BIOLOGY

GENETIC BREEDER

Brief summary of activity:

In this genetics simulation, the user is presented with a sweet pea with the following appearance criteria: Flower Colour (pink or white), Pea Colour (yellow or green), Pea Shape (smooth or wrinkled), Pod Shape (smooth or constricted) and Stem Length (tall or short). The user has to arrive at the target outcome within a certain number of generations. Advanced levels require more appearance characteristics to be met.

Specific Curriculum Area:

Year 9 - Unit 9A: Inheritance and selection, Section 8: a. How are new varieties of plant produced? Section 9: b. How are new varieties of plant produced?

Assessment method:

The pupil could manually record the number of matches made, the number of generations taken and the number of characteristics matched.

Differentiation:

The pre-activity tutorial explains what is expected of the pupil. A pop-up genetic chart ensures that the pupil knows the significance of each symbol.

Learning objectives:

Children should learn: that plant breeders select healthy plants with particular characteristics to breed from; that fertilisation of an ovule by a pollen cell produces a new individual; to suggest how selective pollination could be brought about.

Use of Activity in a lesson:

This task could be set as a homework activity, assuming Internet access is possible. Alternatively, the teacher could demonstrate the task to the class (via an Interactive Whiteboard) and the pupils could then repeat the first level as shown by the teacher, thereafter trying levels on their own.

Hints and tips for teachers:

1. Tell pupils not to get frustrated if they do not succeed until having had many attempts—encourage trial and error.
2. A pop-up box explains the significance of each gene characteristic—use this to help you make choices.
3. A box at the bottom of the screen gives advice to the user about how to meet the required solution.

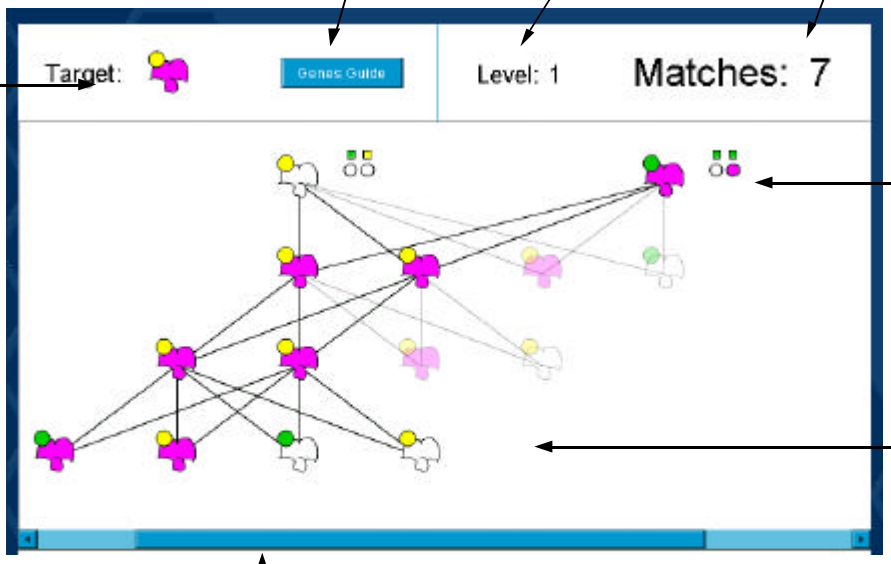
URL:

Clicking here makes this pop-up genetic guide appear

Level of task — each new level becomes more complex

Number of sweet peas the user has made so far

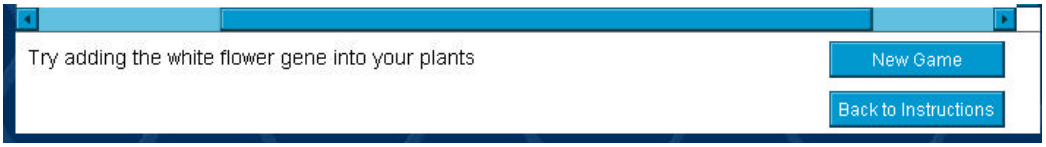
This is the target sweet pea cross you are required to match



First generation

Latest generation

Underneath the window displaying the generations, a helpful window appears which guides the user towards the solution.



Troubleshooting:

Other links:

http://www.standards.dfes.gov.uk/schemes2/secondary_science/sci09a/09aq7a
http://www.standards.dfes.gov.uk/schemes2/secondary_science/sci09a/09aq7b