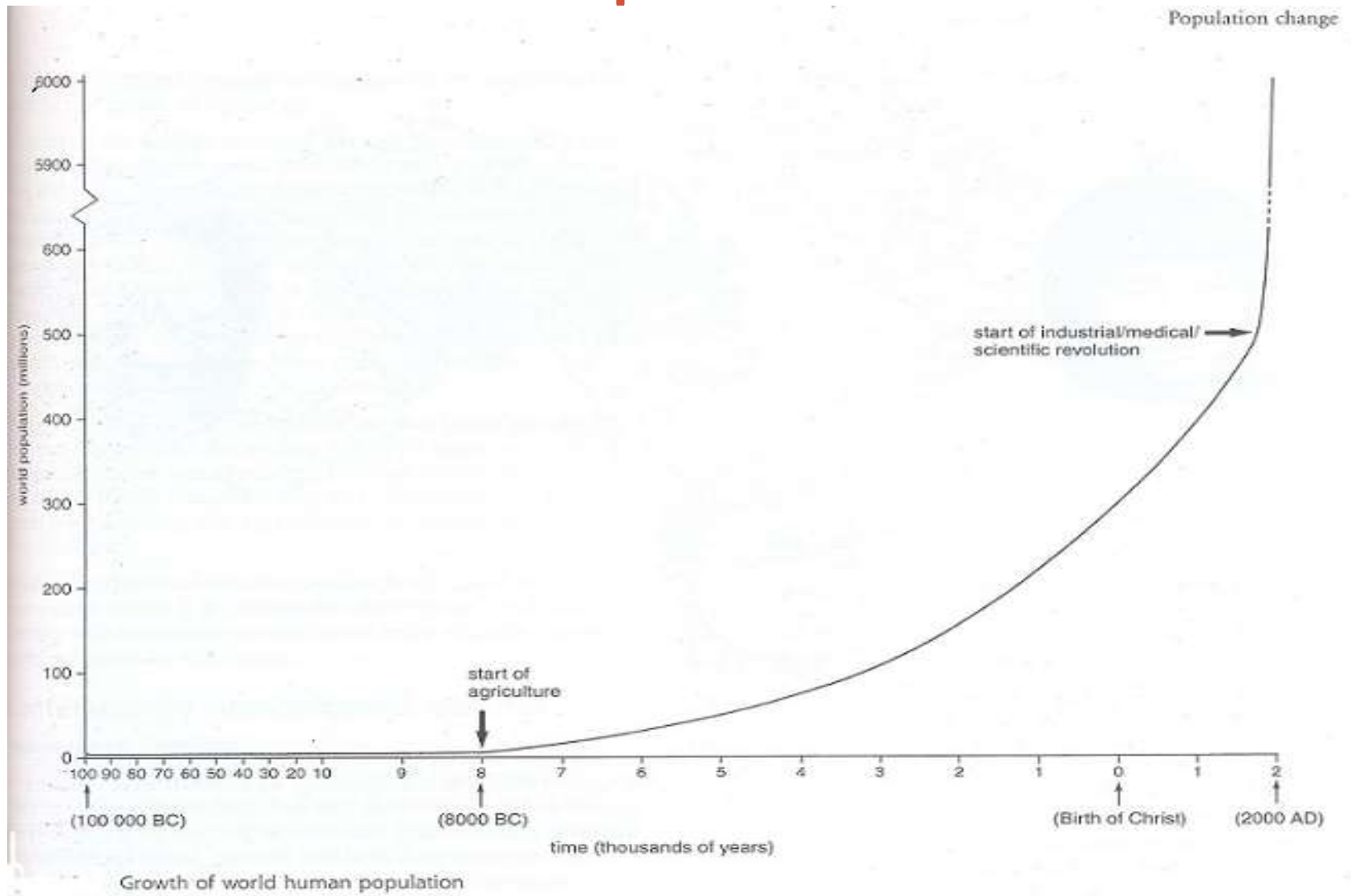


Increasing Human Population

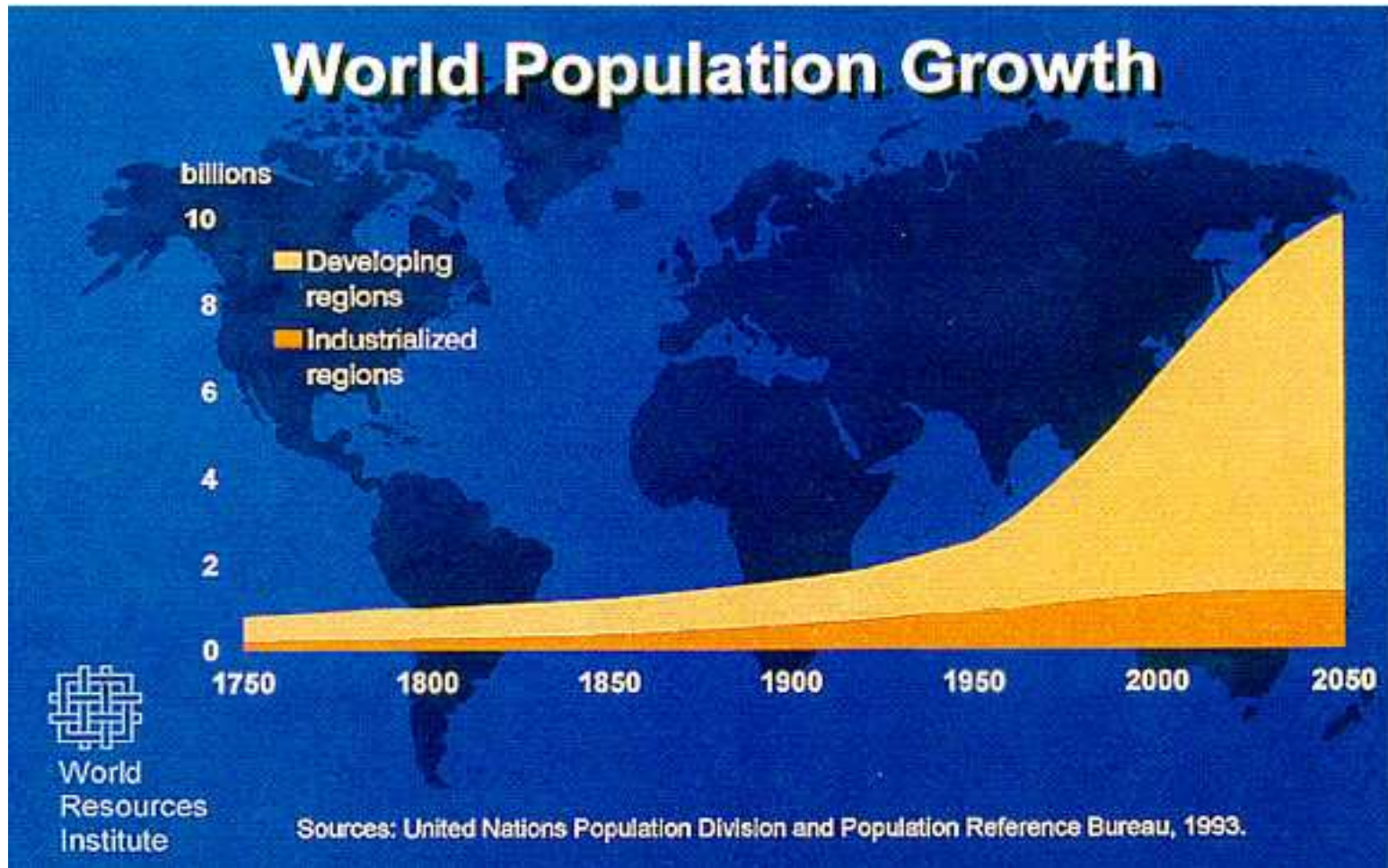
- Learning Outcomes

- To describe the changes in the human population over the last 200 years.
- To state the need for increasing quantities of food in the world
- To explain the methods of farming used to increase the quantities of food for an increasing world population

World Human Population



World Population Growth



World Population



Factors affecting Population Size

- The net effect of BIRTH RATE : DEATH RATE
- Immigration
- Emigration
- Availability of food
- Disease (Health)
- Environmental conditions
- Fertility rates
- Education
- Political
- Cultural

