SUCCESS ACADEMY EDUCATION INSTITUTE

Cell Division and Genetics

Name: _____

Teacher: _____

Class: _____

Life Science (Lower Middle)
Unit 2
Exit Tickets

Lesson 1 Exit Ticket:
Introduction to Heredity: Genetic Diversity

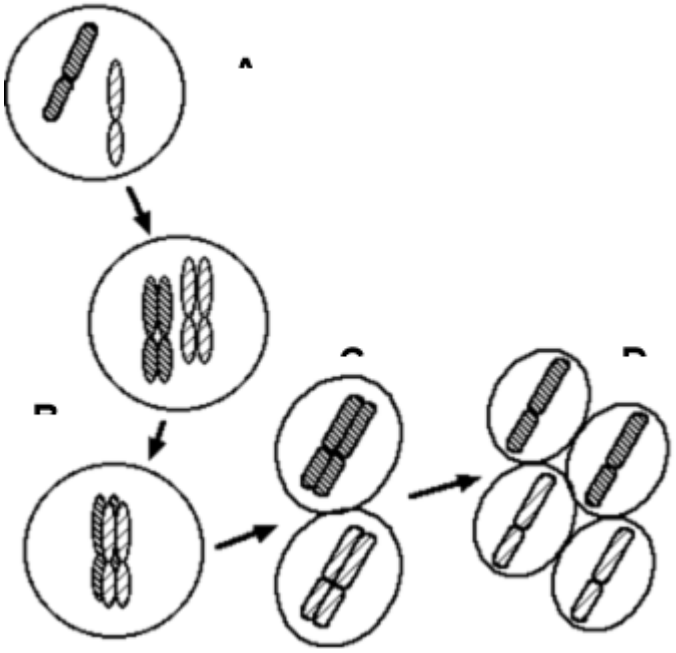
1. How do you think we inherit traits from our parents? Include evidence and explain your reasoning.

Lesson 2, Day One, Exit Ticket: Mitosis and Meiosis

Image credit: George Shulkin, CC BY-SA 1.0, via Wikimedia Commons

1. What might happen if a mouse's cells stopped dividing after it was born? Explain and justify your response. [3]

Lesson 2, Day Two, Exit Ticket: Mitosis and Meiosis



1. Study the image. Does it show the process of mitosis or meiosis? [1]

2. Explain your answer. [1]

Lesson 3 Exit Ticket:
Sexual and Asexual Reproduction

1. Evaluate the following statement. Explain why you agree or disagree. Address both parts of the statement — *process* and *product*. You may draw in the space below your lines to help support your response. If you draw, ensure all drawings are very clearly labeled. [3]

Sexual and asexual reproduction differ in both process and product.

Lesson 4 Exit Ticket:
Generations of Simple Traits

Two scholars are having a debate in science class.

Max says, "Sexual reproduction really increases genetic diversity in a population!"
*Peter replies, "No, Max! It's **asexual** reproduction that increases genetic diversity!"*

1. Which scholar do you agree with? Explain and justify your response. [3]

Lesson 5 Exit Ticket:
Mendelian Genetics and Plant Breeding

Louisa and Ray decide to have a baby! Louisa has brown eyes, and Ray has blue eyes.

1. What will determine their baby's eye color? Provide a detailed explanation to support your claim. [3]

Lesson 6 Exit Ticket:
Modeling Genetic Frequency

A scientist has some red-eyed fruit flies. She knows that red eyes are dominant over white eyes in fruit flies. She is studying the fruit flies and wants to find out if they are homozygous or heterozygous for eye color.

1. What is one way that she could find out whether or not the red-eyed fruit flies are homozygous for eye color? Explain. [2]

2. Use a Punnett square to show and then explain below what will happen if homozygous red-eyed fruit flies are crossed with white-eyed fruit flies. Use R to represent red eyes and r to represent white eyes. [4]

Exit Ticket continues on next page!

