

45.1 Deep Dive – Genetics

Biology

Summarize main points from each video.

Video Title / topic

Video Title / topic

Video Title / topic

Topic Introduction



Summarize your understanding of each paragraph.

Genetic engineering is the deliberate modification of the characteristics of an organism by manipulating its genetic material. Genetic engineering, sometimes called genetic modification, is the process of altering the DNA - in an organism's genome.

The term genetic engineering initially referred to various techniques used for the modification or manipulation of organisms through the processes of heredity and reproduction.

As such, the term embraced both artificial selection and all the interventions of biomedical techniques. Examples of these biomedical techniques were artificial insemination, and in vitro fertilization.

More recently the term refers more specifically to methods of recombinant DNA technology (or gene cloning). This is when DNA molecules from two or more sources are combined either within cells or in vitro.

Read/Summarize Text



1. Read the passage.
2. Underline key expressions in each sentence.
3. Re-write each word (or expression) you underlined.
4. Summarize the passage.

Overview of the Process of Plant Genetic Engineering.

1

What are the 5 steps of genetic engineering?

2

This method is also more specific in that a single trait can be added to a plant. The process of genetic engineering requires the successful completion of a series steps.

Step 1: DNA Extraction. ...

Step 2 : Gene Cloning. ...

Step 3 : Gene Design. ...

Step 4 : Transformation. ...

Step 5 : Backcross Breeding.

<http://agbiosafety.unl.edu/education/summary.htm>

Re-write words you underlined

3

Using a complete sentence, summarize or rephrase the passage

4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

How does genetic engineering work?

To help explain the process of genetic engineering we have taken the example of insulin, a protein that helps regulate the sugar levels in our blood. Normally insulin is produced in the pancreas, but in people with type 1 diabetes there is a problem with insulin production.

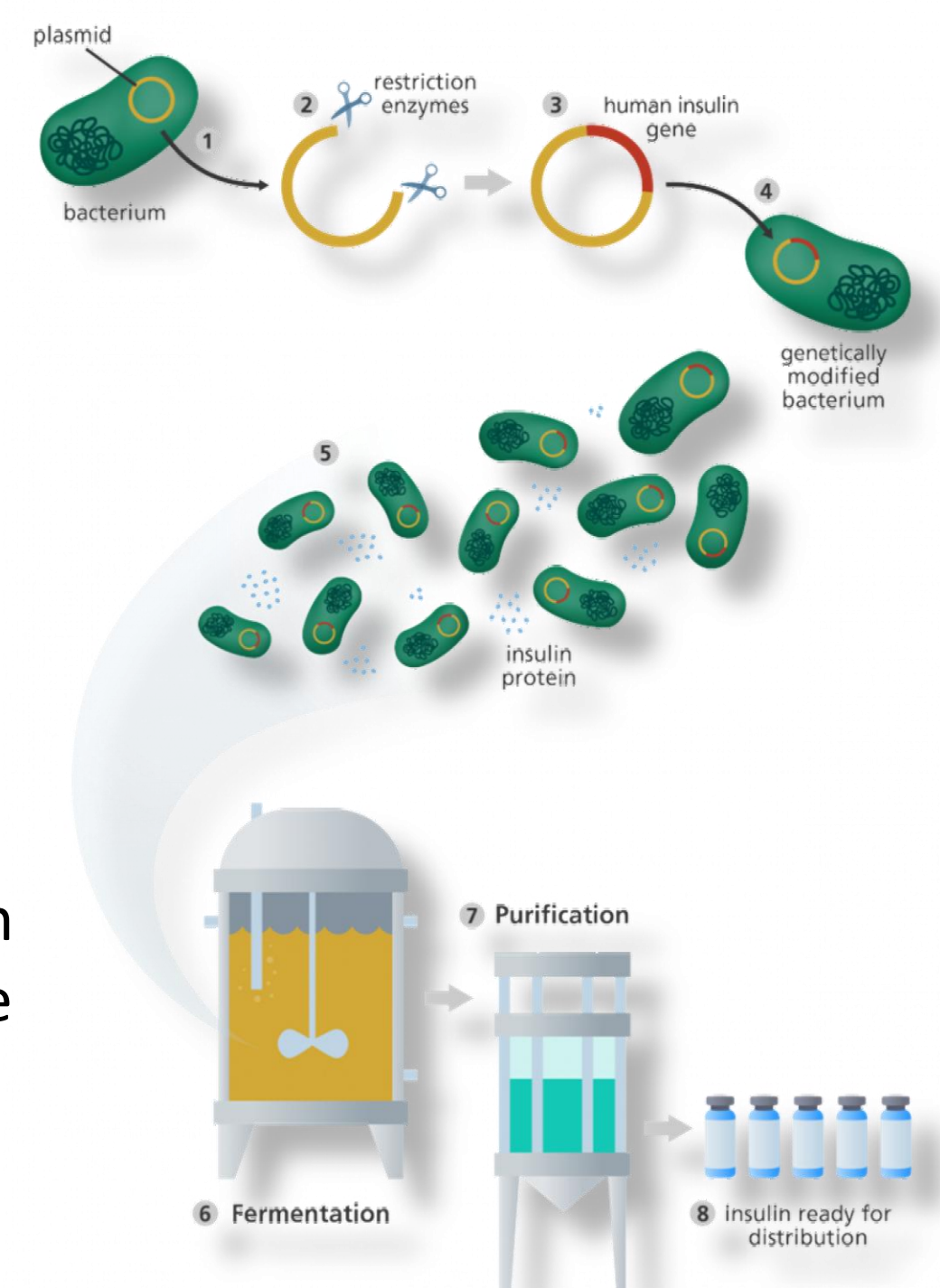
People with diabetes therefore have to inject insulin to control their blood sugar levels. Genetic engineering has been used to produce a type of insulin, very similar to our own, from yeast and bacteria like E. coli.

