



MINISTRY OF EDUCATION AND CULTURE

STUDENT EDUCATION NUMBER									

Samoa Secondary Leaving Certificate

BIOLOGY

2025

QUESTION and ANSWER BOOKLET

Time allowed: 3 Hours & 10 minutes

INSTRUCTIONS

1. You have 10 minutes to read **before** you start the exam.
2. Write your **Student Education Number (SEN)** in the space provided on the top right-hand corner of this page.
3. **Answer ALL QUESTIONS.** Write your answers in the spaces provided in this booklet.
4. If you need more space, ask the Supervisor for extra paper. Write your SEN on all extra sheets used and clearly number the questions. Attach the extra sheets to the appropriate places in this booklet.

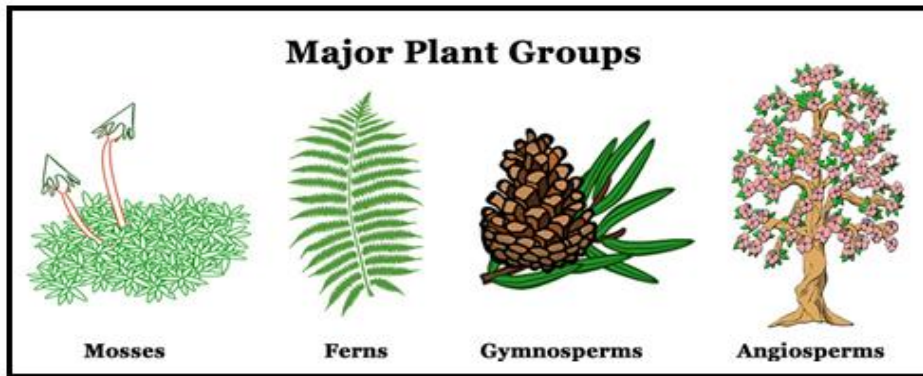
STRANDS		Page	Time (min)	Weighting
STRAND 1	VARIETY OF LIFE	2-4	25	15
STRAND 2	CELL BIOLOGY	5-10	65	35
STRAND 3	ANIMAL BIOLOGY	11-13	40	20
STRAND 4	PLANT BIOLOGY	14-16	25	15
STRAND 5	ENVIRONMENT	17-20	25	15
TOTAL			180	100

Check that this booklet contains pages 2-21 in the correct order and that none of these pages are blank.

HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Questions 1, 2, 6, 7 and 8, choose and write the LETTER of the correct answer in the box provided.

Use the following diagram to answer Questions 1 to 4.



Source: <https://www.youtube.com/watch?v=9Ls9GRpl6Dc>

1. Which group of plants is characterized by the presence of flowers and seeds enclosed within a fruit?

- A. Ferns
- B. Mosses
- C. Angiosperms
- D. Gymnosperms

SL 1

2. Which plant group relies on water for the movement of sperm to the egg and has vascular tissue but does not produce seeds?

- A. Ferns
- B. Mosses
- C. Angiosperms
- D. Gymnosperms.

SL 1

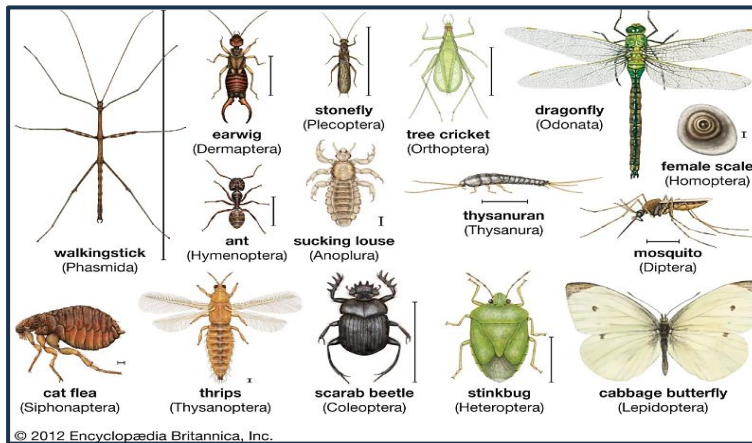
3. Describe **ONE** feature that distinguishes gymnosperms from mosses.

SL 2

4. Explain **ONE** structural feature characteristic of ferns that supports its growth.

SL 3

5. The following diagram is representative of a specific class in the Animal Kingdom. Explain **ONE** characteristic feature of organisms in this class.