Factors affecting Population Size

Cause	Reason
Health	The control of disease, birth control measures, infant mortality rates, diet, malnutrition, numbers of medical staff, sanitation
Education	Health education, age of school leavers, literacy levels, levels of tertiary education
Social provision	Levels of care for elderly, clean water supply
Cultural factors	Religious attitudes to birth control,
Political factors	Access to healthcare, economic strength, wars
Environmental factors	Frequency of natural disasters

Factors affecting Population Size



Exercise

- 1 Give THREE factors that could limit the growth of a population and stop them growing indefinitely.
- 2 Approximately when did the first major 'spurt' in human population size occur.
- 3 Until this time what factor in particular had limited population growth ?
- 4 Approximately when did the second major 'spurt' in human population size occur ?
- 5 What name is given to the time in history when humans began to benefit from scientific discoveries and inventions ?

Increasing Food Demand

period of time	average life expectancy of European male (years)
8000–3000 BC	18.0
800–1600 AD	31.0
1600–1700 AD	33.5
1700–1800 AD	35.3
1800–1900 AD	37.0
around 1910 AD	57.4
around 1950 AD	66.5
around 1990 AD	74.0
2000 AD onwards	?

Average life expectancies

Methods of Farming

Monoculture

There are two distinct definitions of monoculture:

- ***Scientific definition*** – vegetation composed of a single species
- ***Agricultural definition*** – a field composed of a single crop rather than multiple crop species

Monoculture



Monoculture

Advantages	Disadvantages
Reduced plant competition	Limited number of habitats for plants and animals
Control of pest organisms	Habitats not permanent due to crop being grown changing
Reduction of costs	Reduction in the number of many wild animal and plant species
Greater profit for farmer	

