



## 7<sup>th</sup> NATURAL SCIENCE OLYMPIAD

**GRADE 4 TO 6**

**11 MAY 2017**

**09:00 - 12:00**

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### INSTRUCTIONS

**Please read the instructions carefully before answering the questions**

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This is a multiple choice paper. Please answer all the questions on the answer sheet provided. Each question is followed by answers marked A, B, C, and D. **Only one answer is correct.** Choose the most correct answer and shade the corresponding circle on the answer sheet completely, using an HB pencil.

**NB!** The answer sheets are marked electronically – do not make any other dots or marks on the answer sheet. Select only one answer for each question or your answer will be discarded. **Ensure that you shade your selection clearly.**

Note that the question numbers 1 to 100 on the answer sheet moves from top to bottom in several columns. Ensure that the number of your selection on the answer sheet corresponds with the number of the question in your examination paper. Should you make a mistake, please erase the incorrect answer completely.

The use of **non-programmable** electronic calculators is permitted.

**To Avoid Disqualification** - You are required to complete all the information requested on the answer sheet. Please complete the information in script as well as shade the corresponding blocks. If the corresponding blocks are not shaded appropriately, your results will be returned without a name and you will be disqualified. The student number allocated to you can be obtained from your teacher and consists of eight digits e.g. 08149701

Do not fold the answer sheets.

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**Three hours are allowed to answer the questions**

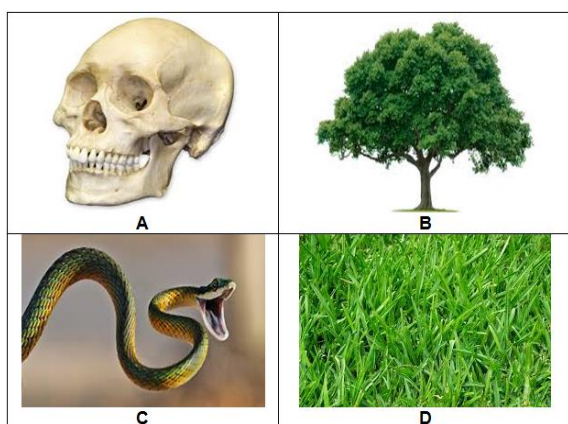
# Natural Science Olympiad 2017

## Grade 4 to 6

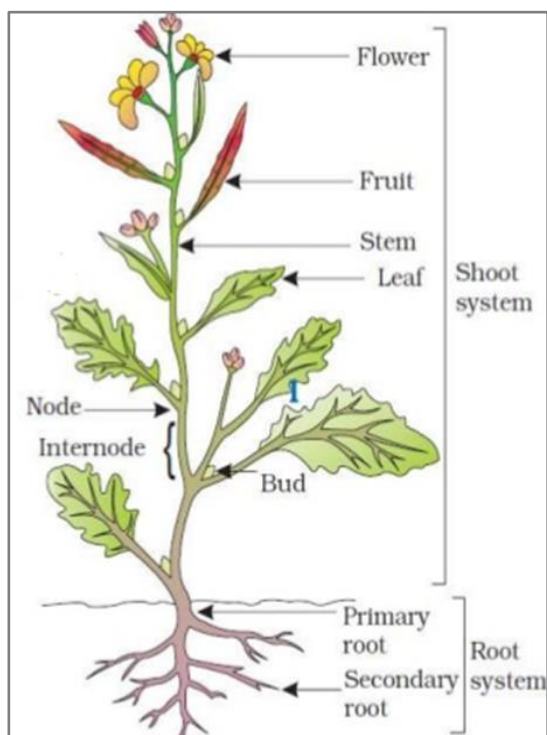
1. Which one of the following is not a characteristic of **ALL** living things?

A Feed  
B Grow  
C Think  
D Reproduce

2. Which one of the following pictures shows a non-living thing?



3. Which one of the following statements is **correct** regarding the living plant shown in the diagram?



- A The shoot system absorbs water and valuable minerals.  
B The flower and fruit are sexual organs of a plant.  
C The plant uses its roots to make food and store the food in leaves and fruit.  
D A plant uses its leaves to make food and store the food in the fruit.