SL 3

6. What is the **BEST** definition of biological organization?

- A. The way organisms interact with their environment.
- B. The process by which living things grow and reproduce.
- C. The classification of organisms into kingdoms and species.
- D. The arrangement of living things into hierarchical levels from simplest to most complex.

SL 1

7. Arrange the following examples in order from the simplest level (organ) to the most complex level (biosphere) of biological organization.

- A. *Earth*
- B. *Taro leaf*
- C. *Lowland farming area in Samoa*
- D. *Taro plantation in a village*
- E. *Taro plant*
- F. *Mixed crops and insects in the plantation*

SL 3

Order: _____

8. What is the **BEST** definition of dicotyledons?

- A. Plants with leaves with parallel veins.
- B. Flowering plants with petals in multiples of three.
- C. Plants that have two seed leaves and branching veins in the leaves.
- D. Plants that reproduce by spores instead of seeds and have no true roots.

SL 1

For Questions 10 and 16, choose and write the LETTER of the correct answer in the box provided.

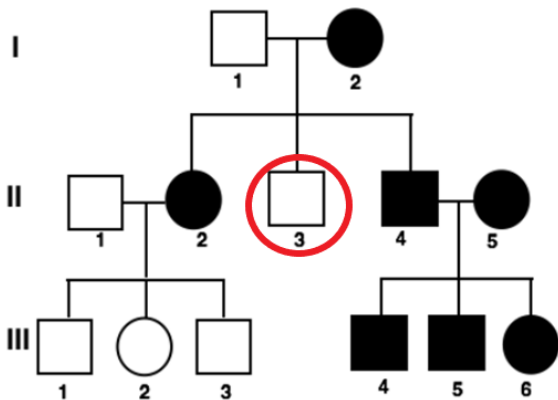
9. The following family tree shows the presence of attached earlobes (**aa**), a recessive trait, through three generations. Free earlobes are the dominant trait (**AA, Aa**).

Using a Punnett square, determine the genotype and phenotype of individual II-3 (encircled). This is an example of an autosomal recessive pattern of inheritance. (Use letter “**A**” and “**a**” as your alleles). Use the Key provided to interpret the pedigree below.

SL 4

Key:

Male	Female	
		presence of traits
		carrier/absence of trait



Genotype: _____

Phenotype: _____

10. Which genotype does a person with blood type A have?

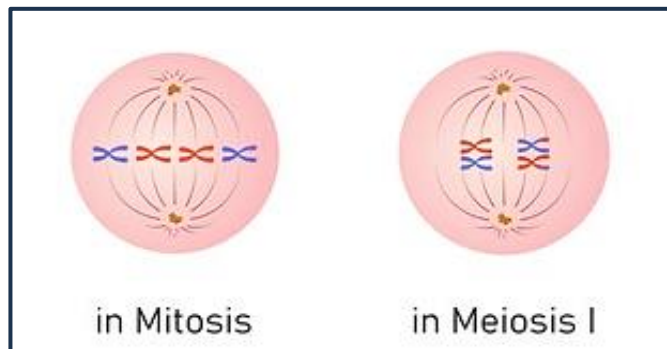
- A. $I^A I^A$
- B. $I^A I^B$
- C. ii
- D. $I^B I^B$

	SL 1

11. A pea plant with round seeds (dominant trait) is crossed with a plant that has wrinkled seeds (recessive trait). Explain how the offspring from this test cross can be used to determine the genotype of the round-seeded parent.

SL 3

12. Using the diagram below, describe **ONE** difference in chromosome arrangement during **metaphase of mitosis** and **metaphase I of meiosis**.



SL 2

Source: <https://www.shutterstock.com/>

13. Lysosomes play a key role in cell maintenance. Explain their structure and how this structure enables them to perform their function effectively.

SL 3

14. A specimen appears 5mm long under a light microscope at 100X magnification. Calculate the actual size of the specimen. Show working out.

