**GENERAL HUMAN BIOLOGY UNIT 4**

**TASK 8 – Micro-organism Growth Investigation**

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

**DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MARK: \_\_\_\_/32 \_\_\_\_ %**

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?

**PART A – RESEARCH (6 MARKS)**

In the coming lessons, you will be investigating bacterial growth around our school. In order to succeed at this investigation, you will need to have a strong background understanding of bacterial growth and hygiene practises.

Your task is to independently research and create notes on the following topics. Your notes should be no more than 2 pages in length.

* 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:
  + How can a bacterial infection be treated?
  + How does this compare to other pathogenic infections?
* What is a bacterial colony?
* How does the body defend itself against pathogenic invasions?
  + What are some external body structures that help to defend against pathogen invasion?
  + What other defences does your body have against pathogenic invasion?
* What are some actions that can be taken by people to minimise bacterial growth?
* How do scientists grow bacteria in a lab for their research?
  + What is a petri dish? What is in agar? How do you apply bacteria to an agar plate?

**PART B – INVESTIGATION (5 MARKS)**

You are to investigate where micro-organisms are able to survive and thrive.

Your Task

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

You can use anything available in a lab including:

* + - Agar
    - Agar plates (petri dish)
    - Sterile swap
    - Incubator

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.

**Write your method here:**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

***PART B – INVESTIGATION***

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.

**PART C - ANALYSIS: (10 MARKS)**

1. In the space below, draw your petri dishes and the class untouched petri dish (Be sure to use scientific drawings). (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** |  |  |  |  |  |

1. Complete the table below describing the appearance of your bacterial colonies using you bacterial colony morphology information. (3 marks)

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

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1. Were 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. Using your data, 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. 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. 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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**End Task ☺**