**GENERAL HUMAN BIOLOGICAL SCIENCE**

**TASK 8 – MICRO-ORGANISMS GROWTH INVESTIGATION**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WEIGHTING: 8% MARK:\_\_\_\_\_ /47**

**Part A = \_\_\_\_/ 16**

**Part B = \_\_\_\_/ 31**

***PART A – RESEARCH AND INVESTIGATION DEVELOPMENT (16 MARKS)***

Have you ever wondered why some people are really picky about cleaning? Why hospitals are so sterile? Why you shouldn’t eat food off of the floor? What makes one thing cleaner than another?

1. You are to investigate why micro-organisms are able to survive and thrive in certain environments/conditions better than on others. Submit your responses in a **report format**.

(5 Marks)

* + What are common micro-organisms can you find in or on your body?
  + Why are we not affected by most bacteria that we come in contact with?
  + What are the optimal conditions in which bacteria grow?
  + How do bacteria infect a host?
  + How do bacteria reproduce in a host?
  + Bacterial Infections:
    1. How can a bacterial infection be treated?
    2. How does this compare to other pathogenic infections?
  + Bacterial Colony:
    1. What is a bacterial colony?
    2. What is bacterial colony morphology?
    3. Include a diagram explaining bacterial colony morphology.
  + How does the body defend itself against pathogenic invasions?

1. Design an experiment to test different surfaces and see what kind of bacteria grows.

(11 Marks)

* + You can use anything available in a lab including:
    - Agar
    - Agar plates (petri dish)
    - Sterile swap
    - Fume hood

***PART B – INVESTIGATION (31 MARKS)***

You will conduct an experiment to test a number of surfaces around the school that you think are and are not dirty. Based on your findings you will respond to a series of questions.

**GENERAL HUMAN BIOLOGICAL SCIENCE**

**TASK 8 – MICRO-ORGANISMS GROWTH INVESTIGATION**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WEIGHTING: 8%**

***PART B – INVESTIGATION (31 MARKS)***

You will conduct an experiment to test a number of surfaces around the school that you think are and are not dirty. Based on your findings you will respond to a series of questions.

PURPOSE: To investigate bacterial growth from various surfaces around the school.

MATERIAL:

* 2 x prepared agar plates
* Sticky tape
* Cotton tips
* Gloves

PROCEDURE:

1. Without opening the prepared agar plates, divide the pass base of the agar plate into two (2) halves
2. Label each side the surface you are going to wipe on to it.
3. Using a new cotton tip, swipe the surface you are testing. Completely cover the cotton tip.
4. Wipe the coated cotton tip across the centre of one half of the petri dish. Try not to breathe over the petri dish while you are doing this.
5. Close the lid and sticky tape the petri dish closed.
6. Repeat steps above for three more surfaces on to the agar plates.
7. Examine the petri dishes for growth of micro-organisms every few days.
8. Do not remove the sticky tape or open the petri dishes
9. At the end of the investigation, record your observations in the spaces on the next page by drawing your petri dish and what has grown.
10. A class untouched petri dish has been made for you to view.

***ANALYSIS: (13 Marks)***

1. In the space below, draw your petri dishes and the class untouched petri dish (Be sure to use scientific drawings). (3 Marks)
2. Complete the table below describing the appearance of your bacterial colonies using you bacterial colony morphology information. (3 Marks)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COLONY** | **SHAPE AND SIZE** | **EDGE** | **ELEVATION** | **COLOUR** | **TEXTURE** |
| **Petri dish 1**   * Half One |  |  |  |  |  |
| **Petri dish 1**   * Half Two |  |  |  |  |  |
| **Petri dish 2**   * Half One |  |  |  |  |  |
| **Petri dish 2**   * Half Two |  |  |  |  |  |
| **Untouched** |  |  |  |  |  |

**Note:** If you did not complete this portion in your research, the following will aid you in your descriptions of the shape, size, edge and elevation

* Shape and size: small, large, round, irregular
* Edge of colony: smooth, curved, waxy, has lobes
* Elevation: flat, raised, concave
* Texture: hairy, smooth

1. Describe any changes in the appearance of the cultures over the incubation period. Are you able to explain any of these changes? (3 Marks)

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1. What was the purpose of including an untouched petri dish? (1 Mark)

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1. Where any of your results surprising? Such as, did any that you thought would be clean turn out to grow more bacteria than expected. (3 Marks)

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***CONCLUSION: (11 Marks)***

1. List your locations from most colonies/bacteria to least. (1 Mark)

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1. If you were successful in culturing any micro-organisms, do you think they could be harmful? Why or why not? (3 Marks)

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1. What can you conclude from this experiment? (2 Marks)

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1. What is a ‘colony’ of bacteria? (1 Mark)

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1. List the various defences the body has to protect itself from micro-organism invasions AND describe how each one works? (4 Marks)

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***APPLICATION: (7 Marks)***

1. Use the piece of A3 paper supplied to you during class to create a Bacteria Fact Sheet. Select one bacterium to research and use the A3 paper to create a fact sheet.

* Include the following information:
  + Scientific name
  + Where can it be found (2)
  + Picture of chosen bacteria (1)
  + General description of bacteria (1)
  + Human or Environmental uses (2)
  + Interesting facts (1)

Below is a list of bacteria you can research:

|  |  |  |
| --- | --- | --- |
| Lactococcus lactis | * Alcanivorax | * T-103 |
| * Nitrosomonas | * Shewanella | * Clostridium sporogenes |
| * Nitrobacter | * Geobacter | * Brocadia anammoxidans |
| * Azotobacter | * Flavobacterium | * [Clostridium butyricum](https://en.wikipedia.org/wiki/Clostridium_butyricum) |
| * Acinetobacter | Hydrocarbonoclastic bacteria | * Thiobacillus ferooxidans |
| * Cyanobacteria | * Rhizobium leguminosarum |  |
| * [Escherichia coli](https://en.wikipedia.org/wiki/Escherichia_coli) | * Bifidobacterium animalis |  |
| [Bacillus thuringiensis](https://en.wikipedia.org/wiki/Bacillus_thuringiensis) / coagulans / subtilis / mycoides / ramosus | | |
| Lactobacillus acidophilus / rhamnosus / reuteri | | |