National Research Foundation | SAASTA South African Agency for Science and Technology Advancement

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GRADES 4 – 6
NATURAL SCIENCES OLYMPIAD - 2019

MEMORANDUM:

Question No.	Answer	Question No.	Answer	Question No.	Answer	Question No.	Answer
1	B	31	A	61	D	91	B
2	C	32	B	62	A	92	C
3	B	33	B	63	D	93	A
4	D	34	B	64	A	94	D
5	C	35	A	65	A	95	B
6	C	36	A	66	C	96	C
7	C	37	A	67	B	97	B
8	A	38	C	68	D	98	B
9	D	39	D	69	A	99	A
10	A	40	D	70	C	100	D
11	D	41	B	71	B		
12	B	42	C	72	D		
13	A	43	C	73	B		
14	A	44	A	74	B		
15	A	45	B	75	D		
16	C	46	B	76	C		
17	B	47	B	77	B		
18	A	48	C	78	D		
19	B	49	A	79	A		
20	C	50	C	80	A		
21	B	51	A	81	C		
22	B	52	D	82	B		
23	C	53	C	83	A		
24	C	54	A	84	A		
25	D	55	C	85	B		
26	C	56	A	86	B		
27	B	57	A	87	C		
28	D	58	C	88	A		
29	D	59	B	89	B		
30	D	60	C	90	C		

SOLUTIONS:

1. In which hospital in South Africa did Dr Christiaan Barnard first successfully performed a human heart transplant?

A Charlotte Maxeke Academic Hospital in Johannesburg.
B Groote Schuur Hospital in Cape Town.
C Chris Hani Baragwanath Hospital.
D Nelson Mandela Academic Hospital.

Explanation: On 3 December 1967, South African doctor, **Dr** Christiaan (**Chris) Barnard**, performed the world's first human to human heart transplant at Groote Schuur Hospital, Cape Town.

2. Cholera is caused by?

A Not exercising regularly.
B Not eating food containing Vitamin C.
C Polluted water.
D Eating a lot of sugar.

Explanation: The substances that **cause water pollution** can be divided into two main groups Germs and chemicals. Germs are small organisms that **cause diseases** such as malaria, cholera and bilharzia, and chemicals are poisons, which are mainly produced by industries.

3. Which body system is responsible for detecting environmental changes?

A Respiratory system
B Nervous system
C Excretory system
D Circulatory system

Explanation: Humans have a **nervous system** which **is responsible for detecting environmental** changes, controlling the **body**, and transmitting signals to and from different parts of the **body.**

4. Which one of the following human senses develops first?

A Hearing
B Sight
C Smell
D Touch

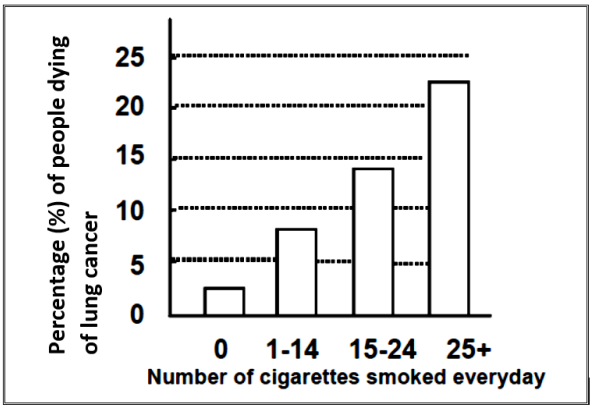
Explanation: The **sense** of touch is the **first** sensory system to **develop** in the womb and is likely the most mature at birth. Newborns have a highly **developed sense** of touch.

5. Which is the hardest working **muscle** in the human body?

A The leg
B The foot
C The heart
D The brain

Explanation: The hardest working **muscle in the human body** is the heart. It can pump out up to 2 ounces (71 grams) of blood at every heartbeat.

6. The graph below shows the relationship between the number of cigarettes smoked per day and the percentage of people dying from lung cancer.



Consider the graph and decide which one of the following statements is true.

A 25% of people who smoke more than 25 cigarettes per day, will die of lung cancer.
B All people who smoke will die of lung cancer.
C Less than 15% of people who smoke 15 – 24 cigarettes per day will die from lung cancer.
D You will not get lung cancer if you don't smoke.

Explanation: According to the graph, 15 – 24 cigarettes smoked per day, shows that 14% of people die from lung cancer.

7. Which one of the following statements is true based on the graph in question 6?

A Smoking reduces the chances of a person to die from lung cancer.
B Lung cancer is caused by smoking only.
C Smoking increases a person's chances of dying from lung cancer.
D You will not get lung cancer if you don't smoke.

Explanation: According to the graph, even if one does not smoke, 2.5% people still die from lung cancer. This means that smoking increases a person's chances of dying from lung cancer.

8. What part of the body does a butterfly taste with?

A **Feet**
B Ears
C Mouth
D Eyes

Explanation: Butterflies taste with their feet. A butterfly has taste sensors on its legs.

9. What mammal has the world's longest tongue?

A A rabbit
B A horse
C A giraffe
D **A blue whale**

Explanation:
The blue whale is the largest mammal in the world, and its massive tongue can weigh as much as an elephant, or 15,000 pounds, according to National Geographic. The blue whale has therefore the world's the largest and longest tongue.

