**S2 Microbes and Immunity Revision**

1. What is a pathogen?
2. What are the three different types of microorganisms?
3. **Name a useful use of bacteria**
4. **Name a useful use of fungi**
5. **How long does it take for bacteria to multiply?**
6. **What are the two types of fungi?**
7. **Give an example of the two types of fungi you have listed in question 6.**
8. **How do you carry microscope safely?**
9. **What type of light helps us see bacteria on our hands?**
10. **How do bacteria multiply?**
11. **How do fungi multiply?**
12. **How do viruses multiply?**
13. **What do bacteria need to multiply and grow?**
14. **What would a doctor prescribe someone with a bacterial infections?**
15. **What did Sir Alexander Fleming discover?**
16. **What do we use to treat fungal infections?**
17. **Describe two physical barriers to bacterial infection in the human body.**
18. **Describe two chemical barriers to bacterial infection in the human body.**
19. **What type of cells are involved in the second line of defence in the human body.**
20. **Describe two ways that you could prevent food poisoning**
21. **Describe the role of phagocytes/macrophages in the second line of defence.**
22. **What type of molecule do lymphocytes produce?**
23. **How do the molecules named in question 22 work against pathogens?**
24. **Draw a labelled diagram to show an antigen and antibody bound together.**
25. **Why is the second infection immune response faster with the same pathogen?**
26. **What are vaccinations?**
27. **What does your body produce in response to vaccinations?**
28. **What do vaccinations prevent?**
29. **Describe the best way to wash your hands**
30. **What does the word ethics mean?**

**S2 Microbes and Immunity Problem Solving**

1. Some bacteria were grown on a nutrient agar plate .At the start (0 mins) there was 1 bacterial colony. After 20 mins this had doubled in number. After 40 mins the experimenter counted 4 colonies .Twenty minutes after that there were 9 colonies. At 1 hour twenty minutes there were 25 colonies.

# Copy the table below

Use the information above to complete the table

|  |  |
| --- | --- |
|  | Number of bacterial colonies |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. A researcher looking at the use of antibiotics recorded the following results for the city of Aberdeen over a one-week period.

|  |  |
| --- | --- |
| Type of antibiotic | Number of people prescribed antibiotic |
| Penicillin | 350 |
| Aminoglycoside | 150 |
| Fluroquinoles | 32 |
| Cephalosporin | 80 |
| Tetracycline | 170 |
| Streptomycin | 220 |

a) Calculate the average number of antibiotic prescriptions for one week

b) Plot a **bar** graph using the information above.

1. A third researcher recorded that out of 54 people prescribed penicillin in one course of treatment, 9 patients were allergic to the antibiotic.

What is the ratio of allergic to non-allergic patients?

Ratio Allergic \_\_\_\_\_\_\_\_\_\_\_ **:** Non allergic \_\_\_\_\_\_\_\_\_\_\_\_

1. Another researcher monitored penicillin prescription with the types of infection it was used to treat. The following results were obtained .

|  |  |
| --- | --- |
| Type of infection | % incidence of infection occuring |
| Tuberculosis | 25 |
| Diptheria | 10 |
| Bronchitis | 50 |
| Others | 15 |

Draw a **pie chart** using these results.

1. In a study with the antibiotic streptomycin, it was observed that 45 patients out of a total 900 were allergic in some form to the antibiotic.

Calculate the **percentage** of patients with allergies to streptomycin.

1. An industrial fermenter was used to grow the fungus penicillin. The fermenter was programmed to run at slightly different temperatures in order to find the temperature which best suited the penicillin production. After the penicillin had been purified and extracted it was then weighed.

Below are the results obtained.

|  |  |
| --- | --- |
| Temperature ( C) | Mass of Penicillin kg/hr |
| 10 | 2.1 |
| 15 | 3.3 |
| 20 | 6.4 |
| 25 | 8.2 |
| 30 | 7.5 |

a) What was the best temperature for penicillin production?

b) What piece of equipment inside the fermentor would be monitoring the

temperature to keep it constant?

c) What is the average mass of penicillin produced in one hour ?

d) Plot the above results as a **line** graph