4. Name the following piece of equipment, which is commonly used in a life science laboratory.

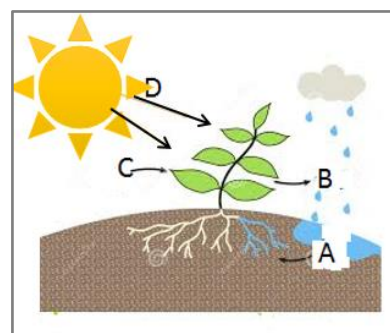


A Periscope  
B Medicine Dropper  
C Microscope  
D Stethoscope

5. Green plants make their own food by;

- A using water from the soil, carbon dioxide from the air, and energy from sunlight  
B using water from the soil, oxygen from the air, and energy from sunlight  
C releasing carbon dioxide and water vapour into the air  
D using roots to store water and nutrients

6. The diagram below represents the process of photosynthesis.



The **CORRECT** combination of labels for this diagram is ...

	Label A represents	Label B represents	Label C represents	Label D represents
A	Absorb water	Release carbon dioxide	Absorb oxygen	Light energy
B	Store water	Release oxygen	Absorb carbon dioxide	Light energy
C	Release water	Release carbon dioxide	Absorb oxygen	Light energy
D	Absorb water	Release oxygen	Absorb carbon dioxide	Light energy

7. Which one of the following is **NOT** an essential component/condition which plants need in order to grow?

A Soil  
B Light  
C Water  
D Air

8. Which one of the following is **NOT** one of the seven life processes of plants?

A Excreting  
B Breathing  
C Sensing  
D Caring

9. The diagram below indicates a very important process in the life cycle of plants. Name this process.



A Photosynthesis  
B Germination  
C Pollination  
D Cross breeding

10. The Green pigment in the leaves of plants used to capture sunlight is called ...

A chloroplast  
B photo-cells  
C leafstalk  
D chlorophyll

11. What name is given to the area or type of environment in which a particular kind of animal or plant usually lives?

A Hole  
B Habitat  
C Species  
D Ecology

12. All plants use energy from \_\_\_\_\_ to make their own food

A minerals in the soil  
B its fruits  
C the Sun  
D its roots

13. A plant makes its own food in the form of?

A Sugar  
B Minerals  
C Vitamins  
D Protein

14. Which of the following are living organisms?

A Bacteria, Enzymes, and Viruses  
B Vitamins, Fungi, and Amoeba  
C Mammals, Amphibians, and Steroids  
D Ferns, Orchids, Fungi

15. Which of the following have the same plant structure?

A Sugar cane, mango, and avocado  
B Grapefruit and orange  
C Banana, pawpaw, and lime  
D All these trees have the same plant structure

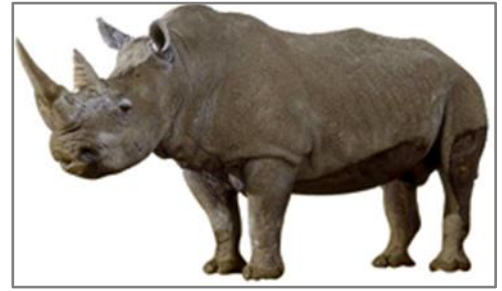
16. Which of the following have the same animal structure?

A Jackal, Hyena, Leopard and Tiger  
B Lion, Cheetah, Jaguar and Bush Baby  
C Wild dog, wild pig, and wild cat  
D Bear, dog, and baboon

17. The monkey below uses its tail to ...



- A ...move and swing in trees.  
B ...kill its prey.  
C ...regulate its body temperature.  
D ...swim.
18. Which of the following can coexist in the same habitat?
- A Grass, Springbok, Lion and zebra  
B Baboon, Mealies, Rat and Cat  
C Jackal, Sheep, Wolf and Grass  
D All of the above can coexist in the same habitat
19. What is the largest member of the cat family?
- A Lion  
B Leopard  
C Tiger  
D Cheetah
20. Consider the Classifications of the following living things and determine which one of the statements is **CORRECT**?
- A Snakes and snails are vertebrates.  
B Fish and frogs are invertebrates.  
C Elephants and lizards are vertebrates.  
D Hyenas and leopards are herbivores.
21. What percentage (%) of all animals are invertebrates?
- A 0,5 %  
B more than 90%  
C less than 50%  
D between 60% and 75%
22. The figure below shows a rhino, which is an example of a mammal.



