

Science MCA Review Unit

Topics:

6th grade Physical Science:

- Scientific Method
- Matter
- Chemical Reactions
- Energy Transformation
- Motion
- Forces

7th grade Life Science:

- Scientific Method
- Cells
- Diversity of Organisms/Classification
- Interdependence/Ecology
- Heredity/Genetics
- Change Over Time/Evolution
- Flow of Energy (photosynthesis, predator-prey relationships)
- Human Organism

8th grade Earth Science:

- Scientific Method
- Earth Processes (plate tectonics, rocks, weathering)
- Water Cycle
- Weather & Climate
- The Universe

MCA Test:

Unlike the Math and Reading tests, which test knowledge that builds on itself yearly, the Science test assesses 3 subjects: Physical, Life and Earth Science. The test is taken on the computer and is organized by modules. There are 4-6 modules for each grade level. Each module has 4-7 questions. The questions will not be mixed up like they are on the NWEA. Each module is kind of like a story and is based on one of the main topics of a grade level. For example, there may be a module named "Bike Ride," which tells a story about going for a bike ride. In the "Bike Ride" module, there are questions about motion and energy.

Review:

You will take a pretest which will test all of the knowledge that is likely to be tested on the Science MCA. Following the pretest, you will analyze your test data and work on reviewing the sections of the test you weren't successful at on the pretest. Finally, you will take a post-test and pass it!

MCA Pretest

Write on loose leaf paper please!

(6th grade Physical Science)

Name/# _____

Hour _____

1. Which of these is an example of scientific evidence?

- a. Cats are better pets than dogs
- c. Boys drink a lot of energy drinks

- b. The sun rises in the east and sets in the west
- d. M&M's are good candy

2. Why do scientists repeat experiments?

- a. because they want to gain accurate results
- c. because they were probably wrong

- b. because they are picky
- d. because they need to put in a 40 hour work week

3. What is true about the laws of nature?

- a. they are different at different latitudes
- c. they are the same everywhere

- b. they are predictable
- d. b & c

4. Describe the difference between scientific laws and theories.

5. Label the following questions, Y=you can answer it using scientific investigation, N= you CANNOT answer it using scientific investigation.

_____ Are cats better pets than dogs?

_____ Which of 5 fruits has the most DNA?

_____ Does fertilizer increase plant growth?

_____ Do 8th grade boys eat more food than 8th grade girls?

6. Label the following as O=observation, P=prediction or I=inference

_____ the sun sets in the west

_____ the tree will die without water

_____ the tree died because it needed water

_____ strawberries give lots of DNA

_____ winds curve because of the earth's rotation

_____ it will rain later today

7. Label the following as a measurement for L=length, M=mass, T=time, V=volume, or P=temperature.

_____ centimeters (cm)

_____ grams (g)

_____ degrees Celsius (^oC)

_____ kilograms (kg)

_____ liters (L)

_____ seconds (s)

_____ cubic centimeters (cc)

_____ Kelvins (K)

_____ meters (m)

8. Describe why scientists might want to work alone.

9. Describe why scientists sometimes work in teams.

10. Which is the most accurate number of elements known to date?

a. 112

b. 12

c. 82

d. 52

11. Atoms are:

a. too small to see

b. what makes up matter

c. all of these

d. none of these

12. What happens to the mass of a substance when it changes from solid to liquid, or liquid to gas?

a. it is reduced

b. it increases

c. it stays the same

13. Put the four states of matter in order from most tightly packed to least tightly packed.

Most tightly packed: _____, _____, _____, _____ least

14. Which of these describes density?

a. volume divided by mass

b. mass divided by volume

c. the amount of matter in a certain space

d. b & c

15. You have 2 white, grainy substances. To determine their identity, you heat them both. Substance A does not react, and substance B begins to turn brown and bubble. Identify the substances.

