

STUDENT EDUCATION NUMBER



Sāmoa School Certificate

BIOLOGY 2016

QUESTION and ANSWER BOOKLET

Time Allowed: 3 hours & 10 minutes

INSTRUCTIONS:

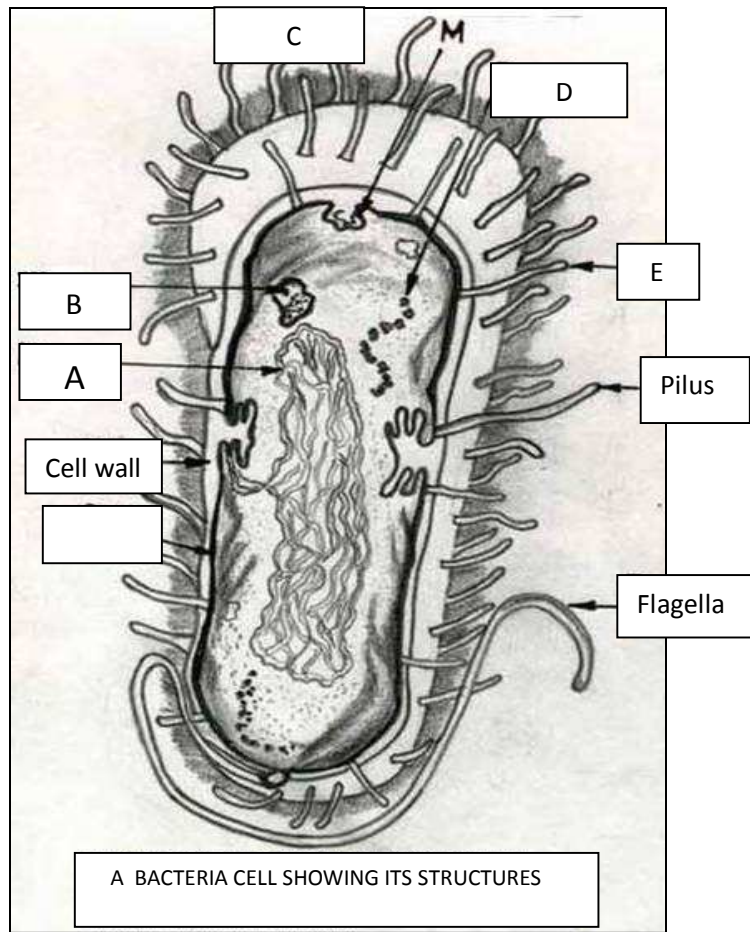
1. You have 10 minutes to read before you start writing.
2. Write your Student Education Number (SEN) in the space provided on top right hand corner of this page.
3. Answer ALL QUESTIONS. Write your answers in the spaces provided in this booklet.
4. If you need more space, ask the supervisor for extra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

STRAND	Page number	Time (minutes)	Weighting
1. Variety of Life	2	28	16
2. Cell Biology	5	12	6
3. Genetics	7	24	12
4. Plants	10	52	30
5. Animals	19	40	24
6. Environment	25	24	12
Totals		180	100

CHECK! This booklet contains pages 2-27 in the right order.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION

Diagram of a Micro-organism



Skill Level 1

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Study the Diagram to answer Number 1 & 2.

1. Name the part labelled 'A'.

2. What economic or medical use does the above organism have?

Skill Level 1

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3. The Animal Kingdom is classified into different phyla.

Describe the Mammal phylum.

Skill Level 2

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4. Describe the disease HIV AIDS.

Skill Level 2

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5. Explain the advantages of using micro-organisms in cleaning up pollution.

