Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block: \_\_\_\_\_

Mendel’s Peas Animation Activity

**Background Information**

Sexually, pea flowers have both male parts (anthers, pollen) and female parts (stigma, ovary).

There are two ways pea plants can reproduce:

* **Self-fertilization**: The eggs are fertilized by its own pollen. (This is a form of sexual reproduction because it involves sperm and egg.)
* **Cross-fertilization**: The flower is fertilized by another plant’s pollen.

**(F0)**

**F0 (P) Generation:** The parental generation. In Mendel’s experiments, his F0 were always pure-breeding.

**F1 Generation:** The offspring produced by the F0 generation.

**F2 Generation:** The offspring produced by the F1 generation.

**Pre-Lab Questions**

1. If you take a purple-flowered pea plant and cross it with a white-flowered pea plant, what do you predict the offspring will look like?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. If you take two purple-flowered pea plants and cross them, what do you predict the offspring will look like?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Instructions**

1. Go to the animation link below, which can also be found on Ms. Au’s website. <https://www.newpathonline.com/api_player/enus_54_6208/2Lgdgi/index.html>
2. Click the “Learn More” link and watch the video 1-2 times until you have a good grasp of the ideas within.
3. Run the simulation 5x for each of the choices of parental crosses. Record your findings in Table 1 on the following page.
4. Use your Table 1 data to complete Table 2.

*Complete Table 1 using data collected from the simulation.*

|  |
| --- |
| **Table 1: Raw data collected from 100 crosses per generation for four different traits.** |
|  | **Experiment 1** | **Experiment 2** | **Experiment 3** | **Experiment 4** | **Experiment 5** |
|  | **F1** | **F2** | **F1** | **F2** | **F1** | **F2** | **F1** | **F2** | **F1** | **F2** |
| White flower | 0 | 8 | 0 | 3 |  |  |  |  |  |  |
| Purple flower | 20 | 12 | 20 | 17 |  |  |  |  |  |  |
| Green pod |  |  |  |  |  |  |  |  |  |  |
| Yellow pod |  |  |  |  |  |  |  |  |  |  |
| Wrinkled seed |  |  |  |  |  |  |  |  |  |  |
| Round seed |  |  |  |  |  |  |  |  |  |  |
| Tall plant (tip: has more flowers) |  |  |  |  |  |  |  |  |  |  |
| Short plant (tip: has fewer flowers) |  |  |  |  |  |  |  |  |  |  |

*Complete Table 2 using data from Table 1.*

|  |
| --- |
| **Table 2: Summary table** |
|  | **Total F1 Plants** | **% of F1 Plants** | **Total F2 Plants** | **% of F2 Plants** |
| White flower | How many F1 plants had white flowers? | Divide “Total F1 White-Flower Plants” by 100. | How many F2 plants had white flowers? | Divide “Total F2 White-Flower Plants” by 100. |
| Purple flower | How many F1plants had purple flowers? | Divide “Total F1 Purple-Flower Plants” by 100. | How many F2 plants had purple flowers? | Divide “Total F2 Purple-Flower Plants” by 100. |
| Green pod |  |  |  |  |
| Yellow pod |  |  |  |  |
| Wrinkled seed |  |  |  |  |
| Round seed |  |  |  |  |
| Tall plant |  |  |  |  |
| Short plant |  |  |  |  |

**Questions**

1. 1. Describe the overall pattern you observe in the F1 generation. What traits do the F1 individuals have? In what proportions?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Describe the overall pattern you observe in the F2 generation. What traits do the F2 individuals have? In what proportions?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. For experiment A, compare your F1 and F2 percentages with your classmates. Are they the same? Different? Why do you think this is?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Estimate the average F­1­ and F­2 percentages for white and purple flower crosses.

 F­1: \_\_\_\_\_\_\_\_\_\_% white flower and \_\_\_\_\_\_\_\_\_\_% purple flower

 F­2: \_\_\_\_\_\_\_\_\_\_% white flower and \_\_\_\_\_\_\_\_\_\_% purple flower

1. Compare your findings in this simulation experiment to your predictions on the first page of this activity. What, if anything, surprised you about your results from this simulation experiment?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_