Initials

Diversity Pretest (High School)

Science is easier to understand if you can make connections between what you know now and the new ideas you are studying. This is a test that will help us know what you know now.

Please answer these questions as carefully and completely as you can. If you aren't sure of the answer, please write any thoughts that you have. If you can help us to understand how you think about these questions, then we can do a better job of explaining science in ways that make sense to you.

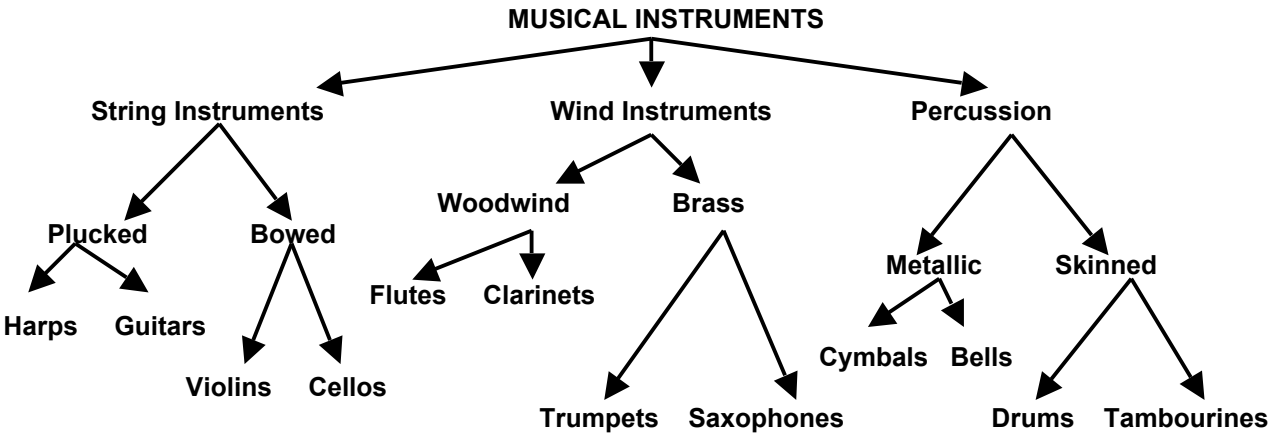
Please put your initials (not your full name) in the boxes:

First	Middle	Last

Date _____

Class _____ Teacher _____

1. Cheetahs are able to run faster than 60 miles per hour when chasing prey. How would a biologist explain how the ability to run fast evolved in cheetahs, assuming their ancestors could only run 20 miles per hour?



2. The above diagram shows *musical instruments* being broken down and categorized into smaller groups, and then into smaller groups again and again. In the same way, break down *living things* into as many different groups as you can, then continue to break those groups down into smaller and smaller groups, as far as you can go.

All Living Things

3. Scientists have long believed that the 14 species of finches on the Galapagos Islands evolved from a single species of finch that migrated to the islands one to five million years ago. Recent DNA analyses support the conclusion that all of the Galapagos finches evolved from a warbler finch. Different species live on the different islands. For example, the medium ground finch and the cactus finch live on one island; the large cactus finch occupies another island. One of the major changes in the finches is in their beak size and shapes.

3a. In the finch population, what are the primary changes that occur gradually over time?

a) The traits of each finch within a population gradually change.
b) The proportions of finches having different traits within a population change.
c) Successful behaviors learned by finches are passed on to offspring through their genes.
d) Mutations occur to meet the needs of the finches as the environment changes.

Answer:_____

3b. How did the different beak types first arise in the Galapagos finches?

a. The changes in the finches' beak size and shape occurred because of their need to be able to eat different kinds of food to survive.
b. Changes in the finches' beaks occurred by chance, and when there was a good match between beak structure and available food, those birds had more offspring.
c. The changes in the finches' beaks occurred because the environment induced the desired genetic changes.
d. The finches' beaks changed a little bit in size arid shape with each successive generation, some getting larger and some getting smaller.

Answer:_____

3c. What type of variation in finches is passed to the offspring?

a. Any behaviors that were learned during a finch's lifetime.
b. Only characteristics that were beneficial during a finch's lifetime.
c. All characteristics that are genetically determined.
d. Any characteristics that were positively influenced by the environment during a finch's lifetime.

Answer:_____

3d. What caused populations of birds having different beak shapes and sizes to become distinct species distributed on the various islands?

a. The finches were quite variable, and those whose features were best suited to the available food supply on each island reproduced most successfully.
b. All finches are essentially alike and there are not really fourteen different species.
c. Different foods are available on different islands and for that reason, individual finches on each island gradually developed the beaks they needed.
d. Different lines of finches developed different beak types because they needed them in order to obtain the available food.