Skill Level 3

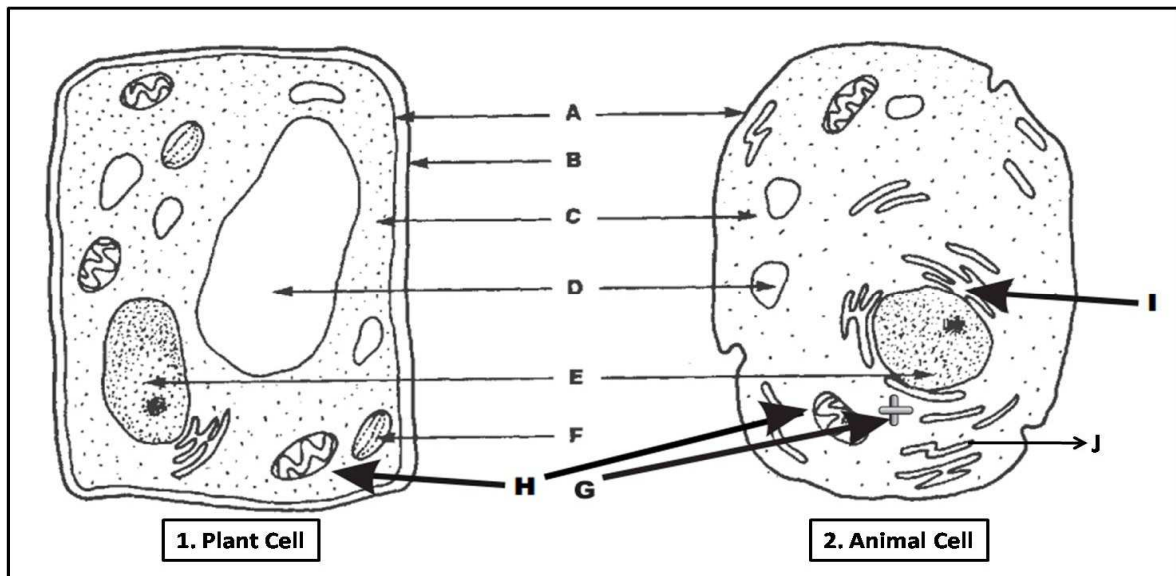
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6. Explain the differences between Angiosperms and Gymnosperms.

Skill Level 3

7. Discuss how the nature of viruses makes them pathogenic.

Skill Level 4



Use the diagram of the cells to answer Number 8 & 9.

8. State the main difference in the functions of the organelles **F** and **H**.

Skill Level 1

9. A process that happens in organelle **H** is important in obtaining energy for cell activities. Write the balance equation for this process.

Balanced Equation:

Skill Level 2

10. Explain how the action of enzymes are affected by temperature.

Skill Level 3

STRAND 3

Genetics

Weighting 12

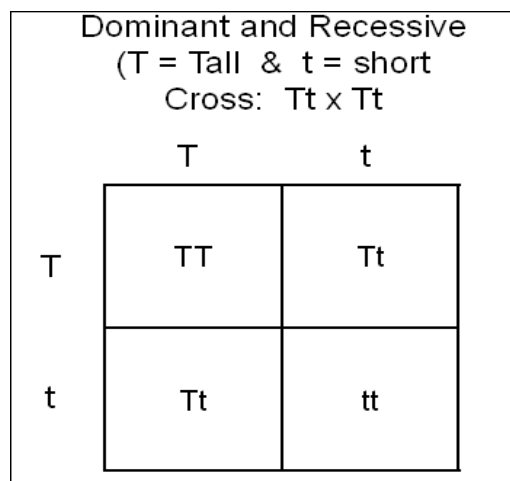
11. Define the term *meiosis*.

Skill Level 1

12. In genetics, what are trait(s)?

Skill Level 1

Monohybrid Cross



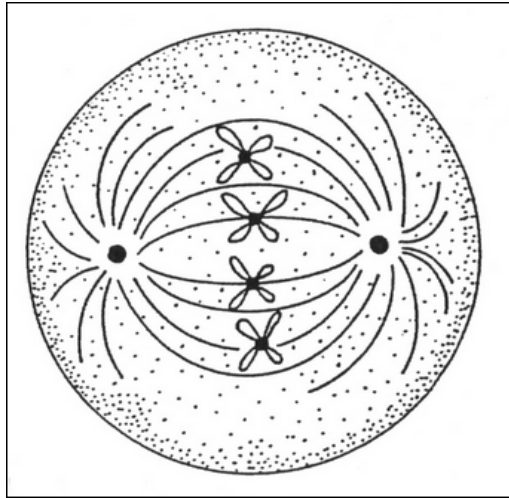
Skill Level 1

Use the monohybrid cross diagram to answer Number 13.

