

# Science 8 Genes/Heredity/Alleles Activity **AUSTIN HORNER**

This is a Live Class Activity. If you were not present in Live Class, watch the recording from 2/28 to complete the assignment.

**Objective:** To determine if traits controlled by dominant alleles are more common than traits controlled by recessive alleles.

Fill in the table below:

Trait 1: Dominant	Group Data	Class Data	% of class with trait	Trait 2: Recessive	Group Data	Class Data	% of class with trait
Free Earlobes	4 5 1 2 2	14/23	61	Attached Earlobes	2 0 2 4 1	9/23	39
Hair on Fingers	3 2 0 0 1	6/23	26	No Hair on Fingers	3 3 3 6 2	17/23	74
Widows Peak	0 0 1 2 1	4	17	Straight Hairline	6 5 2 4 2	19	83
Cleft Chin	0 2 0 1 0	3	13	No Cleft in Chin	6 3 3 5 2	20	87
Dimples	0 0 1 1 1	3	13	No Dimples	6 5 2 5 2	20	87
Curly Hair	3 2 0 2 1	8	35	Straight Hair	3 3 3 4 2	15	65
Hitchhikers Thumb	2 2 0 2 0	6	26	Straight Thumb	4 3 3 4 3	17	74

**Background information:** Answer the following questions.

Who was curious about the physical characteristics, or traits, of pea plants?

**GREGOR MENDEL**

What is the passing of traits from parents to offspring called?

**HEREDITY**

From his work, Mendel reasoned that individual factors, one from each parent controlled the inheritance of traits. Today, scientists call the factors that control traits genes. What are the different forms of a gene called?

Individual alleles control the inheritance of traits. Some alleles are **dominant**, while other alleles are **recessive**. Which type of allele always shows up in the organism when the allele is present?

### **DOMINANT**

Which type of allele is masked, or covered up, whenever the dominant allele is present?

### **RECESSIVE**

A trait controlled by a recessive allele will only show up if the organism inherits how many recessive alleles for that trait?

### **2 / BOTH**

Human traits are controlled by dominant and recessive alleles, causing many different combinations of traits among a group of people.

### **Procedure:**

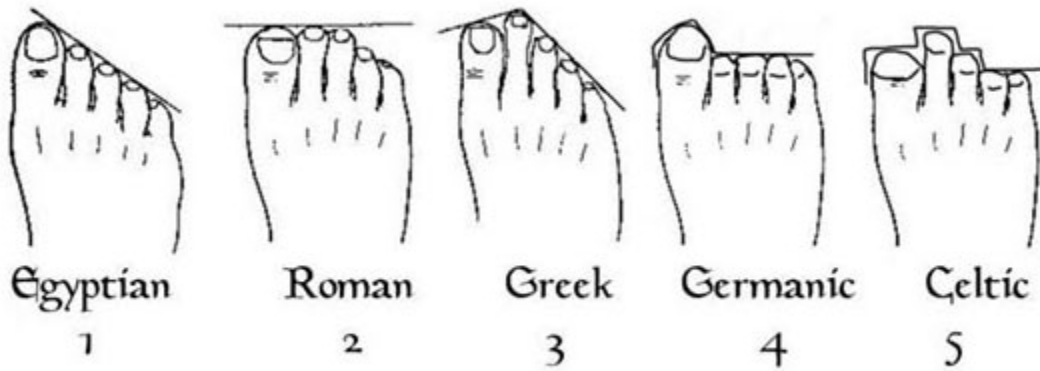
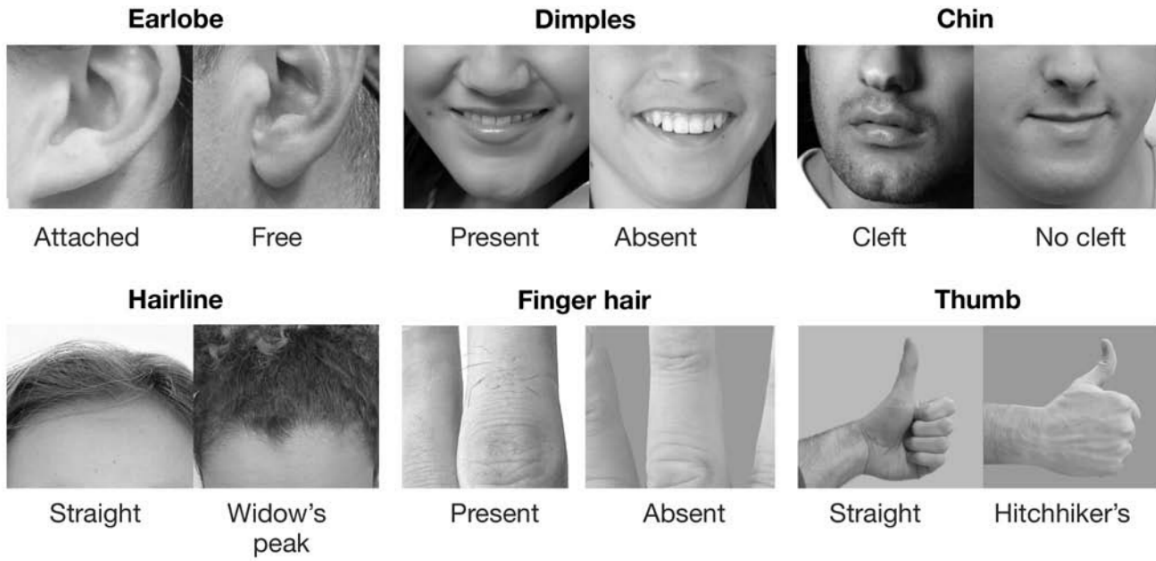
#### **Part 1: Dominant and Recessive Alleles**