Answer:_____

3e. Populations of finches are made up of hundreds of individual birds. Which statement describes how similar they are likely to be to each other?

a. The finches share all of the same characteristics and are identical to each other.
b. The finches share all of the essential characteristics of the species: the minor variations they display don't affect survival.
c. The finches are all identical on the inside, but have many differences in appearance.
d. The finches share many characteristics, but also vary in many features.

Answer:_____

4a. Below are pictures of a Michigan forest and a Michigan corn field. In the boxes below each picture, list as many living things as you can that might be living in each of these places.

Forest

Corn Field

4b. Explain why it might be important to preserve our forests.

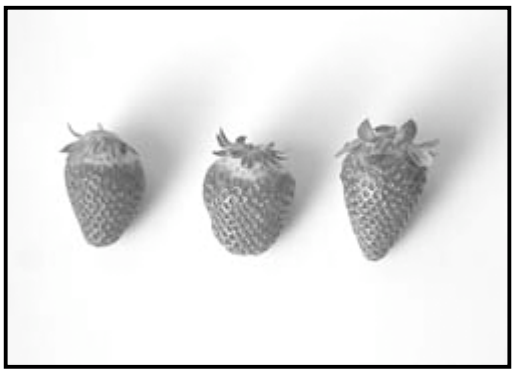
5a. How many different types of animals and plants do you think live in:

	Animals	Plants
a. Your schoolyard		
b. Michigan		
c. The world		

5b. Other than animals and plants, what other types of things do you think live in these places? Name as many as you can.

Other Living Things:

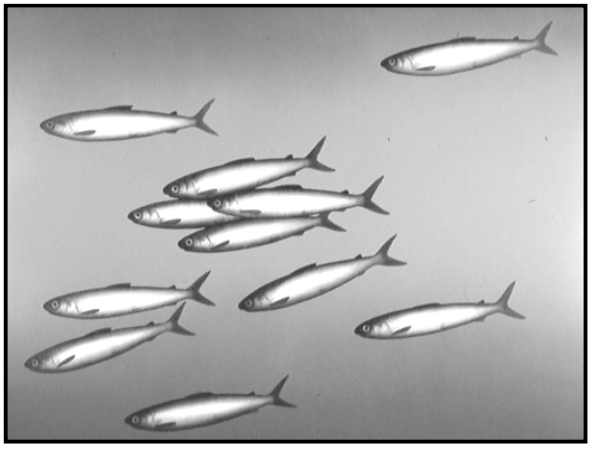
6a. To the right is a picture of some strawberries. They are all slightly different sizes and slightly different shapes. Why do you think these strawberries all grew to look a little different?



6b. Do you think wild strawberries look more or less alike than do strawberries found in the supermarket?

6c. Why do think this is so?

7. The picture to the right shows a group of fish. Which statement below best describes the appearance of a group of fish such as this?



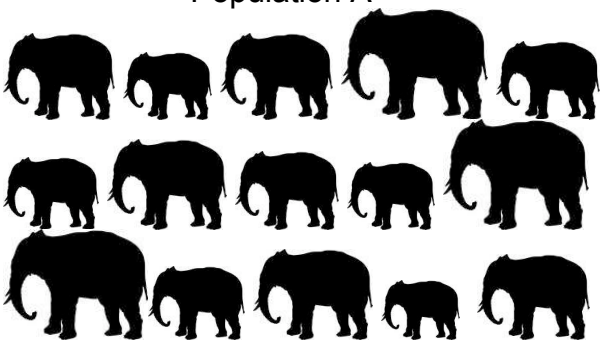
a) The fish are all identical to each other.
b) The fish are all identical on the inside, but have many differences in appearance.
c) The fish are all identical in appearance, but are all different on the inside.
d) The fish share many characteristics, but also vary in many features.
e) The fish are all completely unique and share no features with other fish.

Your answer: ☐

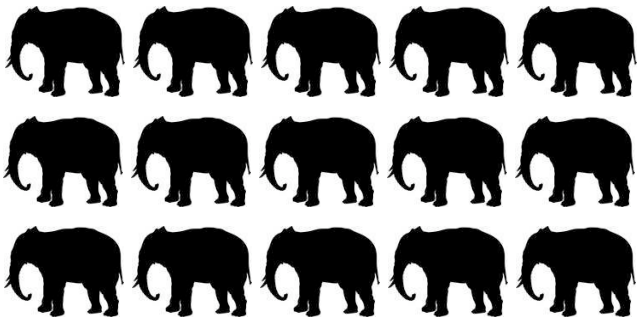
Explain why you chose your answer:

8. Below are two populations of 15 elephants. In Population A contains elephants that are all slightly different, while Population B contains elephants that are all identical. Which of the two populations do you think is most likely to survive if there was a severe drought?