SL 2

15. Describe the role of the electron transport chain (ETC) in the mitochondria in generating ATP.

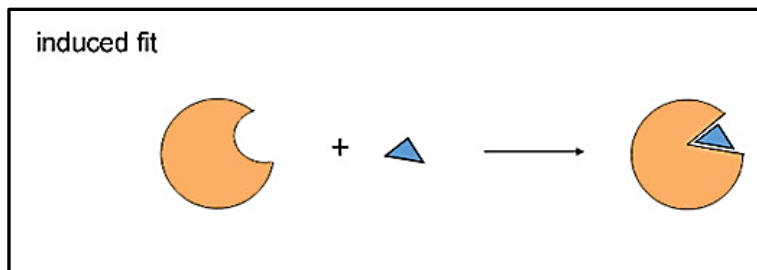
SL 2

16. Which of the following is the correct way to carry and use a microscope?

- A. Hold the microscope by the eyepiece and swing it carefully.
- B. Carry the microscope with one hand on the base and the other on the arm.
- C. Adjust the coarse focus knob first when using high power objective.
- D. Clean the lenses with your shirt to get a clear view.

SL 1

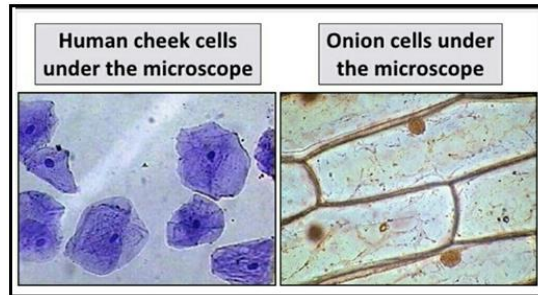
17. The diagram below shows the induced fit model of enzymes, which explains how enzymes and substrates interact during a chemical reaction. Use the diagram to describe the structure of the induced fit model.



Source: <https://www.mdpi.com/1422-0067/25/13/7124>

SL 2

18. During a microscope investigation, a student observed onion epidermal cells and human cheek cells under a light microscope as shown in the diagram below.



Source: <https://edurev.in/t/424309/>

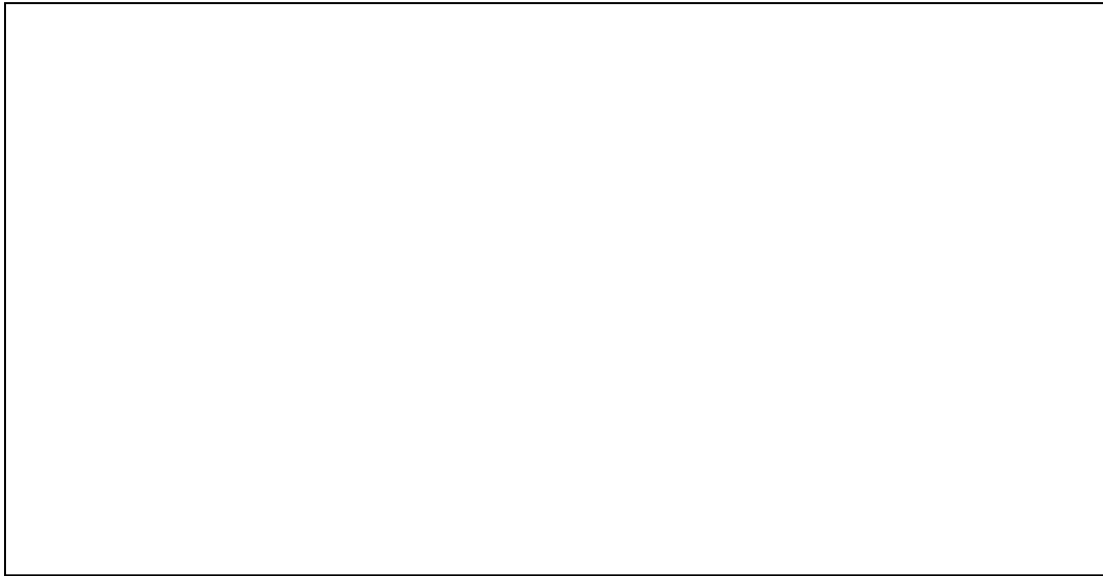
Discuss the results of the observations made of the visible structures in the onion cells and those in the human cheek cells. In your answer, include the functions of the type of cells observed.

SL 4

19. Describe the role of lipids in the function of the cell.

SL 2

20. Draw a diagram to show the structure of an amino acid, labelling the carboxyl and amino groups, and the side chain.



SL 3

21. Discuss **ONE** method of speciation. In your response, discuss the mechanisms of the processes involved and how they lead to the formation of species. Use specific examples to support your answer.