10. This small child with the swollen stomach and skinny legs is suffering from a lack of protein in his diet. A build-up of fluid in the body causes the stomach to swell.

The disease suffered by the child is called …
A **Kwashiorkor**
B Obesity
C Cancer
D Smallpox

Explanation: Kwashiorkor is a severe malnutrition of infants and young children, primarily in tropical and subtropical regions, caused by deficiency in the quality and

quantity of protein in the diet and characterized by anemia, edema, potbelly, depigmentation of the skin, loss or change in hair color, hypoalbuminemia, and bulky stools containing undigested food.

11. **Food passes through the digestive system in the following order:**

A. Mouth, stomach, oesophagus, small intestine, large intestine
B. Mouth, small intestine, large intestine, oesophagus, stomach
C. Mouth, oesophagus, stomach, large intestine, small intestine
D. Mouth, oesophagus, stomach, small intestine, large intestine

Explanation: First the food enters your mouth, the saliva and teeth help break it down. The saliva also helps mush up the food so that it is easier to chew. The food then goes down your esophagus. After that it enters your stomach, where chemicals and acids help break it down. After that it goes into the small intestine where the food is broken down much more. It then goes into the large intestine where it absorbs all the indigestible food and transmits the useless waste from the body.

12. What is the correct order for the levels of classification of animals?

A. class, kingdom, order, phylum, genus, species, family
B. kingdom, phylum, class, order, family, genus, species
C. kingdom, phylum, species, family, genus, order, class
D. class, order, family, kingdom, genus, species, phylum

Explanation: Organisms are grouped together into taxa and these groups are given a taxonomic rank; groups of a given rank can be aggregated to form a super-group of higher rank, thus creating a taxonomic hierarchy. The principal ranks in modern use are domain, kingdom, phylum, class, order, family, genus and species.

13. The main purpose of an adaptation like a mutation or genetic change is to

A help an organism to survive.
B get food.
C provide a habitat.
D change the animal's appearance.

Explanation: An adaptation is a mutation, or genetic change, that helps an organism, such as a plant or animal, survive in its environment

14. Apart from the two colours, black and white, which is the third colour that new born babies can see?

A **Grey**
B Yellow
C Green
D Red

Explanation: Newborns can only focus about eight to 12 inches from their face, and they can see only black, white and grey.

15. A viceroy butterfly looks like the monarch butterfly. The monarch tastes terrible to birds, so birds do not eat a viceroy butterfly. This kind of adaptation is called …?

A **mimicry**
B camouflage
C hibernation
D migration

Explanation: Mimicry is an animal **adaptation** that helps some animals live longer. The harmless viceroy butterfly mimics another butterfly species which is unpalatable due to milkweed they consume as larvae. Birds are reluctant to feed on any of the two species

16. A dog's sweat glands are located around its …

A nose and ears.
B paws and eyes.
C **nose and paws.**
D ears and paws.

Explanation: Dogs only produce sweat on areas not covered with fur, such as the nose and paw pads

17. **An adaptation that allows animals to blend in with certain aspects of their environment.**

A mimicry
B **camouflage**
C behaviour
D copying

Explanation: Camouflage is **an adaptation that allows animals to blend in with certain aspects of their environment.?**

18. What is the only creature that can turn its stomach inside out?

A **Starfish**
B Earthworm
C Squid
D Octopus

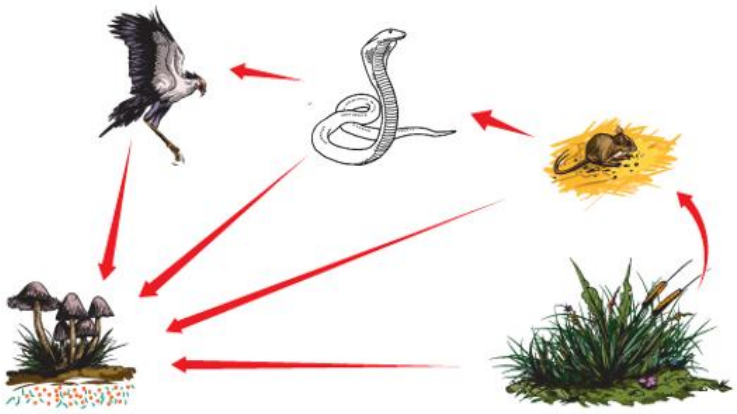
Explanation: A starfish turns **its stomach inside out** in order to consume food that is too large to fit through **its** small mouth opening. By wrapping **its stomach** around an object or

19. In an ecosystem, birds depend on insects to survive. If pesticides are used to control the insect population, the bird population will most likely …

A increase.
B **decrease.**
C decrease, then increase.
D increase, then decrease

Explanation: Spreading pesticides will result in insects dying and birds will not have enough food to eat as they depend on insects. Hence the bird population will decrease as some will die of hunger.

20. Use the following diagram of a food chain and identify a secondary consumer.



A Mouse
B Bird
C **Snake**
D Grass

Explanation: Secondary consumers are organisms that eat primary consumers for energy. Primary consumers are always herbivores, or organisms that only eat autotrophic plants. However, secondary consumers can either be carnivores or omnivores.

21. Which one of the following statements is true when considering the information in the food chain in question 20?

A The bird, snake, and mouse are all producers.
B The bird, snake, and mouse are all consumers.
C The mushrooms and the grass are both decomposers.
D The mushrooms are producers, and the grass is a decomposer.

