Pre-Lab Information

Purpose	Plan an investigation to explore how the phenotypes within a population change over time.
Time	Approximately 60 minutes
Question	How does natural selection change the phenotypes within a population over time?
Hypothesis	Write the hypothesis you developed during the laboratory lesson in the space provided below:

Summary In this experiment, you will examine natural selection within a population and analyze data to determine phenotype changes over time. A phenotype is the physical appearance or set of characteristics seen in an organism. An example is the color of an organism. Changes in the environment might include physical location, light source, temperature, and many others. Your experiment should examine the phenotypes of a population before and after the change in the environment occurs.

Safety

- Wear appropriate clothing.
- Ensure that behavior is purposeful.
- Treat living organisms with respect and proper care.
- Wash your hands thoroughly after handling all lab materials.
- Report all accidents—no matter how big or small—to your teacher.

Introduction

It is time to get you thinking about natural selection and how changes in an environment can affect phenotypes. You have just been given an example scenario that will help you think about possible experiments you can design.

The experiment you will devise should demonstrate how the phenotypes of a population change in response to a changing environment. First, you will need an equal number of light red and dark red kidney beans to represent phenotypes. The independent variable needs to be a change in the light of the environment. The dependent variable is the number of beans of each phenotype. Your teacher will let you know what materials are available. You and your group should plan your investigation around these.

Lab Procedure

Here is an outline of the steps you should follow to plan your investigation for this lab. Later in the guide, you will have space to develop your ideas, collect data, analyze and discuss results, and draw conclusions.

Step 1: Determine the types of data you will gather and the tools of measurement you will use to collect the data.

How will you gather data for your experiment? If gathering quantitative data, you may want to devise a table in which you can record your results in an organized manner. Also, consider how you will record any qualitative or descriptive data in addition to your numerical results. You should use a pencil to record data.

Step 2: Devise an experiment to examine how changing the light in the environment affects the phenotypes of a population over time.

Develop the main steps and describe how you will run the experiment. Your teacher will guide you on what materials are available for your experiment.

Step 3: Gather materials and set up your experiment.

Now that you know what you will do, gather the necessary items. Besides the objects you will experiment with, make sure you have the necessary equipment to take measurements. If you are working with lab partners, make sure each person knows his or her role in running the experiment. Check your setup and make sure everything is in order before you proceed.

Step 4: Run your experiment.

As you proceed with your experiment, make sure you record all the necessary data and, if working in groups, the role each student performed during the experiment. Make sure all elements of your experiment are complete. Do not forget to clean up when you are done!

Step 5: Use the Middle School Lab Report Guide to write your lab report.

Exploring how Natural Selection Changes Phenotypes within a Population over Time

Step 1: Determine the types of data you will gather and the tools of measurement you will use to collect the data.

Make a list of the type of data you plan to collect. If gathering quantitative data, you may want to devise a table in which you can record your results in an organized manner.

Step 2: Devise an experiment to examine how changing the light in the environment affects the phenotypes of a population over time.

Write the steps of your experiment. Include a sketch of your experimental setup.

Step 3: Stop. Have your teacher sign off on Steps 1 and 2 before continuing the investigation.

Step 4: Gather materials and set up your experiment.

Gather the necessary items and equipment. If you are working with lab partners, make sure each person knows his or her role in running the experiment. Document the roles here.

Student Name	Role

Step 5: Run your experiment.

Record your data and observations in the space below. Do not forget to clean up when you are done!

Step 6: Use the Middle School Lab Report Guide to write your lab report.