Appendix F: Periodic Table of the Elements FCAT 2.0 Science Grade 8 and Biology 1 End-of-Course Assessment

Periodic Table of the Elements

(based on $^{12}_{6}C$ = 12.0000)

Group 1 1A | 2 2A | 3 3B | 4 4B | 5 5B | 6 6B | 7 7B | 8 8B | 9 8B | 10 8B | 11 1B | 12 2B | 13 3A | 14 4A | 15 5A | 16 6A | 17 7A | 18 8A

Period 1 | 2 | 3 | 4 | 5 | 6 | 7

14 — Atomic number
Si — Symbol
Silicon — Name
28.086 — Average Atomic Mass

Representative Elements

Transition Metals

Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 H Hydrogen 1.008	2 He Helium 4.003																
2	3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.81	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
3	11 Na Sodium 22.990	12 Mg Magnesium 24.305											13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.06	17 Cl Chlorine 35.453	18 Ar Argon 39.948
4	19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.88	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.847	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.922	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80
5	37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium 98	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.906	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.411	49 In Indium 114.82	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.60	53 I Iodine 126.905	54 Xe Xenon 131.29
6	55 Cs Cesium 132.905	56 Ba Barium 137.327	57 La Lanthanum 138.905	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.85	75 Re Rhenium 186.207	76 Os Osmium 190.2	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium 209.982	85 At Astatine 210	86 Rn Radon 222
7	87 Fr Francium 223	88 Ra Radium 226.025	89 Ac Actinium 227.028	104 Rf Rutherfordium (261)	105 Db Dubnium (262)	106 Sg Seaborgium (263)	107 Bh Bohrium (264)	108 Hs Hassium (265)	109 Mt Meitnerium (268)									

Metals ← → Nonmetals

Inner Transition Metals

Lanthanide series

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce Cerium 140.12	Pr Praseodymium 140.908	Nd Neodymium 144.24	Pm Promethium 144.913	Sm Samarium 150.36	Eu Europium 151.96	Gd Gadolinium 157.25	Tb Terbium 158.925	Dy Dysprosium 162.50	Ho Holmium 164.930	Er Erbium 167.26	Tm Thulium 168.934	Yb Ytterbium 173.04	Lu Lutetium 174.967

90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th Thorium 232.038	Pa Protactinium 231.036	U Uranium 238.029	Np Neptunium 237.048	Pu Plutonium 244.064	Am Americium 243.061	Cm Curium 247.070	Bk Berkelium 247.070	Cf Californium 251.080	Es Einsteinium 252.083	Fm Fermium 257.095	Md Mendelevium 258.099	No Nobelium 259.101	Lr Lawrencium 260.105

Actinide series

Nature of Science

1. Pat has two kinds of plant food,"Quickgrow" and "Supergrow." What would be the best way for Pat to find out which plant food helps a particular type of houseplant grow the most? **SC.8.N.1.1**

   A. Put some Quickgrow on a plant in the living room, put some Supergrow on a plant of the same type in the bedroom, and see which one grows the most.
   B. Find out how much each kind of plant food costs, because the more expensive kind is probably better for growing plants.
   C. Put some Quickgrow on a few plants, put the same amount of Supergrow on a few other plants of the same type, put all the plants in the same place, and see which group of plants grows the most.
   D. Look at the advertisements for Quickgrow, look at the advertisements for Supergrow, and see which one says it helps plants grow the most.

2. Mandy wanted to see if a new, environmentally-friendly pesticide will prevent insect damage to tomato plants. After making her hypothesis, she conducts her experiment.

   She treats five tomato plants with traditional pesticide and five with the new pesticide. Mandy also leaves five plants untreated as a control. She makes careful notes of how she set up her experiment and then records her data about all of the plants.

   Why is it important for Mandy to record her procedures and data accurately? **SC.7.N.1.2**

   A. so that the hypothesis will always be correct
   B. so that she can look intelligent when she presents her data
   C. so that society does not waste money on buying pesticides that do not work
   D. so that other scientists can replicate the experiment and make sure the results are correct

3. Alex and Jennifer conducted an experiment to test reaction times in grabbing a meter stick after it is dropped. They each tested 15 friends. Alex dropped the meter stick for his friends and Jennifer dropped the meter stick for her friends while the other one timed the reactions. Jennifer's friends reacted, on average, 0.9 seconds faster than Alex's friends. Jennifer concluded that her friends were faster.

