

SECTION A (EXPERIMENT)

For this experiment you will need:

- 4 x $\frac{1}{2}$ slices of white bread
- Water
- Dust
- 4 old containers

You have to set up an investigation to test which environmental factors will lead to the most rapid growth of breadmould. The environmental factors that are to be tested are

1. A DRY piece of bread, placed in sunlight
2. A MOIST piece of bread, placed in sunlight
3. A DRY piece of bread, placed in the dark
4. A MOIST piece of bread, placed in the dark.

The pieces of bread have to be exposed to these environmental factors for a week. After the week you will receive a grid to measure the area of growth of the breadmould.

QUESTIONS

1. Formulate a hypothesis for the investigation.

(2)

2. Identify the following variables:

- 2.1 Independent variable

(1)

- 2.2 Dependent variable

(1)

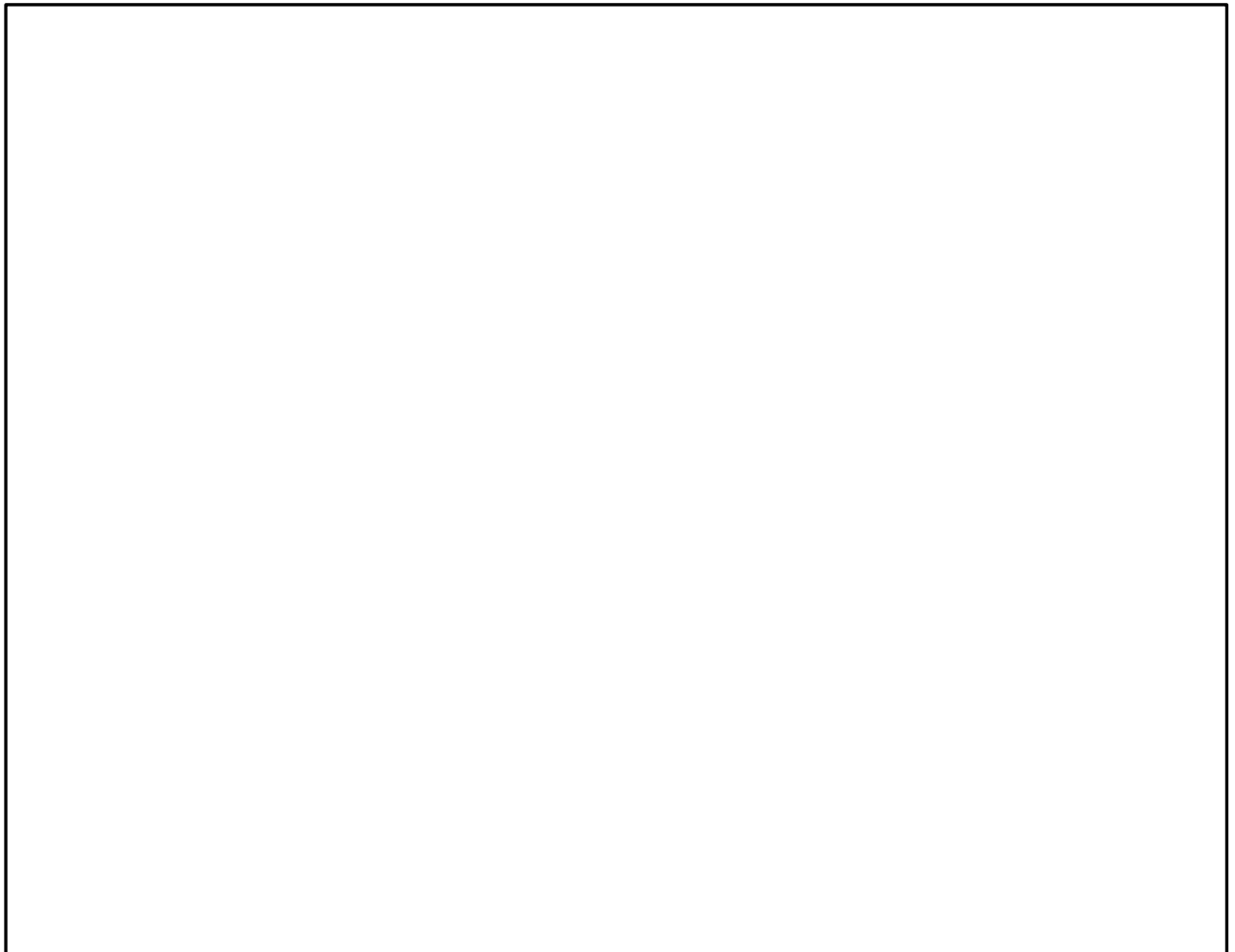
- 2.3 THREE fixed variables

(3)

