



Chapter 1-Children resemble their parents

As you travel through the “Children resemble their parents” animation, answer the questions that follow.

1. Why did Mendel study pea plants? What made them a good organism to study?

Pea plants are easy to grow, and have distinguishable traits from one another. The traits were also easily observed from one generation to the next.

2. Pea plants have the ability to self fertilize. Explain what this means, and the structures that allow the plants to perform this.

The plants have both male and female parts. The stamens produce pollen, which is the male reproductive cell. The pollen is dropped on the pistil where the eggs (female reproductive cells) are produced. The pollen then fertilizes the egg within the pistil.

3. When Mendel started his experiments, he wanted to cross-fertilize two different plants. Describe the two parent plants, and how Mendel succeeded in doing this.

To cross fertilize the pea plants, Mendel cut off the stamens before they produced and dropped pollen. After the pistil matured, he dusted it with pollen from another plant. This is cross fertilization. The parent plants were two plants with different traits, for example, one with pink flowers, with a white flowered plant.



Chapter 2: Genes come in pairs

As you travel through the “Genes come in pairs” animation, answer the questions that follow.

1. What is a phenotype, and how many did Mendel observe this in the pea plants? Describe each one.

A phenotype is a visible trait. He observed the flower position, which could be either on top or on the side, short and tall stem length, puffed or pinched pods, yellow or green pods, round or wrinkled seeds, green and yellow seeds, and white or colored seed coats.

2. For each distinct phenotype, how many different versions of that trait were observed in the plants?

For each distinct trait, two different versions of each trait were observed.

3. Why was Mendel sure to use “purebred” strains of pea plants to begin his experiments?

This was important to ensure that when he crossed two plants with differing traits, there were no other factors contributing to the outcome of the cross.

4. Mendel reasoned that each trait is controlled by one “factor” that has two different “versions”. What terms are now given to describe these concepts?

Each trait is controlled by one gene, and has two different alleles.

5. For seed color, Mendel started with purebred yellow and purebred green seeded plants. Describe what is meant by purebred.

These are plants that could only produce the same trait when it self fertilizes.

6. What is a genotype?

A genotype is a pair of alleles for a particular trait.

7. What was the genotype of the purebred yellow and purebred green seeded plants?

Purebred yellow – YY

Purebred green - yy



Chapter 3: Genes don't blend

As you travel through the “Genes don't blend” animation, answer the questions that follow.

1. For each trait that Mendel studied, he set up a cross between the two pure-bred plants with opposing traits. What did he expect the resulting offspring would look like for the following crosses:

Puffed x Pinched = ___Puffed-pinched_____

Yellow seed x Green seed = ___Yellow-green_____

Tall x Short = ___Medium_____

2. What do we call the offspring of two purebred parent plants?

Hybrids

3. Much to his surprise, what were the actual results from the purebred crosses?

Puffed x Pinched = ___Puffed_____

Yellow seed x Green seed = ___Yellow_____

Tall x Short = ___Tall_____

Side flower x Top flower = ___Side_____

Colored coat x White coat = ___Colored_____

Round x Wrinkled = ___Round_____

Green pod x Yellow pod = ___Green_____

4. After the experiments falsified his hypothesis, what was Mendel's next task?

He wanted to figure out why only one of the phenotypes was visible in the hybrid offspring.



Chapter 4: Some genes are dominant

As you travel through the “Some genes are dominant” animation, answer the questions that follow.

1. What did Mendel do to figure out why the hybrids were not a blend of the parent population?

He allowed the yellow hybrids to self fertilize.

2. What were the results seen in the second generation?

Even though yellow was the phenotype of the parent hybrids, the second generation had some green colored seeds.

3. After performing many experiments, what did Mendel conclude from the second generation?

He was able to figure out the basic rules of inheritance and why the green color reappeared.

4. Fill in the blanks of the following sentence:

Pea color is controlled by one gene, which has a “green” form and a “yellow” form. Each form is called a(n) allele.

5. What is meant by the term homozygous green? Homozygous yellow? What notation was used to represent these plants?

Homozygous green has two green alleles. Homozygous yellow has two yellow alleles.

YY-yellow

yy-green

6. What do the offspring of two purebred plants inherit from each parent?

The offspring inherit one allele for each gene from each parent.

7. What combinations of alleles do plants have that produce yellow seeds? What combinations of alleles do plants have to produce green seeds?

YY – yellow Yy – yellow yy – green

8. The hybrid offspring can also be described as being heterozygous. Explain what this means.

Heterozygous is when there are two different alleles. Also described as hybrids.

9. What were the 3 possible genotypes in the second generation? Describe their corresponding phenotypes.

YY – yellow

Yy – yellow

yy – green

10. What was Mendel able to prove about the dominant and recessive versions of genes (factors) that are present within pea plants?

For each gene, if the dominant allele is present, the resulting phenotype will be the dominant trait (YY-yellow and Yy-yellow). The only way a recessive phenotype will result is if both recessive alleles are present.