13. What is the genotypic ratio of the offspring?

Genotypic ratio: _____

Anaphase Stage of Mitosis



Study the diagram to answer Number 14.

14. Describe what happens at the Metaphase stage of Mitosis.

Skill Level 2

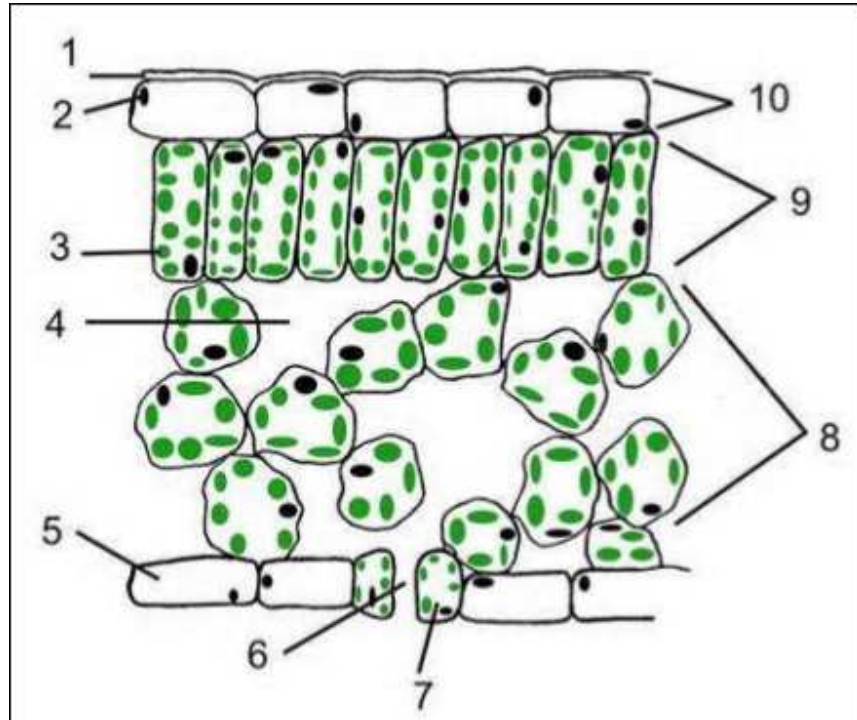
15. Explain the roles of the X and the Y chromosomes in determining the sex of a person.

Skill Level 3

16. 'B' is for brown eyes while 'b' is for blue eyes. A female with a pair of genes Bb is married to a male with bb set of alleles.

Discuss the inheritance patterns of this cross in terms of traits,(eye colour) phenotype and genotype ratios. Heterozygous and homozygous gene pairs.

Skill Level 4



Study the diagram to answer Number 17 & 18.

17. State ONE function of the part labelled 1.

Skill Level 1

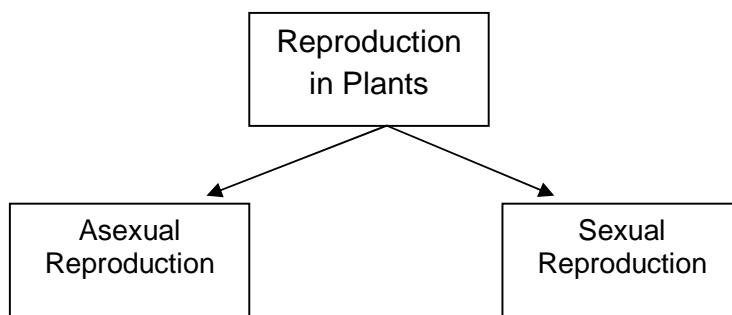
18. The process of photosynthesis takes place mainly at the parts labelled 8 and 9.

State ONE factor that affects the rate of photosynthesis in plants.

Skill Level 1

19. Define the term *transpiration*.

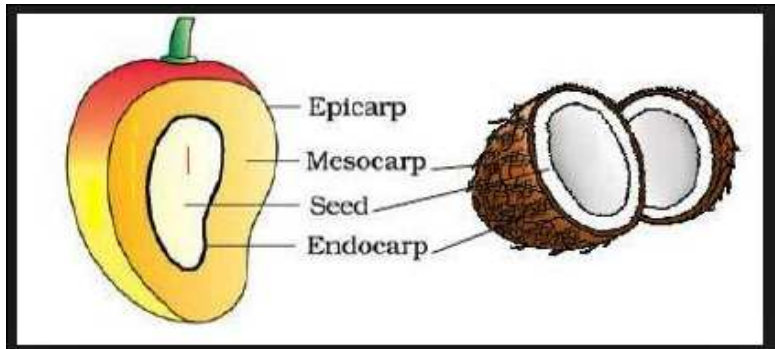
Skill Level 1



Study the diagram to answer Number 20.