This genetically modified insulin, 'Humulin' was licensed for human use in 1982.

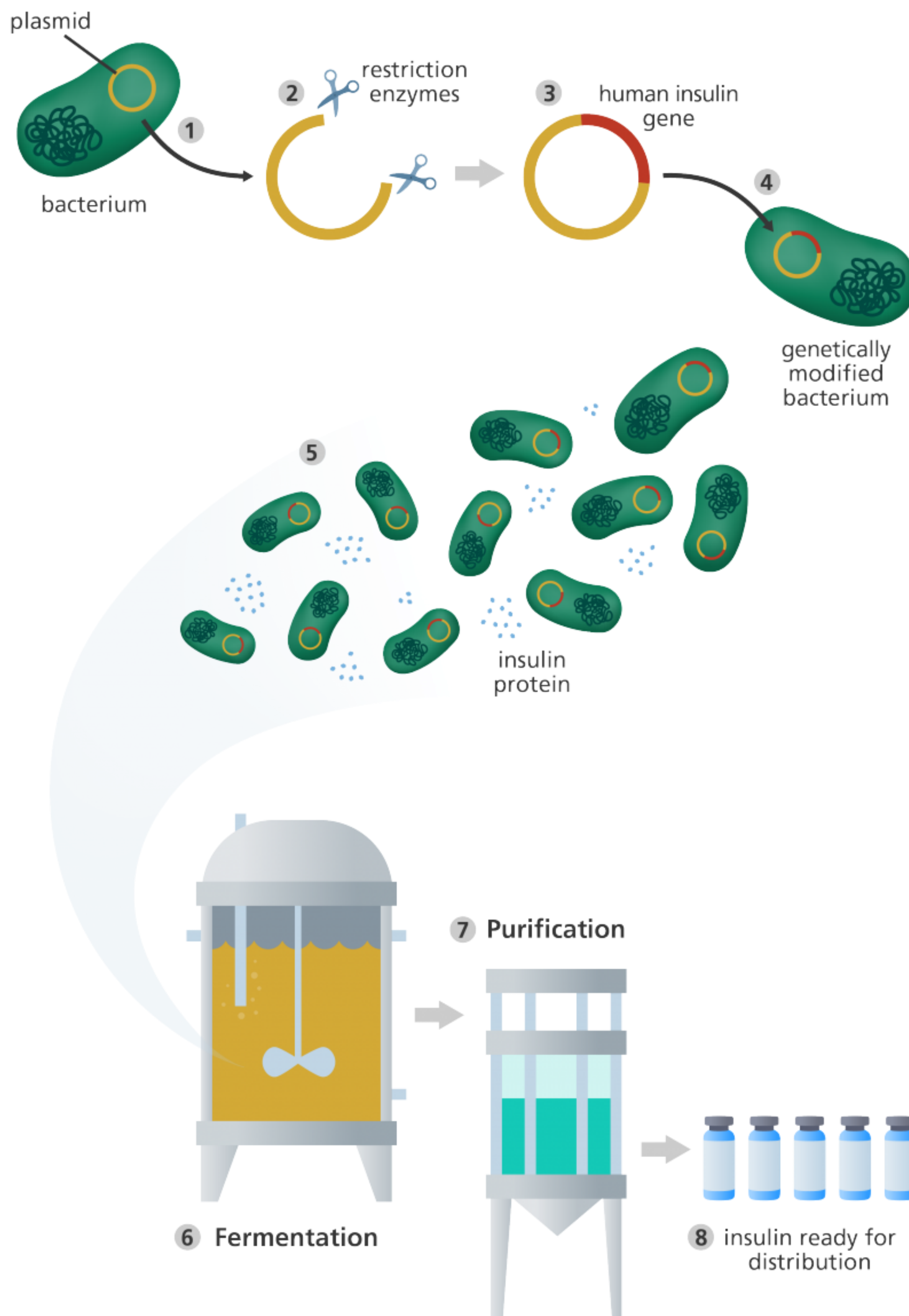
<https://www.yourgenome.org/facts/what-is-genetic-engineering>

The genetic engineering process

1. A small piece of circular DNA called a plasmid is extracted from the bacteria or yeast cell.
2. A small section is then cut out of the circular plasmid by restriction enzymes, 'molecular scissors'.
3. The gene for human insulin is inserted into the gap in the plasmid. This plasmid is now genetically modified.
4. The genetically modified plasmid is introduced into a new bacteria or yeast cell.
5. This cell then divides rapidly and starts making insulin.
6. To create large amounts of the cells, the genetically modified bacteria or yeast are grown in large fermentation vessels that contain all the nutrients they need. The more the cells divide, the more insulin is produced.
7. When fermentation is complete, the mixture is filtered to release the insulin.
8. The insulin is then purified and packaged into bottles and insulin pens for distribution to patients with diabetes.



