

## DNA From the Beginning Webquest

NAME \_\_\_\_\_



Curly wings



Wild type

the arrows at the lower  
will see "Gene." She will give you a question.

Go to: <http://dnaftb.org> and click on  
"Classical Genetics".

You will answer the questions below by  
reading the concept and then clicking on  
the various topics at the bottom of the  
screen. You can move through the  
animation and problems by clicking on  
right. At the end of the animation you

### Concept 1: Children Resemble their Parents.

1. Concept: What are factors (a term that Mendel used)?
2. Animation: How did Mendel cross fertilize the pea plants?
3. Gene questions: Why aren't there naturally occurring hybrid animals, such as a leopard camel cross?
4. Gallery: Look at the cartoon of the man with the wooden leg. What is the cartoon trying to illustrate?
5. Bio: Explain each of Mendel's three laws.
6. Problem: What are the answers to each of the two questions?
7. Why do children resemble their parents?

### Concept 2: Genes Come in Pairs.

1. Concept: Why did purebred plants only produce offspring like themselves?
2. Animation: What is a visible trait called?
3. Animation: What were the seven pea traits that Mendel studied? What are the two phenotypes of each trait?
4. Animation: What are the various forms of a gene called?
5. Animation: What is a genotype? What is the genotype of a purebred yellow pea?
6. Gene's questions: What if Mendel used a plant that could not be self-fertilized?

7. Bio: How long did Mendel work on his pea experiments?
8. How old was Mendel when he died?
9. Problem: Explain what you learned from the problem.

**Concept 3: Genes don't blend.**

1. Concept: Mendel did not see any intermediate phenotypes in the pea traits he chose. Why not?
2. Animation: If Mendel crossed a tall pea plant with a short pea plant, what height were the offspring?
3. Gene's question: If purebred snapdragon plants with white flowers are crossed to purebred snap dragon plants with red flowers, the offspring have pink flowers. Since genes don't blend, what do you think happened?
4. Gallery: What other organisms did Mendel use in experiments?
5. Bio: What other sciences was Mendel interested in?
6. Problem: What is the answer to the questions in the problem?

**Concept 4: Some Genes are Dominant.**

1. Concept: How did Mendel explain "dominant" genes?
2. Animation: What does homozygous mean? What does heterozygous mean?
3. Animation: Show the cross between two heterozygous yellow seed pea plants. What fraction of the offspring will be yellow? What fraction will be green?
4. Gene's question: If the yellow pea color is dominant over the green pea color, then why haven't all pea plants become yellow seeded?
5. Bio: Give a couple of reasons why Mendel's ideas were not widely accepted.
6. Problem: What color is dominant in pea flowers?

**Concept 5: Genetic Inheritance Follows Rules.**

1. Concept: How did Mendel solve the problem of offspring ending up with double sets of alleles - two from each parent?

2. Animation: What is Mendel's law of segregation? What is the cell division process that accomplishes this segregation?
3. Animation: Who invented the Punnett Squares?
4. Animation: Show in a Punnett Square the famous 3:1 ratio that Mendel proposed.
5. Gene's Question: The Manx breed of cats is known for being tailless, though some are born with tails. A dominant gene shortens the spine and is the cause for no tail. In a cross between two tailless Manx cats, you get a litter of kittens where for every 2 tailless kittens, there is 1 kitten with a tail. What happened to Mendel's 3:1 ratio?
6. Bio: How did Reginald Punnett and William Bateson help promote the work of Gregor Mendel?
7. Problem: What is the genotype of the parents in this problem?
8. Problem: What are the gametes of these parents?
9. What is the phenotypic ratio of this cross?
10. What is the law of independent assortment?

**Concept 6: Genes are Real Things.**

1. Concept: What happened around 1900 to help promote Mendel's ideas?
2. Animation: Who were the three scientists who "rediscovered" Mendel's work?
3. Animation: What structures were thought to carry the "units of heredity?"
4. Gene's Question: Did dinosaurs have cells that were the same size of ours? Do we have cells that are the same size as an ant's?
5. Problem: Where in the cell are the genes found? How were scientists able to see these cell structures?

**Concept 7: All cells arise from preexisting cells.**

1. Concept: What cell division process were scientists able to see with stains in the late 1800's?
2. Animation: Carl Nageli saw cell division but he was not sure about what he was seeing. Why?
3. Animation: What did Walther Flemming show and what kind of cells did he use?

4. Animation: What happens during interphase?
5. Animation: How do the daughter cells compare to the mother cell?
6. Animation: Virchow said "omnis cellula e cellula." What does this mean?
7. Gene's Questions: Chromosome number is unrelated to size and the biological complexity of the species. It can range from 2 in roundworms (*Ascaris*, sp) to 1,260 in Indian fern (*Ophioglossum reticulatum*). Why is there such variation?
8. Problem: How many chromosomes do body cells of the fruit fly have? How many chromatids are there at metaphase of mitosis?