20. State an advantage of asexual reproduction.

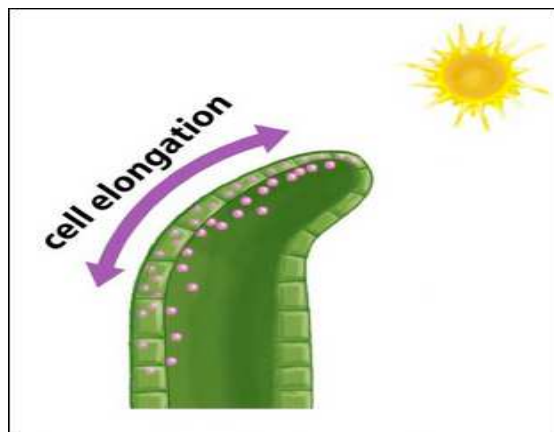
Skill Level 1



Refer to the picture to answer Number 21.

21. Why are seeds important in the life cycle of a mango and coconut trees.

Skill Level 1



Study the diagram of the plant tropism to answer Number 22 & 23.

22. What plant hormone is responsible for the cell elongation?

Skill Level 1

Skill Level 1

23. Give another example of a plant response.

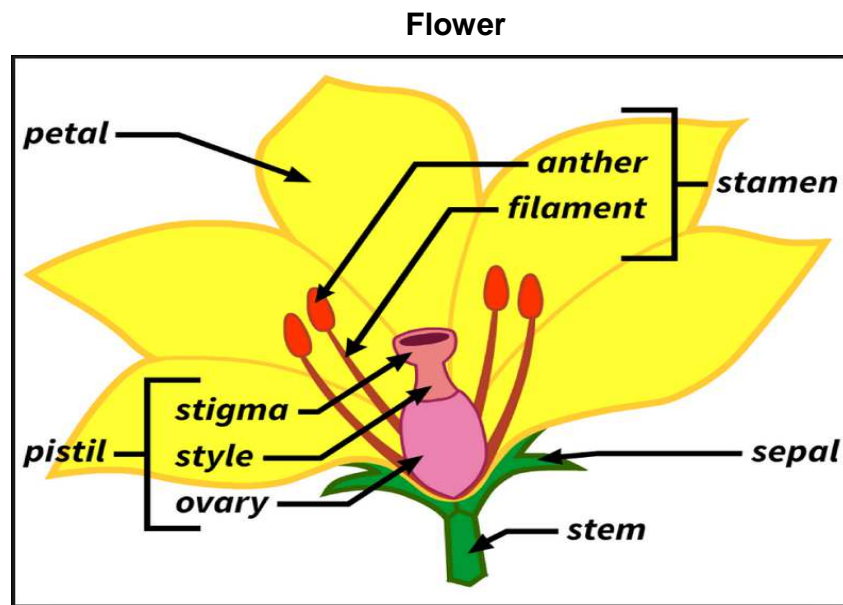
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24. List TWO factors that affect the rate of photosynthesis in plants?