Substance A is probably _____

Substance B is probably _____

16. The difference between mixtures and pure substances is:

a. mixtures are made of more than one substance

b. mixtures react but substances don't

c. mixtures can be separated, substances can't

d. a & c

17. Which is the smallest unit of an element which retains its properties?

a. proton

b. atom

c. neutron

d. molecule

18. Which of these is an example of a chemical change?

a. burning match

b. torn paper

c. broken stick

d. melting wax

19. Which of these happens during a chemical change?

a. a new substance is formed

b. heat may be given off or taken in

c. characteristic properties change

d. all of the above

20. Classify the following as M=mixtures, or PS=pure substances:

_____ salt water

_____ salt

_____ sugar

_____ Lowry's seasoned salt

_____ potting soil

_____ water

21. Label these as M=mechanical energy, C=chemical energy, E=electrical energy, or H=heat:

_____ a ball rolling down a hill

_____ plug in

_____ a hammer

_____ burning coal

_____ getting into a hot car

_____ atomic bomb

22. Label these as R=radiation, CV= convection or CD=conduction

_____ transfer through solids

_____ transfer through air or liquid

_____ transfer through temp difference

23. Why is heat transferred?

a. to seek equilibrium

b. to mix heat up evenly

c. to give energy to other reactions

d. a or b

24. Heat goes from:

a. warmer objects to cooler ones

b. cooler objects to warmer ones

c. either direction

25. Light is made of:

a. one color

b. two colors

c. all colors

d. no color

26. What is the best description of the relationship between heat and light?

a. usually not found together

b. usually found together

c. cannot be found together

27. Which is true of waves?

a. longer the wavelength, faster the wave

b. longer the wavelength, slower the wave

c. shorter the wavelength, slower the wave

d. wavelength has nothing to do with speed

28. Which is true of how waves move?

a. waves move slower through liquids

b. waves move at different speeds in different materials

c. waves always move the same speed

d. a or b

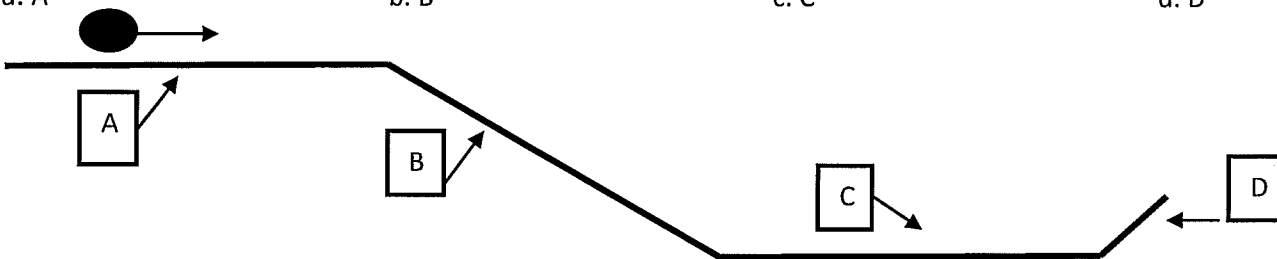
29. At which point on the figure would a ball be accelerating?

a. A

b. B

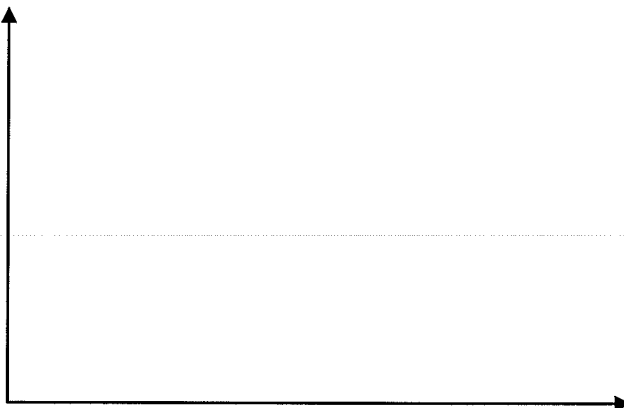
c. C

d. D



30. Graph the following data:

Position	Speed
A	0 m/s
B	5 m/s
C	4 m/s
D	2 m/s



31. Which might happen if another ball was started at the same time but at the opposite end of the track?

- a. the direction might change
- b. the speed might change
- c. neither of these
- d. either of these

32. What happens when you put opposite ends of a magnet together?

- a. they attract
- b. they repel
- c. nothing

33. What happens when you put like ends of a magnet together?

- a. they attract
- b. they repel
- c. nothing

(7th grade Life Science)

34. Which is most likely to happen when new scientific evidence is discovered?

- a. scientists ignore the new evidence
- b. scientists think differently about old theories
- c. scientists might change their theories
- d. b or c

35. Which of these is a use of scientific models?

- a. developing theories
- b. making predictions
- c. giving explanations
- d. any of these

36. Write a hypothesis in the appropriate form.

37. Match the following:

- | | |
|----------------------------|---|
| _____ dependent variable | A. that which is set by the experimenter and doesn't change |
| _____ independent variable | B. that which must be kept constant so it doesn't affect the experiment |
| _____ controls | C. that which changes depending on the experiment |