Which of the following statements is **NOT** a characteristic of a mammal?

- A They are warm-blooded.  
B Mammals are invertebrates  
C They have mammary glands to produce milk for their offspring.  
D They all have hair.
23. A butterfly can only see three colours and these are ...
- A yellow, green and black  
B red, green and black  
C red, yellow and black  
D red, green and yellow
24. Which one of the following animals, shown in the diagram below, is a member of the marsupial family of animals?

A



B



C



D



25. The following food is rich in ...



- A Proteins  
B Carbohydrates  
C Fats  
D Lipids
26. A balanced diet for human beings consists of ...

- A 25% protein rich food, 25% carbohydrates and 50% fruit and vegetables.  
B 50% protein rich food, 25% carbohydrate and 25% fruit and vegetables.  
C 25% protein rich food, 50% carbohydrate and 25% fruit and vegetables.  
D 33% protein rich food, 33% carbohydrate and 34% fruit and vegetables.

27. Tooth decay occurs when you eat or drink too much sugar, the bacteria in your mouth produces \_\_\_\_\_ that eat away at the tooth surface (called enamel) and causes cavities to form.

Choose one of the following words to complete the sentence above.

- A bases  
B fats  
C oils  
D acids
28. Anorexia nervosa is ...
- A ...a disorder where patients starve themselves and deprive their bodies of nourishment in so cause themselves to lose tremendous amounts of weight.  
B ...a disease that affects many children. It is a lack of protein and iodine in their diet.  
C ...disease that affects the body's ability to use blood sugar for energy

- D ...a condition (not a disease) that occurs when bowel movements become difficult and take place days or even weeks apart.

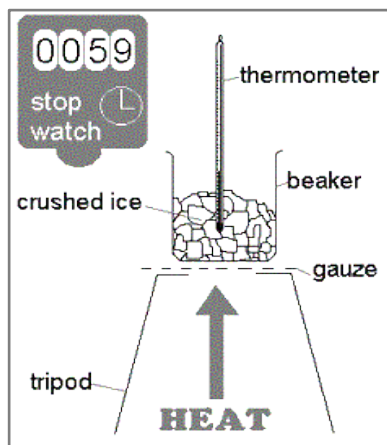
29. Which one of the following statements is **NOT** true?

- A Herbivores only eat plants and plant products.  
B Carnivores only eat meat and meat products (eggs).  
C Omnivores eat plant and animal products.  
D Scavengers prey on omnivores.

30. Consider boiling water in a kettle as shown in the figure below and choose the **CORRECT** statement.



- A The boiling water absorbs heat, the temperature of boiling water increases while the water changes from liquid phase to gaseous phase.  
B The boiling water absorbs heat, the temperature of the boiling water remains unchanged while the water changes from liquid phase to gaseous phase.  
C The boiling water release heat, the temperature of boiling water increases while the water changes from liquid phase to gaseous phase.  
D The boiling water releases heat, the temperature of boiling water remains unchanged while the water changes from liquid phase to gaseous phase.
31. The ice in the container shown in the diagram below is likely to undergo which process?

