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 POPULATION 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.

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 BECAUSE 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.  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.  THE NATIVE AMERICAN POPULATION NOW INCLUDES BLUE EYED INDIVIDUALS FOLLOWING THE MIGRATION OF EUROPEAN SETTLERS TO NORTH AMERICA.

M.  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 camouflagel 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.

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