SL 4

22. Describe how selective breeding is used to improve a common Samoan plant.

SL 2

For Questions 23 and 25, choose and write the LETTER of the correct answer in the box provided.

23. Which of the following organisms is **autotrophic**?

- A. Fruit bat
- B. Taro plant
- C. Coconut crab
- D. Sea cucumber

SL 1

24. Describe a **key** feature of heterotrophic nutrition.

SL 2

25. What is the best definition of **nutrient deficiency**?

- A. Eating too much food every day.
- B. A type of food that gives lots of energy.
- C. A sickness caused by bacteria or viruses.
- D. A condition caused by a lack of essential nutrients in the diet.

SL 1

26. Explain how an **incorrect diet** can affect people’s health in Samoa. Include examples of common foods and the health problems they may cause.

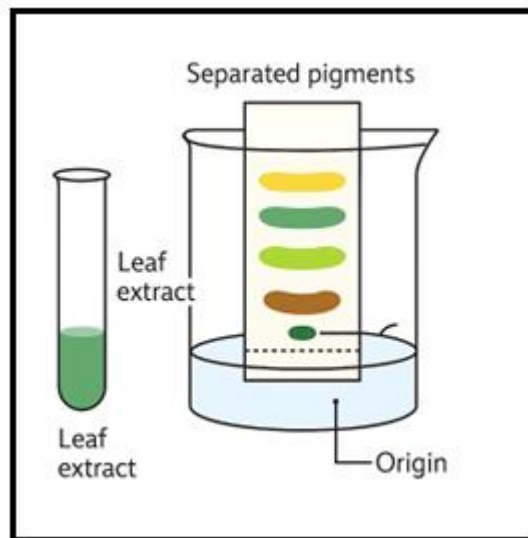
SL 3

For Questions 31 and 35, choose and write the LETTER of the correct answer in the box provided.

- 31. Which statement correctly defines the dark phase of photosynthesis?
 - A. It occurs only at night and releases oxygen and water.
 - B. It requires light to produce ATP and NADPH in the thylakoid membranes.
 - C. It splits water molecules using sunlight and produces starch in the cytoplasm.
 - D. It produces glucose in the stroma using energy from ATP and NADPH made in the light phase.

	SL 1

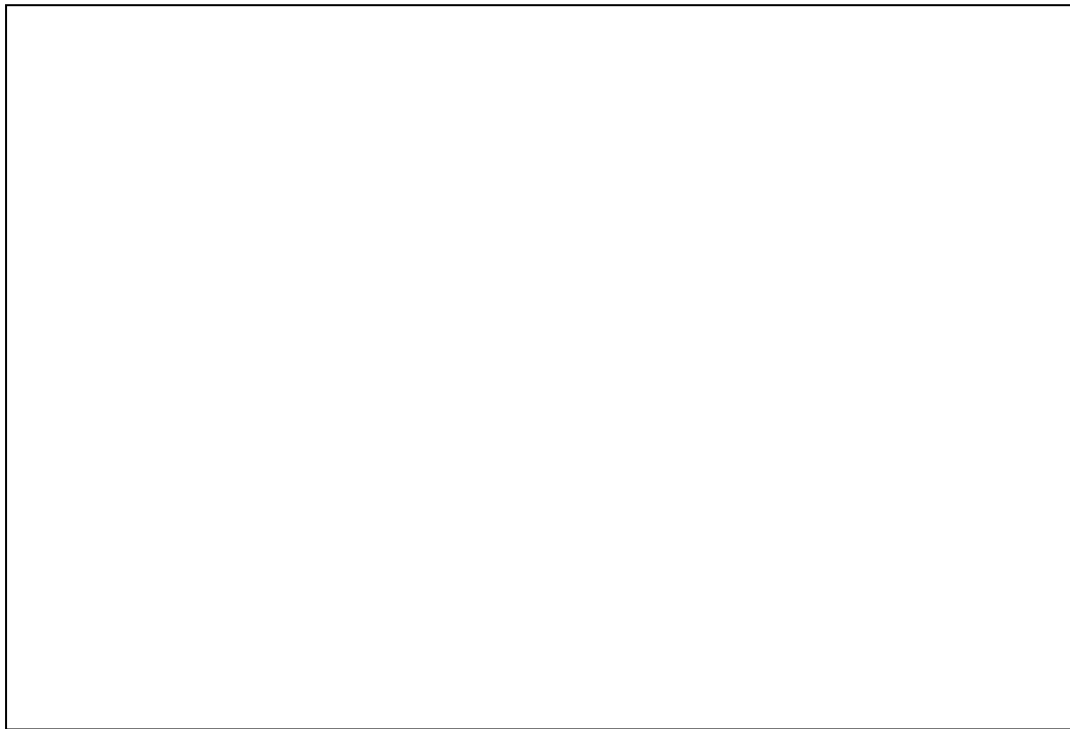
- 32. Study the diagram below showing the chromatography of pigments extracted from Nonu (noni) leaves.



