

Thème 1 - La Terre dans l'Univers, la vie, l'évolution du vivant
1-A – Le brassage génétique et sa contribution à la diversité génétique.

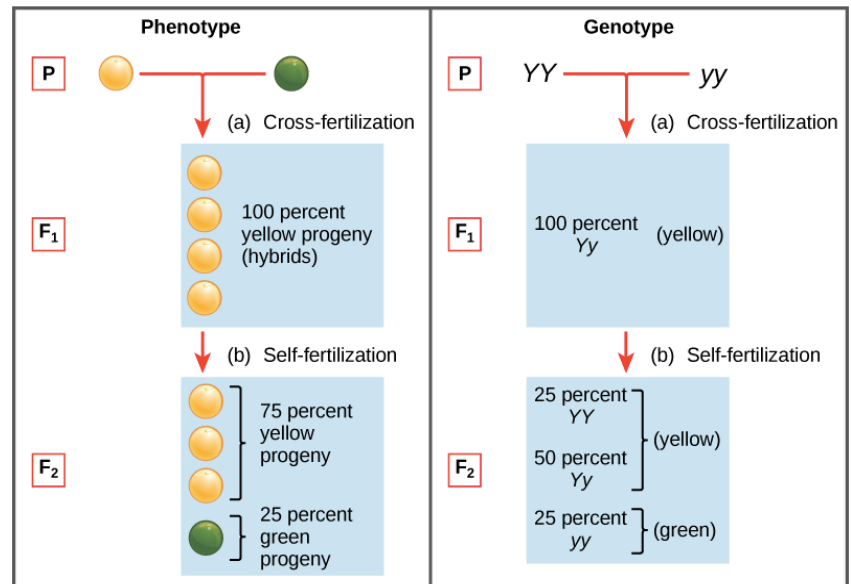
Mendel and Darwin

With the help of the documents and of your scientific knowledge, explain how Mendel's work could have helped Darwin and why it didn't.

Document 1:

Gregor Mendel (1822-1884) was a monk living in what is now the Czech Republic. He had access to an experimental garden in which he could breed "true" lines of pea plants and patiently wait for them to crossbreed in specified combinations. To explain his results, Mendel coined¹ the terms "recessive" and "dominant" in reference to certain traits. He published his work in 1866, demonstrating the actions of invisible "factors"—what we now call genes—in providing for visible traits in predictable ways.

<https://history.nih.gov>



Document 2:

As a scientist, biologist, author and amateur historian, I have often been struck by the ironies of scientific discovery. Here is one of them, it concerns Darwin (1809-1882) and the natural selection.

One of the most serious difficulties facing Darwin and his mechanism for evolutionary change was the lack of an adequate mechanism to explain inheritance. An inheritance mechanism was crucial as it provided the variations on which natural selection was supposed to act.

Darwin was not unaware of this problem, and at various times subscribed to a number of different theories. One popular theory at the time was "blending² inheritance" which proposed that offspring³ were merely an average between the two different characteristics of their parents. But, as Darwin soon realized, blending inheritance had its problems: in a few generations, the original variation would be reduced to some average of the starting characteristics.

Of course, the vital missing link in Darwin's mechanism could be filled using Mendelian genetics. Darwin had just published his book "On The Origin of Species" as Gregor Mendel was starting to publish the results of his experiments and the clear lesson from this work was that characteristics do **not** mix or blend but segregate in the formation of the sex cells, or gametes.

Mendel's work and his discoveries, however, remained unknown to Darwin and, indeed, did not become generally known until 1900. Here is the irony. Darwin's library at Down House contains one book among many others. This book is a collection of abstracts⁴. On each page a current scientific paper is summarized in a single side. Darwin has obviously read and re-read one particular page. On the opposite, facing page, is a summary of Mendel's work. The solution to Darwin's biggest problem was right there and he must have stared at it a dozen times, but he never saw it. Even the greatest minds have their blank spots.

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1: created; 2: mixing; 3: descendance; 4: summary of text.