MECHANISMS OF EVOLUTION

FILL IN THE MISSING WORD(S) USING THE FOLLOWING WORD BANK: **DNA SEQUENCE**, **INHERITABLE ADVANTAGEOUS**, **INTO OR OUT OF**, **MATING PARTNER**, **RANDOM CHANCE.** NEXT, MATCH THE DEFINITION ON THE RIGHT TO THE TERM ON THE LEFT.

_C_ 1. **INTRODUCES NEW ALLELES/TRAITS THROUGH RANDOM ERRORS/CHANGES IN A _DNA SEQUENCE __.**

_E_ 2. **OCCURS WHEN MEMBERS OF A POULATION SELECT THEIR _ MATING _ __PARTNER ____ BASED ON THE PRESENCE OF SPECIFIC DESIRABLE TRAITS.**

_B_ 3. **IS THE MOVEMENT OF ALLELES _INTO OR OUT OF __ A POPULATION THROUGH MIGRATION.**

_D_ 4. **DESCRIBES HOW THE FITTEST MEMBERS OF A POPULATION SURVIVE AND PASS ON THEIR __INHERITABLE ADVANTAGEOUS ___ TRAITS TO THEIR OFFSPRING.**

_A_ 5. **OCCURS WHEN A _RANDOM CHANCE _ EVENT (LIKE A NATURAL DISASTER) AFFECTS THE ALLELE FREQUENCY OF SMALL POPULATIONS.**

A. GENETIC DRIFT
B. GENE FLOW
C. MUTATION
D. NATURAL SELECTION
E. NON RANDOM MATING

CLASSIFY EACH OF THE FOLLOWING SCENARIOS AS EXAMPLES OF: GENETIC DRIFT **(GD)**, GENE FLOW **(GF)**, MUTATION **(M)**, NATURAL SELECTION **(NS)**, NON RANDOM MATING **(NRM)**

__NS _ 1. THE FASTEST CHEETAHS OF THE POPULATION CATCH ENOUGH FOOD TO SURVIVE, REPRODUCE, AND FEED THEIR OFFSPRING.

_GF __2. THE AFRICANIZED HONEYBEE WAS INTRODUCED INTO BRAZIL IN THE 1950'S . THE AFRICAN BEE MATED WITH THE WESTERN BEE POPULATION, INTRODUCING NEW GENES TO THE INDIGINOUS POPULATION (ULTIMATELY LEADING TO A NEW HYBRID SPECIES COMMONLY KNOWN AS "KILLER BEES".

_M __3. A RANDOM CHANGE IN THE DNA SEQUENCE RESULTED IN BLUE EYES BEING INTRODUCED TO THE HUMAN POPULATION 10,000 YEARS AGO.

_NS _4. AN ANT POPULATION CONSISTS OF RED AND GREEN MEMEBERS. OVER THE COURSE OF MANY GENERATIONS, THE NUMBER OF RED MEMBERS IN THE POPULATION HAS BEEN GREATLY REDUCED. THIS IS BECAUSE THE RED ANTS ARE MORE EASILY LOCATED BY INSECT EATING PREDATORS IN THE LEAFY ENVIRONMENT WHICH THEY LIVE.

_NRM _5. A MALE BLUE-FOOTED BOOBY BIRD PICKS UP ITS FEET SLOWLY IN A DIGNIFIED FASHION AS IT PERFORMS A COURTSHIP DISPLAY. ALONG WITH ITS HEAD BOWING AND WING SPREADING ARE WAYS MALES ATTRACT FEMALES.

__NS _6. TORTOISES ON A CERTAIN GALAPAGOS ISLAND HAVE EVOLVED TO HAVE A SADDLE SHAPED SHELL, LONG NECK AND LENGTHY FORE LIMBS BECUASE THE FOOD AVAILABLE TO THEM IS PERCHED HIGH ATOP THE CACTUS PLANT.

NS, NRM 7. THE BASCOMB BUMBLE BEE ONLY RECOGNIZES (IS ATTRACTED BY) THE COLOR YELLOW. ALL OF THE FLOWERS ON BASCOMB ISLAND ARE YELLOW. (2 POSSIBLE ANSWERS?)

