

Year 12

General Biology

Task 4 Extraction of DNA Practical

Miss Cunningham

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Form: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| Practical Marks | Validation Marks | Total Marks | Percentage |
| /14 | /16 | /30 |  |

**Assessment type:** Science Inquiry - Practical

**Conditions**

Time for the task:

* **Part A -** practical investigation and data collection- completed in class and data collected for a duration of 1 lesson.
* **Part B -** completed of Science Inquiry questions in class under supervised conditions.

**Task weighting** – 5%

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**Part A: Extraction of DNA Practical**

**Introduction**

Cells are the basic unit of life and make up all plants, animals and bacteria. Deoxyribonucleic acid (commonly known as DNA) found in the cell nucleus is the molecule that controls all activity within the cell and contains all genetic information.

This practical extracting DNA from a strawberry will demonstrate how to isolate this genetic information from a living organism using simple methods and observing it under the microscope for investigation.

Purpose

1. To extract DNA from an organism using scientific methods.
2. To observe and make scientific findings on DNA extraction under microscope.
3. To apply knowledge of DNA and genetics to findings from practical.

**Aim:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Hypothesis:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Materials:**

Small piece of strawberry

Ziplock bag

Filter funnel

Filter funnel stand

10mL measuring cylinder

Test tube

Piece of chux cloth

Beaker

10mL of DNA extraction buffer

Ice cold ethanol

Petri dish

Stirring rod

Tweezers

Microscope slide

Microscope

**Method:**

1. Wash fruit, remove sepals if present and place into zip lock bag and seal.
2. Crush fruit carefully in sealed zip lock bag.
3. Add 10mL of DNA extraction buffer, sealing it back and squeezing it all together for 1 minute.
4. Place the funnel lined with chux into a filter funnel and so that it is over the test tube that is placed in a beaker.
5. Pour the mixture into the funnel.
6. Observe the amount of filtrate and add an equal amount of cold ethanol on top of it in the test tube.
7. Observe what happens at the interface of the ethanol and the fruit solution when whirling a stirring rod through (please note not to shake the test tube) and record your observations in your results table.
8. Using tweezers, remove the strands of material and place them onto a petri dish, grabbing one strand and placing it onto a microscope slide.
9. Place your slide under a microscope and record your observations.

**Results Table**

Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| Observations |  |

**Microscope Slide Observation**

Below, include a labelled diagram of your slide under the microscope, be sure to include magnification and detailed labels.

Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Part A: Marking Rubric** | |
| **Aim**  Correctly writes scientific aim based on experimental outcomes. | /1 |
| **Hypothesis**  Correctly writes hypothesis and making scientific predictions on experiment outcomes. | /2 |
| **Results Table**  Correct title for table  Detailed observation on results using scientific language. | /1  /2 |
| **Microscope Slide**  Clearly visible slide with correct magnification and field of view on microscope. | /2 |
| **Microscope Diagram**  Correct title  Correct scientific drawing  Use of pencil  Correct magnification specified  Detailed labels on diagram | /1  /1  /1  /1  /2 |
| **Total Marks** | /14 |

 Year 12 General Biology

Task 4 DNA Extraction Validation

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Discuss your findings during the DNA extraction practical using scientific language (2 marks).

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1. Relate your findings discussed above in Question 1 linking to scientific ideas and your knowledge on DNA structure and function (2 marks).

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1. Explain your observations found based on the microscope slide, ensuring to outline structures found and your observations for it (2 marks).

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1. Compare how DNA differs in humans to plants such as strawberries shown in this practical (2 marks).

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1. Identify the role of the DNA extraction buffer in this practical (1 mark).

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1. Draw and label the structure of a DNA double helix ladder model (7 marks).