   Which of the following should she do next to check her results? **SC.7.N.1.2**

   A. Try a different reaction time experiment.
   B. Try the experiment again, this time using a ruler instead of a meter stick.
   C. Repeat the experiment as it was done the first time but using only Jennifer's friends.
   D. Repeat the experiment and have one person drop the meter stick for all the friends tested.

4. Francesca creates a model that shows the movement of the tectonic plates of the Earth's surface.

   If she wants to use the model to understand the concept of how a mountain is formed, how does that model help her? **SC.7.N.1.5**

   A. It shows all of the plates in the correct layout.
   B. It explains in detail how mountains are formed.
   C. It displays details that cannot be seen in a drawing.
   D. It speeds up a process that takes millions of years.

5. In science, a theory is different from how we use the term "theory" to apply to everyday ideas. The statement, "It's only a theory" might mean something very different than "theory" when used as a scientific term.

   What is the best way to explain the word, "theory," when used in science? **SC.7.N.3.1**

   A. In science, there is no difference between a law and a theory.
   B. In science, there are few principles that can be considered theories.
   C. In science, a theory is well supported by observations and/or experimental data.
   D. In science, a theory is a completely accurate and reliable fact about natural events.

6. In what way is a scientific law different from a scientific theory? **SC.7.N.3.1**

   A. A law is true in all situations and all circumstances, while a theory is only true in certain instances.
   B. A law describes the major ideas of the universe, while theories are based on the smaller ideas of the universe.
   C. A law is based on testable facts and data, while a theory is just a combination of one or more hypotheses that have not been tested.
   D. A law expresses a relationship between two or more variables, while a theory explains the causal mechanism of how something happens.

7. Colleen waters the plants in her greenhouse once every day. She wants to find out if the plants will grow more leaves if they are watered more often. She counts the number of leaves on each plant before she starts. She then continues to water half of each type of plant once daily, but she waters the other half of each type twice a day.

   What is the outcome variable (dependent variable) in Colleen's experiment? **SC.8.N.1.1**

   A. the type of plant being grown
   B. the number of leaves the plants grow
   C. the amount of light the plants receive
   D. the number of times the plants are watered

8. Christy wants to find out if the birds that visit the bird feeders in her backyard would rather build nests in birdhouses or in trees. She puts a birdhouse next to the feeder containing sunflower seeds and hangs a feeder containing cracked corn from a tree.

   She observes the birds' nesting activities over the next two weeks and records her observations. Which of the following would improve Christy's investigation? **SC.8.N.1.1**

   A. putting more food in both bird feeders
   B. setting the feeders up closer to each other
   C. putting the same kind of food in both bird feeders
   D. setting up a third bird feeder containing fruit near a bird bath

9. Susan noticed that hummingbirds in her yard visited all the flowers, but especially seemed to like the red trumpet-shaped ones. She read that they use the nectar in the flowers for food. She assumed that since the parents were eating nectar, they must feed their babies only nectar as well.

   To her surprise, she saw hummingbirds bringing small spiders and insects to feed the young hummingbirds. How does this new evidence affect her original assumption? **SC.6.N.2.2**

   A. She should stick to her assumption that the babies eat nectar since she thought that first.
   B. She should believe what she read in the book and disregard what she witnessed.
   C. She should change her original assumption that they only feed their babies nectar.
   D. She should ask other people what they think and agree with the majority.

10. A paleontologist who is trying to figure out if a meteor impact killed all the dinosaurs would not be able to find an answer by setting up an experiment. Which of the following would be the best way for a paleontologist to approach this problem? **SC.7.N.1.5**

    A. search for dinosaur fossils in many places and note where the fossils stop appearing in the rock layers at each location
    B. study the evidence a meteor impact leaves in a rock layer, then look for that evidence in the layers of rock that formed after those layers with dinosaur fossils
    C. wait for a very large meteor to hit Earth again and see which kinds of animals are killed by it
    D. study similar kinds of disasters that result in large animals becoming extinct, like an oil spill

11. A scientist has been studying bullfrogs for many years. She has noticed that these bullfrogs are now laying eggs 8 days earlier than they did 20 years ago when she first began studying them. The trees around the pond have also grown taller and shade the water more than they did 20 years ago. What would be the best thing for the scientist to do next? **SC.6.N.2.2**

    A. See if she can determine why they are laying eggs earlier.
    B. Choose a different species of frog to study for the next twenty years.
    C. Conclude that the changed tree heights have affected the frogs.
    D. Assume that the water temperature must have risen so frogs can lay eggs earlier.