1. _____

2. _____

Skill Level 2

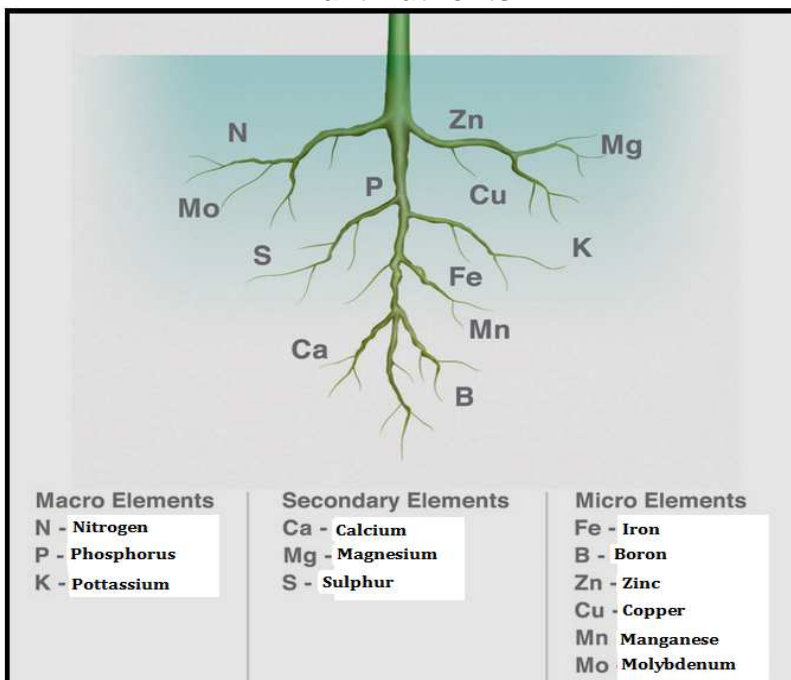


Study the diagram of the flower to answer Number 25.

25. What is the importance of the pistil in a flower?

Skill Level 2

Plant Nutrients



Refer to the diagram to answer Number 26 & 27

26. There are a lot of essential nutrients that play a very important role in the growth of plants. State the functions of calcium and Potassium in relation to plant growth.

Calcium:

Potassium:

Skill Level 2

27. Explain the effect of nitrogen deficiency on plant growth.

Skill Level 3

28. Compare the different methods of seed dispersal mentioned below.

Write your comparisons in the boxes below each type of seed dispersal.

Wind	Water	Animals

Skill Level 3

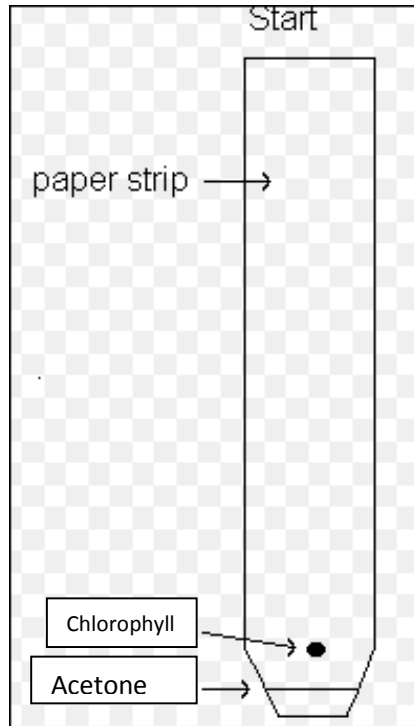
29. Why are meristematic tissues so important to plants?

Skill Level 3

30. Iosua, a Year 12 student carried out a **chromatography experiment** to find out the distribution of leaf pigments on a chromatography paper. It was assumed that every step of the experiment was correctly followed.

Discuss the results and label on the chromatography paper the expected positions of the different colour pigments.

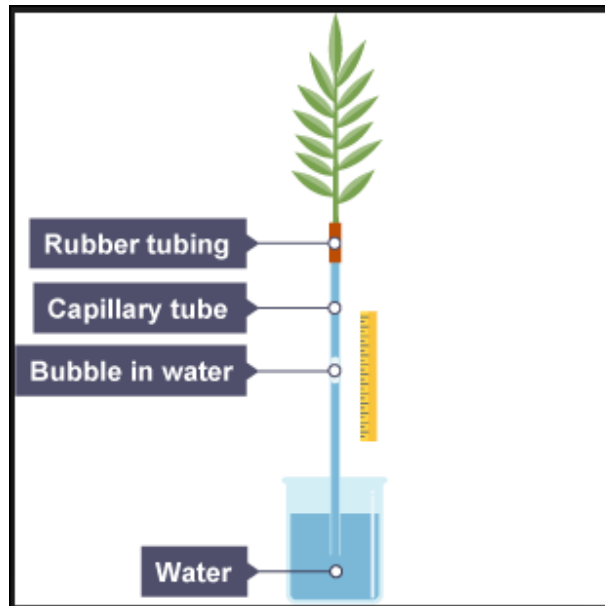
Label on the diagram below the results of the chromatography experiment.