38. Give at least 4 examples of some discoveries or contributions made by scientists.

39. Give at least 2 examples of how our society or culture might influence scientific or technological advances.

40. Which of these is **NOT** part of the cell theory?

- a. all living things are made of one or more cells
- b. all cells come from other cells
- c. all cells are made of living atoms
- d. cells are the basic unit of life

41. Animal and plant cells are different because:

- a. animal cells have chloroplasts and cell walls
- b. animal cells have chloroplasts, but not cell walls
- c. animal cells do not have chloroplasts or cell walls
- d. animal cells have cell walls, but not chloroplasts

42. Why do cells need to divide?

- a. for a multicellular organism to grow
- b. to repair damage to an organism
- c. for a unicellular organism to reproduce
- d. any of these

43. Which function do cells use to break down food into energy?

- a. photosynthesis
- b. mitosis
- c. respiration
- d. osmosis

44. Which function do cells use to reproduce?

- a. photosynthesis
- b. mitosis
- c. respiration
- d. osmosis

45. What is probably the main function of the cells in the intestines?

- a. breathing
- b. digestion
- c. blood circulation
- d. brain function

46. What is probably the main function of the cells of the heart?

- a. breathing
- b. digestion
- c. blood circulation
- d. brain function

47. Which of these are in the correct order of complexity?

- a. organ systems, cells, organs, tissues
- b. organs, cells, organ systems, tissues
- c. tissues, cells, organs, organ systems
- d. cells, tissues, organs, organ systems

48. Match the following organs with their appropriate system:

- | | |
|---|-----------------------------|
| _____ heart, blood vessels, arteries, veins | A. Nervous System |
| _____ lungs, mouth, nose, esophagus | B. Excretory System |
| _____ brain, spinal cord, nerves, neurons | C. Muscular-Skeletal System |
| _____ stomach, pancreas, intestines, liver | D. Circulatory System |
| _____ bones, muscles, cartilage | E. Respiratory System |
| _____ bladder, intestines, rectum | F. Digestive System |

49. Charles Darwin studied Finches on the Galapagos Islands. He noticed that there were finches that looked like the same species and looked the same as the ones on the mainland, but their beaks were different. What is most likely the reason why they had different beaks?

- a. they ate different food
- b. they had different ways of keeping warm
- c. they had different ancestors
- d. they had different predators

50. Darwin noticed that one of the finches had a really large, thick beak and was often found around shrubs and trees. Which of these foods was probably its main source?

- a. insects
- b. leaves
- c. nuts
- d. other birds

51. One of the finches was seen using a twig to dig grubs out of a tree. This is an example of:

- a. migration b. adaptation c. natural selection d. none of these

52. How is it that baby sea turtles know to run for the sea?

- a. parents show them b. they've done it before c. its innate (in their genes) d. none of these

53. Which of these are ways that living organisms know how to react to their environment?

- a. parents show them b. they've done it before c. its innate (in their genes) d. all of these

54. Dichotomous keys are used to:

- a. identify an organism b. classify an organism by characteristics
c. either of these d. none of these

55. Match the following characteristics with the appropriate Kingdom:

- | | |
|---|----------------------|
| _____ unicellular, prokaryotic, some cell walls, some chloroplasts | A. Animals |
| _____ multicellular, eukaryotic, no cell walls, no chloroplasts | B. Plants |
| _____ uni- or multicellular, eukaryotic, cell walls, no chloroplasts | C. Protists |
| _____ multicellular, eukaryotic, cell walls, chloroplasts | D. Bacteria/Monerans |
| _____ mostly uni- but some multicellular, eukaryotic, some chloroplasts | E. Fungi |

56. Which is true about humans' effects on the ecosystem?

- a. their effect is sometimes irreversible b. their effect can be damaging
c. their effect can sometimes be fixed d. all of these

57. Which of these is a population?

- a. all animals in a certain area b. all plants and animals in a certain area
c. all members of a certain species in a certain area d. all living things in a certain area

58. Which of these is an ecosystem?

- a. all animals in a certain area b. all plants and animals in a certain area
c. all members of a certain species in a certain area d. all living and nonliving things in a certain area

