NORTHERN CAPE DEPARTMENT OF EDUCATION

LIFE SCIENCES

PRACTICAL INVESTIGATION 2

GRADE 12

17 - 19 MAY 2023

MARK	
	30

TIME: 2 hours

NAME:

This paper consists of 06 pages

QUESTION	TOTAL MARK	MARK OBTAINED	REMARKS
1			
2			
3			
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TOTAL			
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LEVEL			
Educator's signature		Date	
Signature of moderator		Date	

Background information

Some characteristics in humans are controlled by one gene with two alleles, one dominant and one recessive. The diagrams below represent three human characteristics that are controlled in this manner.

CHARACTERISTICS

1 **2** **3** **4** **5** **6**

The table below describe the characteristics numbered 1 to 6.

Characteristic	Dominant	Recessive
Ear lobe	Unattached earlobe	Attached earlobe
Tongue roll	Tongue-roller	Non-roller
Position of thumb when hands are folded.	Left thumb clasper	Right thumb clasper

Note: *Thumb clasper refers to the position of the thumbs when the hands are folded.*

A. Instructions:

This investigation must be done individually and under controlled conditions at school.

1. Conduct a survey of the occurrence / frequency of dominant and recessive phenotypes for each of the three characteristics / traits (as shown in the pictures above) among the learners in your s*chool.*

2. Select **10** learners that will form part of your sample.

3. Record the characteristic / trait for each learner selected.

4. Use the results of your survey to write a scientific report.
   Remember to attach your survey to your report.

B. Scientific Report:

1. Formulate **a hypothesis** for the frequency of right thumb claspers compared to thumb claspers in your school. (2)

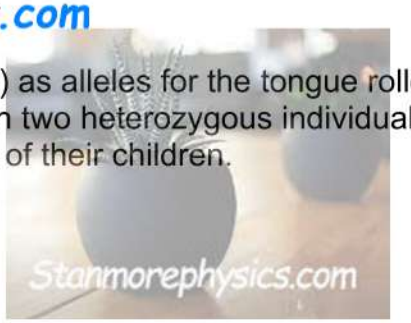
2. **Method:** List any THREE planning steps used as part of the method used in this investigation. (3)

3. **Result:**

3.1 Draw a table to show the results of this investigation. Include the percentage of learners displaying the phenotype for each of the three characteristics at the end of your table. (7)

3.2 Draw a bar graph, using the same set of axes, to represent the percentage of learners displaying each phenotype for each of the three characteristics (7)

3.3 Use the symbols **R** (tongue-roller) and **r** (non-roller) as alleles for the tongue roller characteristic and show a genetic crossing between two heterozygous individuals to determine the possible genotypes and phenotypes of their children. (6)



4. **Conclusion:** Use your data regarding the type of thumb claspers used in your investigation:

4.1 The dependent variable. (1)

_____

4.2 The independent variable. (1)

_____

4.3 Use the results obtained in your investigation to either accept or reject your hypothesis formulated in QUESTION 1 . (1)

_____

4.4 State TWO ways in which you could increase the reliability of the results of your investigation. (2)

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[30]