

Name: \_\_\_\_\_

# Different Perspectives on Genetic Engineering

In this activity, you will consider ethical issues regarding a scenario about genetic testing.

1. Read the following scenario regarding genetic testing and cystic fibrosis.
2. Write a position statement regarding the issues in this scenario from the perspective of one of the six individuals listed on the next page. Your teacher can provide Web sites to help guide your research. You may wish to use the quotation included for each individual. Address the following questions:
  - Who should be responsible for answering these ethical questions? (Political leaders? Individuals? Religious leaders? Lawyers?)
  - Should an issue such as the one presented here be regulated by federal laws, by state laws, or by regulations enforced by a federal agency such as the Federal Drug Administration? Which group should be the one to take on the responsibility of monitoring this industry?
  - What benefits does this technology offer us? What risks should we be aware of?

## **PART 1**

Scenario: Genetic Testing and Cystic Fibrosis

A couple has undergone genetic testing and discovered that both parents are carriers for cystic fibrosis, a disease characterized by a deficiency of certain enzymes needed for digestion and respiratory health. Some specialists have recommended against the couple's having children, stating that cystic fibrosis is a serious disease that usually shortens an individual's life span. On the other hand, great advances have been made in research, and people with cystic fibrosis are now living longer lives of a higher quality than ever before. In addition, it's possible that a cure for cystic fibrosis could be found within the next 25 years. The couple is trying to decide what to do and is interested in the viewpoints of the people listed below.

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## PART 2 - Individual Perspectives

**Religious person:** “I am opposed to the manipulation of human genes for any purpose. It’s just not right. Who are we to be playing God?”

**Bioethicist:** “I am undecided about the use of genetic engineering in reproductive medicine. What we want is to enjoy the benefits of the technology while minimizing the risk.”

**Lawyer:** “I think we should accept human gene engineering, make it legal, regulate it, and make sure it's done in a responsible way.”

**Expectant father with an inherited heart condition that may be passed on to children:** “Although the technology to diagnose my child’s susceptibility to my heart condition is available, it still is a scary piece of knowledge to have in reproductive decision making, and I’m not sure I want to go through with the screening.”

**Molecular biologist:** “I am in favor of genetic engineering for reproductive purposes. It is just a better way of doing what animal breeders and botanists have already done to improve their livestock and agriculture.”

**Eugenicist:** “Eventually it will be possible to pick genes for virtually any inherited human characteristic. I support this technology because it will make it possible for parents to correct genetic defects and improve the genes of our their children.”

## **Vocabulary:**

### **bioethics**

Definition: The study of the ethical issues of biological research and applications, especially in medicine.

Context: Scientists must consider **bioethics** to make appropriate decisions about some medical procedures.

### **biotechnology**

Definition: The techniques of managing biological systems for human benefit.

Context: Advances in **biotechnology** allow scientists to separate sperm by gender.

### **deoxyribonucleic acid (DNA)**

Definition: The chemical inside the nucleus of a cell that carries the genetic instructions for making living organisms.

Context: Scientists examine **DNA** from a developing embryo to find out whether it will have any serious birth defects.

### **ethics**

Definition: A system of moral principles

Context: Manipulating genes violates the **ethics** of some people.

### **eugenics**

Definition: The science of improving the qualities of a breed or species by different strategies, such as the careful selection of parents or the use of genetic testing.

Context: Some people argue that designing traits for offspring is reminiscent of **eugenics**.

### **gene**

Definition: The functional and physical unit of heredity passed from parent to offspring.

Context: Introducing healthy **genes** into diseased cells is becoming an established medical practice.

### **genetic code**

Definition: The instructions in a gene that tell the cell how to make a specific protein.

Context: By studying a person's **genetic code**, a scientist can detect certain abnormalities.

### **genetic engineering**

Definition: The techniques used to manipulate genes in an organism.

Context: A great number of innovations may arise in the next 20 years because scientists are making progress in **genetic engineering**.