

How to engineer cotton

The process of modifying the genes of an organism nearly always involves a common set of steps:

- a feature to be introduced into an organism is identified;
- a gene that controls the identified feature is located;
- the gene that controls the new feature is isolated and made ready for insertion into a new cell;
- the new gene is put into the DNA of cells of the organism to be changed; and
- the genetically modified cells are cultured.

A gene that produces an insecticide exists in *Bacillus thuringiensis*, a soil bacterium. The gene is usually referred to as the Bt gene.

At the end of this activity you will:

- know that cotton has been genetically modified to produce an insecticide;
- understand the steps that scientists usually follow to produce genetically engineered cotton.

You will need:

- access to the internet
- access to the information on cotton from *Biotechnology online*.

Biotechnology Online School Resource

Increasing the public's general awareness of biotechnology and its uses, through the provision of balanced and factual information explaining the technology, its applications, and regulations to safeguard people and the environment.

For further information contact the Gene Technology Information Service on freecall **1800 631 276**.

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What to do:

1. Work with a partner.
2. Research the use of *Bacillus thuringiensis* as a source of an insecticide gene. Summarise the process that is used to:
 - cut the Bt gene from the bacterial cell;
 - implant the gene into cotton cells; and
 - grow the cotton cells into mature plants.

What to do with your information:

1. Display your information as a flow chart. These charts consist of:
 - a box for each stage of the process where an action take place;
 - arrows that connect each box indicating the direction of the process; and
 - input and output boxes, connected with the arrows between the process steps, that show anything that is added to or removed from the process.

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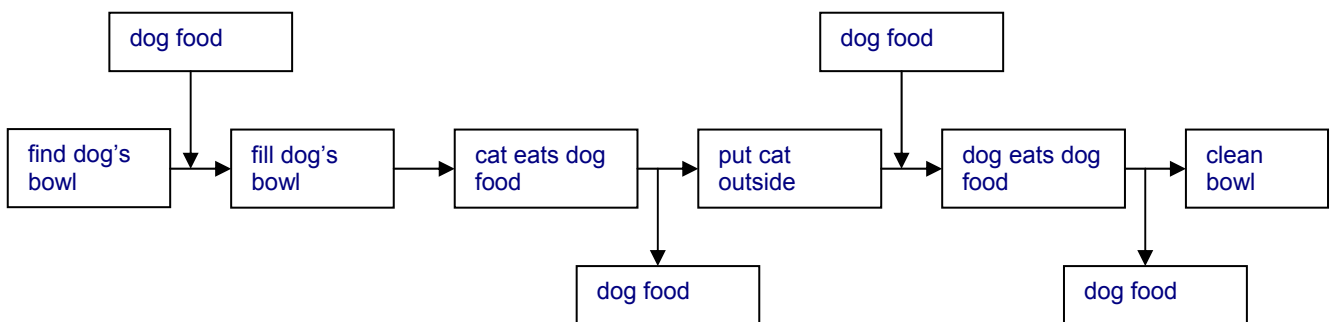
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Preparing a flow chart

- You might find it useful to write each step, input and output onto small rectangles of paper and to position these until the steps are in the correct order.
- Draw up the flow chart using a word processing package using text boxes and arrows.
- Here is an example:



Useful resources

CSIRO - Gene Technology: How is it Done?
<http://genetech.csiro.au/how2.htm>

CSIRO - Current research
<http://genetech.csiro.au/research/index.htm>

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