59. List some reasons why an ecosystem might only be able to support a small number of living things.

60. Your inherited traits, the ones you got from your parents, are located:

- a. in your cells b. in your genes c. in your chromosomes d. all of these

61. One gene carries how much information?

- a. 1,000's of pieces b. 100's of pieces c. 10's of pieces d. one piece

62. One gene can influence how many traits?

- a. just one trait b. a few traits c. hundreds of traits d. thousands of traits

63. Can the environment affect your traits?

- a. yes b. no

64. Which of these is the MOST IMPORTANT thing for a species to be able to continue?

- a. reproduce b. find food c. have shelter d. find water

65. Label these as an A= asexual reproduction, or S= sexual reproduction.

_____ exact copy of the organism is made

_____ genetic variation

_____ better ability to adapt to environment

_____ quicker reproduction rate

 no need to find a mate

_____ need to find a mate

 no need for dispersal or travel

_____ bad traits are always passed on

66. How many species have gone extinct?

- a. one, the dinosaurs, duh!
b. a few
c. hundreds to thousands
d. none, and there's no evidence of any extinctions

67. The fossil record tells us:

- a. a general order of when certain species lived on earth
b. where certain species lived on earth
c. how long ago certain species lived on earth
d. all of these

68. Which of these is an example of a body structure adaptation?

- a. changing a mating call b. using wings to swim c. curvature of turtle shell for mating

69. Which of these is a behavioral adaptation?

- a. changing a mating call b. using wings to swim c. curvature of turtle shell for mating

70. Which of these is a functional adaptation?

- a. changing a mating call b. using wings to swim c. curvature of turtle shell for mating

71. Which of these groups has been shown to be most closely related?

- a. sharks, manta rays, lamprey b. bats, birds, insects
c. whales, sharks, bony fish d. chickens, cows, pigs

72. How fast does a species change?

- a. one day b. one year c. one generation d. several generations

73. Which of these are necessary for photosynthesis to take place (the reactants)? [you may circle more than one]

- a. light b. water c. carbon dioxide d. sugar e. oxygen

74. Which of these are the products of photosynthesis? [you may circle more than one]

- a. light b. water c. carbon dioxide d. sugar e. oxygen

75. Which is the correct order of how energy is transferred in a food web?

- a. secondary consumer, producer, primary consumer b. primary consumer, secondary consumer, producer
c. producer, secondary consumer, primary consumer d. producer, primary consumer, secondary consumer

76. Which of these holds the most available energy?

- a. producer b. secondary consumer c. primary consumer d. decomposer

77. About how much energy is transferred to the next trophic level (feeding level)?

- a. 100% b. 75% c. 50% d. 10%

78. What happens to all of the energy as it is transferred through the food web?

- a. it disappears into space b. it is used and released through digestion
c. it goes back to the sun d. it is absorbed into the ground

79. A lion and a gazelle would be an example of a:

- a. parasite – host relationship b. predator – prey relationship c. producer – consumer relationship

80. A virus and a human would be an example of a:

- a. parasite – host relationship b. predator – prey relationship c. producer – consumer relationship

81. Grass and mice would be an example of a :

- a. parasite – host relationship b. predator – prey relationship c. producer – consumer relationship

82. A communicable disease is one that you:

- a. inherit from your parents b. catch from other infectious people c. get from the environment d. any of these

83. A genetic disease is one that you:

- a. inherit from your parents b. catch from other infectious people c. get from the environment d. any of these

84. A chronic disease is one that you:

- a. inherit from your parents b. catch from other infectious people c. get from the environment d. any of these

(8th grade Earth Science)

85. Give an example of how science can help you make an informed decision.

86. Explain how scientific models can be helpful.

87. How do you know if a source is credible and valid?

88. Give some examples of how science has contributed to changes in sanitation, warfare, transportation, agriculture, medicine, or communication.

89. Which of these represents evidence for plate movement?

- a. volcanoes & earthquakes b. mountain building c. seafloor spreading d. all of the above

90. Plate Tectonics is a:

- a. theory b. proven fact c. hypothesis d. experiment

91. Which is TRUE of weathering & erosion?

- a. they ONLY break down rocks b. they ONLY build up landforms
c. they don't break rocks OR build landforms d. they break down rocks AND build landforms

92. Which of these describes erosion?

- a. rocks being broken by a glacier b. rocks being carried down a river
c. rocks being compacted together d. none of these

93. Which of these can create a valley?

- a. glacier b. wind c. river d. gravity e. a or c

94. Which of these are necessary for a dune to form?

- a. sand b. wind c. something to pile against d. all of the above

95. Which of these creates new land?

- a. volcanoes b. gravity c. earthquakes d. wind

96. Match the following rocks with their possible rock cycle interactions:

- | | |
|-------------------|--|
| _____ Magma | A. compact to sedimentary, melt to magma, heat & pressure to metamorphic |
| _____ Igneous | B. cool to igneous |
| _____ Sediments | C. weather to sediments, melt to magma, heat & pressure to metamorphic |
| _____ Sedimentary | D. melt to magma, weather to sediments |
| _____ Metamorphic | E. weather to sediments, melt to magma, heat & pressure to metamorphic |