Summarize this Process

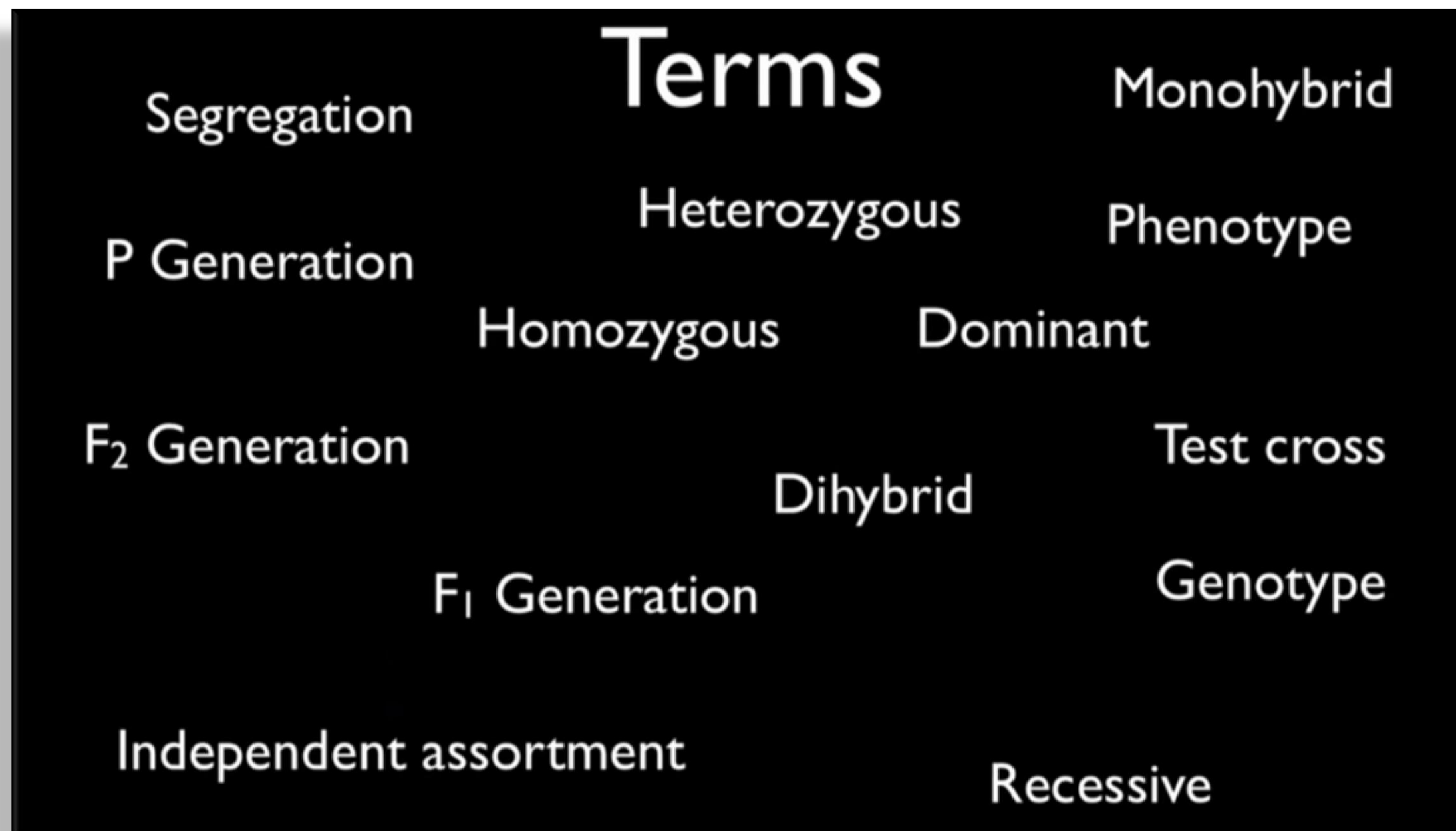


Summarize here ...

Draw Illustration



Copy and Label the Illustration in the Space Provided



<https://www.youtube.com/watch?v=ya7h-Y-9l8c>

Draw (Copy) the Illustration Here

Show-Off Your Smarts!

