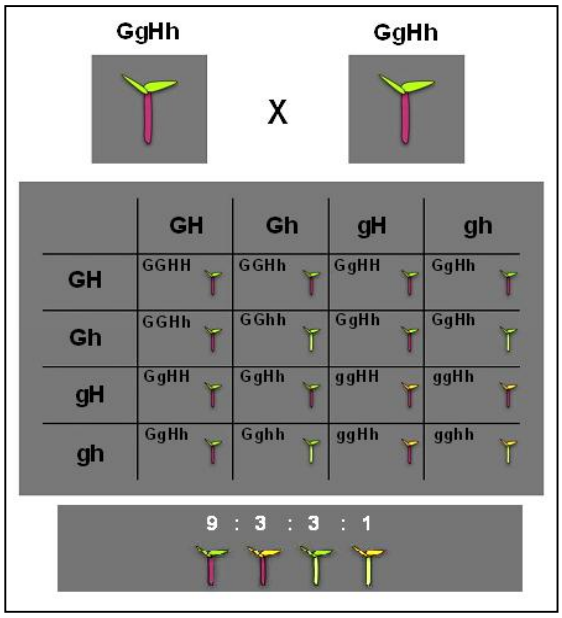
Teaching Mendelian genetics

EU-SOL Tomato Seeds are a FREESCHOOLS RESOURCE funded by the European Union which help school pupils learn about genetics. The possibility of continuing this successful program is now investigated.

In 2010 Nunhems Zaden agreed to produce packages, each of them containing 100 tomato seeds for EU-SOL that can be grown by school pupils, demonstrating the principles of Mendelian genetics. The seeds have been distributed to 340 schools (9,860 students) in 19 countries.

The seeds are produced by crossing two naturally occurring mutants:

- a mutant with a recessive trait where its cotyledons (seed leaves) are golden rather than green. Let's say this mutation is controlled by the recessive gene g. Its purple hypocotyl is pure breeding dominant (HH).
- a mutant with a recessive trait where its hypocotyl has no purple in it whatsoever and is light green. Let's say this mutation is controlled by the recessive gene h. Its green cotyledons are pure breeding dominant (GG).

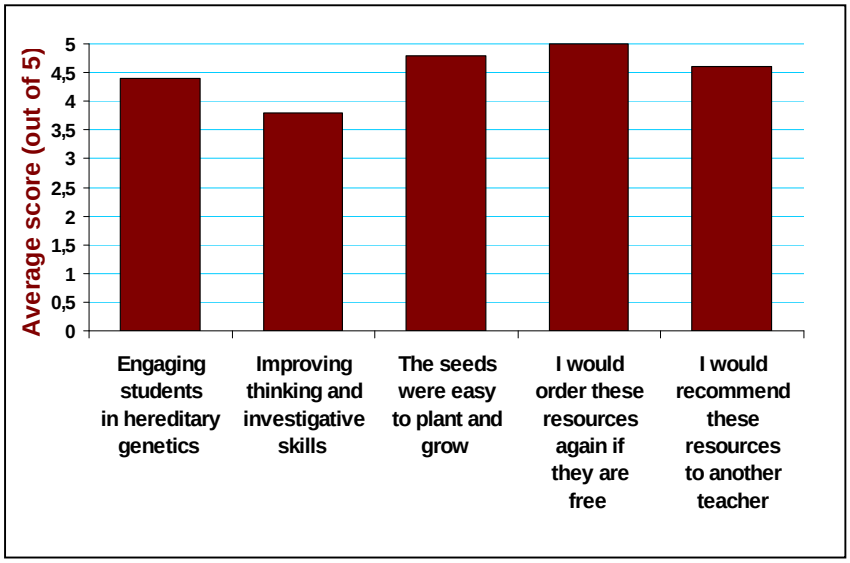


Crossing these mutants (ggHH x GGhh) results in a population of plants with green cotyledons and purple hypocotyls (all GgHh). In the class room these seeds are then grown and self-fertilized, resulting in a mixed population of:

1. plants with green cotyledons and purple hypocotyls,
2. plants with green cotyledons and light green hypocotyls,
3. plants with golden cotyledons and purple hypocotyls, and
4. plants with golden cotyledons and light green hypocotyls

in a 9:3:3:1 ratio typical for Mendelian genetics.

All that is needed for the experiment is a tray to grow the seeds in, a bit of soil and EU-SOL tomato seeds. A website www.eu-soltomatoseeds.com/ provides a number of resources on teaching the effect of linkage, downloadable worksheets with simple instructions (how to grow), explanation (Mendelian genetics) and even a template for a Chi-squared test, films and images, and an online spreadsheets that enables pupils to compare their results with those from other schools.



Teachers from participating schools have been asked to fill in evaluation forms. The results show a high degree of satisfaction, which makes it worthwhile to continue distribution of this schoolpack, provided that the resources remain free.

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