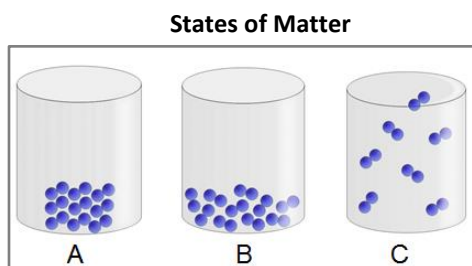


- A Condensation
- B Melting
- C Evaporation
- D Freezing

32. Which one of the following is **NOT** a property of solids?

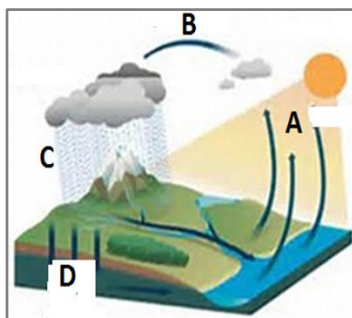
- A Maintains a fixed shape and volume.
- B Not easily compressible.
- C Particles vibrate within fixed positions.
- D Very large spaces between the particles.

33. Which one of the states of matter shown below have particles with the greatest energy?



- A State A
- B State B
- C State C
- D States A and B

34. The diagram below represents the water cycle.



The **CORRECT** combination of labels for this diagram is ...

	Label A represents	Label B represents	Label C represents	Label represents
A	condensation	evaporation	precipitation	infiltration
B	condensation	precipitation	evaporation	infiltration
C	infiltration	evaporation	precipitation	condensation
D	evaporation	condensation	precipitation	infiltration

35. Which one of the following shelters is the most suitable for extremely hot weather conditions?

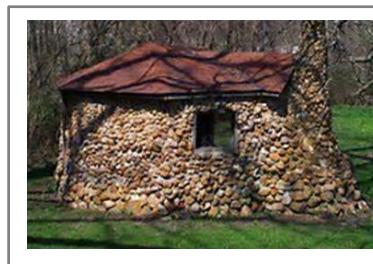
**Shelter A: Mud walls and grass thatched roof.**



**Shelter B: Walls and roof are made from zinc plates**



**Shelter C: Walls made from stone with zinc roof**



- A Shelter A
- B Shelter B
- C Shelter C
- D None of these shelters is suitable for extreme hot weather

36. Which of the shelters in question 35 is the safest in severe weather conditions?

- A Shelter A
- B Shelter B
- C Shelter C



D None of these shelters are safe during severe weather conditions.

37. Which one of the following is a **CORRECT** example of raw material(s) which are used to produce or make useful materials?

- A Sand is used to make paper and glass.
- B Coal is used to make plastics and fibre.
- C Wood and fibre from plants are used to make paper and plastics.
- D None of the above is a correct example.

38. Which one of the following is a property of non-metals?

- A Lustrous (shiny)
- B High tensile strength (resist being stretched)
- C High melting and boiling points.
- D Poor conductor of Heat and Electricity

39. The undesirable rough texture that has formed on the body of this car is as a result of...



- A Paint
- B Coating
- C Corrosion
- D Galvanizing

40. One example of a homogeneous mixture is ...

- A An atom
- B An element
- C A solution
- D A compound

41. Table salt, also known as Sodium Chloride, can be classified as ...

- A ...a homogeneous mixture
- B ...a heterogeneous mixture

- C ...an element
- D ...a compound

42. Which one of the following metals is used to purify gases emitted by vehicles?



- A Platinum
- B Titanium
- C Chrome
- D Aluminum

43. Consider the ice blocks in a glass of water as shown in the figure below and choose the **CORRECT** statement.

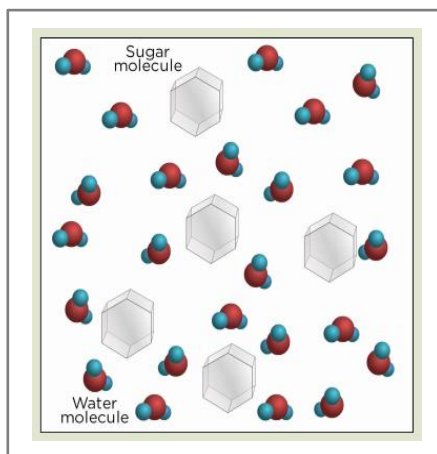


- A The temperature of ice will always be the same as that of water.
- B The temperature of water will always be higher than the temperature of ice.
- C The temperature of water will always be less than the temperature of ice.
- D The temperature of water can be the same as the temperature of ice.