**Completed in LC. Watch the recording from 2/28, if you were not present in LC.**

1. **What I know:** Write a hypothesis that states whether you think certain traits controlled by dominant alleles occur more often than traits controlled by recessive alleles.  
[Example: I predict that traits controlled by dominant alleles are (more common, less common, equally as common) as traits controlled by recessive alleles]

**My hypothesis is:** dominant alleles should be more common than recessive.

2. The graphic below shows different human traits. Each trait has two different forms. Study the chart, then follow the procedures carefully.



FamilyTree.com

<https://www.anklefootmd.com/can-you-determine-your-genealogy-by-looking-at-your-feet/>



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## Toe length: The myth

In some people, the big toe is longer than the second toe (here called "L," for long big toe), while other people have the big toe shorter than the second toe ("S"). This is sometimes said to be controlled by one gene with two alleles, with the allele for S dominant to the allele for L. There is no good evidence for this myth; the small number of studies of toe length give contradictory results.



[Myths of human genetics](#)

3. For each of the traits in the chart, determine which trait you have. Circle that trait on the chart above. Use a mirror or your computer camera to look at yourself, if you are not sure.
  
4. On the data table, include the data for your group.
  
5. Teacher will ask you for your group data so that we can complete the class data table on the chart below.

REC

You are viewing Miriam Castillo's screen

WK26 Science 8 Genes/Heredit/Alleles Activity

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Miriam Castillo

Participants 13 Share Screen Chat Reactions Settings More Leave

Fill in the table below: **Group 1**