3. If heterozygous red-eyed fruit flies are crossed with white-eyed fruit flies, what is the probability of an offspring having red eyes? Show your work in the space below and circle your final answer. [3]

Lesson 7 Exit Ticket:
More Complex Patterns of Inheritance

The top row in the picture below shows two different plants with different genes for flower color (pure red and pure white). The plants on the bottom are the result of breeding one pure red-flowered plant with one pure white-flowered plant. Use the picture to answer the question that follows.

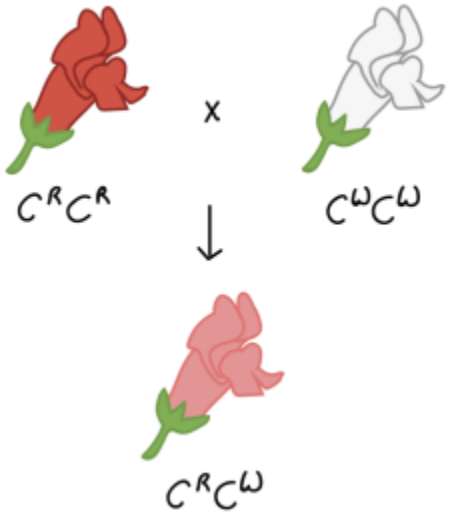
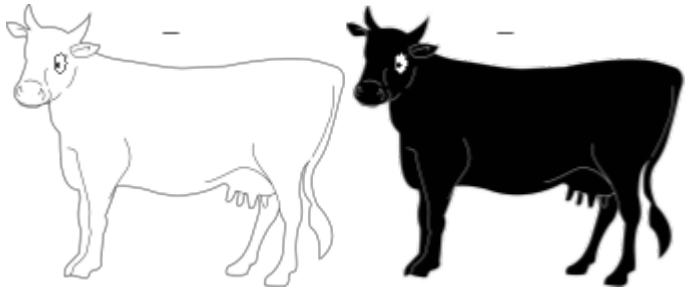


Image credit: Khan Academy

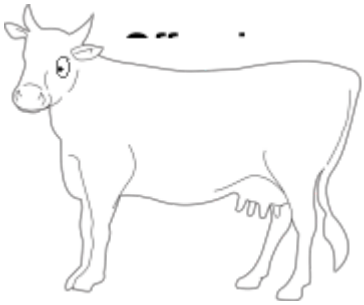
1. Does the offsprings' flower color best represent a Mendelian pattern of inheritance, codominance, or incomplete dominance? Explain your response using evidence from the picture. [2]

Exit Ticket continues on next page!

The two cows pictured below each carry a dominant trait for coat color: one for a black coat (BB) and one for a white coat (WW). Use the picture to answer the question that follows.