44. John keeps on adding sugar to a glass of water, while continuously stirring the solution with a tablespoon. He eventually realises that the sugar does not want to dissolve any further. The solution can best be described as being.....

- A Insoluble
- B Unsaturated
- C Saturated
- D Condensed

45. The diagram below illustrates a...



- A Solution
- B Solvent
- C Compound
- D Element

46. Which one of the following does **NOT** affect the rate of dissolving?

- A Temperature
- B Particle size of the solute
- C Amount of solvent
- D Stirring

47. Which one of the following is a process which is **NOT** involved in the treatment of water?

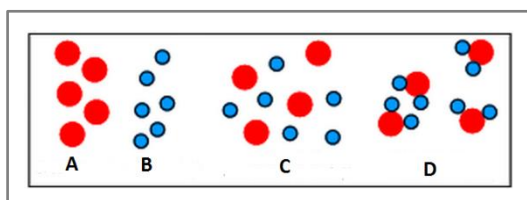
- A Screening
- B Sedimentation
- C Aeration
- D Cracking

48. Which one of the following is **NOT** a mixture?

- A Air
- B Salty water
- C Fruit salad
- D All of the above are mixtures

49. Consider the substances in the following diagram:

Which one of these substances is considered to be a mixture?



- A C and D
- B C
- C A and B
- D None of the above

50. Which of the substances in the following diagram is an example of a solution?



- A Tap water
- B Sweetened coffee
- C Distilled water
- D Tap water and sweetened coffee

51. Which of the following are examples of **soluble substances** which can pollute fresh water?

- A Plastics and glass
- B Fertilisers and soap
- C Toilet waste and oil
- D Paper and tins

52. Which one of the following illnesses are associated with polluted water?

- A Malaria
- B Gonorrhea
- C Diarrhea
- D Septicemia

53. Salt from sea water can be recovered by?

- A Filtering the solvent
- B Settling the solute
- C Decanting the solute
- D Evaporating the solvent

54. Which one of the following statements is **CORRECT** regarding all freshwater resources on Earth?

- A Less than 3% of all water on Earth is fresh water.
- B 97% of all water on Earth is fresh water.

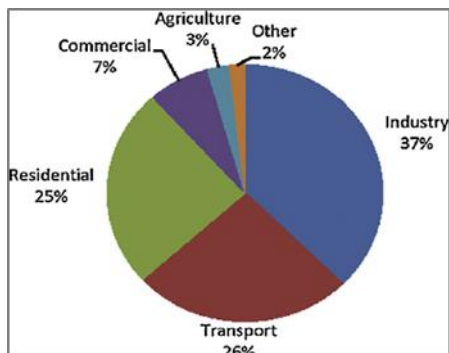


- C 99% of all fresh water is found in the lakes.
- D 99% of all fresh water is found in rivers and dams.

55. Which one of the following statements is **NOT** correct regarding wetlands?

- A Wetlands removes soluble and insoluble substances from water.
- B Wetlands regulates the flow of water.
- C Wetlands are not seasonal and never dry up.
- D Wetlands provide habitat for a wide variety of animals and plants.

56. Consider the pie chart below that shows the total energy usage by different sectors in South Africa and choose the correct statement.



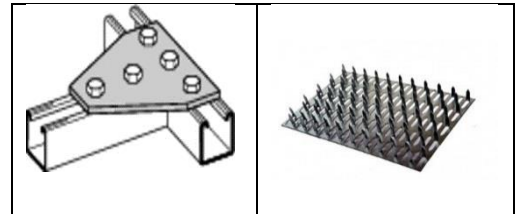
The largest amount of energy in South Africa is used ...

- A ...in our homes.
- B ...on farms, by tractors and other farm equipment.
- C ...by the industries.
- D ...by cars, trucks, airplanes, trains and ships.

57. Sound travels fastest in ...

- A ...the sea.
- B ...a broomstick made from wood.
- C ...the atmosphere
- D ...fabric made from wool.