Population A



Population B

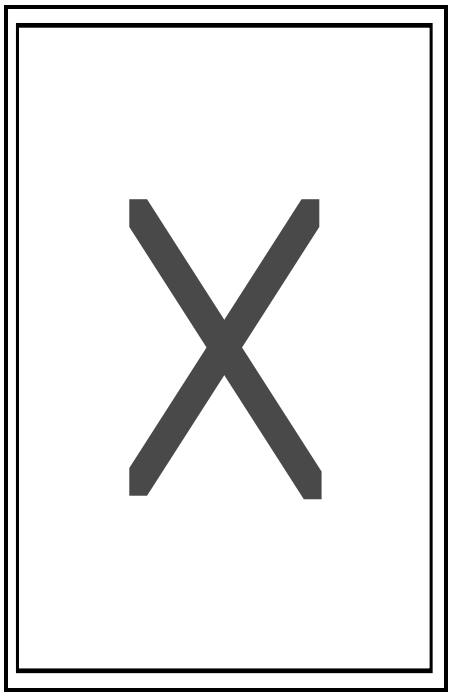


Circle one:	Population A	Population B	Both have an equal chance of surviving

Explain why you chose your answer:

9. Each species in an ecosystem has a different role, and is affected by the other species in that ecosystem. For example, some insects pollinate flowers, provide food for animals that eat them, and recycle dead biological material. What roles do you think the following organisms play in their ecosystems?

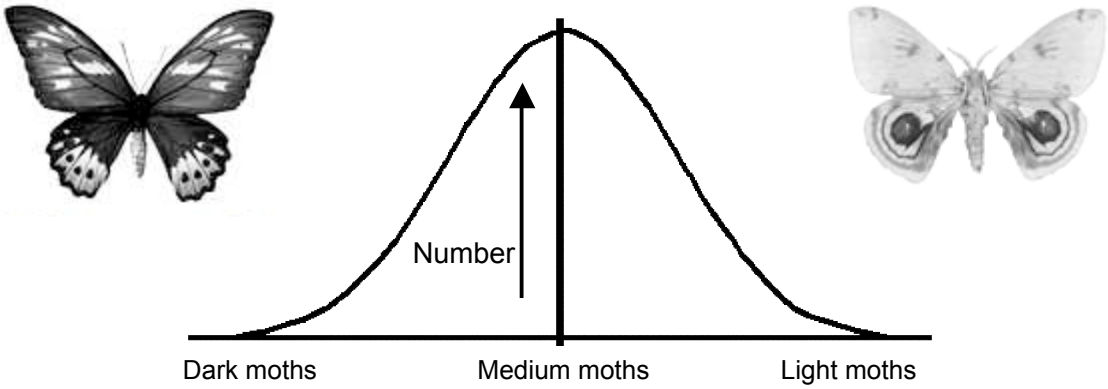
Oak Tree
Bacteria
Humans



10. Above is a picture of two sisters. In the boxes below, describe two ways HOW two sisters look alike and how they look different, and the reasons for WHY they look alike and different.

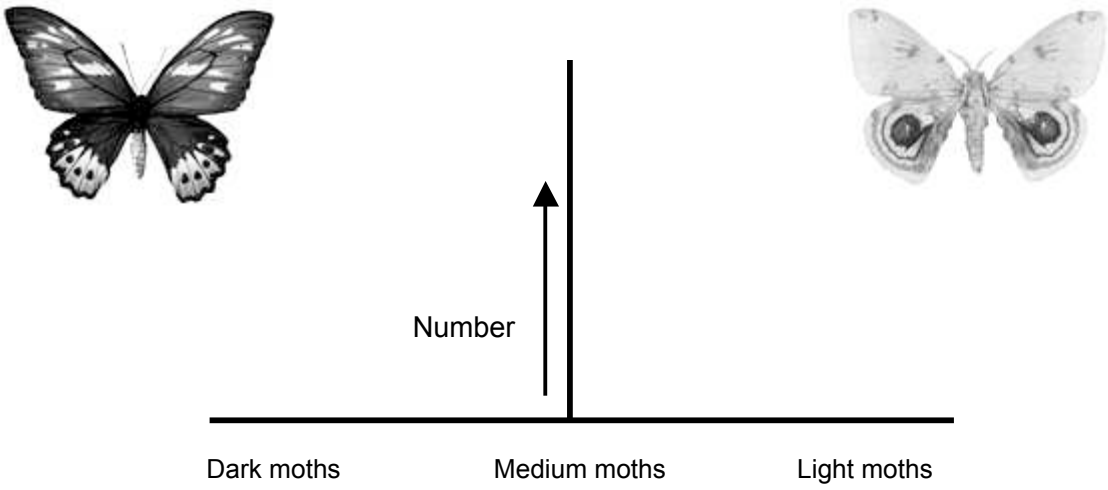
HOW they look **alike**:	WHY they look **alike**:
1.	Reason:
2.	Reason:

HOW they look **different**:	WHY they look **different**:
1.	Reason:
2.	Reason:



11. The graph above shows the distribution of moth coloration in a population of 1000 moths living on an island. The curve shows that there are a small number of dark moths, a large number of medium colored moths, and a small number of light moths. If a bird species was introduced to the island that ate light colored moths, but couldn't see dark colored moths, how would this change the distribution of moth coloration on the island?

Draw you answer in a graph below:



Please explain why you chose your answer:

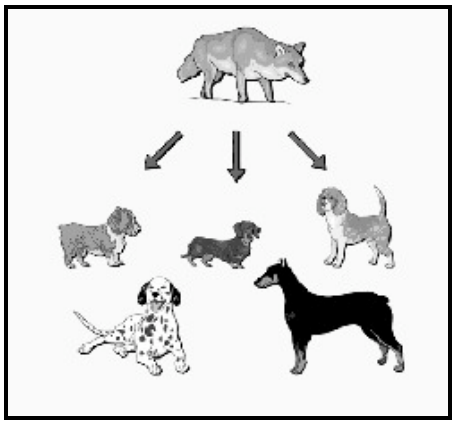
Zebra Mussels

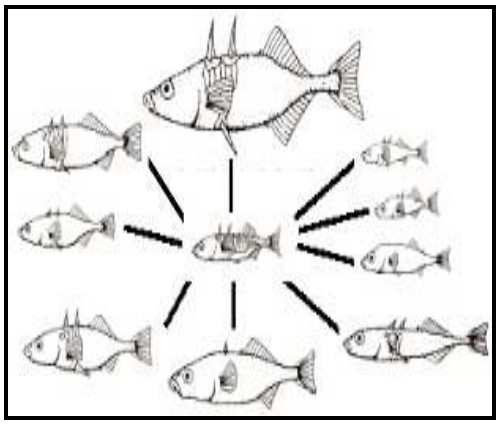
Purple Loosestrife

12. In Michigan, zebra mussels, and a plant called Purple Loosestrife have been introduced from different parts of the world. Their populations have rapidly expanded, and they are now taking up large areas of Michigan that were once home to other native species.

a. Why do you think that these two species have done so well in their new environments?

b. Why do you think invasive species such as these might be a problem in new ecosystems?

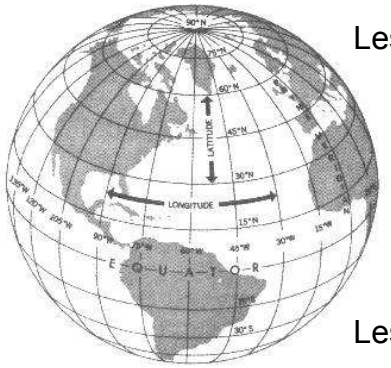




13. The diverse range of domestic dogs has evolved from wolves over the last 15,000 years by humans deliberately breeding for desirable traits, such as size, strength and agility. In the boxes below, explain how this process is similar and different to the way wild animals evolve naturally, such as the fish in the picture on the right.

How the processes are **similar**

How the processes are **different**



Less diverse

More diverse

Less diverse

14a. Species diversity is not the same throughout the world; some areas contain lots of different species, while others contain relatively few. One pattern is the increase in diversity from the poles to the equator: while the tropical areas around the equator team with life, temperate areas which are closer to the poles have fewer kinds of plants and animals, while the polar regions have even fewer.

Why do you think this might be the case?

14b. Which ecosystems do you think are more stable, that is, more able to withstand stress, damage or disturbance? Circle one

Ecosystems with low diversity	Ecosystems with medium diversity	Ecosystems with high diversity

Explain why you chose your answer:
