

Student's name: _____

Teacher's name: _____

Outcome assessed: Unit 2 – Reproduction and Inheritance
Genetic Material

Due: Term 3 - Wednesday 19th July 2017

Task 7: DNA EXTRACTION

Human Biology – General Year 11

Term 3 2017

Weighting 10%

Mark

/57



Yr. 11

PART 1 - DNA EXTRACTION VIRTUAL LAB

INTRODUCTION: DNA Extraction is commonly known as DNA isolation because the way DNA is extracted is by isolating it from many other components that make it difficult to collect it.

For this part, you will go onto the link below, conduct a DNA Extraction Virtual Lab by following the instructions once you press start and answer the questions. (NOTE: If it does not work, you will need to download adobe flash player or update it).

<http://learn.genetics.utah.edu/content/labs/extraction/>

QUESTIONS	TOTAL	40 MARKS
-----------	-------	----------

Q1. What 3 reasons would you isolate DNA from a human test subject?		(3 MARKS)
---	--	-----------

Q2. What main thing from a human test subject do we need so we can conduct DNA extraction?		
--	--	--

(1 MARK)

Q3. Why does DNA need to be purified before extracting it?		
--	--	--

(2 MARKS)

Q4. What area of the human is ideal to get cell specimens from for DNA extraction? (1 MARK)		
---	--	--

Q5. List the 4 steps to purify DNA?		
-------------------------------------	--	--

(4 MARKS)

Q6. List all the materials used to purify and extract DNA.		
--	--	--

(5 MARKS)

Q7. Describe in your own words what occurred/was used in each step

(12 MARKS)

Step 1 - 4	Description
Step 1: Collect Cheek Cells	
Step 2: Burst Cells open to release DNA	
Step 3: Separate DNA from proteins and debris	
Step 4: Isolate concentrated DNA	

Q8. For Step 2 – Burst Cells open to release DNA, what 2 important ingredients does the lysis solution contain and what is the purpose of these 2 ingredients? (4 MARKS)

Q9. For Step 3 – Separate DNA from proteins and debris, what did the added salt do? (1 MARK)

Q10. What was needed to balance the centrifuge? (1 MARK)

Q11. When spun in the centrifuge, what is the debris part and what is the liquid part? (2 MARKS)

Q12. What does the isopropyl alcohol do to the DNA in step 4? (2 MARKS)

Q13. After the experiment finishes, our DNA is leftover the small test tube? From the final paragraph (starting with “Once the liquid is removed...”) how did you know it is leftover in the small test tube? (2 MARKS)

PART 2 – DNA REPLICATION: PCR (Polymerase Chain Reaction)

INTRODUCTION: Once we extract/isolate DNA, we can actually replicate it ourselves! The most common method is PCR or Polymerase Chain Reaction.

Research and answer the following questions on PCR.

TOTAL

17 MARKS

Q1. What is PCR used for?

(2 MARKS)

Q2. In PCR you use 2 components, one called Taq polymerase and the other called PCR primers.

What is the role of both in the PCR method?

(6 MARKS)

Q3. What are the 3 basic steps of PCR and what temperatures does each occur in?

(3 MARKS)

Q4. How many times is the PCR cycle repeated and how many hours does this take?

(2 MARKS)

Q5. How are PCR results visualized?

(1 MARK)

G _____ E _____

Q6. What practical applications can the results of PCR be used for (HINT: Same reasons why you would want to isolate/extract DNA)

(3 MARKS)

MARKING GUIDE

PART 1: DNA EXTRACTION VIRTUAL LAB	/40
PART 2: DNA REPLICATION: PCR (Polymerase Chain Reaction	/17
TOTAL	/57
WEIGHTING	/10%