__GF _8. DURING THE VIETNAM WAR, U.S. SOLDIERS HAD CHILDREN WITH VIETNAMESE WOMEN. THE GENE POOL OF THE VIETNAMESE POPULATION HAD NEW ALLELES ADDED TO IT AS A RESULT.

_NS _9. RELIES ON INHERITABLE **VARIATION**, **OVERPRODUCTION**, DIFFERENTIAL SUCCESS AND **COMPETITION**.

_GD _10. A SMALL POPULATION OF DEER ARE CAUGHT IN A FOREST FIRE. MOST OF THE UNSPOTTED VARIETY ARE KILLED. NOW THE POPULATION CONSISTS OF MOSTLY SPOTTED DEERS.

_**NS** __11. ANTIBIOTICS PRESCRIBED TO TREAT A BACTERIAL STAPH INFECTION KILLED 95% OF THE STAPH BACTERIA. THE REMAINING 5% OF *ANTIBIOTIC RESISTANT* STAPH BACTERIA REPRODUCE AND NOW MAKE UP THE MAJORITY OF THE STAPH BACTERIAL POPULATION.

_**GF** __12. THE NATIVE AMERICAN POPULATION NOW INCLUDES BLUE EYED INDIVIDUALS FOLLOWING THE MIGRATION OF EUROPEAN SETTLERS TO NORTH AMERICA.

__**M** _13. BECAUSE BACTERIA HAVE SHORT GENERATION TIMES, THEY ARE MORE LIKELY TO EXPERIENCE RANDOM BENEFICIAL CHANGES TO THE DNA THAT WILL LEAD TO SURVIVAL ADVANTAGES.

MIMICRY VS CAMOUFLAGE. Both mimicry and camouflage are forms of defense for a species. Indicate whether each of the following is an example of Mimicry (**M**) or Camouflage (**C**)

* **Camouflage** is when a species' colors or patterns match its environment to blend in and be undetected.
* **Mimicry** is when a harmless creature makes itself look dangerous by "copying" the look of a more dangerous species making the predator afraid to eat them.

_**M** __1. The viceroy butterfly has a wing color pattern similar to the pattern of the foul tasting monarch butterfly.

_**C** __2. The chameleon lizard can change its skin color to match the leaf color of its surrounding and thus avoid detection of predators.

_**C** __3. A flounder lays flat on the ocean floor and adopts the same color as its surroundings to be less conspicuous to predators and to would-be prey.

_**M** __4. The harmless king snake resembles in color and patterns the poisonous coral snake, causing would-be predators to avoid them.

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1. Genetic variation can aid in the survival of species when the environment changes. Which of the following is the best example of an organism with a genetic variation that could improve survival chances over time?
   - **a.** **An ant that is genetically resistance to pesticide**
   - b. A mouse that has learned to avoid mousetraps
   - EXPLAIN___**More easily passed genetically to offspring**_____

2. Some organisms have genes that improve their ability to survive and reproduce. If the genes also help their offspring survive and reproduce, then which of the following will most likely increase?
   - a. The frequency of the genes in one individual
   - **b.** **The frequency of the genes in the population**
   - c. The number of genes in a population
   - EXPLAIN **More surviving individuals possess the gene and pass it to offspring, increasing its presence in the population.**

3. The Guppy is a species of small freshwater fish. Scientists observed that the average size of guppies in the pond decreased over a few years after a guppy predator was introduced into the pond.
   - a. What evolution mechanism is demonstrated? __**Natural Selection**_____
   - EXPLAIN__**The predator had an effect on the guppy size – smaller guppies had advantage.**___

There are 2 types of worms: worms that eat at night (nocturnal) and worms that eat during the day (diurnal). The birds eat during the day and seem to be eating ONLY the diurnal worms. The nocturnal worms are in their burrows during this time. Each spring when the worms reproduce, they have about 500 babies but only 100 of these 500 ever become old enough to reproduce.

a. What worm has natural selection selected AGAINST? __ diurnal ___ FOR? _ nocturnal ___

Darwin's 5 points: Identify the 5 points in the scenario above.

Population has variations. _____**nocturnal** and **diurnal**_____

Some variations are favorable. ____**nocturnal- avoids predators**_____

More offspring are produced than survive._____**nocturnal- survive to reproduce**_____

Those that survive have favorable traits. _____**Eating at night when there are less predators**_____

A population will change over time. ____**More nocturnal worms will make up the population**_____