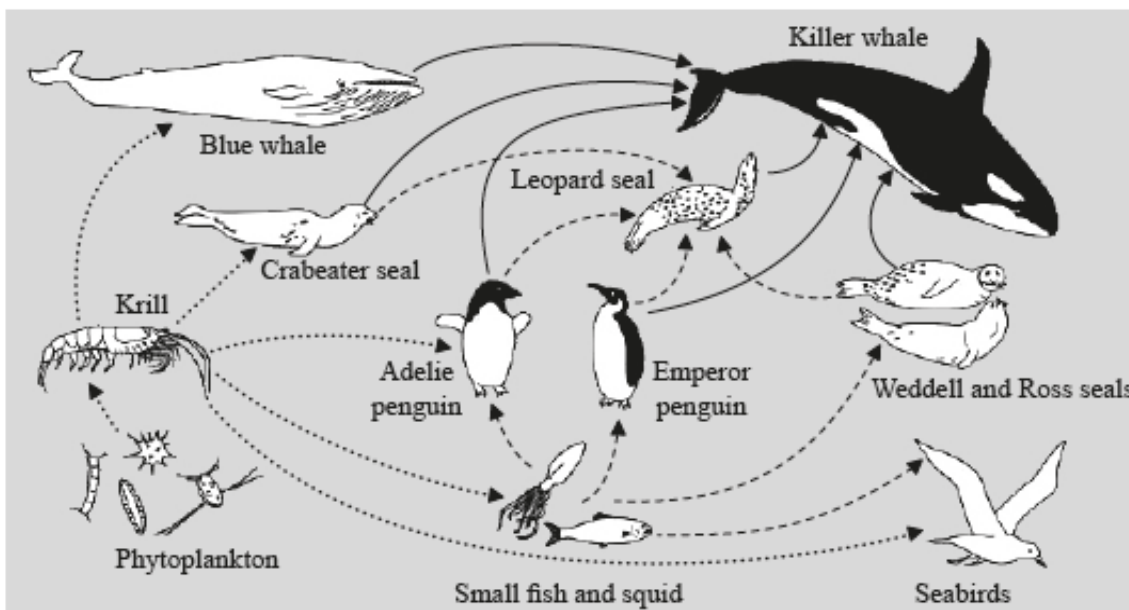


## SCIENCE

01. Which substances are made during photosynthesis and store energy that can be used by cells?

- |                           |                             |
|---------------------------|-----------------------------|
| A. Carbon dioxide and ATP | B. Water and carbon dioxide |
| C. Water and glucose      | D. Glucose and ATP          |

02. What is the trophic level of the Leopard seal?



- I. Secondary consumer
- II. Tertiary consumer
- III. Quaternary consumer

- |            |             |                    |                  |
|------------|-------------|--------------------|------------------|
| A. II only | B. III only | C. II and III only | D. I, II and III |
|------------|-------------|--------------------|------------------|

03. Which pair shows the correct change in atmospheric composition?

	Increases CO <sub>2</sub> in the atmosphere	Decreases CO <sub>2</sub> in the atmosphere
A.	Cell respiration	Combustion
B.	Photosynthesis	Fossilization
C.	Combustion	Photosynthesis
D.	Fossilization	Cell respiration

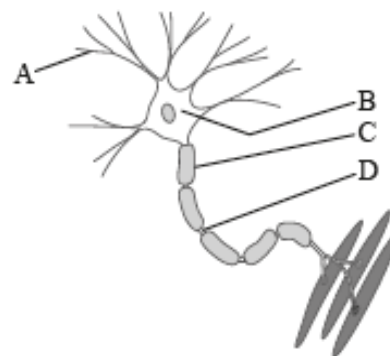
04. How has the transmission of HIV been reduced?

- A. Delaying the progression of HIV to AIDS
- B. Single use of disposable needles
- C. Treatment with antibiotics
- D. Vaccination

05. The image shows a diagram of a motor neuron.

Which structure is correctly labelled in the diagram?

- A. Cell body
- B. Axon
- C. Dendrite
- D. Node of Ranvier



06. In peas, tall is dominant to dwarf. In a cross between a dwarf plant and a heterozygous tall plant what percentage of the offspring will be dwarf?