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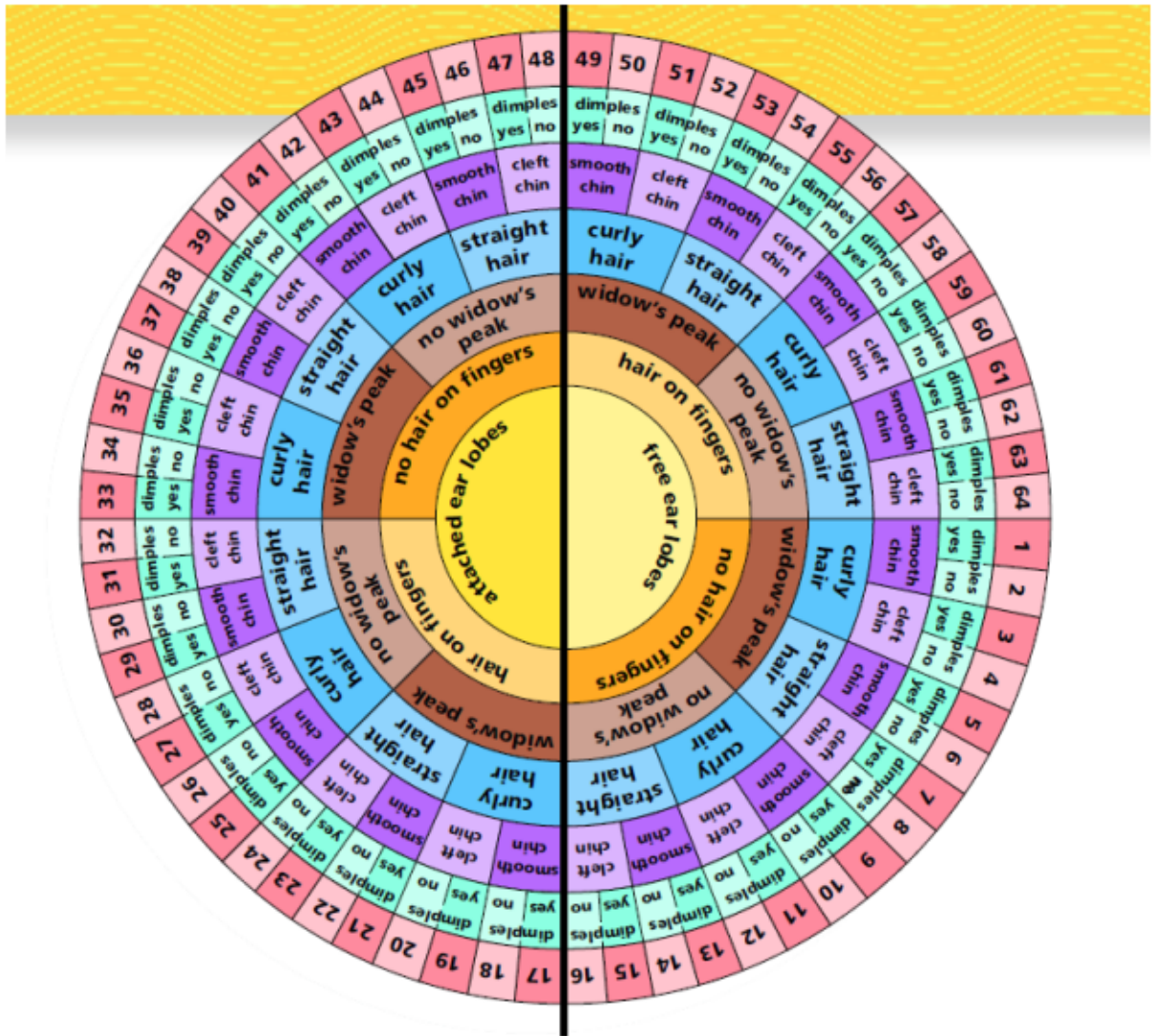
Part 2: Are you unique?

- Look at the circle of traits below. All the traits on your data appear in the circle. Determine your number on the circle of traits. What is your number on the circle of traits?

**26**

Was there anyone else in Live Class (watch the recording if you were not attending live) what had the same number as you?

**NO**



Part 3: Questions

1. Which traits controlled by dominant alleles were shown by a majority of students in Live Class?

FREE EARLOBES

2. Were more dominant or recessive traits shown by students in live class?

More recessive than dominant traits were shown by students in class.

3. How does your data support your hypothesis? Explain your answer with specific examples from the activity.

I would have hypothesized that dominant traits would be more prevalent. By far, however, the class data showed that recessive traits like a straight hairline and a straight thumb were more common. This would agree with John McDonald of the University of Delaware, whose study indicated that these traits are determined by more than one gene. He concluded these feature associations were a myth.

On the other hand, perhaps sexual selection promotes recessive alleles because perhaps people may be more attracted to those with specific, rarer characteristics. Perhaps those with recessive traits work harder at conquest or reproduction, or maintaining their bloodlines.

4. Why do you think it is important to know about the alleles that are in your genes? Use terms such as traits, genes, heredity, dominant, recessive, and/or alleles, to explain your answer.

It is important to know what alleles are in your genes because they determine your health risk factors. Heredity, and the percent of a dominant or recessive allele can also help us to reconstruct the history of migrations and the development of the human race.