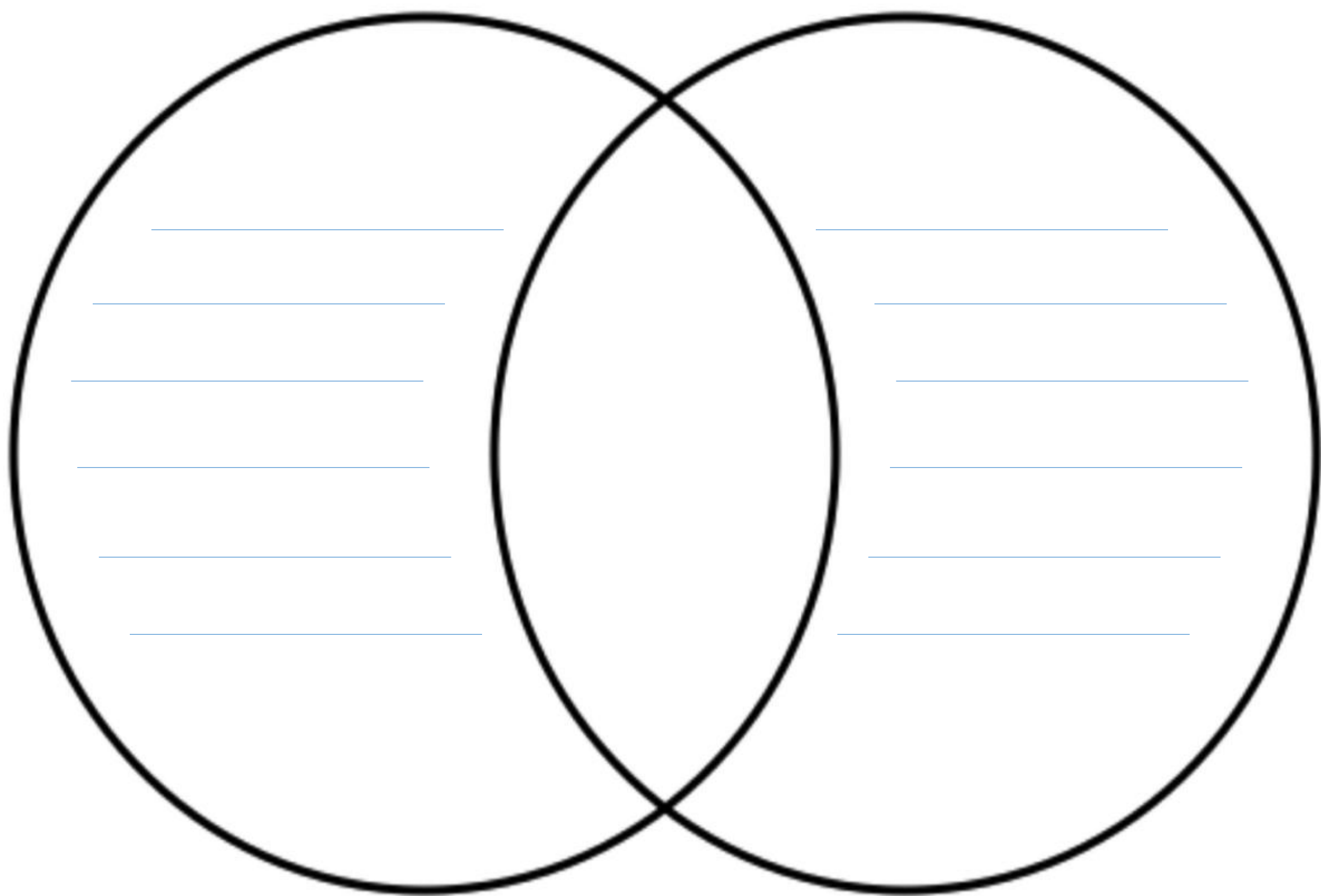


Instructions

- Complete as an individual or small group.
- Discuss your ideas/answers/responses in a small group.
- Select one person to present your responses to the class.

Genetic Engineering

Natural Selection




Your opinion ... defend why or why not ...

We should continue to emphasize genetic engineering technologies ...

Make a Poster


In the space provided here, illustrate genetic engineering concepts through the use of four diagrams suggested.

Process




Process

Pyramid



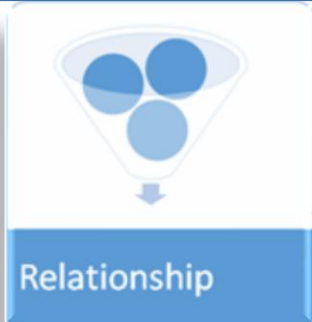
Pyramid

Hierarchy



Hierarchy

Relationship



Relationship