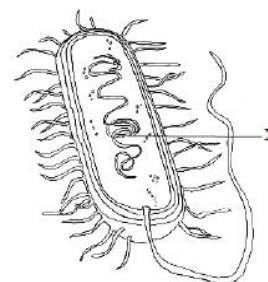
- A. 0 %
- B. 25 %
- C. 50 %
- D. 100 %

073. What would you expect to find in the fossil record if evolution had **not** occurred?

- A. Fossils of simple organisms only in the oldest layers
- B. Only fossils of extinct forms
- C. Fossils of complex organisms only in the oldest layers
- D. Same fossil forms in all layers

08. The diagram below shows a bacterium. What structure does the part labelled X identify?

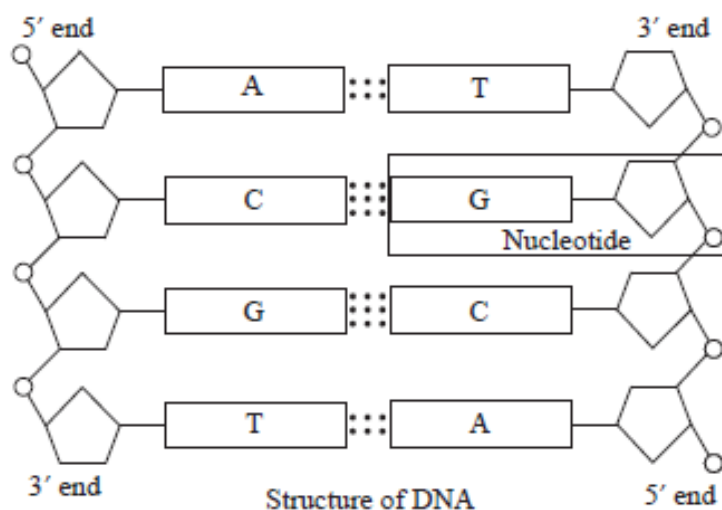
- A. Nucleus
- B. Nucleoid
- C. Nucleolus
- D. Nuclear membrane



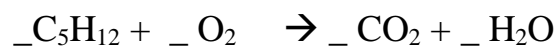
09. Which property is characteristic of acids in aqueous solution?

- A. Acids react with ammonia solution to produce hydrogen gas and a salt.
- B. Acids react with metal oxides to produce oxygen gas, a salt and water.
- C. Acids react with reactive metals to produce hydrogen gas and a salt.
- D. Acids react with metal carbonates to produce hydrogen gas, a salt and water.

10. Which molecules form the nucleotide marked in the diagram?



- A. Phosphate, deoxyribose and nitrogenous base
  - B. Phosphorus, ribose and nitrogenous base
  - C. Phosphorus, deoxyribose and guanosine
11. Pentane is used as a fuel. The burning of pentane is represented by the equation below.



What coefficients (numbers) correctly balance this equation?

	<b>Pentane(C<sub>5</sub>H<sub>12</sub>)</b>	<b>Oxygen (O<sub>2</sub>)</b>	<b>Carbon dioxide(CO<sub>2</sub>)</b>	<b>Water(H<sub>2</sub>O)</b>
A.	1	8	5	6
B.	1	16	5	12
C.	1	8	10	12
D.	1	16	10	6

12. Which statements about period 3 are correct?

- I. The electronegativity of the elements increases across period 3.
- II. The atomic radii of the elements decreases across period 3.
- III. The oxides of the elements change from acidic to basic across period 3.

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

13. What is the electron arrangement of the Ca<sup>2+</sup> ion?

- A. 2, 8, 8, 2
- B. 2, 8, 8, 10
- C. 2, 8, 2
- D. 2, 8, 8

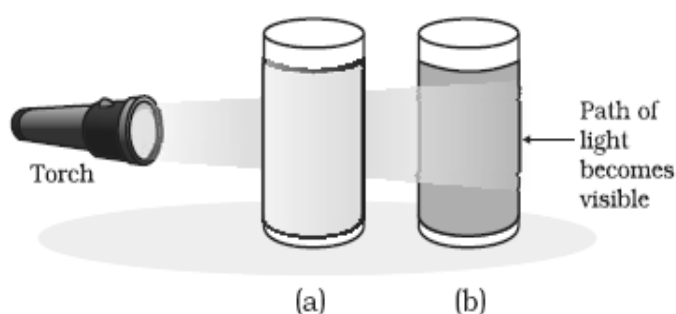
14. Consider the relative abundance of the isotopes of element X.

Isotope	Relative abundance (%)
$^{24}\text{X}$	80
$^{25}\text{X}$	10
$^{26}\text{X}$	10

What is the relative atomic mass of X?

