



New plants from old

Worksheet 3 - The discoveries of Gregor Mendel

Johann Mendel was born on July 22, 1822 in Hyncice, Silesia, the Hapsburg Empire, Austria. His mother was Rosine and his father, Anton. He had two elder sisters, Veronica and Theresia.

When he was old enough, Johann went to the local school. His teachers soon realized his brilliance, and recommended him to a higher-level school, the “Gymnasium”, which was 36 kilometres from his home. The Mendels were poor, but they managed to scrape up some money for his tuition. He spent six years there, and graduated in 1840.

Johann wanted to continue his education, but his father was seriously injured by a falling tree, and wanted him to take over the farm for a while. Luckily, his sister Veronica had been married while he was at school, and her husband offered to take the farm for a while. His other sister, Theresia, offered him part of her dowry money so he could go to University. In turn, he agreed to put her children all the way through school.

In 1843 Johann entered a monastery to become a monk. As the tradition goes, he took a new name, Gregor.



Every morning, Gregor got up at six o'clock and went straight to the library to study. He studied theology, physiology, and natural sciences. He also taught 20 Latin, Greek, and mathematics classes a week to students at the monastery school.

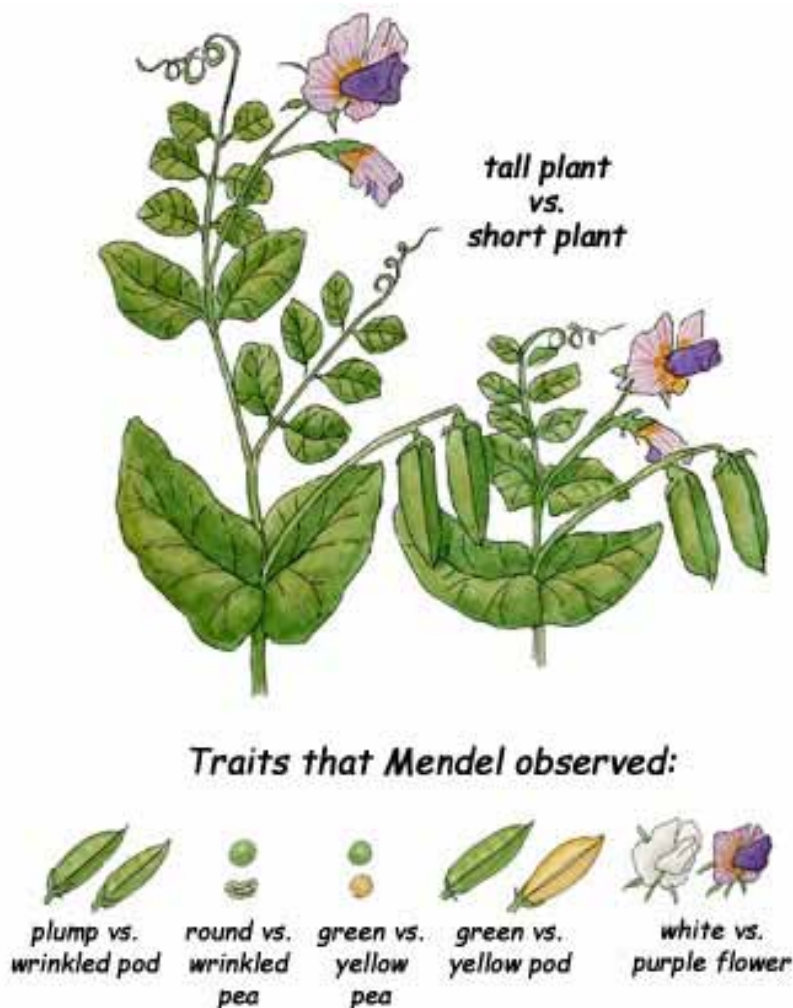


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The first experiments Mendel conducted used mice. He was interested in the inheritance of the color of the mice's coats.

Then Mendel began studying plants. He chose the common garden pea, of the genus *Pisum*, to experiment on. First he chose seven characteristics to look at: the position of the flowers on the stem, the stem length, the colour of the unripe pod, the shape of the ripe seed, the color of the seed coat, the shape of the ripe pod, and the color of the ripe seed.



Then he planted his first generation of peas and watched them grow. For two years he kept planting the seeds to make sure they were pure breeding, that is, they always produced offspring that had the same characteristics as their parent plants – this was the first clever bit (know what you are 'starting with'). Then he "began" his experiments.

The first of the experiments that he conducted cross pollinated plants with round seeds and plants with wrinkled seeds. The resulting plants produced all round seeds! The next year he grew plants from these round seeds and produced more seeds. This time there were 5474 round seeds and 1850 wrinkled seeds, making a 3:1 ratio of round to wrinkled seeds.



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Mendel was fascinated! It seemed that the wrinkled trait, which seemed to have disappeared in the first generation of offspring, reappeared in the second generation. He called the round trait “dominating” and the wrinkled trait “recessive.”

Mendel repeated the experiment with the other six characteristics and got the same 3:1 ratios.

<p>Not sure what this means?</p> <p>Don't worry - you will be able to work it out on the next page.</p>	<p>By 1863, Mendel's experiments with peas were finally complete. He didn't know that he was studying what we now know as genes , but he knew that every plant had two factors that determined its appearance for a particular characteristic, one inherited from each parent. He learned that these factors could be dominant or recessive, and that when a plant inherited both a dominant and a recessive factor, the recessive factor was masked but could reappear in a later generation.</p>
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In 1865 Mendel gave two lectures about his experiments, but he used formulas no one understood, and confused his audience. His results were published the following year but few people seem to read them. His work was almost forgotten for the next 30 years.

In 1900 three biologists, Carl Correns, Hugo de Vries, and Erich Tschermak, working independently, rediscovered Mendel's principles of inheritance. They were dismayed to find that a mere monk, who had died 15 years earlier, had already published their discoveries.

Today Mendel's work is world-renowned and has inspired generations of modern geneticists. He is considered by many as the Father of Genetics.

Adapted from In the Glasshouse - The Life and Discoveries of Johann “Gregor” Mendel

By Beth Cruzan

1. Use an atlas to find out which country Hyncice is in now. What is its approximate population?
2. How did his family help his education? How did he help them back?
3. His name was 'Johann'. Why do we call him 'Gregor'?
4. Underline the seven features or characteristics of peas that he was studying.
5. Why do you think peas would be a good plant to study?
6. What was he trying to discover through his breeding experiments?
7. What did he discover? (You may need to look at the next Worksheets to understand this.)
8. Why was he not famous at the time?
9. Why is he famous now?