

B1.41 Triple Science; Plant Disease

Plant Disease; detection and identification	
1. Give four examples of organisms that can infect plants	<ul style="list-style-type: none"> • Viral pathogens • Bacterial pathogens • Fungal pathogens • Insects
2. Name a viral plant disease	Tobacco mosaic virus (TMV)
3. Name a fungal plant disease	Rose black spot
4. Name an insect that can infect plants	Aphids
5. State two effects of ion deficiency conditions in plant (include examples)	<ul style="list-style-type: none"> • A nitrate deficiency causes stunted growth • A magnesium deficiency causes chlorosis
6. Explain why the above ion deficiencies cause those effects	<ul style="list-style-type: none"> • Nitrate ions are needed for protein synthesis and therefore growth • Magnesium ions are needed to make chlorophyll, without this leaves appear yellow rather than green
7. Describe how chlorosis affects plants	Yellowing of leaves due to lack of chlorophyll
8. HT: Examples of symptoms of disease in plants	<ul style="list-style-type: none"> • Stunted growth • Spots on leaves • Areas of decay or rotting • Growths • Malformed stems and leaves • Discolouration • Presence of visible pests e.g. aphids, caterpillars •
9. HT: Describe the symptoms of black spot fungus on roses	Spots on leaves and areas of decay/rotting
10. HT: Explain why identification of plant diseases can be difficult	Because many plant diseases have very similar symptoms
11. HT: Describe methods of identification	<ul style="list-style-type: none"> • Using gardening manuals or websites to compare symptoms in living plant with descriptions • Taking infected plants to a lab for DNA analysis to identify pathogen causing the disease • Using testing kits that contain monoclonal antibodies which can identify certain pathogens
12. HT: Suggest why fast detection of diseases is important	Increases chance of effective treatment and helps to reduce the spread of disease between plants
Defence responses in plants	
13. Name four physical defence responses in plants	<ul style="list-style-type: none"> • Cellulose cell walls • Tough waxy cuticle on leaves • Bark on trees • Leaf fall

<p>14. Explain how one of these physical defences reduce invasion of pathogens</p>	<ul style="list-style-type: none"> • Cellulose cell walls: strengthens plant cells walls to prevent microorganisms entering • Tough waxy cuticle on leaves: acts as a barrier to the entry of pathogens • Bark on trees: acts as a protective layer that is hard for pathogens to penetrate • Leaf fall: Happens in autumn, causes infected pathogens in the leaves e.g. rose black spot, fall off
<p>15. State two chemical defence responses in plants</p>	<ul style="list-style-type: none"> • Antibacterial chemicals • Poisons
<p>16. Explain how one of these chemical defences reduce invasion of pathogens</p>	<ul style="list-style-type: none"> • Antibacterial chemicals: Protect plants against invading bacterial pathogens by killing them • Poisons: Deter herbivores as the animals remember plants that previously made them feel ill and avoid eating them
<p>17. State three mechanical defence responses in plants</p>	<ul style="list-style-type: none"> • Thorns and hairs • Leaves which droop/curl when touched • Mimicry
<p>18. Explain how one these mechanical defences reduce invasion of pathogens</p>	<ul style="list-style-type: none"> • Thorns and hairs: Deter animals from eating the plants and laying eggs on them • Leaves which droop/curl when touched: This dislodges insects so they fall off or can frighten animals • Mimicry: Some plants droop to mimic unhealthy/wilting plants tricking animals not to eat them and preventing insects from laying eggs on/in them