Genetics with a Smile II

February 23, 2012

Objective and Catalyst

Students will:

- Analyze the results of the "Genetics with a Smile" activity to draw conclusions about dominant and recessive traits
- Quiz 5.1
- Begin Research Projects

Catalyst: WRITE ANSWERS IN COMPLETE SENTENCES

1. Which of the following correctly applies to a dominant trait?
   - A. Always expressed when present
   - B. Only expressed when it's the only trait present
   - C. Sometimes expressed, depending on the environment
   - D. Never expressed in a healthy person
2. Which of the following correctly applies to a recessive trait?
   - A. Always expressed when present, represented by a capital letter
   - B. Only expressed when it's the only trait present, represented by a lower case letter
   - C. Always expressed when present, represented by a lower case letter
   - D. Only expressed when it's the only trait present, represented by a capital letter

Objectives

Students will:

- Analyze the results of the "Genetics with a Smile" activity to draw conclusions about dominant and recessive traits
- Quiz 5.1
- Begin Research Projects

Homework

- 2 sources and 10 facts about your topic
- HW 5.1 (in preparation for Quiz 5.1)
- *Survival of the Sickest Ch 8 DUE Wed, 2/18*
- *PROJECT DUE Friday 2/20!!!!*

Catalyst

1. Which of the following correctly applies to a dominant trait?
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   B. Only expressed when it's the only trait present
   C. Sometimes expressed, depending on the environment
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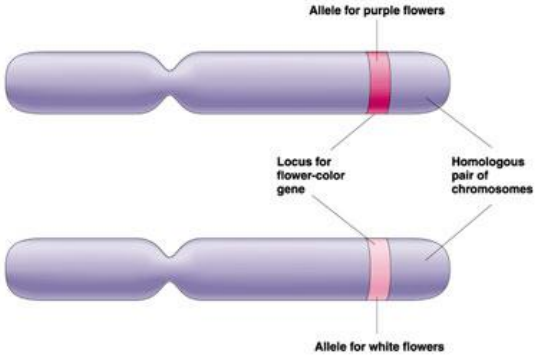
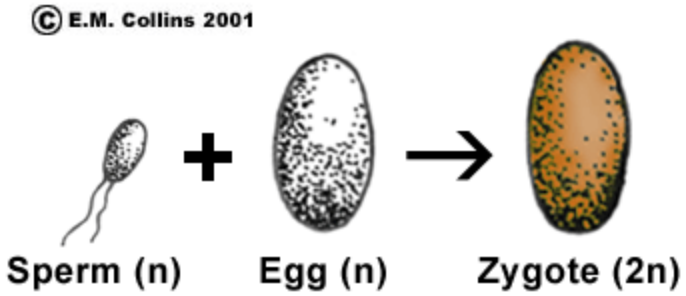
Genes and Alleles



- **Genes** are specific pieces of DNA that code for traits
- **Alleles** are different forms or variations of a trait on a gene
- You have two alleles of each gene—one from mom and one from dad!
  - For example: Eye color could be **brown (B) or blue (b)**. Maybe you get a (B) from your father, and a (b) from your mother…
  - Another example is A, B, or O blood type.

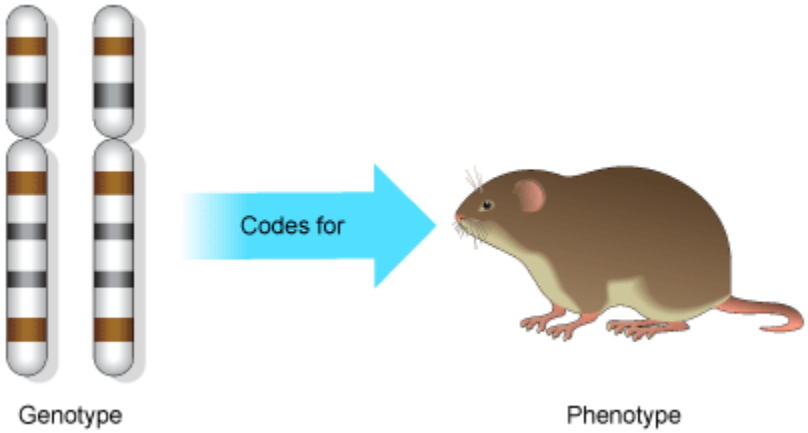
Meiosis and Fertilization

- Meiosis makes gametes, with half the number of chromosomes
- They are combined during fertilization, making a full UNIQUE set of DNA

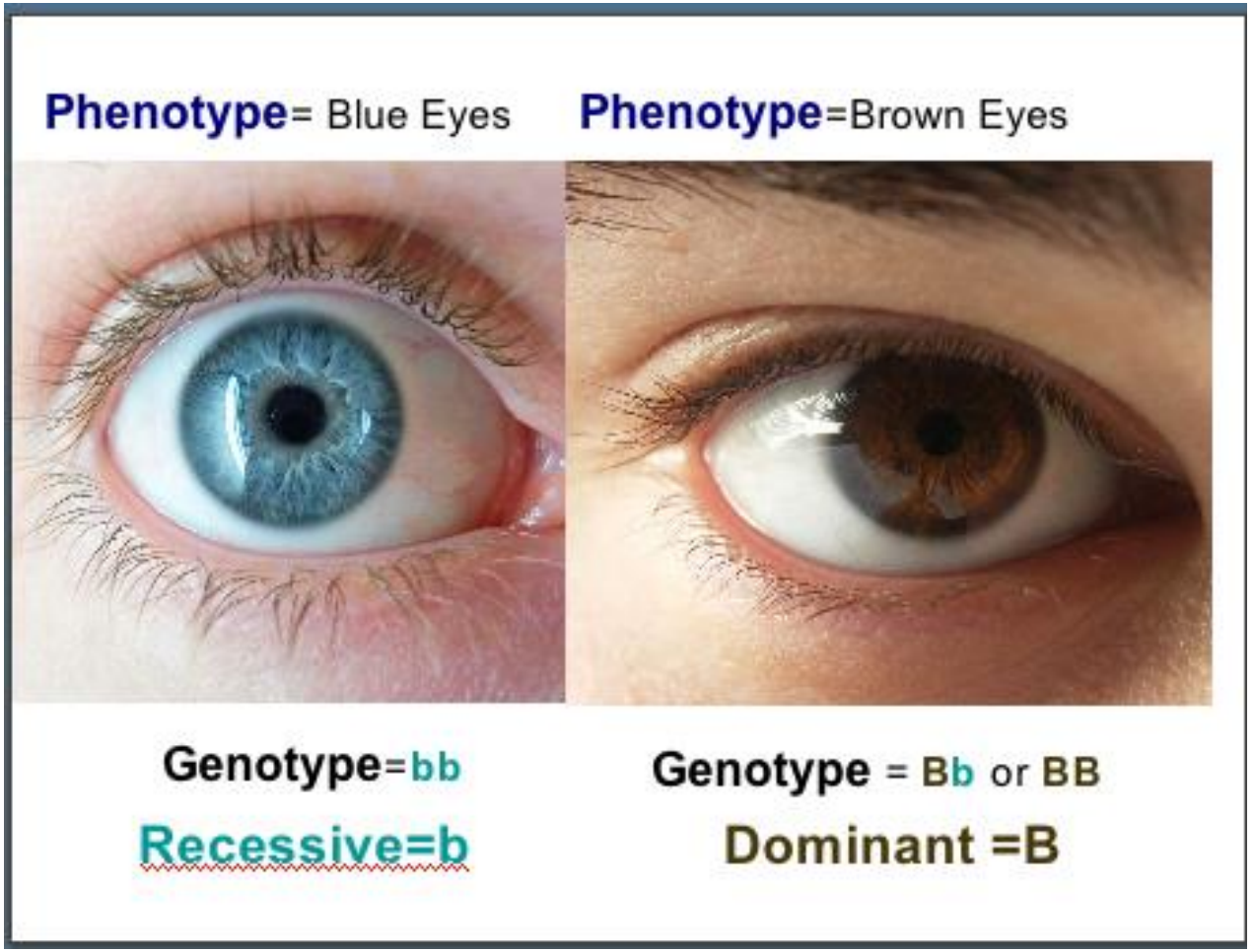


Determining Genotype and Phenotype

- **Genotype** is the genetic makeup—what do the genes say?
  - Ex. BB, Bb, bb
- **Phenotype** is the physical makeup—what do the traits look like?
  - Ex. Long fur, short fur, brown eyes, curly hair…



