Curriculum Aligned Competency Based Test Items
Science
Class 10 – Chapter 9
Heredity and Evolution

A plant with red flower (Rw) is cross bred with a plant with white flower (ww).
There are two variations of the gene controlling the colour of the flower.
The gene for red flower (R) is dominant over that for white flower (w).

Red flower (Rw) White flower (ww)

The Punnett square shows the result of the cross.

	w	**w**
R	Rw	Rw
w	ww	ww

SAS21S100901

1 What percentage of the plants is likely to produce white flowers?

A. 25%
B. 50%
C. 75%
D. 100%

SAS21S100902

2 A red flower plant (RR) was cross bred with a white flower plant (ww).
What will be the colour of the flower of the next generation plants?

_____

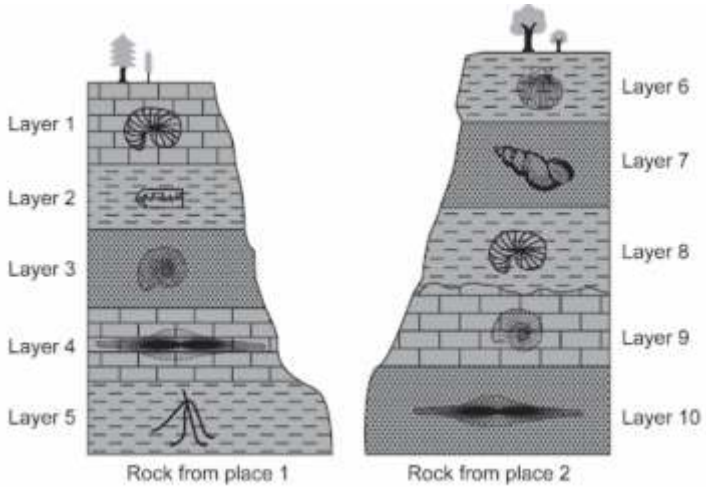
_____

SAS21S100903

3 What would have caused the variation in the gene for flower colour?

A. Mutation
B. Pollination
C. Speciation
D. Adaption

The picture shows different layers of rocks with fossils dug out from two different places.



SAS21S100904

4 Which layer of rocks contains the youngest fossil?

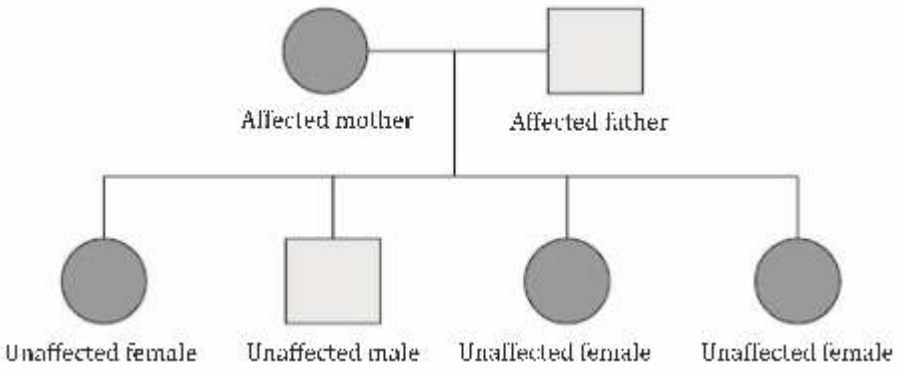
A. Layer 1
B. Layer 5
C. Layer 6
D. Layer 10

SAS21S100905

5 Which layers of rocks must have formed during the same time period?

A. Layer 1 and Layer 6
B. Layer 3 and Layer 9
C. Layer 4 and Layer 8
D. Layer 5 and Layer 10

The picture shows the inheritance of an X chromosome-linked trait in a family. There are two variations of the trait - X and x. The trait is recessive, and affected individuals carry two copies of the recessive gene.



