**Year 9 Maintaining Balance**

**Investigation Revision**

‘Pathogenator’ is a company that specialises in producing a variety of products that is designed to kill pathogens.

In designing their product they wanted to experiment on the effectiveness of their products. They asked four (4) groups of 15 individuals each to volunteer to participate in the experiment.

Group 1 were given Dettol to clean up their hands after touching cow manure fertiliser.

Group 2 were given hand sanitiser containing alcohol to clean up their hands after touching cow manure fertiliser.

Group 3 were given soap to clean up their hands after touching cow manure fertiliser.

Group 4 were given water to clean up their hands after touching cow manure fertiliser.

All 4 groups had to swipe their hands on an agar petri dish after touching the fertiliser and then swipe their hands after applying the cleaning agent on another petri dish.

The petri dishes were incubated and allowed the bacteria to grow and after 2 weeks of incubation the bacteria colonies were counted in each petri dish. The results are as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Number of bacteria colonies | | | |
| Time (Days) | Group 1- Dettol | Group 2 - sanitiser | Group 3 - soap | Group 4 - water |
| 1 | 0 | 0 | 0 | 2 |
| 3 | 1 | 1 | 1 | 8 |
| 5 | 3 | 5 | 4 | 15 |
| 7 | 6 | 9 | 7 | 28 |
| 9 | 9 | 16 | 11 | 40 |
| 11 | 13 | 22 | 15 | 56 |
| 13 | 18 | 28 | 22 | 86 |

1. Write a possible hypothesis for the clinical trial.

**Dettol is the most effective cleaning agent in reducing the number of bacterial colonies grown on an agar dish. OR, different cleaning agents have different impact on the growth of bacteria on an agar dish.**

1. Identify the variables involved in the clinical trial. Complete the table below

|  |  |
| --- | --- |
| Independent variable | **The type of cleaning agent** |
| Dependent variable | **Amount of bacterial colonies** |
| Controlled Variables | **Temperature of incubation; duration of incubation;** |
| **Type of nutrient in petri dish; same manner of swiping the agar.** |

1. On the grid below, draw a graph of the data represented in the table
2. What two (2) conclusions can be made about the experiment? Refer to your graph to support your answers.

**Dettol is the most effective cleaning agent in killing pathogens.**

**Washing hands with water alone is not sufficient in reducing the number of pathogens on your skin.**

1. Which groups was the control group? Why was it important for the company to use this group in their experiment?

**The groups who washed with water.**

**This control group serves to compare the effectiveness of each cleaning product.**

1. Identify a way to make this experiment more reliable.

**Repeat the experiment and take averages.**

1. Identify a way to make this experiment more valid.

**Control as many variables as possible; make sure you have the same number of participants in each group; the participants should be picked up randomly.**