Genotype and Phenotype Example



Dominant and Recessive

- A dominant trait is EXPRESSED or SEEN whenever the allele is present
- A recessive trait is NOT expressed UNLESS BOTH alleles are recessive
  - For example, blue eyes (b) was recessive and brown eyes (B) was dominant
    - BB = brown eyes
    - Bb = brown eyes
    - bb= blue eyes

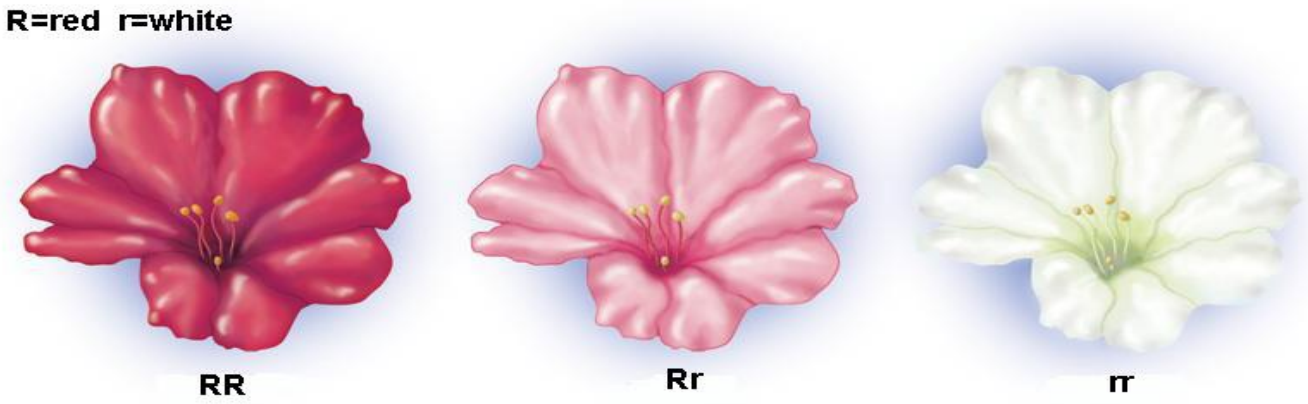
Homozygous and Heterozygous

- **Homozygous** = 2 of the same allele
  - **BB** or **bb**

- **Heterozygous** = 2 different alleles
  - **Bb**

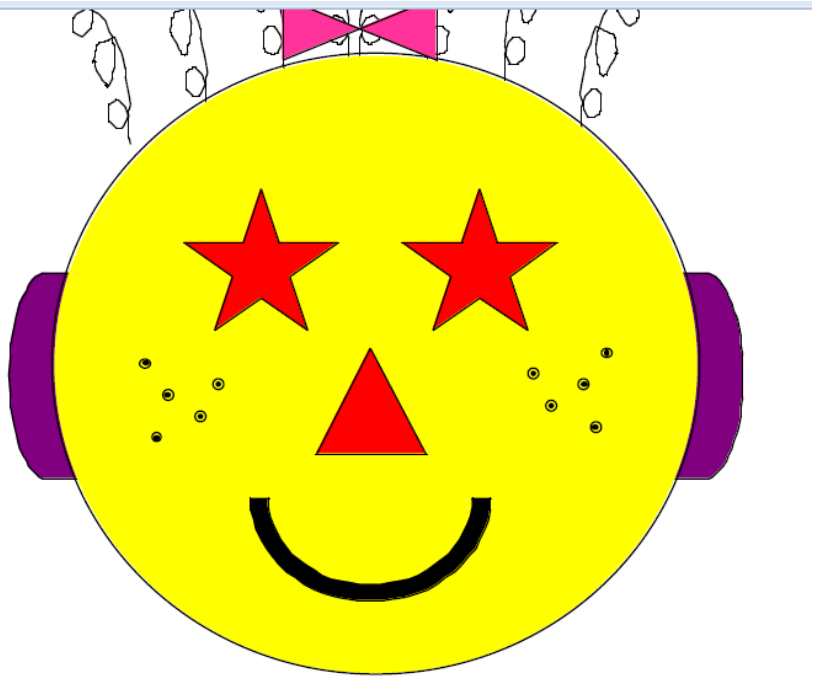
Incomplete Dominance

- **Occasionally**, genes don't follow the basic rule of dominant/recessive—showing one OR the other—and make a mixture!
- This is called incomplete dominance.
- You may see an example of this in the lab today!



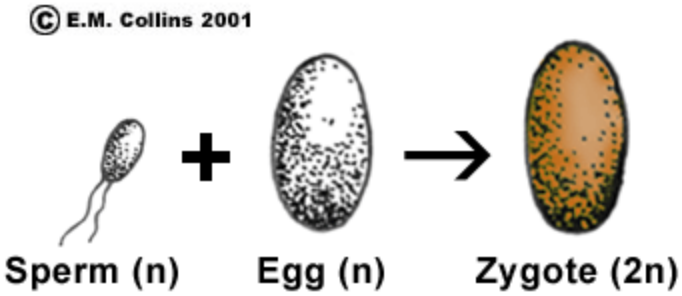
Genetics with a Smile

- Let's review!
- What did we do yesterday?
- Why did we use a penny toss to determine traits?

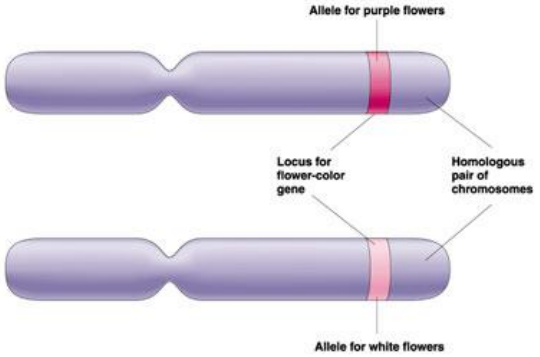


Meiosis and Fertilization

- Meiosis makes _____, with ____ the number of chromosomes
- They are combined during fertilization, making a full UNIQUE set of DNA



Genes and Alleles

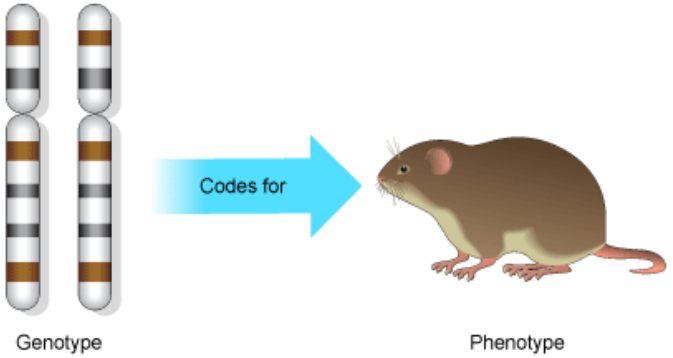


- Genes are _____ _____of DNA that code for _____
  - What is an example of a trait?
- Alleles are different _____ or _____ of a trait on a gene
  - How many alleles do you have of each gene?
  - Where did they come from?