58. Identify the two structures in the table.



A	Gang nails	Gusset plate
B	Gusset Plate	Strut
C	Gusset Plate	Gang nails
D	Strut	Tie

59. The tiny coiled metal wire present inside an electric bulb is called...



- A Element
- B Conductor
- C Filament
- D Rheostat

60. The power station in the picture below is an example of a...



- A ...hydroelectric power station.
- B ...coal-fired power station.
- C ...solar power station.
- D ...wind power station.

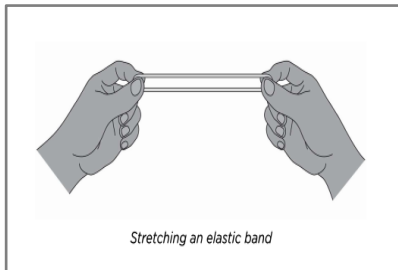
61. The following are examples of fossil fuels, except for ...

- A coal
- B oil
- C natural gas
- D wood

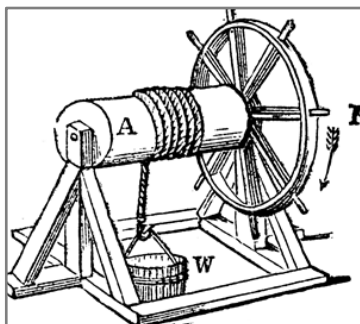
62. The diagram below illustrates



- A A power station  
B An oil Rig  
C A ship  
D An irrigator
63. What form of energy does the stretched elastic band possess?



- A Kinetic energy  
B Potential energy  
C Chemical energy  
D Light energy
64. The diagram below shows a device that has made life for many people much easier. Name the device.



- A Electric drill  
B Grinder  
C Wheel and axle  
D Newton's colour wheel
65. Iron, Cobalt, and Nickel are metals which are ...

- A non-magnetic  
B magnetic  
C insulators  
D none of the above

66. Select the correct combination of labels for the circuit components in the table.

A	Fuse	Bulb	Fuse	Cells
B	Cell	Bulb	Fuse	Battery
C	Cell	Switch	resistor	Battery
D	Battery	Bulb	resistor	Switch

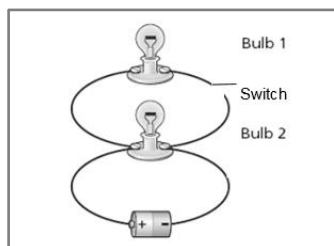
67. Complete the sentence below by selecting the missing word **OR** term from the options given.

\_\_\_\_\_ is the term used to refer to the electricity supplied from power stations to households.

- A Mains electricity  
B Voltage Electricity  
C Direct Current  
D Photovoltaic electricity
68. A circuit is a path taken by an electrical current. A circuit with no breaks is called...
- A ..an open system  
B ...a parallel system  
C ...a closed system  
D ...a series system
69. Which one of the following is **NOT** a good conductor of electricity?
- A Lead  
B Copper  
C Plastic  
D Wood
70. What will happen if you add more cells in series to an electrical circuit containing two light bulbs which are also connected in series?

- A There will be no observable change.  
B The two bulbs will glow dimmer.  
C The two bulbs will glow brighter.  
D The two bulbs will last longer.

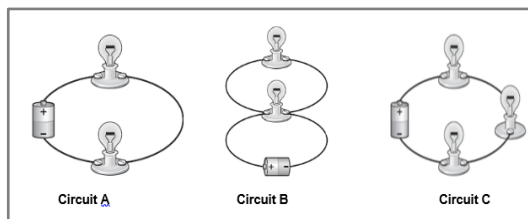
71. A circuit with two bulbs connected in parallel is shown in the figure below. The two bulbs have the same resistance.



Which of the following statements **best** describes what will happen when the switch is closed?

- A Bulb 2 will stay lit and will glow brighter than bulb 1.
- B Bulb 2 will stay lit and will glow with a lower brightness than bulb 1.
- C Bulb 2 will stay lit and will glow with the same brightness as Bulb 1.
- D Bulb 2 will stay lit and become brighter with time.

72. In which of the three circuits shown below will the light bulbs be the brightest? (You can assume that all bulbs have the same resistance and that all cells are the same)



- A Circuit A
- B Circuit B
- C Circuit C
- D Both circuits A and B

73. Which of the following substances can conduct electricity?

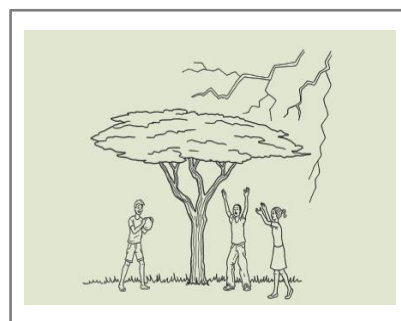
- A Water
- B Rubber
- C Paper
- D Air

74. Which one of the following source of light is the most energy efficient and can be used to save electricity in our homes?



75. The diagram below shows children playing in an irresponsible manner during a lightning storm.

What would you **NEVER** advise them to do when a thunderstorm threatens?



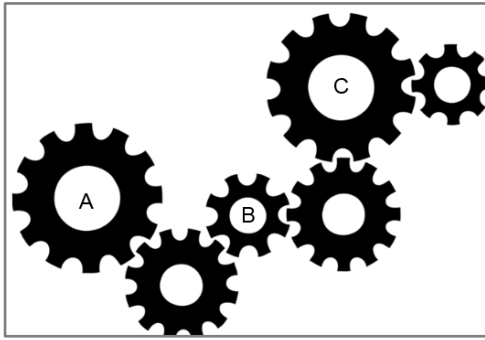
- A Getting inside a home or large building, or inside an all-metal (not convertible) vehicle.
- B Avoid putting yourself above the surrounding landscape.
- C Avoid being the highest point in an open area.
- D Climb the nearest tree.

76. What energy conversions take place in the following devices?



A	Sound to Electrical	Electrical to Sound
B	Electrical to kinetic	Sound to Electrical
C	Sound to kinetic	Kinetic to Sound
D	Electrical to Kinetic	Electrical to Sound

77. If a rotational force in a clockwise direction is exerted on gear A, then...



- A Gears B and C will rotate in a clockwise direction.  
 B Gear B will rotate clockwise and C anti-clockwise.  
 C Gears B and C will rotate in an anti-clockwise direction.  
 D Both B and C will be unable to rotate.
78. Choose the **CORRECT** arrangement of planets starting from the planet nearest to the sun to the one furthest from the sun.
- A Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune  
 B Mercury, Venus, Mars, Earth, Jupiter, Saturn, Uranus, and Neptune  
 C Venus, Mercury, Earth and Mars, Jupiter, Saturn, Uranus and Neptune  
 D Jupiter, Mercury, Venus, Earth and Mars, Saturn, Uranus, and Neptune
79. Which planet has no surface which is suitable for spacecraft to land on?
- A Mars  
 B Venus  
 C Saturn  
 D Jupiter
80. Which planet in our solar system have two moons?
- A Mercury  
 B Saturn  
 C Mars  
 D Earth
81. Which one of the following is **NOT** a continent of the planet Earth?

- A Africa  
 B The United States of America  
 C Europe  
 D Asia

82. The sun is ...

- A a Star  
 B a Moon  
 C a Planet  
 D A huge bright object that is bigger than all the stars in the universe.

83. The approximate surface temperature of the sun is ...

- A 100°C  
 B 1000°C  
 C 5500°C  
 D 100000°C

84. Which one of the following planets is the largest?

- A Saturn  
 B Uranus  
 C Neptune  
 D Jupiter

85. Which of the following gases is formed during a chemical reaction taking place inside the Sun?

- A oxygen  
 B hydrogen  
 C carbon  
 D nitrogen

86. Which of the following statements is correct regarding the Earth-Moon-Sun relationship?

- A The Earth takes 24 hours to rotate on its axis and it takes about 30 days to travel around the Sun.  
 B The Sun takes about 365 days to travel around the Earth.  
 C The moon rotates once a month on its axis and it orbits the Sun once a month.  
 D The Earth takes 24 hours to rotates on its axis and it takes about 365 days to travel around the Sun.

