

**HANDS-ON LAB****Investigating Traits and Heredity**

Although most tobacco plants have green leaves, there is a trait known as albinism that causes some tobacco plants to have white leaves. This trait is the result of an allele, or version of a gene, that can be passed from parent plants to their offspring. The seeds that you will use in this activity are the product of a cross between two green tobacco plants. However, you may observe the albinism trait in some of their offspring. Ask a question about the albinism allele in tobacco plants and design an experiment that will help you investigate your question. Your experiment should be carried out within a 1–2 week timeframe.

**PREDICT**

Write your question in the space provided and then offer a possible answer to that question.

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**POSSIBLE MATERIALS**

- light source
- paper, black
- paper, filter (5)
- Petri dish (5)
- pipette, plastic disposable
- tobacco seeds
- toothpick
- water (to moisten filter paper)

**PROCEDURE**

1. With your partner or group, generate a question that you want to investigate about the albinism trait in tobacco plants. Your question can be related to whether the albinism allele is dominant or recessive, how the albinism trait affects growth, what proportion of plants will be albino, or how environmental factors affect the expression of the albinism trait. Have your teacher approve your question before continuing.
2. Write a hypothesis that predicts the outcome of your question.
3. Design an experiment to test your hypothesis. Write a procedure with numbered steps that includes an experimental variable, an experimental setup, a control setup, and constants. Have your teacher check your procedure before continuing.
  - Environmental factors that could be investigated include the amount of light or water given to the plants.
  - Data that could be collected include the number of plants of each color and the relative growth or health of the plants.
  - Once you have determined what your experimental variable will be (the variable that you will change), design a control setup (a setup in which the variable is not changed).
4. Carry out your procedure. Begin by placing filter paper in petri dishes. Use a pipette to soak the filter paper with water.
5. Use a toothpick to spread the seeds evenly over the filter paper, and then place the covers on the dishes. Label the dishes according to the treatment they will receive.
6. Set up the remaining materials needed for your investigation, and track the growth of your seeds each day for one week. Record your data and observations in a table in your Evidence Notebook.
7. Dispose of tobacco seeds as instructed by your teacher.

Name:

Date:

## ANALYZE

1. How is it possible for two parent plants with green leaves to produce offspring with white leaves?

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2. According to your results, is the albinism allele most likely dominant or recessive? Use evidence from your experiment to support your answer.

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3. For a cross in which both parent tobacco plants are green, 75% of the offspring are green, and 25% of the offspring are albino. What are the genotypes of the parent plants? How do you know?

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## CONCLUDE

Write a conclusion addressing these points:

- Does the data you collected support your hypothesis?
  - Give specific evidence from your data, and explain how it does or does not support your hypothesis.
  - Describe any sources of error that you think might have affected your data.
  - Explain how you would improve this investigation if you were to do it again.