**Lessons 2 & 3: Variation within Species**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Project ID: \_\_\_\_\_\_\_\_\_\_

Period: \_\_\_\_

Teacher: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Lesson 2: Variation**

1. Answer these questions individually:

1. Which is true of adult bumblebees? Circle the best answer.

a. Adult bumblebees are all exactly the same.

b. Adult bumblebees are all very, very close to the same.

c. Adult bumblebees differ from each other in many ways.

d. Adult bumblebees are the same in most ways, but they differ in a few ways.

B. Juncos are a kind of bird that are very common in New Jersey. There are probably many Juncos living in your neighborhood. Here are photos of two Juncos:

 

1. Which is true of adult Junco birds found in central New Jersey? Circle the best answer.

a. Adult Junco birds are all exactly the same.

b. Adult Junco birds are all very, very close to the same.

c. Adult Junco birds differ from each other in many ways.

d. Adult Junco birds are the same in most ways, but they differ in a few ways.

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2. Below are pictures of different adult finches from the same species. (You can see them in color on the PowerPoint slide.)



A. Individually, list the different types of acquired and inherited variation there are among adult finches of this species.

Acquired variation:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Inherited variation:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Now your teacher will show you a PowerPoint on variation.

4. In groups, look at your feet and list 5 types of variation that you see in your feet.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5. In groups, look at the following pictures and read about the case of the Doma people. Then list 5 more types of variations you notice on this page.



The Doma tribe lives in northern Zimbabwe and has stayed mostly out of contact with people outside of the tribe for generations. A genetic mutation in part of the population caused some people to have only two toes. These toes are curved inwards to give them an advantage in climbing trees. This is a dominant gene, and has been passed onto offspring. Now, this mutation occurs frequently within the tribe.







1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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6. Below are pictures of different adult parrots from the same species. (You can see them in color on the PowerPoint slide.)



A. Individually, list the different types of acquired and inherited variation that there are among adult parrots of this species. Use the new ideas you have learned when you answer.

Acquired variation:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Inherited variation:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7. Answer these questions individually. Use new ideas you have learned when you answer.

I. Which is true of adult bumblebees? Circle the best answer.

a. Adult bumblebees are all exactly the same.

b. Adult bumblebees are all very, very close to the same.

c. Adult bumblebees differ from each other in many ways.

d. Adult bumblebees are the same in most ways, but they differ in a very few ways.

II. Juncos are a kind of bird that is very common in New Jersey. There are probably many juncos living in your neighborhood. Here are photos of two:

 

Which is true of adult Junco birds found in central New Jersey? Circle the best answer.

a. Adult junco birds are all exactly the same.

b. Adult junco birds are all very, very close to the same.

c. Adult junco birds differ from each other in many ways.

d. Adult junco birds are the same in most ways, but they differ in a very few ways.

8. Individually answer this question. Is variation important? If so, why? If not, why not?

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**Lesson 3: Variation and Selection**

1. Two students were discussing the tadpole study.

Jorge said, “You can see that all the tadpoles are practically the same. On average, it’s a matter of luck as to which tadpoles get eaten and which survive. So the tadpoles in the ponds with dragonfly larvae will be about the same as the tadpoles in the ponds without dragonfly larvae.”

Prutha said, “I don’t agree. I think there will be some kind of difference between the tadpoles.”

Who do you agree with more, Jorge or Prutha? Explain your answer in detail.

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2. Two students were discussing the grasshopper study.

Eric said, “It’s clear. All the grasshoppers are just about the same in each cage. Just by chance, some grasshoppers will be lucky and survive, and others will be unlucky and get caught by the praying mantids. On average, the grasshoppers that survive will be the same as the grasshoppers that are eaten.

Tara said, “I don’t agree. I think there will be some kind of difference between the grasshoppers.”

Who do you agree with more, Eric or Tara? Explain your answer in detail.

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