Explanation: Producers are organisms such as plants that rely on the sun to make food for themselves. **Consumers** feed on producers or other **consumers** to gain their energy.

22. A _____ eats primary consumers.

A producer
B secondary consumer
C decomposer
D tertiary consumer

Explanation: Secondary consumers are a category of living organisms that feed on primary consumers to get energy.

23. The only vitamin that is not found in an egg is

A Vitamin D
B Vitamin A
C Vitamin C
D Vitamin E

Explanation: Almost all Vitamins, except vitamin C is found in an egg.

24. The average human tongue has approximately _____ taste buds.

A 10
B 100
C 10,000
D 10,000,000

Explanation: According to KidsHealth, the average human **tongue** has about 10,000 **taste buds**. In **many** people, there is a regular turnover every two week and all the **taste buds** are replaced.

25. At what age do we usually start to get permanent teeth?

A Ninety-nine years
B Sixteen years
C Two months
D Six years

Explanation: The first **permanent** tooth in a child's mouth **usually** appears when the child is around six years of age.

26. Ants live in groups called …

A group of ants

A Packs
B Herds
C Colonies
D Swarms

Explanation: An **ant colony** is the basic unit around which **ants** organize their lifecycle.

27. Which statement regarding muscles is true?

A Muscles in your brain help you think.
B Muscles help you digest food.
C All of your muscles are attached to bones.
D All of the above statements are true.

Explanation: The brain actually does not have muscles but it controls muscles. Only skeletal **muscles** are connected **to bones**. These **muscles** allow the stomach to squeeze and churn the **food** during mechanical **digestion**.

28. What is the most important reason why endangered species should be protected?

A People pay a lot of money to visit zoos and see endangered animals.
B Protecting endangered species removes pollution from the environment.
C Endangered species are viewed as unique by the people in the community.
D When any endangered species dies out, it affects other animals within the ecosystem.

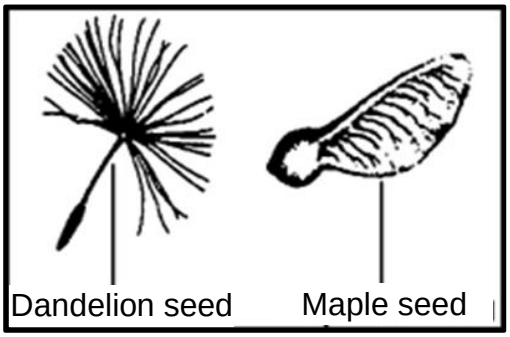
Explanation: Just like humans, an individual plant or animal could not live by itself. It has to interact with other organisms as well as with its environment to survive. Removing one animal or plant species from the ecosystem will compromise the life of other organisms that interact with it.

29. Why is watering plants and grass in the early morning a way to conserve water?

A Water used in the morning can be recycled.
B Grass can absorb water only in the morning.
C There is always more water available in the morning.
D Smaller amounts of water evaporate in the cool morning.

Explanation: Watering while the ground is still cool and the sun is not out yet conserves water because less water evaporates and more water is absorbed by the soil and by the plants.

30. Two different seeds are shown in the diagram below.

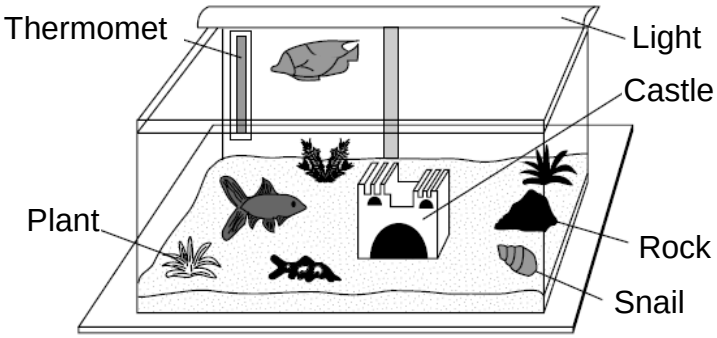


How are these seeds most likely dispersed in nature?

A Eaten by animals
B On an animal's fur
C By water
D By wind

Explanation: The seeds from Dandelion and Maple tress are light and have feathery bristles and can be carried long distances by the wind.

31. The figure below shows an aquarium with six items.



Which item in the diagram above gets its energy by absorbing light?

A **Plant**
B Thermometer
C Fish
D Snail

Explanation: Photosynthesises is the process by which plants convert energy from the sun into food.

32. How long does it take the leaves of "the sensitive" plant shown in the figure below to fold up after the leaves have been touched?

The Sensitive Plant

A About an hour
B **4 - 5 seconds**
C About a day
D About a week

Explanation: The folding process takes between 4-5 seconds. After folding is complete, the unfolding of the leaflets can take anywhere from tens of seconds to up to 10 minutes.

33. A Venus flytrap is one of a few plants that can eat animals. When a fly or other small animal lands in its trap, the Venus flytrap snaps shut and eats it.