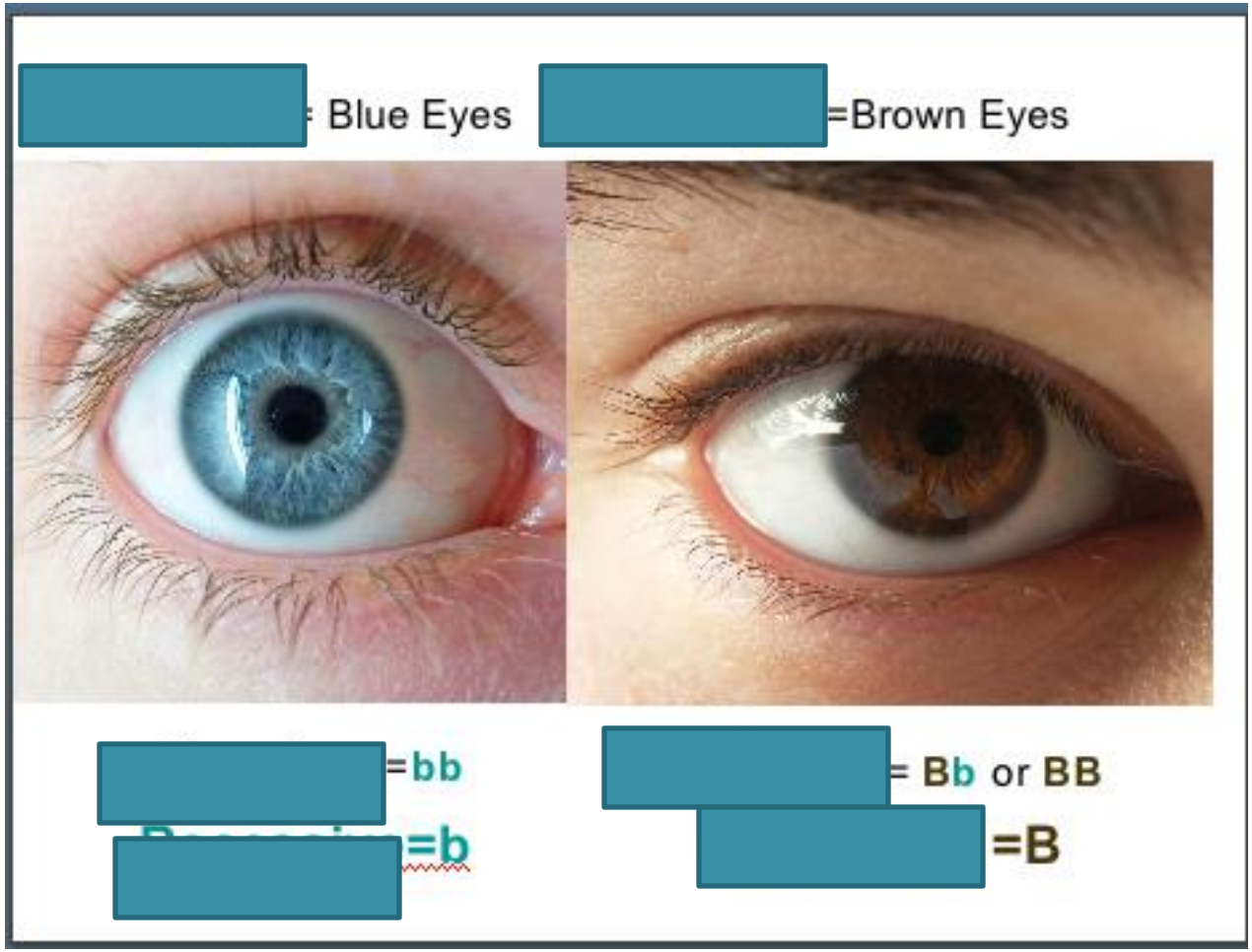
Determining Genotype and Phenotype

- Genotype is the _____ makeup—what do the _____ say?
- Phenotype is the _____ makeup—what do the ____ look like?

What does "genotype codes for phenotype" mean?



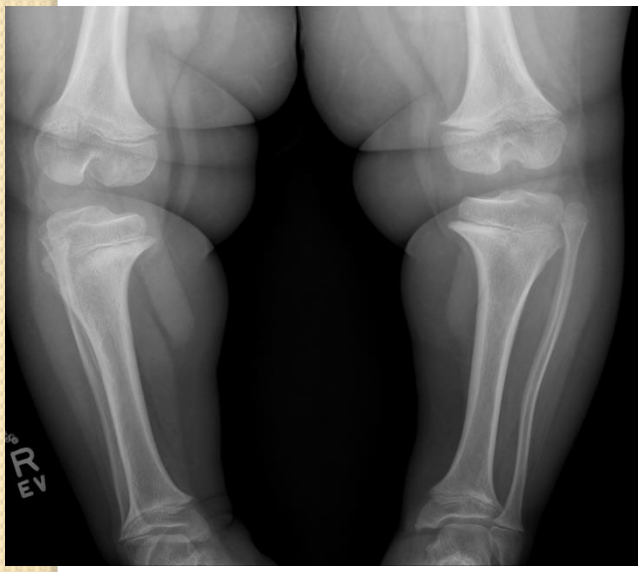
Genotype and Phenotype Example



Dominant and Recessive

- A _____ trait is EXPRESSED or SEEN
- A _____ trait is NOT expressed or NOT SEEN
  - What is an example of this?
- Law of Dominance—the dominant trait "_____" the recessive

