GROWING BACTERIA INVESTIGATION

DUE DATE\_\_\_\_\_\_\_\_\_\_\_\_\_

**Introduction**– We all know that we should wash our hands before we eat, after sneezing/coughing etc. but is all hand washing the same? If you wash your hands under cold water are your hands more or less clean than if you use a hand sanitiser? And where does the old bar of soap fit in? In this experiment we will look at the following methods of hand cleaning: plain water, bar of soap, liquid soap, soap free wash, hand sanitiser.

**What we will do as a class** – We will swab an uncleaned hand from a student and smear it onto an agar plate. That same student will clean their hands using one of the mentioned methods and we will swab their hands again and smear it onto the agar. This will be done twice for each method of cleaning. These plates will be placed in an incubator to grow.

Once the bacteria have had time to grow, everyone will have access to the resulting cultures to use for their investigation.

**What you need to do** – You will then research hand washing methods and the claims that have been made alongside the facts that have been recorded. Once you have done this research you need to come up with an aim and hypothesis you will base your investigation on.

Some examples of aim are:

*To determine the most effective hand washing technique*

*To determine if hand sanitiser kills 99% of bacteria*

*To determine if washing hands with liquid soap is more effective than washing them with a bar of soap*

Some examples of hypotheses for the previous aims:

*If the hands have been washed with liquid soap then there would be the least amount of bacteria on the agar plate because liquid soap is the most effective method of washing hands*

*If the hands have been washed with hand sanitiser then there will be no visible bacteria on the agar plate because hand sanitiser kills 99% of bacteria*

*If the hands have been washed with a bar of soap then there will be more bacteria on the agar plate because a bar of soap is less effective at cleaning hands than liquid soap*

PLANNER FOR BACKGROUND

|  |  |  |
| --- | --- | --- |
| **HAND CLEANING METHOD** | **CLAIMS/STATISTICS** | **INFO/RESEARCH** |
| WATER |  |  |
| BAR OF SOAP |  |  |
| LIQUID SOAP |  |  |
| SOAP FREE WASH |  |  |
| SANITISER |  |  |

DRAFT REPORT

|  |  |  |
| --- | --- | --- |
| BACKGROUND  (Why did you choose this aim? Discuss the claims about the methods of washing hands) |  | |
| AIM |  | |
| VARIABLES | INDEPENDENT |  |
| DEPENDENT |  |
| CONTROLLED |  |
| HYPOTHESES  (Come up with a few and pick one to use) |  | |
|  | |
|  | |
| MATERIALS |  | |
| METHOD (Rewrite in 3rd person AND past tense) |  | |
| DIAGRAM  (Include a handwritten or photograph) |  | |
| RESULTS  Show how you will display your results by drawing an appropriate table or by writing a written statement of the results  (number of colonies, area covered) |  | |
| DISCUSSION  (Refer to aim and hypothesis, explain the data you collected, and discuss errors and solutions) |  | |
| CONCLUSION |  | |

MARKING GUIDE

|  |  |  |  |
| --- | --- | --- | --- |
| ASSESSMENTS | DESCRIPTION | YOUR MARK | MARKS AVAILABLE |
| **BACKGROUND** | What made you choose your aim? Identify some claims, beliefs and/or statistics that led you to decide on a certain aim involving the hand washing methods you chose to use. |  | 4 |
| **AIM** | State what you would like to get out of the investigation. |  | 1 |
| **HYPOTHESIS** | Use the correct hypothesis format.  (independent and dependent variable) |  | 2 |
| **VARIABLES** | Correct independent variable  Correct dependent variable  At least three controlled variables listed |  | 3 |
| **MATERIALS** | Listed all materials used |  | 1 |
| **METHOD** | Method written in third person and past tense (0.5 each) and own words (1) |  | 2 |
| **DIAGRAM** | An accurate diagram/s showing what has occurred in the investigation.  (Diagrams can be hand-drawn or photograph images) |  | 1 |
| **RESULTS** | Present the results as either a detailed (1) written statement of class data (1)  OR  A completed table (1) with title and headings (1) |  | 2 |
| **DISCUSSION** | 1. Hypothesis supported/unsupported 2. Use data to 3. Explain the results 4. Describe errors 5. Suggest improvements |  | 5 |
| **CONCLUSION** | Summarises aim, hypothesis, and outcome |  | 4 |
| **PRESENTATION** | Neatness/Legible |  | 1 |
| Effort |  | 1 |
| **TOTAL** |  |  | 27 |

COMMENTS\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_