Intensive Farming

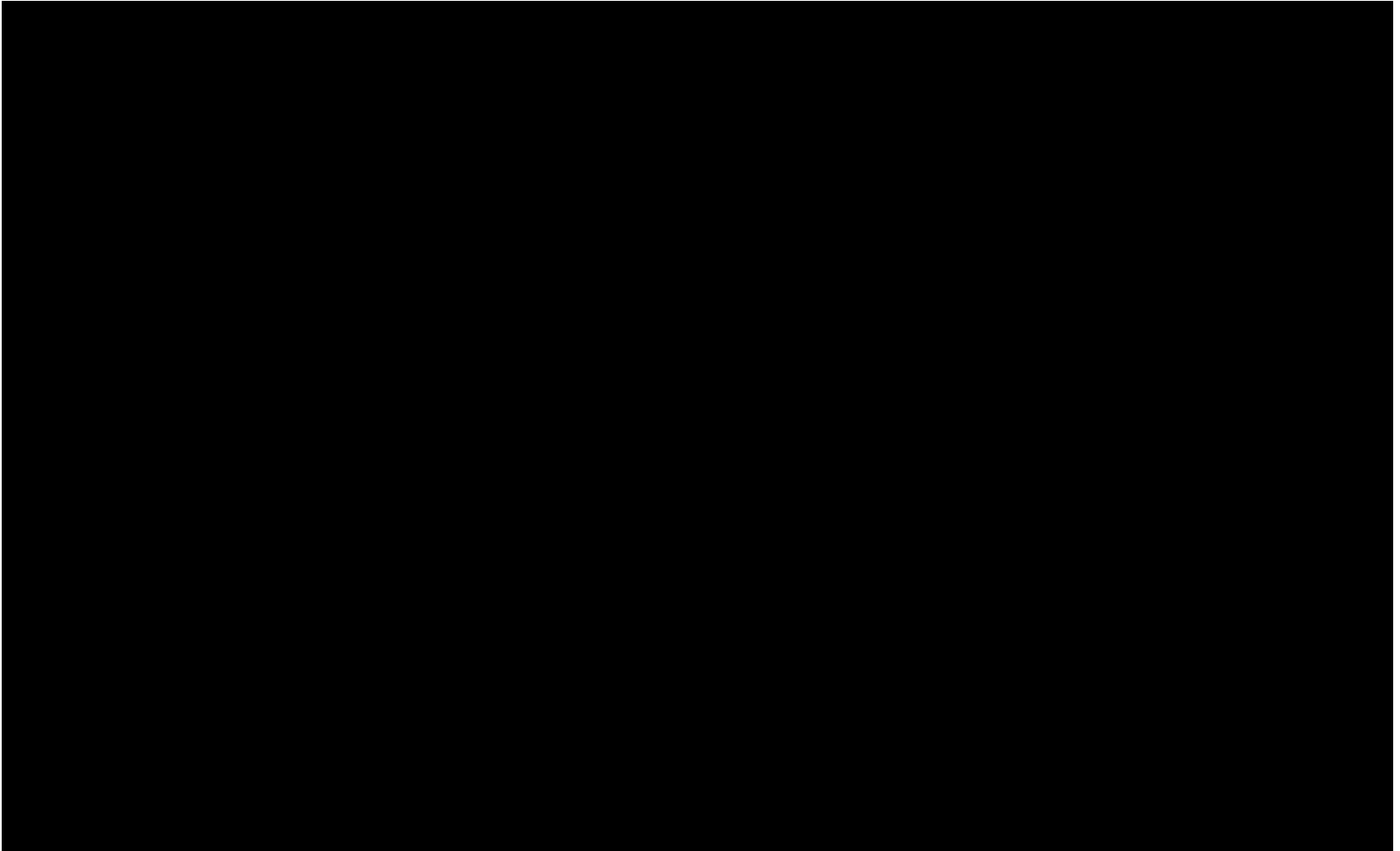


Fish Farms



Tomato Growing

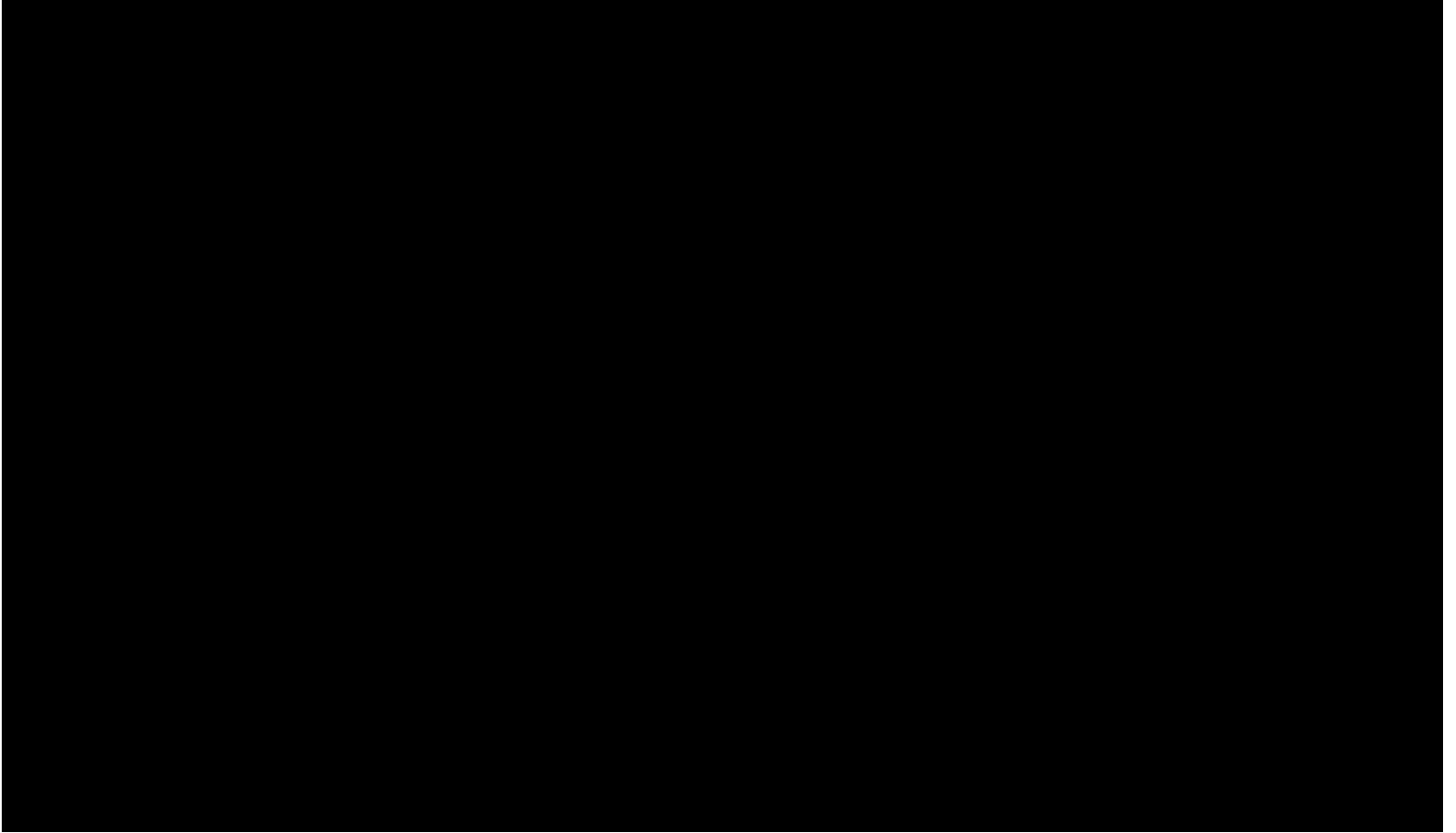
Intensive Farming



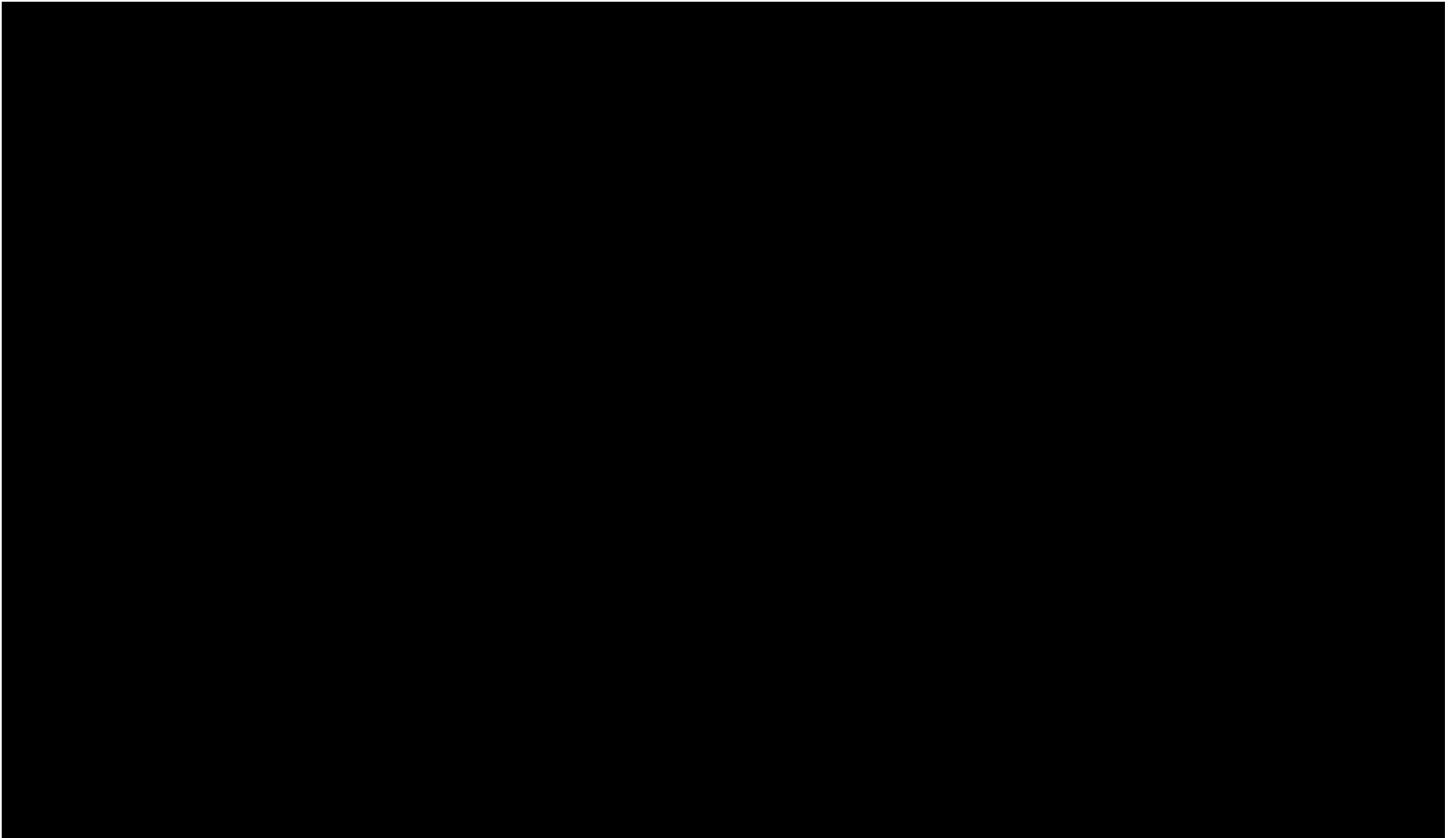
Intensive Farming

Action	Treatment	Explanation	Side Effect