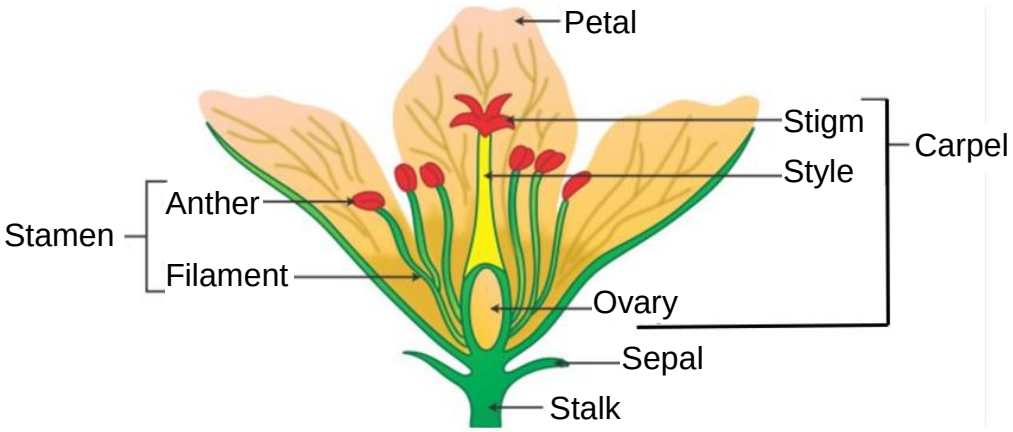
Venus Flytrap

Venus flytraps can eat …

A ants, beetles and birds.
B flies, ants and spiders.
C flies, beetles and frogs.
D lizards, beetles and frogs.

Explanation: Venus flytraps are carnivorous plants that mostly feast on ground critters like spiders and ants.

34. Consider the diagram of a flower
What is the name of a female reproductive structure that includes the ovary?

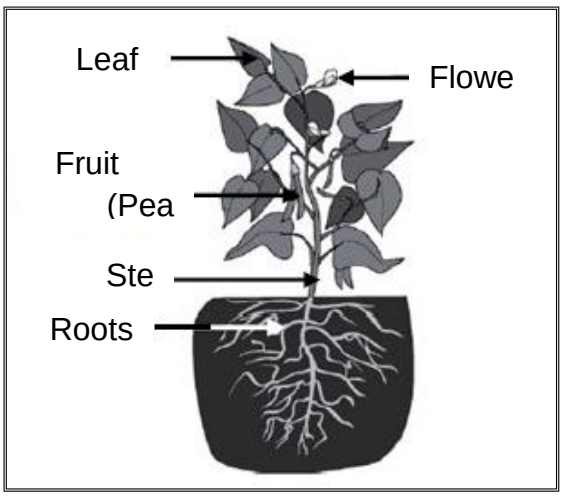


Flower

A Ovary
B Carpel
C Stamen
D Sepal

Explanation: The **Carpel** is a female reproductive organ of a **flower.**

35. Study the diagram of the pea plant below and answer the question that follows:



A pea plant

The plant's stem is used to …

A **support the leaves.**
B produce seeds for the plant.
C absorb water and minerals from the soil.
D all of the above.

Explanation: The **stem of a plant** provides support as the plant grows. It carries the leaves, fruits and flowers.

36. 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

Explanation: Plants needs light, water and air(carbon dioxide) to grow.

37. Amongst the four given elements, which one is most abundant in a plant?

A **Carbon**
B. Manganese

C. Iodine
D. Nitrogen

Explanation: By weight the most common element in a plant would be oxygen, because plants consist mostly of water. The second most common element, by weight, would be carbon which is the most abundant in this example.

38. One year on Earth lasts 365 days. Which of the following definitions could be used to define an Earth year?

A The time it takes the Earth to complete one rotation on its axis.
B The time it takes the Moon to travel around Earth twelve (12) times.
C The time it takes the Earth to travel around the Sun.
D The time it takes the Moon to complete all of its phases.

Explanation: It takes roughly 365 days, or 1 year, for the **Earth** to complete its orbit **around the Sun**.

39. On average, how many high tides and low tides are there each day?

A There is one **high tide** and one **low tide** each day.
B There is one **high tide** and two **low tides** each day.
C There are two **high tides** and one **low tide** each day.
D There are two high tides and two low tides each day.

Explanation: On average four tides occur in a 24 hours period. Two low and two high ones.

40. Oceans have a huge effect on weather and climate mainly because …

A of the effect of waves near coast lines.
B oceans are very salty.
C the fish and sea creatures give off heat.
D ocean currents are able to transport heat around the world.

Explanation: The great ocean **currents** act as a "the **climate** engine" - Ocean **currents** transport enormous amounts of **heat around the world**. This makes them one of the most important driving forces of **climate.**

41. Saltwater ecosystems include

A lakes and ponds.
B oceans and estuaries.

C rivers and streams.
D dams and reservoirs

Explanation: Saltwater ecosystems have a high salt concentration and include oceans, coral reefs, and estuaries.

42. The Earth's axial tilt affects

A days.
B years.
C seasons.
D weight.

Explanation: The seasons are caused as the Earth, tilted on its axis, travels in a loop around the Sun each year. Summer happens in the hemisphere tilted towards the Sun, and winter happens in the hemisphere tilted away from the Sun. ...

43. Which one of the following is an example of weathering?

A Mountains are built
B Water freezes
C Plant roots widen cracks in rocks
D A volcano erupts

Explanation: Plants can cause mechanical weathering by sprouting and growing in soil that has collected in the cracks of a rock. As the plant grows, the roots extend and spread the crack until the rock eventually breaks.

