**Agriculture in Society**

**Unit 3:** Plant Science in Agriculture

Gene Editing Simulation

Gene editing and GMOs are an important and powerful tool in modern agricultural production. One tool, called CRISPR, or *Clustered Regularly Interspaced Short Palindromic Repeats* helps scientists make changes to the DNA of plants. This could lead to increase drought tolerance, disease and pest resistance, improved nutrition or taste of food, reduced need for chemical pesticides, or even growing crops in new climates. It works by cutting and changing out DNA.

**Directions:** You will simulate how gene editing by building and editing “Plant DNA”

**Materials:**

* 10 Pony beads in 4 colors. Each color will represent a letter for DNA bases (A, T, C, G)
  + A = Red
  + T = Blue
  + C = Yellow
  + G = Green
* String, 12 inches long
* Worksheet (included on back of this sheet)

**Step 1: Building Your DNA Code**

* You will put pony beads on randomly. You should put at least 16 beads on your string. This will serve as your “base” DNA strand.

**Step 2: Editing Your DNA Code**

* You will select three of the sample traits listed below and create the code that describes it on your string. It will require you to make changes to the DNA on your string, and make you take off and edit some pony beads. After completing, you will staple or glue your string to this sheet.

|  |  |
| --- | --- |
| **DNA** | **Trait Description** |
| ATCG | Short plant, purple flowers |
| GCTA | Tall plant, orange flowers |
| CGTA | Medium plant, yellow flowers, pest-prone |
| TTAA | Short plant, white flowers, drought-tolerant |
| ACGT | Tall plant, red flowers, disease-resistant |
| TACC | Small plant, edible fruit |
| GGAT | Large plant, bitter leaves, bug-prone |
| CTAG | Medium plant, blue flowers, cold-tolerant |
| AGTC | Tall plant, thorny stem, attracts pollinators |

**Step 2:** Analysis Questions

1. Which traits did you use for your new plant? Why?
2. Draw your plant below.
3. How do you think gene editing can help a plant survive better?
4. What are some ways gene editing could help solve problems in agriculture?
5. Why might people be worried about GMOs and using CRISPR technology?