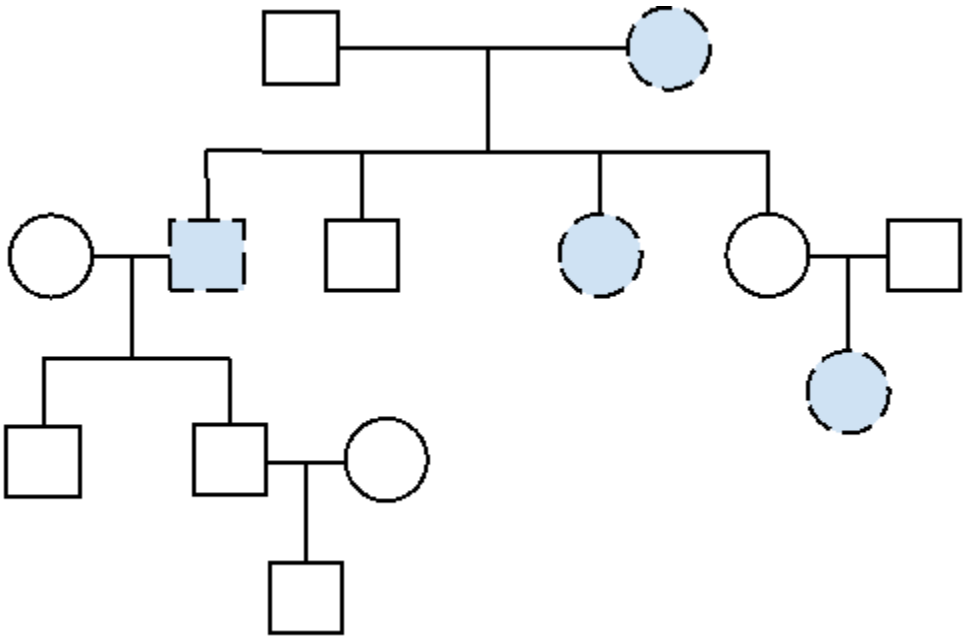


2. If a pure black male cow and a pure white female cow mated, what might their offspring's coat look like? Shade in the picture below using your pencil to show one possible phenotype for the baby cow. [1]



Lesson 8 Exit Ticket:
Patterns in Pedigrees

Directions: The pedigree chart below tracks the inheritance of a hereditary genetic disorder through several generations in a family. Family members who have expressed symptoms of the disorder are represented by shaded symbols.



1. How many generations of this family are represented on this pedigree chart? [1]

2. How many children did Justin and Anna have? [1]

3. How many family members have the genetic disorder? [1]

4. Dan marries a woman named Terri who does not have the disorder, and they have a son named Jason. He also does not have the disorder. Draw these additions to the family on the pedigree chart above. [3]

5. If Alec and Tracey have another child, is it possible for the child to have the disorder? Explain your response. [2]

Lesson 9 Exit Ticket:
Cell Specialization, Gene Expression, and Mutations

After studying the link between exposure to the sun's UV rays and skin cancer, Molly says, "All mutations are so dangerous! I hope I never have one!"

1. Should Molly be afraid of a genetic mutation occurring in her body? Explain your response. [2]

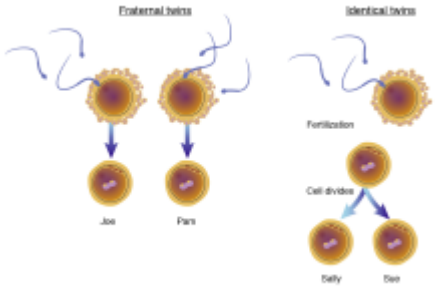
Lesson 12, Day One, Exit Ticket: Gummy Bear Genetics

Read the excerpt below about the formation of fraternal twins, then answer the question that follows.

Fraternal Twins

By Donna Krasnewich, M.D., Ph.D.

Fraternal twins are also dizygotic twins. They result from the fertilization of two separate eggs during the same pregnancy. Fraternal twins may be of the same or different sexes. They share half of their genes, just like any other siblings. In contrast, twins that result from the fertilization of a single egg that then splits in two are called monozygotic, or identical, twins. Identical twins share all of their genes and are always the same sex.



Fraternal twins are also called dizygotic twins. And the difference between fraternal and identical twins is that fraternal twins derive from two different eggs. Fraternal twins may be the same gender, they may have many of the same characteristics, but they also may be very different from each other and, in fact, share half of their genes, just like their sisters and brothers. It's important to recognize that the difference between fraternal twins and monozygotic, or identical, twins is that monozygotic twins result from the fertilization of a single egg with a single sperm, and then, during the embryonic development or during the cell splits, those massive eggs split into two individuals, which later develop into two offspring.

Excerpt courtesy of: National Human Genome Research Institute

1. How is it possible that a set of twins can look different from each other? Explain your response using evidence from the excerpt above and your knowledge from the unit. [2]

Lesson 12, Day Two, Exit Ticket: Gummy Bear Genetics

1. Compose an answer to the unit's Essential Question: Do I have more in common with my friends or my family? Include a detailed explanation with at least three pieces of evidence from the unit. [4]