44. Sandstone, shale, and limestone are examples of _____rock.

A sedimentary
B igneous
C metamorphic
D volcanic

Explanation: Sedimentary rocks like sandstone, shale and limestone are formed from pre-existing rocks or pieces of once-living organisms. They form from deposits that accumulate on the Earth's surface.

45. Shaking of the ground, caused by a sudden movement of the Earth’s crust, is called a(n) …

A volcano.
B earthquake.
C sinkhole.
D jitter.

Explanation: A sudden movement of the earth's crust caused by the release of stress accumulated along geologic faults or by volcanic activity is called and earthquake.

46. _____is the geological process in which sediments, soil and rocks are added to a landform or land mass.

A Weathering
B Deposition
C Erosion
D Crystallization

Explanation: Deposition is the geological process in which sediments, soil and rocks are added to a landform or land mass. Wind, ice, water, and gravity transport previously weathered surface material, which, at the loss of enough kinetic energy in the fluid, is deposited, building up layers of sediment.

47. Which planet was classified as a dwarf planet in 2006?

A. Venus
B Pluto
C Mars
D Earth

Explanation: Pluto is the smallest planet in our solar system. In 2006 scientists confirmed that Pluto was a dwarf planet. This is because Pluto is unable to clear up its orbit around the Sun.

48. Which one of the following is not an inner planet?

A Mercury
B Mars
C Uranus
D Earth

Explanation: In the inner Solar System, we find the “Inner Planets” – Mercury, Venus, Earth, and Mars – which are so named because they orbit closest to the Sun.

Uranus forms part of the so called “Outer Planets”.

49. Which one of the following is the hottest planet in our Solar system?

A Venus
B Mercury
C Earth
D Mars

Explanation: The **hottest planet** in the solar system is Venus with an average temperature of 864 degrees Fahrenheit or 462 degrees Celsius.

50. Mercury was named after the god of …

A war.
B love.
C travelers.
D the sea.

Explanation: Mercury is the fastest moving planet in our Solar system, it was named after the Roman messenger god Mercury. Mercury was also the god of travelers.

51. What is the difference between the outer planets and the inner planets?

A The outer planets have many moons while inner planets have a small number or no moons.

B The outer planets orbit in an anticlockwise direction while inner planets orbit in a clockwise direction.

C The outer planets have high densities while inner planets have lower densities.

D The outer planets have small diameters while inner planets have larger diameters.

Explanation: Outer planets often have dozens of satellites or **moons**, while **inner planets** have little or no moons.

52. How old is our Sun?

A 1 000 000 24 years
B 4,5 000 000 years
C 2019 years
D 4,500 000 000 years

Explanation: Our **Sun** is 4,500,000,000 or 4.5 billion years **old**.

53. Outer planets are known as _____ planets while inner planets are known as _____ planets.

A rocky, gaseous
B smooth, rocky
C gaseous, rocky
D rocky, smooth

Explanation: The inner planets are closer to the Sun and are smaller and rockier. The outer planets are further away, larger and made up mostly of gas.

54. A frozen chunk of ice and dust with an elliptical orbit around the Sun is called a(n)…
A comet.
B meteoroid.
C asteroid.
D moon.

Explanation: A comet is a small, icy object that orbits the sun and has a long gaseous "tail".

55. What can be found in the region of space between the orbits of Mars and Jupiter?

A Nothing but space
B Meteorites
C An asteroid belt
D Stars

Explanation: The asteroid belt is a region of space between the orbits of Mars and Jupiter where most of the asteroids in our Solar System are found orbiting the Sun

56. Which planet has a surface which is suitable for spacecraft to land on?

A **Mars**
B Uranus
C Saturn
D Jupiter

Explanation: The asteroid belt is a region of space between the orbits of Mars and Jupiter where most of the asteroids in our Solar System are found orbiting the Sun

57. Which of these planets would have the greatest gravitational pull on a nearby object?

A **Jupiter**
B Mercury
C Earth
D Neptune

Explanation: The planet with the **greatest** gravitation **pull** in Earth's solar system is **Jupiter**. NASA measures the gravity of other planets in relation to Earth. Gravity on **Jupiter** is about 2.36 times that of Earth.

58 Our Sun consist mainly of …

A Hydrogen and Oxygen.
B Oxygen and Helium.
C **Hydrogen and Helium.**
D Hydrogen, Helium, and Sulphur.

Explanation: Our **sun** mainly consists of 71 % Hydrogen, 27 % Helium.

59. Which one of the following planets has seasons that last for about 40 years?

A Jupiter
B **Neptune**
C Uranus
D Earth

Explanation: Seasons on **Neptune last** for over **40 years,** and it's now winter in its northern hemisphere.

60. Which planet in our Solar System is known for extreme sulfuric acid rain showers?

A Mars
B Jupiter
C Venus
D Earth

Explanation: It does rain sulfuric acid on Venus, but not on the surface. Precipitation
takes place 25 km high up in the atmosphere. The sulfuric acid evaporates long before it reaches the surface of the planet.

61. About how many Earths can fit inside the planet Jupiter?

A 40
B 365
C 1 million
D 1320

Explanation: Volume of Jupiter/volume of Earth = about 1320 Earths

62. What would happen if the Earth suddenly started to move faster in its orbit around the Sun?

A A year on Earth will become longer.
B Earth's distance from the Sun would decrease.
C A year on Earth will become shorter.
D Earth's gravity would decrease.

