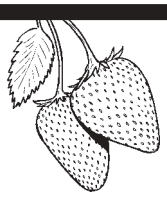
Design Yer Genes

Name _____



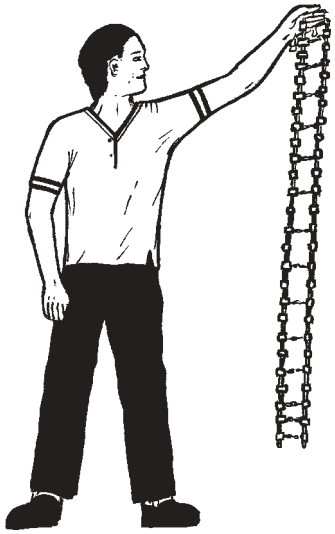
Part 2

Problem

How does a geneticist change a strawberry's trait?

Introduction

You are about to alter your strawberry DNA model. You must remember that the science of genetics is very complex and that changes in DNA occur naturally in nature as well as artificially in a laboratory. You can pretend that the changes you make in your model are occurring naturally (called a mutation) or artificially (called genetic engineering or transgenics).



Materials

- Colored markers or pencils
- *Design Yer Genes — Part 2* lab sheet
- DNA models from Part 1
- *Gene Key for Strawberries*
- Glue or tape
- Phosphate, sugar, and base pair cut-out sheets
- Scissors

Procedure

1. Refer to the *Gene Key for Strawberries* in Part 1 of this lab. You chose three traits from this list to put on your strawberry DNA molecule. Recall what three genes you chose. You will change one of these three traits. Pick the one you would like to alter and locate it on your DNA model.

2. Remove the trait you wish to change by cutting out the four base pairs (gene) from the sugar units. In nature, genes are changed at random. In the laboratory, genetic engineers try to control which genes are altered.

3. Referring to the *Gene Key for Strawberries* in Part 1, make a new gene to replace the one you just removed. Remember, this new gene must consist of four base pairs and must be different than the other two genes that are already on your DNA molecule. For

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(Part 2 continued)

example, you may not add a fragile skinned gene if there is a fragile skinned or tough skinned gene already on the chromosome. After you are certain that the change you are making is compatible with the rest of your DNA, color the base pairs, cut them out and insert this gene at the sugar units.

3. Tape or glue the new gene in place.

Questions

Answer the following questions on your own paper. Label your answers "Design Yer Genes — Part 2."

1. What trait (gene) did you remove from your model of strawberry DNA?

2. What trait (gene) did you insert into your model of strawberry DNA?

3. Compare the traits of your old strawberry plant to your new strawberry plant.

4. Explain why you chose to insert the new trait into your strawberry DNA. In your answer, discuss how this new trait might benefit the strawberry, the environment and/or humans. Discuss any problems that may arise.

5. When a real section of DNA changes, it is called a mutation:

   - How could a naturally occurring mutation help a species? List at least two examples.

   - How could a natural mutation hurt a species? List at least two examples.

6. Some people are uncertain or even fearful of genetically altering an organism. Write a short essay on:

   - What you think people might be worried about.

   - What you think the problems and/or benefits are in changing the genes in an organism.