Notes about Dominant Traits

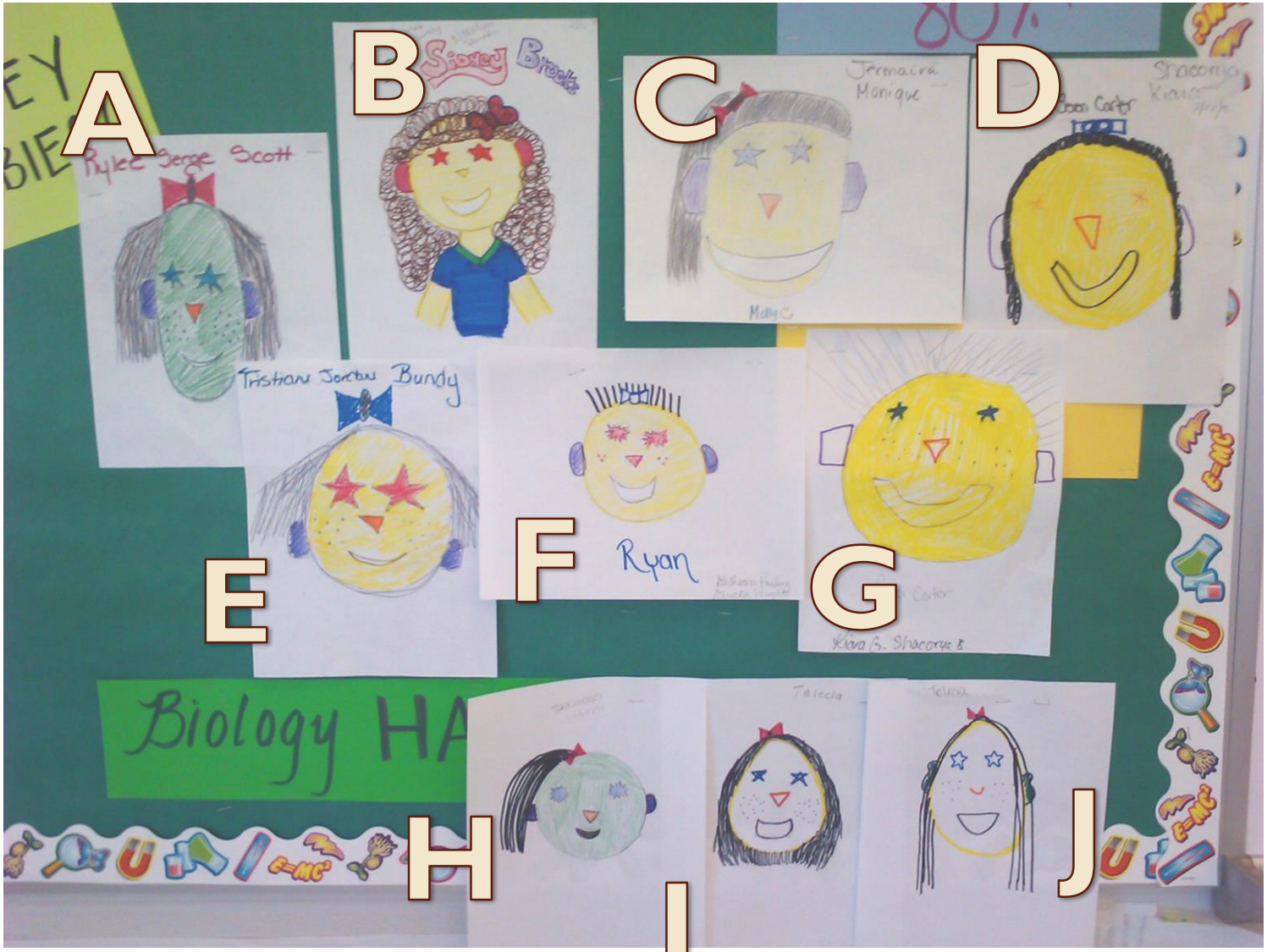


- When we have a dominant trait, it will be expressed, making it more popular
- But sometimes, very few people have the Dominant trait, so it is the least common.
  - For example, the gene for Achondroplasia (Dwarfism) is Dominant, but not many people have dwarfism.
  - What is the genotype for MOST of the population?