- A. 24      B. 25      C. Between 24 and 25      D. Between 25 and 26

15. In this picture, identify the type of solutions in the glass (a) and glass (b) and name of the effect.



	Glass (a)	Glass (b)	Type of Effect
A.	Colloidal	suspension	Tyndall effect
B.	True solution	suspension	Joule-Thompson effect
C.	True solution	Colloidal	Tyndall effect
D.	Suspension	True solution	Joule-Thompson effect

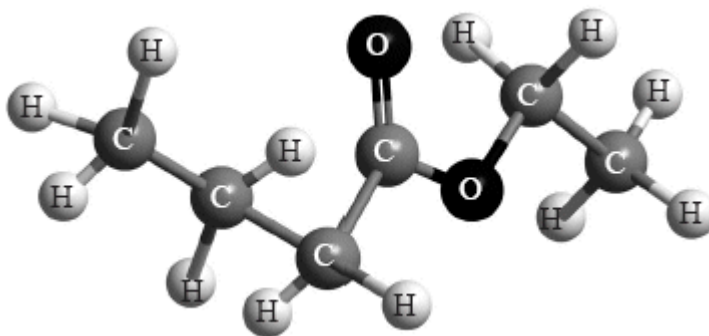
**Questions 16 and 17 refer to the following information:**

Excessive pumping of water from an aquifer bore can lead to salinity (salt) problems. The amount of salt in water is measured in parts per million (ppm) where 1 ppm is equivalent to 1g of salt present in 1000 000 g of solution. The table shows how saline the water has to be to have 0%, 10% and 25% effect on the yield of some common vegetable crops when irrigated with saline water.

Crop	Yield loss 0% (salinity ppm)	Yield loss 10% (salinity ppm)	Yield loss 25% (salinity ppm)
Broccoli	1045	1430	2035

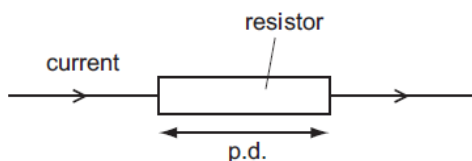
Cabbage	660	1045	1595
Lettuce	495	770	1155
Potato	605	935	1375

16. The crop most at risk from the effects of salty water is  
 A. Broccoli                      B. Cabbage                      C. Lettuce                      D. Potato
17. Some water from the bore was tested. When a sample of 2000g of bore water was heated until all the water was evaporated and 1.24 g of salt was left out. What was the concentration of salt in the bore water?  
 A. 62 ppm                      B. 124 ppm                      C. 620 ppm                      D. 1240 ppm
18. What condition is necessary for the electroplating of silver, Ag, onto a steel spoon?  
 A. The spoon must be the positive electrode.  
 B. The silver electrode must be the negative electrode.  
 C. The spoon must be the negative electrode.  
 D. The electrolyte must be acidified.
19. The nucleon number and proton number of the lithium atom are shown by the symbol  $\text{Li}_3^7$ . What is the correct symbol for the lithium ion in lithium chloride?  
 A.  $\text{Li}_3^{7-}$                       B.  $\text{Li}_3^{7+}$                       C.  $\text{Li}_3^{6-}$                       D.  $\text{Li}_3^{6+}$
20. Which reactants could be used to form the compound below?



- A. Butanoic acid and ethanol                      B. Propanoic acid and ethanol  
 C. Ethanoic acid and propan-1-ol                      D. Ethanoic acid and butan-1-ol
21. In a hydroelectric power station, the water in the reservoir flows through the dam and turns the turbine which in turn runs the generator to produce electricity. Which of the following indicates the energy conversion taking place?  
 A. Kinetic Energy to Potential Energy to Mechanical Energy to Electrical Energy  
 B. Mechanical Energy to Potential Energy to Kinetic Energy to Electrical Energy  
 C. Potential Energy to Mechanical Energy to Kinetic Energy to Electrical Energy  
 D. Potential Energy to Kinetic Energy to Mechanical energy to Electrical Energy

22. A current flows through a resistor when there is a potential difference across its ends. In an experiment, the potential difference (p.d.) and the resistance of the resistor can both be changed. Which row shows two changes that will increase the current in the resistor?



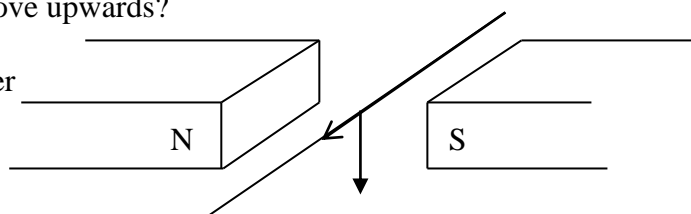
	<b>p.d.</b>	<b>resistance</b>
A	decrease p.d.	decrease resistance
B	decrease p.d.	increase resistance
C	increase p.d.	decrease resistance
D	increase p.d.	increase resistance

23. What is the nature of the image produced by an object kept in front of a convex mirror?
- Erect, diminished and virtual image
  - Inverted, enlarged and real image
  - Inverted, diminished and real image
  - Erect, enlarged and real image

24. A student carries out an experiment to see the effect of a magnetic field on a wire carrying a current. The wire moves downwards as shown.

What should the student do to make the wire move upwards?

- change the direction of the current
- move the poles of the magnet closer together
- send a smaller current through the wire
- use a stronger magnet



25. A lamp is connected in four circuits in turn, each using identical batteries. The resistors are all identical. In which circuit will the lamp be brightest?