Remove competing plants from the crop growing area	Herbicide spray	Allows more energy to be transferred to the crop	Reduces biodiversity. May have harmful effect on health
Remove animals that feed on the crop	Pesticide spray	Prevents energy being transferred from the crop to consumers	Reduces biodiversity. May poison helpful organisms
Keep animals indoors	'Battery farming'	Reduces energy transferred to environment so more energy available for growth	Increased risk of disease. Lower quality product. Ethical concerns

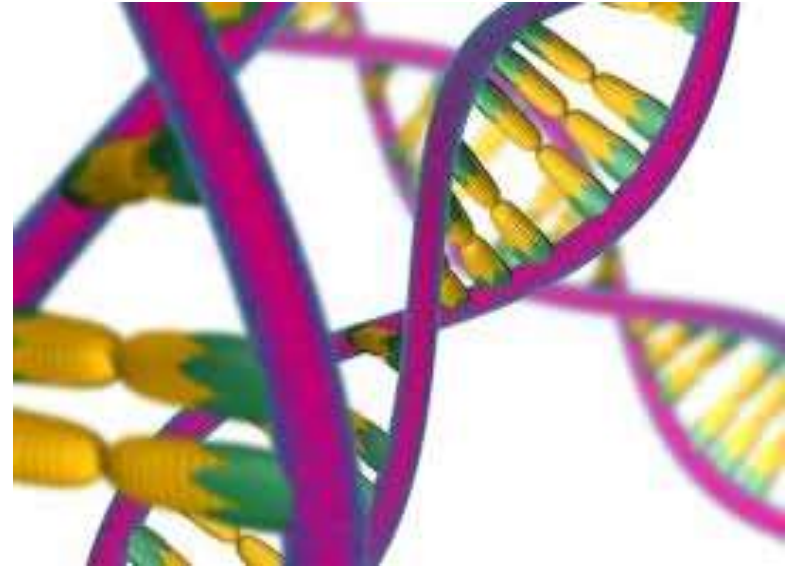
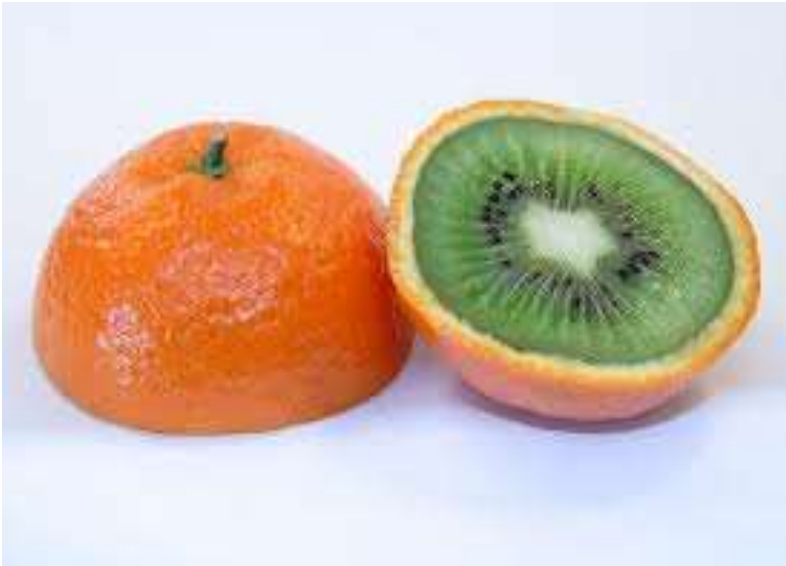
GM Crops