Explanation: Years will become longer because the increase in speed would cause the earth to go outward from its current orbit and into a new orbit further away from the sun. It will therefore take the Earth longer to orbit the Sun.

63. Which one of the following planets has a year that is shorter than a day on the same planet?

A Jupiter
B Mercury
C Earth
D Venus

Explanation: Venus takes about 243 Earth days to rotate around its own axis. It takes 225 Earth days for **Venus** to orbit the Sun. That means that a **day** on **Venus** is a little longer **than** a **year** on **Venus.**

64 The Sun is classified as a ...

A **star.**
B planet.
C burning rock.
D giant comet.

Explanation: a star: The Sun is classified as a yellow dwarf or as a main sequence star

65. What is the name of South Africa's second satellite? This satellite was launched in September 2009.

A **SumbandilaSat**
B Da Vinci
C Fresco
D Rotor

Explanation: SumbandilaSat, is a South African micro earth observation satellite, launched in 17 September 2009.

66. In which year was Laska and Benji, the two mice, sent into space?

A 1962
B 1972
C **1958**
D 1994

Explanation: Laska and Benjy, the two mice, were the first two animals sent to space by US in 1958

67. How do astronauts warm their food aboard the Orbiter space capsule?

Astronauts aboard the Orbiter space capsule

A Using a microwave oven.
B Injecting the food with warm water.
C Placing the food near the orbiter's exhaust system.
D Placing the food in the food warmer.

Explanation: Water guns are used to inject hot water into food.

68 How long does it take the Moon to orbit the Earth?

A Approximately 28 years
B Approximately 1 day
C Approximately 1 year
D Approximately 27 days

Explanation: The **moon** orbits **the Earth** once every 27.322 days. It also **takes** approximately 27 days **for the moon** to rotate once on its axis.

69 In what year did Mark Shuttleworth became the first South African to travel to space?

Mark Shuttleworth

A 2002
B 1994
C 2010
D 1985

Explanation: Mark Shuttleworth gained worldwide fame on 25 April 2002 as the second self-funded space tourist and the first-ever South African in space

70. Which legendary astronaut walked on the moon and later commanded the first space shuttle flight?

A Neil Armstrong
B Mark Shuttleworth
C John Young
D Galileo Galilei

Explanation: John Young, was NASA's longest-serving astronaut, who walked on the moon and flew on the first Gemini and space shuttle missions.

71. What is currently the farthest man-made object from Earth?

A Sputnik 1
B Voyager 1
C Voyager 2
D Alpha capsule

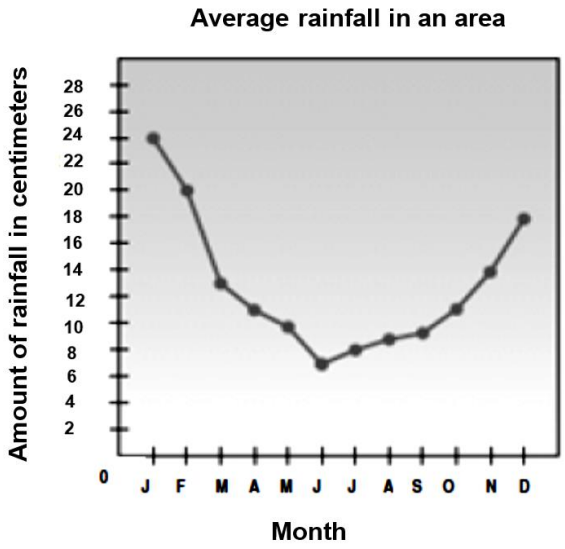
Explanation: Voyager-1: At a distance of 145 AU from Earth as of February 22, 2019, it is the most distant human-made object from Earth.

72. Neil Armstrong was the first person to set foot on the moon. Part of his mission mandate was to take as many photos as he could during his brief stay on the moon. For how long did he explore the moon by means of walking on the surface of the moon?

A 30 days and 3 hours
B 5 hours and 20 minutes
C 10 days and 5 hours
D 2 hours and 36 minutes

Explanation: Armstrong and Aldrin together explored the surface during a moonwalk that lasted 2 hours and 36 minutes. They collected 48.5 pounds (22 kilograms) of material from the surface —including 50 moon rocks and planting the U.S. flag

The graph below shows the average rainfall in a specific area measured over a period of one (1) year. Study the graph and answer questions 73, 74, 75 and 76



73. What is the difference in rainfall figures when comparing the months of January and December?

A 24 centimeters
B 6 centimeters
C 18 centimeters
D 4 centimeters

Explanation: 24 cm (January) – 18 (December) cm = 6 cm difference

74. Which month was the driest in this area?

A. August
B June
C January
D All the months

Explanation: A minimum rainfall of 7 cm was measured in the month of June.