SAS21S100906

6 Which of the following is the correct genotype of the mother and the father?

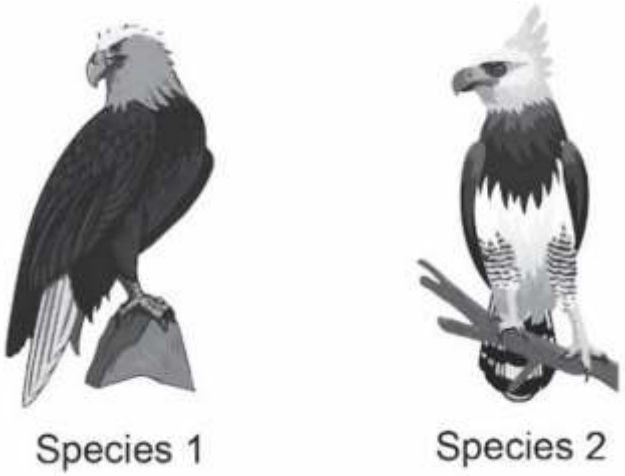
	Mother	Father
A.	XX	XY
B.	xx	XY
C.	Xx	xY
D.	xx	xY

SAS21S100907

7 Which of these traits is acquired by a human population in response to the environment?

A. Short hair
B. Body mass
C. Tall height
D. Brown eyes

The picture shows two species of birds living in different regions.

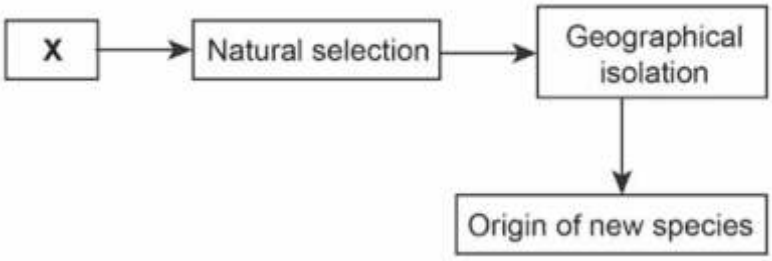


SAS21S100908

8 Which of the following is the correct genotype of the mother and the father?

A. They cannot interbreed.
B. They are not similar in shape.
C. They live in different geographical areas.
D. They have different mutations in their genes.

The two birds once belonged to the same species.
The following sequence of events is likely to have caused the origin of the two different species.



SAS21S100909

9 What is the biological event X?

A. Evolution
B. Speciation
C. Changes in DNA
D. Sexual reproduction

SAS21S100910

10 Which of the following statements is correct?
Circle 'Yes' or 'No' to mark your responses.

Is this statement correct?	Yes or No
Natural selection provides an advantage to organisms.	Yes/No
Genes mix with each other to produce new traits	Yes/No
All chromosomes in human cells are found in pairs.	Yes/No

Answers

Item Number	Question 1
Question Code	SAS21S100901
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Rules of Inheritance Of Traits
Competency	Interpreting Data & Evidence Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	B. 50%
No Credit (No Score)	Any other response or missing response

Item Number	Question 2
Question Code	SAS21S100902
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Rules of Inheritance Of Traits
Competency	Interpreting Data & Evidence Scientifically
Item Type	Constructed Response
Full Credit (Full Score)	Mentions that all flowers in the next generation would be red as R is the dominant trait, the flowers will inherit Rw set of genes For example: • All flowers would be red as R is dominant • All flowers would be red as they would have Rw set in the first generation.
No Credit (No Score)	Any other response or missing response

Item Number	Question 3
Question Code	SAS21S100903
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Rules of Inheritance Of Traits
Competency	Explaining Phenomena Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	A. Mutation
No Credit (No Score)	Any other response or missing response

Item Number	Question 4
Question Code	SAS21S100904
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Fossils
Competency	Interpreting Data & Evidence Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	C. Layer 6
No Credit (No Score)	Any other response or missing response

Item Number	Question 5
Question Code	SAS21S100905
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Fossils
Competency	Interpreting Data & Evidence Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	B. Layer 3 and Layer 9
No Credit (No Score)	Any other response or missing response

Item Number	Question 6
Question Code	SAS21S100906
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Determination of Sex
Competency	Interpreting Data & Evidence Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	B. Mother xx/Father XY
No Credit (No Score)	Any other response or missing response

Item Number	Question 7
Question Code	SAS21S100907
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Acquired and Inherited Traits
Competency	Explaining Phenomena Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	A. Short hair
No Credit (No Score)	Any other response or missing response

Item Number	Question 8
Question Code	SAS21S100908
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Speciation
Competency	Explaining Phenomena Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	A. They cannot interbreed.
No Credit (No Score)	Any other response or missing response

Item Number	Question 9
Question Code	SAS21S100909
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Speciation
Competency	Explaining Phenomena Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	C. Changes in DNA
No Credit (No Score)	Any other response or missing response

Item Number	Question 10
Question Code	SAS21S100910
Grade & Unit Name	Grade 10 | Heredity and Evolution
Concept | Sub-concept	Life Science | Evolution
Competency	Explaining Phenomena Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	Mentions all three responses correctly Yes No No
No Credit (No Score)	Any other response or missing response