GM Crops



GM Crops



Genetically modified - DNA altered, changed

Advantages of Genetically Modified(GM) Crops

- Higher crop yield
- More fruit per plant
- Resistance to pesticides and diseases
- Extend shelf-life

Examples

- The anti-freeze gene, found in a species of fish called a Flounder, can be spliced and inserted into strawberries or tomatoes

Animal \longrightarrow Plant
 ▲ (reprogrammed)

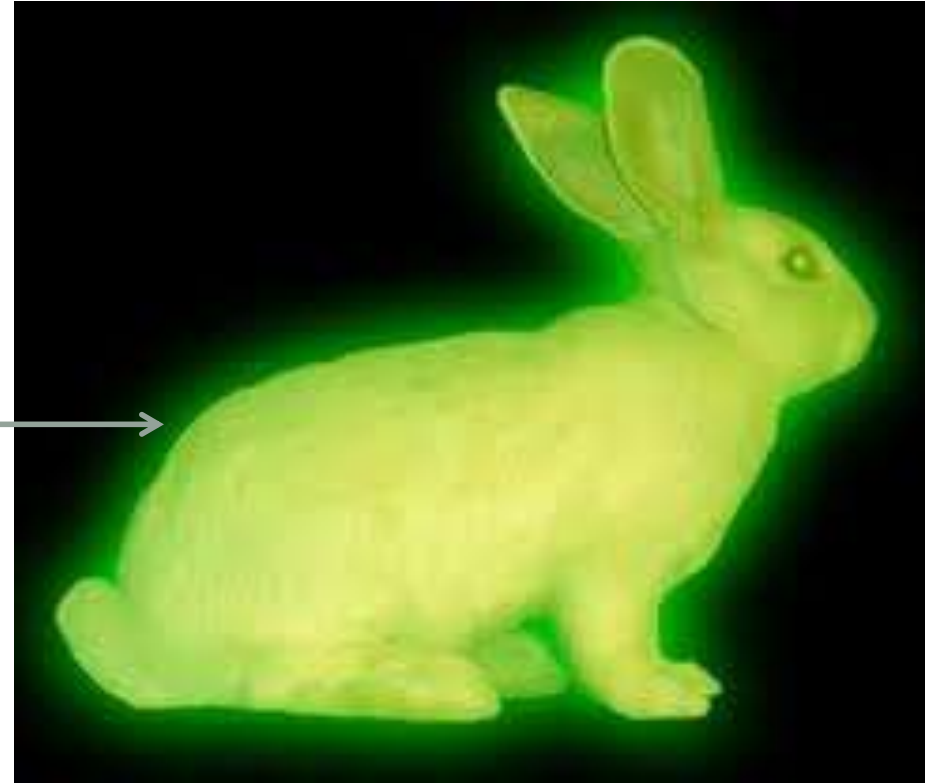


- An insect-killing toxin gene, found in a bacterium, into maize, cotton or Rape seed.

Microbe \longrightarrow Plant
 (reprogrammed)



Bioluminescent



GM Crops

- In preparing your notes for GM crops, consider drawing a table showing the advantages and disadvantages e.g.

GM Crops	
Advantages	Disadvantages

Methods of Farming

- Make notes on;
- Monoculture
- Intensive farming
- GM Crops

Success Criteria

- State 3 factors that can limit the growth of a population
- Explain the changes in the human population in the last 200 years
- Recognise the need for greater food production for humans
- Describe methods of farming used to meet these increasing demands