3. Sort the results of your experiment in a table in the space provided below.

(4)

4. Use your table in 3 to draw a BAR GRAPH that represents the data in the space below.



(6)

5. Write a conclusion based on your results.

(2)

6. Answer the following questions:

6.1 What is the colour of the mass of threads?

(1)

6.2 What are the threads called?

(1)

6.3 Suggest the function of these threads.

(2)

6.4 Would you describe the mould as being autotrophic, saprophytic or parasitic? Explain your answer.

(3)

7. Your teacher will provide you with a magnifying glass. Observe the threads under the magnifying glass. Make a fully labelled drawing of three of the threads that you observe.



(2)

TOTAL SECTION A [28]

SECTION B (CASE STUDY)

Allison is an active, healthy girl. She loves to take part in sport activities at school. She missed only one day of school last year. When Allison woke up this morning, she had a headache and a sore throat. She was not hungry, so she just had juice for breakfast.

Allison's mom felt her forehead and said that Allison seemed a little too warm. Her mom decided to take Allison to their family doctor, because Allison's cousin had a strep throat infection. Two of Allison's classmates have colds, her dad had a headache and her brother vomited the previous night. Allison's mom took her to the doctor and after inspecting her he found that her body temperature and blood pressure was normal. She had a lot of clear mucus (runny nose) in the nose and had difficulty breathing through it. When the doctor looked inside Allison's mouth no redness or white patches were present. Allison was also not nauseous and did not have body aches, although she had a congested cough. The doctor asked Allison's mom if she had any medications to which her mom answered that she had not been given any medications to her symptoms.

Many different microorganisms can infect the human respiratory system, causing fever, a runny nose or a sore throat. Usually, cold symptoms appear within two to three days of infection and include: mucus buildup in the nose, swelling of sinuses, cough, headache, sore throat, sneezing and mild fever. The body's immune system, which protects against disease-causing microbes, almost always is able to eliminate the viruses responsible for a cold. Flu, however, is more serious than the common cold and needs to be prevented in some cases through a vaccine.

Use the case study as well as the column in Addendum A to answer the questions that follow:

1.1 Which illness is Allison most likely to have?

_____ (1)

1.2 Provide TWO reasons for your answer in 1.1.

_____ (2)

2. Why would it be important to know if Allison had been given any medication?

_____ (1)

3. Would antibiotics be helpful to Allison? Why or why not?

(3)

4. Why does a person need to receive vaccinations against flu but not against the common cold?

(2)

5. Explain what is meant by the term “infectious disease”.

(2)

6. Why is it important to take antibiotics properly and to finish a course?

(1)

TOTAL SECTION B [12]

GRAND TOTAL [40]

ADDENDUM A

Table 1: Diseases and their related symptoms, causes and treatment

Illness	Symptoms	Causes	Treatment
Common Cold	<ul style="list-style-type: none"> • Headache • Cough • Sore throat • Sneezing • Clear mucus in nose 	Viruses	Resting, drinking plenty of fluids
Flu	<ul style="list-style-type: none"> • Headache • Sore throat • Muscle aches • Tiredness (fatigue) • Dry cough • Diarrhea • Vomiting • High and sudden fever 	Viruses	Resting, drinking plenty of fluids (if caught early, flu can be treated with special antiviral medication) Prevention: vaccination
Strep throat	<ul style="list-style-type: none"> • Red, painful throat • White patches on tonsils • Fever • Headache • Stomach pain • Vomiting 	Bacteria	Resting, drinking plenty of fluids, taking antibiotics prescribed by a doctor
Nasal Allergy	<ul style="list-style-type: none"> • Itchy eyes and throat • Clear mucus in nose • Frequent sneezing or coughing • Irritated or sore throat • Headache 	Reaction by the body to substances in air, such as pollen or dust	Taking medications recommended by doctor (anti-histamine)

Source: Clayton, S. R., Denk, J. P., Erdmann, D. B., Moreno, N. P., Tharp, B. Z. 2008. *The science of microbes: infectious disease case study*. Baylor College of Medicine. Downloaded from www.BioEdOnline.org.