Using the diagram and your knowledge of chromatography, describe how the solvent and paper work together to separate the pigments.

SL 2

33. Draw and label a diagram of a transverse section of a young root. Include the cortex, endodermis, and vascular tissue in your drawing.



SL 3

34. Root hairs are small, slender, tubular extensions of individual epidermal cells located in the **zone of maturation** of plant roots. Describe the role root hairs play in the transport process in plants.

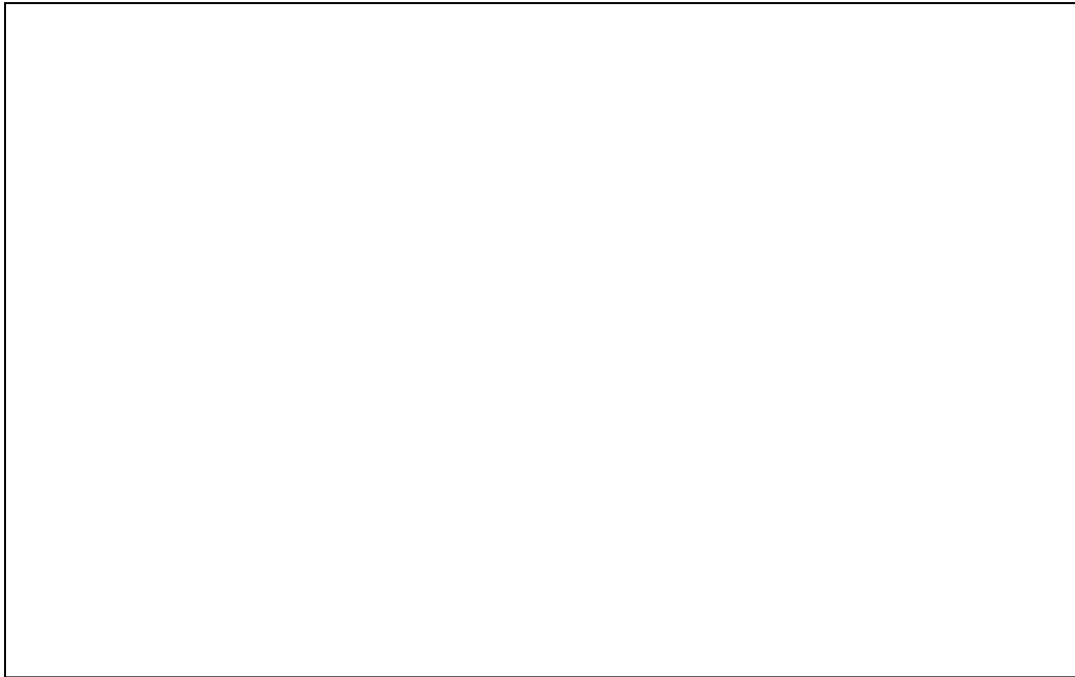
SL 2

35. Which of the following correctly defines asexual reproduction?

- A. It requires the fusion of gametes to produce seeds.
- B. It always produces offspring through flowers and seeds.
- C. It involves two parents and produces genetically varied offspring.
- D. It involves one parent and produces offspring identical to the parent.

SL 1

36. Draw and label the structure of a flower.



SL 3

37. Explain the importance of seed development for the survival of the plant kingdom.

SL 3

For Questions 38 and 41, choose and write the LETTER of the correct answer in the box provided.

38. **Adaptation** is best defined as a:

- A. type of food that animals eat.
- B. change in the weather over time.
- C. process by which an organism adjust to new habitats.
- D. feature that helps an organism survive in its environment.