Analyze the Data—Genetics with a Smile

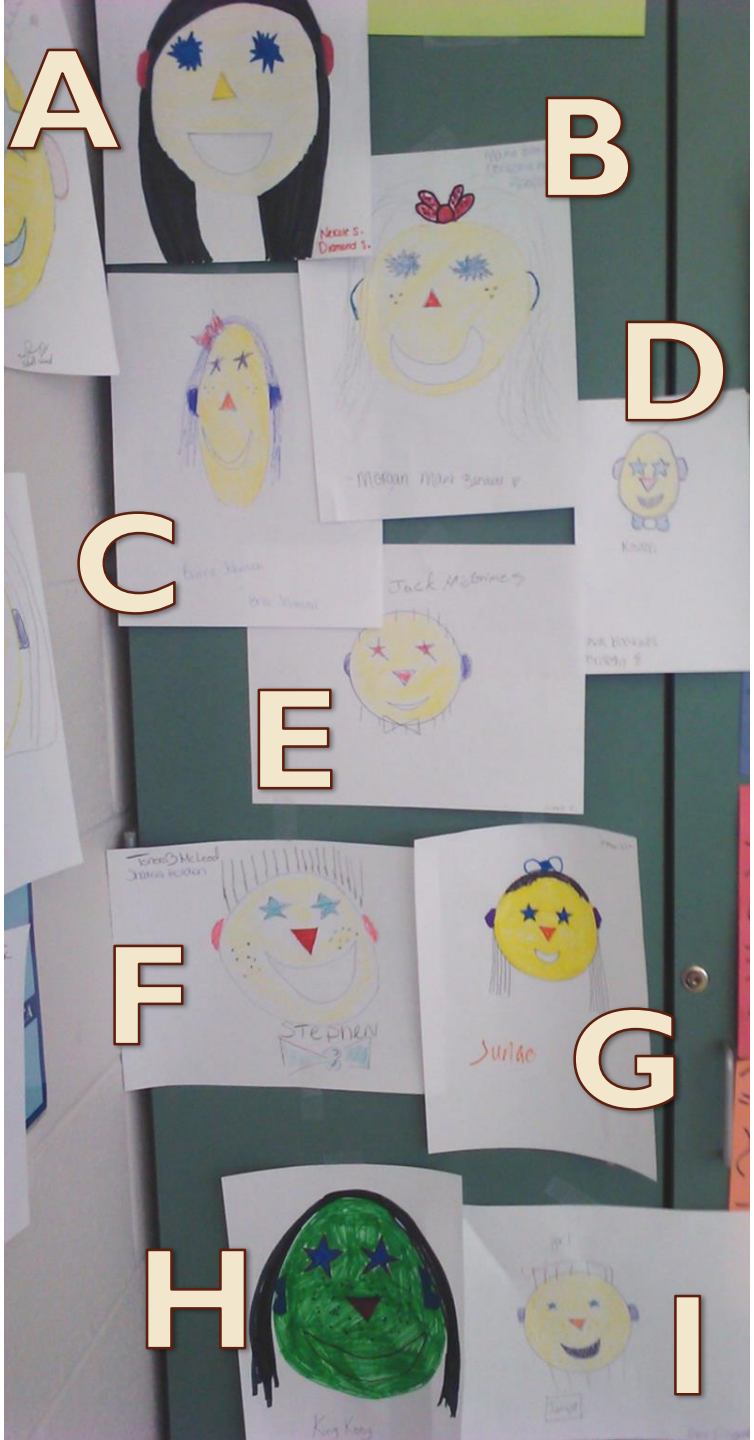
- Now we'll look at our results from yesterday and make some conclusions about the smiley faces and how the traits were passed

Pd 2/3 Smiley Faces



Pd 8/9 Smiley Faces

Pd 10
Smiley Faces



Review

Provide an example of each of the following terms from the activity

A. Gene/Trait
B. Allele
C. Dominant
D. Recessive
E. Genotype
F. Homozygous
G. Heterozygous
H. Phenotype

Analysis Questions

- Complete the handout "Genetics with a Smile: Wrapping it UP!" with your partner from yesterday.
  - HINTS
    - When the question mentions a genotype, write it out!
    - Use pictures to help you
    - Flip the coin to see what would happen
    - Refer back to your definitions and examples

Helpful Hint for Genetics Problems

- Write out the genotype!!

- Example:

5. Your smiley face's parents were each heterozygous for each trait. How would your smiley faces change if one parent were homozygous dominant for all the traits while the other was homozygous recessive?

THINK

- Is the dominant trait always more popular?
    - When is it more popular?
    - When is it NOT more popular?

Quiz 5.1

Begin Research

- Fill in the first two pages of your packet