Discussion of results of the chromatography experiment.

Skill Level 4

Water Potometer



Refer to the diagram to answer Number 31.

31. Discuss the effect of high humidity; high temperature and wind on the above experiment. Answer with reference to the above experiment set up.

High Humidity

High Temperature

Wind:

Skill Level 4

STRAND 5

Animals

Weighting 24

32. Define the term *carbohydrates*.

Skill Level 1

33. Define the term *lipids*.

Skill Level 1

34. What is the definition of a protein?

Skill Level 1

35. Define the essential nutrient iodine.

Skill Level 1

36. Which of the following best defines Vitamin D?

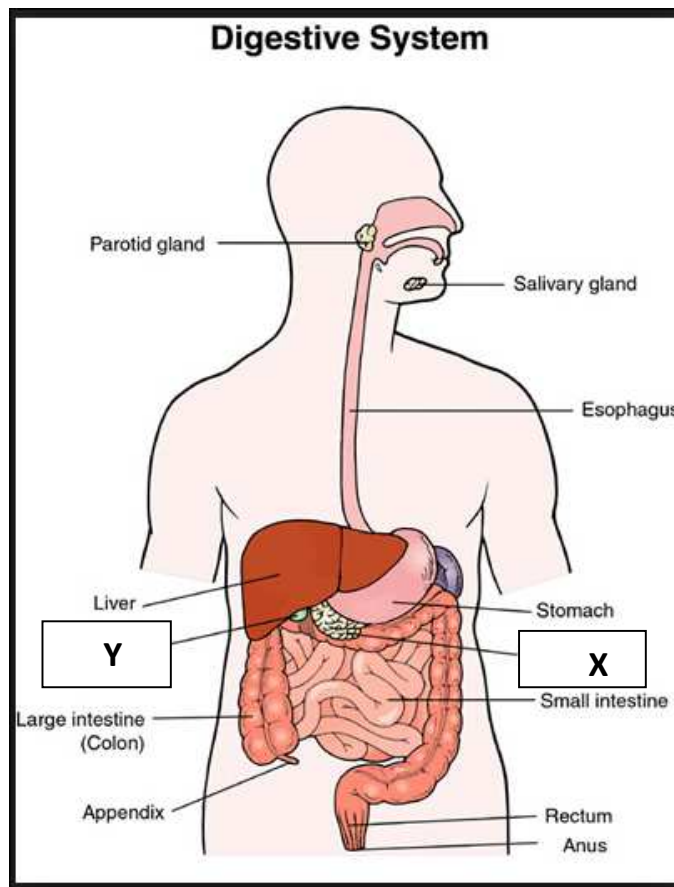
Circle the number of the correct answer.

1.	Vitamins that play a vital role in bone growth, vision and cell division.
2.	It helps in cell repair, digestion and metabolism. It also boosts the immune system
3.	It is vital for healthy bones and teeth. Its best source is the sun. Helps maintain the level of calcium and phosphorus
4.	It is important for growth, and maintenance of bones and blood vessels. Found mainly in fruits and vegetables.

