

# Biology Topics Triple Only B5 and B6

## Plant disease (TRIPLE ONLY)

Type	Disease	How it damages plants
<b>Pest</b>	Aphid	A insect pierces the phloem
<b>Fungal</b>	Black spot	Damages leaves
<b>Virus</b>	Tobacco mosaic virus	Damages leaves

## Plant mineral deficiency (TRIPLE ONLY)

Mineral	Symptom	Reason
<b>Nitrates</b>	Stunted growth	Cant make enough protein
<b>Magnesium</b>	Chlorosis: yellow leaves	Cant make chlorophyll

## Plant defence responses (TRIPLE ONLY)

Type	Examples
Physical	<ul style="list-style-type: none"> <li>Cellulose cell wall, waxy cuticle on leaves, layers of dead cells (bark on trees)</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>Antibacterial chemicals, poisons to stop animals</li> </ul>
Mechanical	<ul style="list-style-type: none"> <li>Thorns and hairs stop animals</li> <li>Leaves which droop or curl when touched</li> <li>Mimicry to trick animals</li> </ul>

## Culturing micro-organisms TRIPLE ONLY

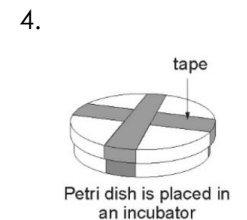
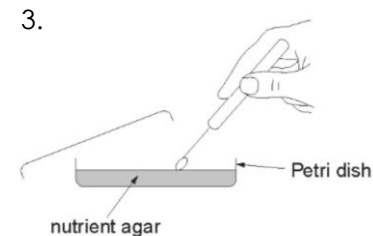
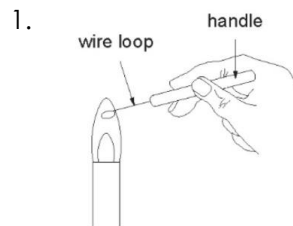
### Keywords

<b>Binary fission</b>	“Splitting in two” how bacteria divide every 20 mins
<b>Agar gel</b>	A gel of nutrients bacteria can grow on
<b>Nutrient broth</b>	A liquid bacteria grow well in
<b>Colony</b>	A group of bacteria making a small circular shape
<b>Inoculating loop</b>	A metal loop use to transfer microorganisms
<b>Petri dish</b>	A small plastic dish used for growing microorganisms
<b>Aseptic</b>	Free from bacteria and viruses
<b>Incubator</b>	Device kept at constant temperature to help the microorganisms grow

### Aseptic technique

Step	Description
	All agar plates and broth must be sterilised before use
1.	The inoculating loop is sterilised by passing through a flame
2.	Sample to be cultured is taken using the loop
3.	Sample spread on agar in petri dish
4.	Dish sealed shut with tape and incubated at 25° C

## Aseptic Technique (Triple only)

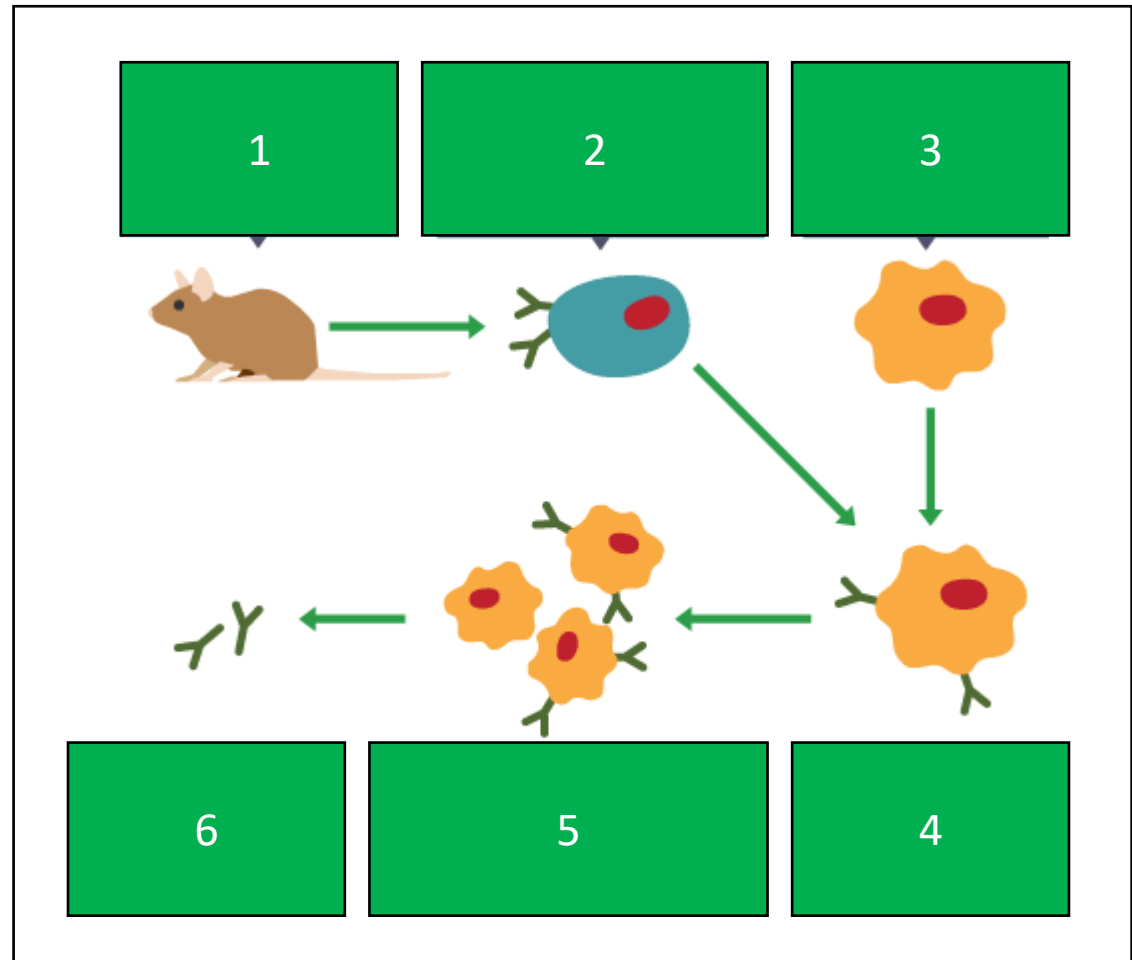


## 7. Monoclonal antibodies (HT TRIPLE ONLY)

What are they?	<b>Antibodies</b> produced from a single clone of cells.
Why are they useful?	Bind to only on binding site on a specific chemical or cell in the body
Uses	Pregnancy tests Measure levels of hormones or other chemicals in blood Locate specific molecules in cells Treat cancer

### How are monoclonal antibodies made?

1	Mouse vaccinated to start production of antibodies
2	<b>Lymphocyte:</b> Produce antibodies but can't divide
3	Tumour cell: No antibodies but divides
4	Cells fused to form a single <b>hybridoma</b>
5	Single hybridoma cell cloned to make identical cells
6	A large amount of identical antibodies collected



## 8. Detecting plant disease (HT TRIPLE ONLY)

Symptoms:	<ul style="list-style-type: none"> <li>Stunted growth</li> <li>Spots on leaves</li> <li>Areas of decay</li> <li>Growths</li> <li>Malformed stems and leaves</li> <li>Discolouration</li> <li>Presence of pests</li> </ul>	Identified by:	<ul style="list-style-type: none"> <li>Reference to book or internet</li> <li>Taking to a lab</li> <li>Testing kits containing <b>monoclonal antibodies</b></li> </ul>
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