87. What is the name of a star which is closest to the Earth?

- A Southern Cross
- B The Sun
- C Alpha Centauri
- D Proxima Centauri

88. Which one of the following statements about the Sun is **INCORRECT**?

- A The Sun is made of hot gas which gives out heat and light energy.
- B The Sun is much smaller than the Earth.
- C The Sun is located much further from the Earth than the moon.
- D The Sun provides heat and light energy to all living things on Earth.

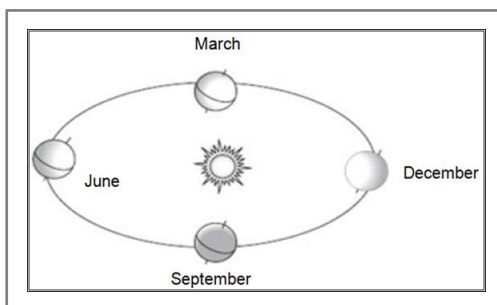
89. Which one of the following planets has the highest surface temperature?

- A Venus
- B Mercury
- C Earth
- D Mars

90. How long does the moon take to orbit around the earth?

- A 20 days
- B 365 days
- C 30 days
- D 28 days

91. The amount of direct sunlight which the Southern Hemisphere receives changes throughout the year. The diagram below shows the Earth revolving around the Sun.



In which month will the Southern Hemisphere receive the greatest amount of direct sunlight?

- A March
- B June
- C September
- D December

92. What name is given to the device used by the girl in the picture below?



- A Microscope
- B Stethoscope
- C Telescope
- D Endoscope

93. The space capsule that took Mark Shuttleworth to the International Space Station was called...

- A Mir
- B Salyut
- C Soyuz
- D Vostok

94. South Africa launched a satellite from Russia in 2009. What was this shuttle called?

- A NalediSAT
- B SunSAT 11
- C SASAT 1
- D SumbandilaSAT

95. Which one of the following statements about the moon is **INCORRECT**?

- A The force of gravity is weaker on the moon than on the Earth.
- B The moon is smaller than the Earth.
- C The moon is closer to the earth than the sun.
- D During a full moon, the moon produces its own light.

96. Which one of the following products is manufactured using sedimentary rocks?

- A Tombstones
- B Cement

- C Kitchen tops
- D None of the above

97 What is the term for the general process by which rocks are broken down at the Earth's surface? The pictures below are evidence of this process.

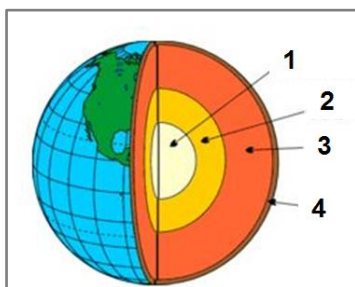


- A Oxidation
- B Exfoliation
- C Corrosion
- D Weathering

98. Carbon dioxide gas makes up about \_\_\_\_\_ of the Earth's atmosphere

- A 0,1 %
- B 1%
- C 10%
- D 25%

99. The diagram below shows the cross section of planet earth.



Which one of the following represents the **CORRECT** combination of labels

	Label 1	Label 2	Label 3	Label 4
A	Crust	Inner Core	Mantle	Outer core
B	Mantle	Crust	Inner Core	Outer Core
C	Crust	Mantle	Outer Core	Inner Core

D	Inner Core	Outer core	Mantle	Crust
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100 The two products in the diagram below were manufactured (made) by using a variety of processes in which different materials were combined.



- A The mixing and setting process is used to make a brick and a cake.
- B The mixing and drying process is used to make a brick and a cake.
- C Concrete bricks are made by means of a mixing and cooling process while a cake is made by a cooking process.
- D The Mixing and setting process is used to make a brick while the mixing and cooking process is used to make a cake.

**The End**