75. How much rain fell in that month mentioned in question 74?

A 24 centimeters
B 6 centimeters
C 18 centimeters
D 7 centimeters

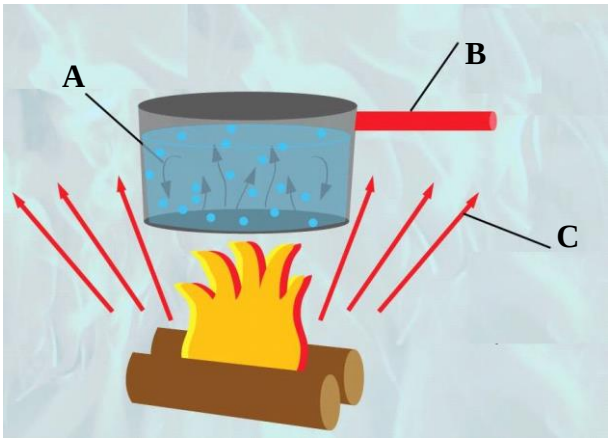
Explanation: Measurement taken from the graph. (7 cm)

76. What was the average rainfall during the first six months?

A 24 centimeters
B 6 centimeters
C 14 centimeters
D 85 centimeters

Explanation: From January to June, it rained 24 cm, 20 cm, 15 cm, 11 cm, 10 cm and 7 cm respectively. The sum = 85 cm. To get the average rainfall for the 6 months, one divides 85 cm by 6 months = 85 cm/6months = **14.2 cm per month**, rounding off, this will give **14 cm/month**.

Use the following diagram to answer questions 77, 78 and 79.



77. Name the type of heat transfer taking place at position A in the diagram.

A Radiation
B Convection
C Evaporation
D Condensation

Explanation: Convection is the heat transfer due to the bulk movement of molecules within fluids such as gases and liquids.

78. Name the type of heat transfer taking place at position B in the diagram.

A Radiation
B Convection
C Evaporation
D Conduction

Explanation: This is the transfer of heat or electric current from one substance to another by direct contact.

79. Name the type of heat transfer taking place at position C in the diagram.

A Radiation
B Convection
C Evaporation
D Condensation

Explanation: Radiation is energy that is transmitted or radiated in the form of waves or particles.

80. Which one of the following statements is correct regarding molecules in a gas and the molecules in a liquid?

A The molecules in a liquid move over shorter distances than the molecules in a gas.
B The molecules in a liquid cannot move, but the molecules in a gas can.
C The molecules in a gas are more tightly packed than the molecules in a liquid.
D The molecules in a gas cannot move, but molecules in a liquid can move.

Explanation: The molecules of a liquid are packed relatively close together. Consequently, liquids are much denser than gases. The molecules of gases are able to move freely over longer distances when compared to the molecules of liquids.

81. Rain, sleet, hail, and snow are all part of the process of _____, which is found
in the water cycle.

A transpiration
B evaporation
C precipitation
D condensation

Explanation: Precipitation is the various **water** forms present in the atmosphere, usually falling as rain, hail, frozen rain, sleet or snow.

82. Which of the following are all examples of fossil fuels?

A Soil, rocks, and sand.
B Coal, oil, and natural gas.
C Plants, trees, and animals.
D The Sun, gravity and wind.

Explanation: Common **examples** of **fossil fuels** include natural gas, oil, peat and coal. These **fuels** are organic biomass extracted from the remains of primitive organisms that roamed the planet millions of years ago.

83. Which one of the following is the best description of animals that live in a desert ecosystem?

A They are light-coloured, camouflaged to blend in with their surroundings and are most active at night.
B They are covered with fur to keep them insulated, and they require a lot of water.
C They have with webbed feet, and they stay in the water most of the day.
D They are bright-coloured, easily seen in their surroundings, and active during the day.

Explanation: Described in A

84. Which of the following substances can be separated by using filtration as the separation method?

A A mixture of mud and water.
B A solution of vinegar and water.
C A mixture of sand and sawdust.
D A solution of salt and water.

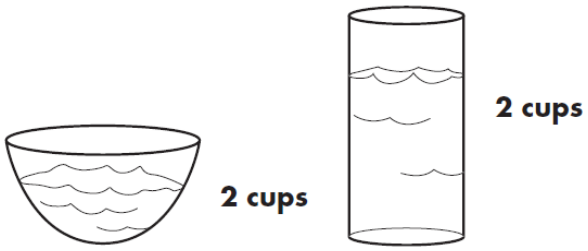
Explanation: Water and mud can be separated by filtration. Water will penetrate through the filter paper and mud will remain behind on the filter paper

85. Liquids have …

A definite shape and volume.
B definite volume but not a definite shape.
C definite shape but not a definite volume.
D variable shape and volume.

Explanation: A liquid has definite a volume (E.g. 50 ml), but the shape will depend on the container the liquid is poured in.

86. Each of the open containers shown in the figure below, contains two cups of water.



Conta of water.

Predict what will happen to the amount of water after two days have passed.

A The same amount of water will be left in both cups.
B B will contain more water.
C A will contain more water.
D Both cups will still contain two cups of water.

Explanation: More water will have evaporated from cup A, because of a larger water surface is exposed to the air.

87. Sand consists of two chemical elements, namely:

A Oxygen and Nitrogen
B Carbon and Oxygen
C Oxygen and Silicon
D Hydrogen and Sodium

Explanation: The chemical **composition** of **sand** is primarily SiO_2, or silica. Silica, which is also named as quartz, is a type of mineral that makes up most of the **sand** types like beach **sand**.

88. Five (5) grams of baking soda and 20 grams of vinegar are added together. A bubbling reaction takes place. When the reaction is over, the solution weighs 24 grams. How can this difference in mass be explained?

A A gas has formed and escaped from the solution.
B The vinegar has evaporated.
C The molecules in the new solution is packed more densely.
D Baking soda is lighter when dissolved in vinegar.