SL 1

39. Describe any structural adaptation of a local Samoan animal species.

SL 2

40. Explain how **Gause’s Principle** helps species survive in Samoa’s natural environment. Use one local example.

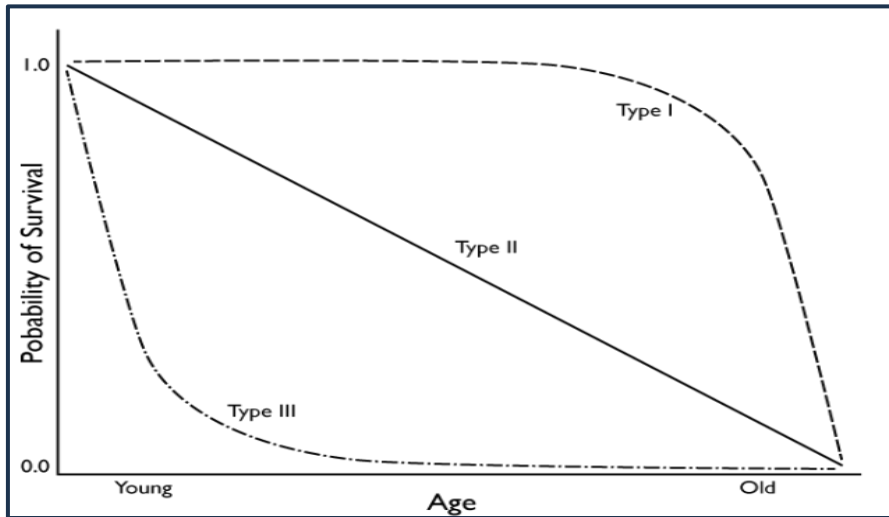
SL 3

41. What is the best definition of population density?

- A. The total number of species in an area.
- B. The number of people living in a country.
- C. The number of organisms per unit area.
- D. How fast a population grow over time.

SL 1

Use the following survivorship curve to answer Question 42.

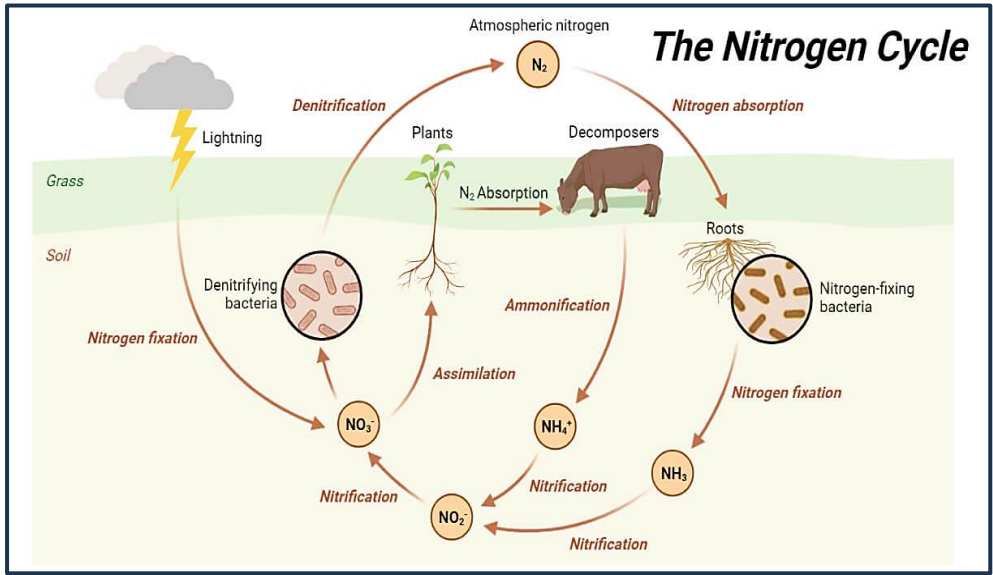


Source: <https://humanwildlifeecology.wordpress.com/home/>

42. Using the Type III survivorship curve, describe **ONE** characteristic of the population growth of turtles.

SL 2

44. Describe **ONE** process in the nitrogen cycle that helps recycle nitrogen in an ecosystem.



Source: Image created by BioRender.com

SL 2

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SSLC BIOLOGY

2025

(For Scorers only)

STRANDS		Weighting	Scores	Check Scorer	AED Check
STRAND 1	VARIETY OF LIFE	15			
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