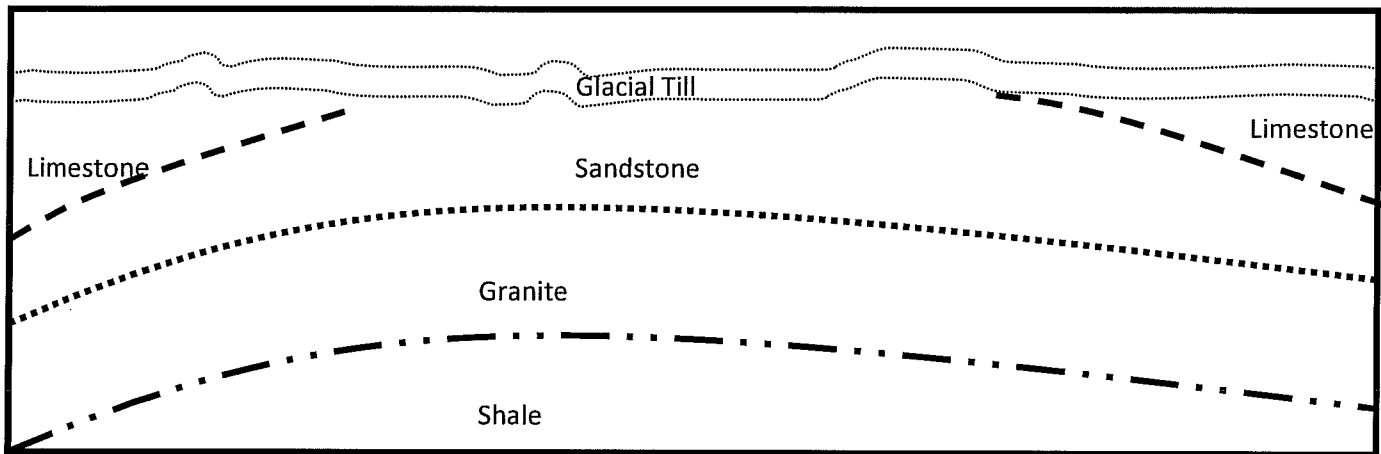
97. The principle of superposition states:

- a. oldest rocks are at the bottom
- b. newest rocks are at the bottom
- c. oldest rocks get mixed up
- d. newest rocks are never in the right place

98. If you found 4 fossils, how would you know which is oldest and which is youngest?

- a. you wouldn't be able to tell, call a scientist
- b. the youngest ones would be at the bottom, oldest at top
- c. the oldest ones at the bottom, youngest at top
- d. same age if you found them at the same time

99. According to the diagram below, write the history of this portion of the earth.



History:

100. What may have caused the destruction in the above diagram?

- a. shale
- b. limestone
- c. glacier
- d. volcano

101. What could happen to fossils that were in the limestone above?

- a. melted by magma
- b. eroded by glacier
- c. nothing, they are still there
- d. compacted into sediments

102. Which mineral property shows the true color?

- a. streak
- b. cleavage
- c. color
- d. hardness

103. Which mineral property is tested by the Mohs scale?

- a. streak
- b. cleavage
- c. color
- d. hardness

104. Which of these is a rock that contains a useable amount of metal?

- a. pore
- b. source
- c. dock
- d. ore

105. Which is an example of convection affecting the weather?

- a. receiving rays from the sun
- b. warm wind blowing from the south
- c. water washing up on warm soil
- d. none of these

106. Which is an example of conduction affecting weather?

- a. receiving rays from the sun
- b. warm wind blowing from the south
- c. water washing up on warm soil
- d. none of these

107. Which is an example of radiation affecting weather?

- a. receiving rays from the sun
- b. warm wind blowing from the south
- c. water washing up on warm soil
- d. none of these

108. The atmosphere is divided up by:

- a. temperature change
- b. pressure change
- c. who discovered the layer
- d. height

109. Ocean layers are divided by:

- a. temperature change
- b. pressure change
- c. who discovered the layer
- d. depth

110. If the earth did not rotate, the winds would:

- a. not change
- b. still curve
- c. stop all together
- d. travel straight

111. Ocean currents and winds are:

- a. opposite in opposite hemispheres
- b. same in opposite hemispheres

112. Which of these is the best description of the chemical composition of the atmosphere?

- a. silica, oxygen, aluminum
- b. nitrogen, oxygen, carbon dioxide, water vapor
- c. iron, nickel, oxygen
- d. carbon dioxide, oxygen

113. Which of these represents the correct order of the atmosphere layers?

- a. thermosphere, stratosphere, troposphere, mesosphere
- b. stratosphere, troposphere, mesosphere, thermosphere
- c. troposphere, stratosphere, mesosphere, thermosphere
- d. mesosphere, stratosphere, thermosphere, troposphere.