Skill Level 1

37. Give a benefit of the nutrient roughage.

Skill Level 1



38. Name the parts of the digestive system labelled X and Y.

X _____

Y _____

Skill Level 1

39. Define the term *gametogenesis*.

Skill Level 1

40. What is the definition of fibre?

Skill Level 1

41. What is the main role of the circulatory system in humans?

Skill Level 1

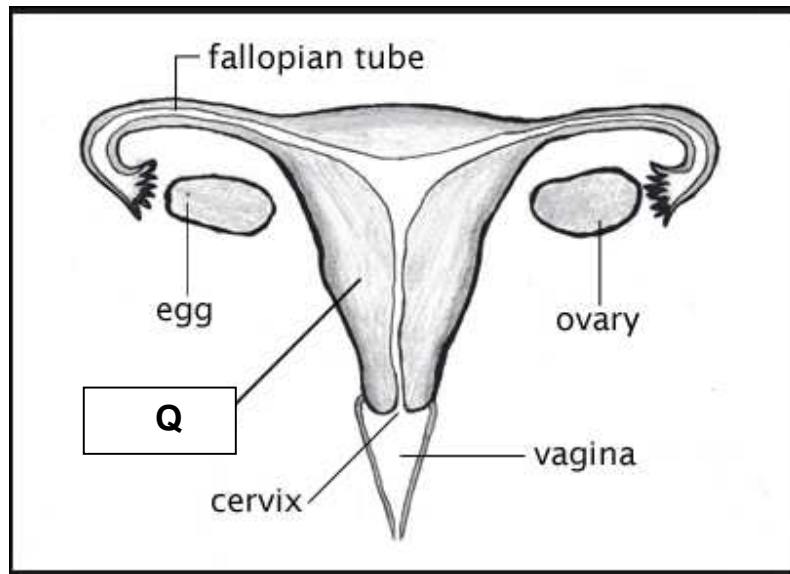
42. List **TWO** excretory products in animals.

1. _____

2. _____

Skill Level 2

Female Reproductive System



43. Describe the function of the structure labelled Q.

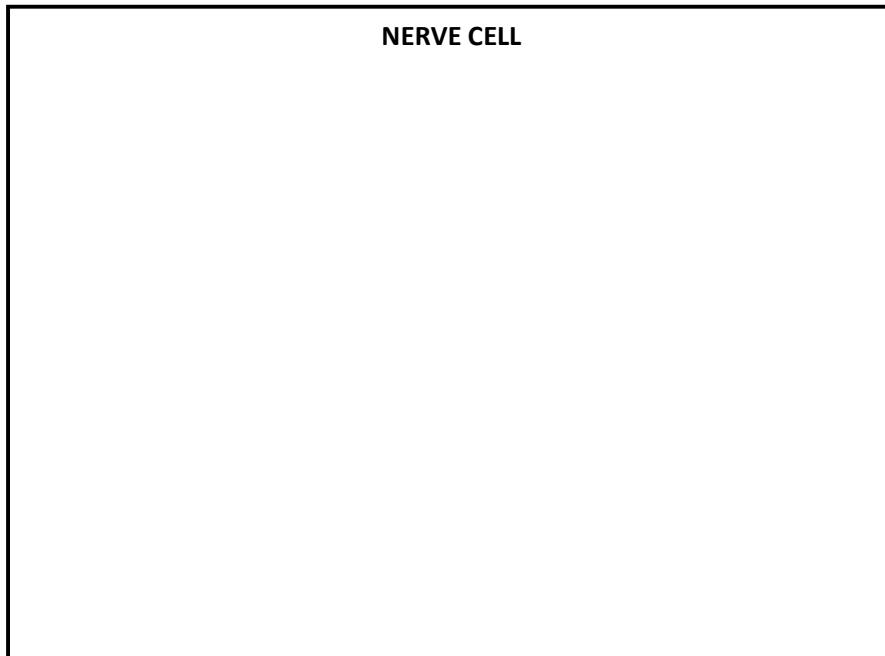
Skill Level 2

44. Explain what happens to the human body if the excretory system does NOT function.

Skill Level 3

45. Draw a nerve cell and label the nucleus, dendrites, axon and body.

NERVE CELL



Skill Level 3

46. **“ALL eating disorders are DANGEROUS.”**

Discuss what the above statement means in relation to ONE of the following.

- Anemia, Diabetes, Peptic Ulcer

Your discussion should focus on nutrient deficiencies, the contributing factors to the disorder, the symptoms and effects of the disorders.

Skill Level 4

STRAND 6

Environment

Weighting 12

Define the following terms:

47. *food chain*

Skill Level 1

48. *biological control*

Skill Level 1

49. *environment*

Skill Level 1

50. *adaptations*

Skill Level 1

Relationships amongst or between organisms in an ecosystem are very important.

Define the following types of relationships:

51. *Commensalism*

Skill Level 1

52. *Mutualism/Symbiosis*

Skill Level 1

53. *Parasitism*

Skill Level 1

54. Our coral reefs are not as productive as fifty years ago
Describe TWO contributing factors that have caused this problem.

Skill Level 2

55. Nutrient cycles play a very important role in our lives and the lives of plants.
Explain the importance of recycling with reference **EITHER** to the Carbon Cycle **OR** the Nitrogen Cycle.

Skill Level 3