

A Mendel Seminar: Teacher Sheet

Suggested Discussion Points

Please note: We encourage you to start the discussion with an opening question and then let your students lead the rest of the seminar. Below are some discussion points or questions to use as you see fit.

The numbers below coincide with the segments of the *Experiments in Plant Hybridization (1865)*, (<http://www.netSPACE.org/MendelWeb/Mendel.plain.html>) by Gregor Mendel. Each offers a “discussion paragraph,” and then a question. You can use one or the other, or both.

1. Introductory Remarks— Focus: Paragraph 4

What do you think Mendel means when he says: “It requires indeed some courage to undertake...this appears to be the only right way by which we can finally reach the solution...the history of the evolution of organic forms.” The interesting words here are courage, and “the only right way.” You may want to discuss whom he is trying to convince. Could it be the nonbelievers, or his peers, or the general public? Or is it that he has given this a lot of thought, and pea plants provide the most precise way to do this experiment? (Also keep in mind that this is a translation.)

2. Selection of the Experimental Plants—Focus: Paragraph 1

What are all of the considerations Mendel makes when selecting his plants? (Fitness of the plant, characteristics, protection from foreign pollen.) Why are these things important? Would the experiment have had different results without such considerations?

3. Division and Arrangement of the Experiments—Focus: Paragraph 2, last sentence

Is it good science to have a goal like Mendel does for his experiment? What are the goals and expectations Mendel has for his experiment? What are the expectations based on? Can you do an experiment without goals?

4. The Forms of Hybrids—Focus: Paragraph 2

Discuss dominant and recessive characters. What do Mendel’s hybrids look like? (You may want to direct students to look at the original list of plants that were cross-fertilized and compare it to the hybrid list. From this alone they should realize that the “hybrid-character resembles one of the parental forms so closely...”)

5. The First Generation From the Hybrids—Focus: Paragraph 1

What do the results of Mendel’s first generation show? Do you think the number of plants fertilized and used could change the outcome of the numbers?

6. The Second Generation From the Hybrids—Focus: Last paragraph

The conclusion of experiments one and two state that the ratio in all experiments is 2:1:1 if the dominant character is differentiated according to its significance as a hybrid-character or as a parental one. Discuss what this means. Though it is quite watered down, there is a summary of Mendel’s findings *at Mendel’s Discoveries* (<http://www.sonic.net/~nbs/projects/anthro201/disc/>) on the Pea Soup website that you can use as a reference.

7. The Subsequent Generations From the Hybrids—Focus Paragraph 2

Discuss Mendel’s labeling system when expressing the ratio in each generation. This is crucial for understanding his further experiments and conclusions, and it is pretty straightforward: A stands for a parental character of which there is one; a also stands for a parental character of which there is one; Aa is the hybrid form of which there are two.

8. The Offspring of Hybrids in Which Several Differentiating Characters are Associated—Focus 2nd to last paragraph

Discuss his experiment in general and its goals: that he starts to cross-fertilize with more characters in the pea plants to see what the trends in the offspring will be. “The offspring of the hybrids of each pair of differentiating characters are one-half hybrid again.” Discuss this statement written at the end of this section.

*** You may not cover all of this material in one class; however, right before the end of the period, be sure that students have expressed (and understand) the following:

- A discussion of at least the first two experiments and what they set out to prove, and what they did prove.
- How the information about hybrids and their characters supports natural selection.