114. If a cold front is approaching, what is likely to happen?

- a. thunderstorm
- b. sunny skies
- c. cooler temperatures
- d. a & c

115. If a warm front is approaching, what is likely to happen?

- a. thunderstorm
- b. rainshower
- c. warmer temperatures
- d. b & c

116. If an occluded front is approaching, what is likely to happen?

- a. thunderstorm
- b. sunny skies
- c. lasting rainshowers
- d. warmer temperatures

117. If we are under HIGH PRESSURE, the sky is probably:

- a. sunny
- b. raining
- c. overcast
- d. b & c

118. If we are under LOW PRESSURE, the sky is probably:

- a. sunny
- b. raining
- c. overcast
- d. b & c

119. About 10,000 years ago, our area was:

- a. same as today b. much warmer than today c. much colder than today

120. What is the principal energy source for our solar system?

- a. earth's core b. nuclear reactors on the moon c. the sun d. all stars

121. How is energy from the sun transferred through the solar system?

- a. radiation b. convection c. conduction d. none of these

122. Which of these causes the seasons to change?

- a. the calendar b. tilt of the earth c. revolution around the sun d. b & c

123. When the Northern Hemisphere is tilted toward the sun, it is:

- a. spring b. summer c. autumn d. winter

124. When the Northern Hemisphere is tilted away from the sun, it is:

- a. spring b. summer c. autumn d. winter

125. During the Vernal and Autumnal Equinoxes, the earth is:

- a. not tilted toward or away from the sun b. tilted toward the sun c. tilted away from the sun

126. Which moon of Jupiter has possible ice and volcanic activity, suggesting there might be life?

- a. Io b. Galileo c. Europa d. Callisto

127. Which are the 2 main things needed for life to flourish on another planet or moon?

- a. warmth & oxygen b. oxygen & food c. water & oxygen d. warmth & water

128. If life is found elsewhere in the universe, it would most likely be found:

- a. in an ocean/water b. in soil c. in a cave d. in the atmosphere

129. Which planets are small and rocky?

- a. Mercury, Venus, Mars & Earth b. Inner Planets c. Outer Planets d. a & b

130. Which planets are large & gaseous?

- a. Outer Planets b. Inner Planets c. Middle Planets d. none of the above

131. The length of a day was determined by:

- a. the revolution around the sun b. revolution of the moon c. rotation of the earth

132. The length of a month was determined by:

- a. the revolution around the sun b. revolution of the moon c. rotation of the earth

133. The length of a year was determined by:

- a. the revolution around the sun b. revolution of the moon c. rotation of the earth

134. Which is true of a solar eclipse?

- a. earth is in between sun and moon
- b. moon is in between sun and earth
- c. happens during a new moon
- d. b & c

135. Which is true of a lunar eclipse?

- a. happens during a new moon
- b. earth is in between sun and moon
- c. moon is in between sun and earth
- d. happens during first half moon

136. Tides are caused by:

- a. gravitational pull on the moon
- b. gravitational pull of the sun
- c. winds pushing the ocean currents
- d. earth's rotation

137. Which is the best estimation of the number of stars and galaxies in the universe?

- a. 100's
- b. 1,000's
- c. millions
- d. billions

138. Which of these is not a type of galaxy?

- a. spiral
- b. corkscrew
- c. irregular
- d. elliptical

139. Which of these is the best distance measurement to use in the universe?

- a. light years
- b. meters
- c. kilometers
- d. miles

140. Why is the sun so bright?

- a. because it is the biggest star
- b. because it is so close to us
- c. because it has the most gas
- d. because it is yellow in color

141. Which color star is the hottest?

- a. red
- b. orange
- c. yellow
- d. blue

142. Blue stars are:

- a. smallest
- b. medium sized
- c. large
- d. extra large

143. After a very massive star dies, what is left behind?

- a. quasar
- b. neutron star
- c. black hole
- d. supernova