

BIOLOGY

Learning objectives I can:	I can do this very well	I can do this quite well	I need to do more work on this
3.1 Describe biotechnology as the alteration of natural biomolecules using science and engineering to provide goods and services			
3.2 Describe a fermenter as a vessel used to cultivate microorganisms for the production of biomolecules on a large scale			
3.3 Explain the need to supply suitable conditions in fermenters, and the effect they have on growth including:			
a aseptic precautions			
b nutrients			
c optimum temperature			
d pH			
e oxygenation			
f agitation			
HSW 5 Plan to test a scientific idea, answer a scientific question, or solve a scientific problem by controlling relevant variables			
3.4 Investigate the effect of factors on the growth of yeast, including pH			
3.5 Explain the advantages of using microorganisms for food production, including:			
a rapid population growth			
b ease of manipulation			
c production independent of climate			
d use of waste products from other industrial processes			
3.6 Describe how mycoprotein is manufactured, including the role of the fungus <i>Fusarium</i> sp.			
3.7 Explain the advantages of using mycoprotein as a food source			
HSW 13 Describe the social, economic and environmental effects of decisions about the uses of science and technology			
3.8 Describe how bacteria are used in the production of yogurt from milk by the conversion of lactose to lactic acid			
3.9 Investigate the effect of different factors on yogurt making.			
3.10 Describe the use of enzyme technology including:			
a chymosin, produced by genetically modified microorganisms, used in the manufacture of vegetarian cheese			
b invertase (sucrase) produced by <i>Saccaromyces cerevisiae</i> (yeast), used in the manufacture of sweets			
c enzymes used in washing powders			
H 3.13 Explain recombinant DNA technology using insulin as an example, including:			
a restriction enzymes			
b ligase			
c sticky ends			
HSW 12 Describe the benefits, drawbacks and risks of using new scientific and technological developments			
3.11 Investigate the use of immobilised lactase to produce lactose-free milk.			
3.12 Investigate the use of enzymes in food production.			
3.14 Demonstrate an understanding of the impact of human population growth on global food security			
3.18 Explain how increased food production for humans includes:			
a conventional plant breeding programmes			
b pest management strategies			
c genetic modification			
H 3.19 Demonstrate an understanding of the advantages and disadvantages of replacing fossil fuels with biofuels, including the facts that biofuels are renewable and that their production uses carbon dioxide but that growing the crops to make them requires land and may affect the availability of land for growing food			

B3 Topic 3 Revision tracker

HSW 12 Describe the benefits, drawbacks and risks of using new scientific and technological developments			
3.15 Describe the use of <i>Agrobacterium tumefaciens</i> as a vector in creating transgenic plants			
H 3.16 Demonstrate an understanding of the advantages and disadvantages of introducing genes for insect resistance from <i>Bacillus thuringiensis</i> into crop plants			
3.17 Demonstrate an understanding of the costs and benefits of genetic modification of crop plants in the context of developed and developing countries, including the introduction of flavonoids in the purple tomato			
HSW 12 Describe the benefits, drawbacks and risks of using new scientific and technological developments			