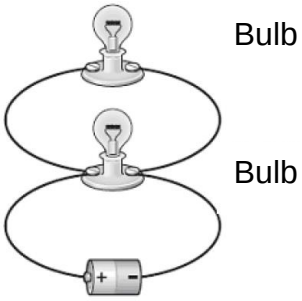
Explanation: The gas (Carbon dioxide) which has escaped has a mass of 1 gram.

89. Which one of the following is an example of a temporary magnet?

A Magnetite
B. Electromagnet
C. Bar magnet
D. Horseshoe magnet

Explanation: Electromagnet - It only retains magnetism when an electrical current is running through it.

90. Consider the circuit diagram and answer the question that follows:

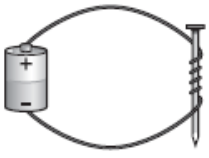


Which statement **best** describes what will happen if bulb 1 burns out?

A Bulb 2 will also burn out.
B Bulb 2 will flash on and off.
C Bulb 2 will stay lit.
D The current will stop flowing.

Explanation: Since this is parallel connection, if bulb 1 burns out, bulb 2 will still be lit.

91. Students made an electromagnet by wrapping a piece of insulated wire in loops around an iron nail and attaching the wire to a cell as shown in the figure below.



An Electromagnet

The students then conducted an experiment to learn how the number of wire loops affected the number of paper clips that can be picked up by the electromagnet. The table below shows the results of the experiment.

Number of wire loops	Number of paper clips picked up by the electromagnet
5	**1**
15	**3**
25	**5**
40	**9**

Based on the results in the table, which of the following is the best conclusion that can be made from the student's experiment?

A Adding more wire loops makes an electromagnet weaker.
B Adding more wire loops makes an electromagnet stronger.
C Adding more wire loops makes an electromagnet use more electricity.
D Adding more wire loops makes an electromagnet use less electricity.

Explanation: The strength of an **electromagnet** is directly proportional to not only the current (I), but also **the number** of windings (n) around the solenoid. Increasing **the number** of windings is probably the easiest way to increase **the strength of** an **electromagnet.**

92. Most renewable energy originates from…

A fossil fuels.
B. the ground.
C the Sun.
D Uranium.

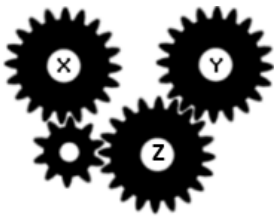
Explanation: Most renewable energy sources originate from the sun (solar energy), while tidal energy originates from the gravitational pull of the moon.

93. When using levers (all classes of levers), the force and the work needed to lift a load will be less, if we …?

A. move the load closer to the fulcrum.
B. move the load away from the fulcrum.
C. shorten the leaver.
D. The distance from the fulcrum does not matter.

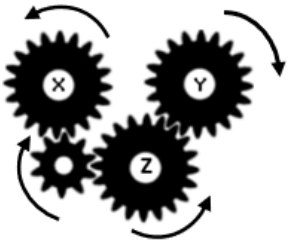
Explanation: A **lever** is a bar or a board that rests on a support called **fulcrum** which lifts or moves **the load**. The **closer** the object is **to the fulcrum** the **easier** it is to **move** it.

94. How do gears X and Z turn when gear Y turns in a clockwise direction?



A X turns clockwise and Z turns anti-clockwise.
B Both X and Z turns clockwise.
C X turns anti-clockwise and Z turns clockwise.
D Both X and Z turns anti-clockwise.

Explanation:



95. A pulley is …

A a bar used to lift heavy objects.
B a wheel with a groove which guides a rope or a cable.
C made of two inclined planes.
D a lever with an arm and a fulcrum.

Explanation: Pulley is a simple machine and comprises of a wheel on a fixed axle, with a groove along the edges to guide a rope or cable.

96. In which way are tundra and desert ecosystems similar?

A Both ecosystems have rich soil.
B Both ecosystems support a lot of plant life.
C Both ecosystems receive little rainfall.
D Both ecosystems have extremely warm temperatures.

Explanation: A **desert** and **tundra** are **similar** in that both of these regions receive little precipitation, have somewhat limited vegetation and experience cold temperatures at night.

97. The correct order for fossil formation is:

A Soft body parts decay, sediments are deposited and cover organisms, sediments and hard parts become rock.
B Sediments are deposited and cover organisms, soft body parts decay, sediments and hard parts become rock.
C Hard and soft body parts decay and become rock.
D Sediments cover organism and all body parts decay.

Explanation: The stages of **fossil formation** include the decay of any soft body parts, the settling of the remains where they ultimately fossilize, and the alteration of the hard body parts in a way that typically replaces them while maintaining their shape.

98. How long does it take a sock made of wool to fully decompose when buried in soil?

A 3 years
B 1 year
C 5 days
D 10 years

Explanation: Many products will decompose when placed in soil, or left to the elements, wool include. Wool will actually take up to 1 year to fully decompose.

99. Which element on the Periodic Table is represented by the symbol Au?

A. Gold
B. Silver
C. Copper
D. Tin

Explanation: Gold is represented by the symbol Au
100. An atom consists of two different regions namely the _____and the_____.

A nucleus; proton cloud
B proton; neutron region
C electron cloud; electrons
D electron cloud; nucleus

Explanation: The **two** main components of an **atom** are the nucleus and the cloud of electrons. The nucleus contains positively charged and neutral subatomic particles, whereas
the electron cloud contains negatively charged particles called electrons.