**Evolution Practice/Review: Name \_\_\_\_\_KEY\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Name 6 kinds of evidence that support the theory of evolution:**

**\_\_\_\_\_\_\_\_\_\_Fossil Records \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_Structures (Homologous and Vestigial)\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_Biogeography\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_Geographic Distribution\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_Embryology\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_Biomolecules\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_1. The natural differences between individuals of a species are referred to as\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **A. fitness**

 **B. natural selection**

 **C. adaptations**

 **D. natural variation**

**\_\_\_\_\_\_2. An inherited characteristic that increases an organism’s ability to survive and reproduce in its specific environment is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

 **A. homologous structure**

 **B. vestigial organ**

 **C. adaptation**

 **D. speciation**

**\_\_\_\_\_\_3. Which of the following best describes how DARWIN would explain giraffes with long necks?**

 **A. Long-necked giraffes eat more grass than short necked giraffes so their necks grow longer.**

 **B. Natural variation in the population produces some longer and some shorter-necked giraffes and**

 **longer necked giraffes can reach food more easily and survive to pass on their genes.**

 **C. Some giraffes have acquired longer necks by stretching to reach food and passed that trait on.**

 **D. Giraffes just started out with long necks and haven’t changed.**

**\_\_\_\_\_\_4. Darwin believed in the idea that evolution happened slowly over a long period of time called \_\_\_\_**

 **A. punctuated equilibrium**

 **B. gradualism**

 **C. natural selection**

 **D. mass extinction**

**\_\_\_\_\_\_5. Which of the following must be TRUE for Hardy-Weinberg to apply to a population?**

 **A. The population must be small.**

 **B. There must be NO movement in or out.**

 **C. Mutations can’t happen.**

 **D. Natural selection can occur.**

 **E. Mating must be random.**

**\_\_\_\_\_\_6. Which of the following is most likely to have caused the change in the population shown in the graphs at the left?**

 **A. a new predator prefers dark-tan crabs**

 **B. a new predator prefers light-tan crabs**

 **C. a new beach color makes medium-tan crabs the least visible**

 **D. a new beach color makes medium-tan crabs the most visible**

**\_\_\_\_\_\_7. The rock pipit and the water pipit are two types of birds found in the United Kingdom and other areas of Europe. The rock pipit and the water pipit have similar appearances and their habitat ranges overlap.**

**Which of the following observations most likely caused scientists to classify the birds as separate species?**

|  |  |  |
| --- | --- | --- |
|  | **A.** | **The rock pipit is not able to produce fertile offspring with the water pipit.** |
|  | **B.** | **The rock pipit population in the United Kingdom is larger than the water pipit population.** |
|  | **C.** | **The rock pipit eats insects, fish, and seeds, but the water pipit eats only insects and larvae.** |
|  | **D.** | **The rock pipit remains in the United Kingdom year-round, but the water pipit only overwinters there.** |

**\_\_\_\_\_\_8. Which of the following statements gives the most likely explanation for the presence of two very similar species of squirrels living on opposite sides of the Grand Canyon?**

|  |  |  |
| --- | --- | --- |
|  | **A.** | **One squirrel traveled across the canyon and started a new population on the other side.** |
|  | **B.** | **One squirrel traveled across the canyon and interbred with a different population on the other side.** |
|  | **C.** | **Members of a single squirrel species were geographically separated by the formation of the canyon.** |
|  | **D.** | **Members of two different squirrel species migrated from two different places to opposite sides of the canyon.** |

**List the different mechanisms of evolution we studied in class:**

1. **\_\_\_\_\_\_\_natural selection\_\_\_\_\_\_\_\_\_\_\_\_\_ 3. \_\_\_\_\_Genetic Drift\_\_\_\_\_\_\_\_\_**
2. \_\_\_\_\_\_speciation\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4. \_\_\_\_\_\_Hardy-weinberg\_\_\_\_\_

LABEL THE THREE GRAPHS BELOW SHOWING PATTERNS OF SELECTION:

 A B C

  

9. \_\_\_\_\_\_Disruptive\_\_\_\_\_\_\_\_\_ 10. \_\_\_\_Directional\_\_\_\_\_ 11. \_\_\_\_\_\_Stabilizing\_\_\_\_\_\_

MATCH THE GRAPH ABOVE WITH THE POPULATION DESCRIPTION:

**\_\_B\_\_\_ 12. In which of these is the fitness of individuals at one end of the normal distribution curve higher**

 **than that of individuals in the middle or at the other end of the curve**

**\_\_C\_\_\_ 13.In which of these is the fitness of individuals in the middle higher than that of
 individuals at the extreme ends**

**\_\_A\_\_\_ 14.In which of these is the fitness of individuals at the extreme ends higher than that of
 individuals in the middle**

**\_\_\_C\_\_ 15. Human babies born smaller than average are likely to be less healthy and less likely to survive.**

**Larger than average babies are likely to have difficulty being born. The fitness of these larger or smaller weight babies is lower than average-sized babies so human babies tend to born of average size.**

**\_\_B\_\_\_ 16. Birds with bigger, thicker beaks can feed more easily on larger, harder seeds. A food shortage**

**causes the supply of small and medium seeds to run low, leaving only larger seeds. Birds with bigger beaks show greater fitness than birds with medium or small beaks. Over time more birds with bigger beaks survive and reproduce.**

\_\_\_**B**\_\_ 17. **The orange and black pattern of a Monarch butterfly serves as a warning to sharp-eyed birds that the Monarch is poisonous to eat and tastes bad. Individuals with the brightest color pattern were**

**More likely to warn off birds and survive to reproduce than those with a dull or medium color pattern.**

**over time and many generations, the Monarch population became more brightly-colored.**

**\_\_C\_\_\_ 18.In birds, feather color among males is more likely to attract a mate, but also more likely to attract a predator. Over time and many generations, the highest frequency color is for males with medium colors, while males with very dull colors and males with very bright colors became increasingly rare.**

**\_\_\_A\_\_\_19.A population of birds lives in an area where plants with medium sized seeds are wiped out by a fungal infection. Birds with unusually large or small beaks would have higher fitness than those with medium sized beaks. Over time the population splits into two subgroups; one that eats small seeds and one that eats large seeds.**

**Antibiotic Resistance:**

1. **Draw a picture of what would occur over time for a bacteria to become resistant to antibiotics.**



1. **Explain how antibiotic resistance is an example of natural selection.**

**Antibiotic resistance is an example of natural selection because the bacteria from one generation to the next have a small mutation that allows them to be better suited for an environment with antibiotics in it allowing them to survive and reproduce. Over time, as they continue to reproduce the entire population contains the mutations that allows them to be resistant.**

**Genetic Drift:**

**Draw an example of genetic drift and explain how it contributes to evolution.**



**Speciation:**

**What is speciation and in what ways can organism evolve into new species?**

**Speciation is the formation of a new species population over time due to random environmental factors.**

**Examples include: reproductive isolation, geographic isolation**

**Hardy-Weinberg Principle:**

**What is genetic equilibrium?**

**Genetic equilibrium is a measurement equation used to show the evolution of a population based on allele frequencies.**

 **p2 + 2pq + q2 = 1**

**If the allele frequencies within a population equals 1 then the alleles are not changing in the population and that population is not evolving.**

**The farther away from 1 a population is, the more the population is evolving.**

**What are Hardy-Weinberg rules of genetic equilibrium?**

**Five Conditions are required to maintain genetic equilibrium:**

**1. Random Mating**

**2. The population must be very large**

**3. There can be no movement into or out of the population**

**4. No mutations**

**5. No natural selection**