (525)

**Domains and Kingdoms**

23.) All living things are composed of:

24.) Compare and contrast prokaryotic cells and eukaryotic cells (72):

25.) List the 3 domains used today. Then underneath each list the kingdoms which are contained in each domain (533).

26.) List the 6 kingdoms below and give the characteristics of each an organisms needs to have in order to fall under the kingdom (Internet Activity).

27.) What is the major difference between archaea and bacteria (534)?

**ECOLOGY UNIT**

Ecology:

Organism:

Populations:

Community:

Biotic:

Abiotic:

Keystone species:

Niche:

Habitat:

Carrying capacity:

Homeostasis:

1. A food chain contains grass (producer), rabbits (herbivore), snakes (carnivore), and hawks (carnivore). How many trophic levels does this food chain have?
2. What do food webs show or display?
3. What is the hydrologic cycle? Where does the hydrologic cycle take place?
4. The phosphorus cycle is different from most the other biogeochemical cycles because it takes place where?
5. When looking at a food chain we need to understand that energy is lost as we move each level up. What does the energy get lost to?
6. Organisms that occupy similar niches, but are found in different geographical regions are known as what?
7. Compare and contrast mutualism, commensalism, & parasitism.
8. Compare and contrast density dependent and density independent limiting factors.
9. What is primary succession?
10. What is secondary succession?