12. A swimming team wants to select one of three fabrics for their new swimsuits. Each fabric is made of a different material. The team decides to do the following experiment:

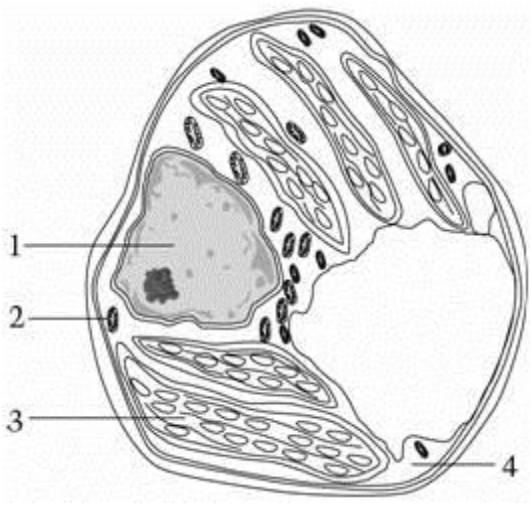
    They cut the same size pieces from each fabric and wet each piece with the same amount of water. They hang the pieces in the sunlight and they check every two minutes to see if any of the pieces are dry.

    What can the team find out about the different fabrics from doing just this experiment? **SC.6.N.2.2**

    A. If the amount of water affects how long it takes the pieces of fabric to dry.
    B. If the type of fabric affects how long it takes the pieces of fabric to dry.
    C. If the amount of water and the amount of light affect how long it takes the pieces of fabric to dry.
    D. If the type of fabric, the amount of water, and the amount of light affect how long it takes the pieces of fabric to dry.

Life Science

13. In the picture of a cell below, which label indicates the part of the cell that contains most of the cell's genetic material? **SC.6.L.14.4**



    A. 1
    B. 2
    C. 3
    D. 4

14. How do molecules from food and molecules of oxygen that enter the body through the mouth and the nose move to cells of the body? **SC.6.L.14.5**

    A. Molecules from food and molecules of oxygen move from the mouth and the nose to cells of the body through a series of blood vessels, including veins, arteries, and microscopically small blood vessels (capillaries), that extend throughout the body.
    B. Molecules from food and molecules of oxygen move from the nose and the mouth to cells of the body through special respiratory and digestive tubes that directly connect the lungs and stomach to the rest of the body.
    C. Molecules from food and molecules of oxygen move from the mouth and the nose to cells of the body through special respiratory and digestive tubes that directly connect the mouth and nose to the rest of the body.
    D. Molecules from food and molecules of oxygen do not move from the mouth and the nose to cells of the body. Oxygen is breathed in and out of the lungs without entering the cells of the body, and molecules from food enter the digestive tract and pass through the body without entering cells of the body.

15. Which of the following statements is TRUE about competition between organisms with the same needs when resources are limited? **SC.7.L.17.2**

    A. Animals are the only organisms that compete for resources.
    B. Plants are the only organisms that compete for resources.
    C. Neither plants nor animals compete for resources.
    D. Both plants and animals compete for resources.

16. Ants burrow into a thorn of the Acacia tree to live and eat sugar secreted by the tree. These ants are a benefit to the Acacia because they attack the tree's predators. What type of relationship do the ants and these trees share? **SC.7.L.17.2**

    A. commensalism
    B. competition
    C. mutualism
    D. parasitism

17. Where does the food that a plant needs come from? **SC.8.L.18.4**

    A. The food comes in from the soil through the plant’s roots.
    B. The food comes in from the air through the plant’s leaves.
    C. The plant makes its food from carbon dioxide and water.
    D. The plant makes its food from minerals and water.

18. Humans, dogs, and trees are all living things. In which of these organisms would you find DNA molecules? **SC.7.L.16.1**

    A. Only in humans
    B. Only in humans and dogs
    C. In humans, dogs, and trees
    D. DNA molecules are not found in any of these organisms

19. Leigh Ann is learning about the differences between inherited traits and learned behaviors in organisms. For example, she knows that being able to read is learned, while having straight or curly hair is inherited. How does a person inherit a trait such as hair texture? **SC.7.L.16.1**

    A. through the storage of excess fatty acids in tissues
    B. through DNA that is passed from parents to offspring
    C. through the breakdown of different proteins during birth
    D. through different viruses that are passed from parents to offspring

20. In a human body, which of the following represents the highest level of structural organization? **SC.6.L.14.1**

    A. an atom in the lung
    B. lung tissue
    C. the lungs
    D. the respiratory system

21. Which of the following is something that all living organisms have in common? **SC.6.L.14.2**

    A. They all contain at least one cell.
    B. They all need a source of oxygen.
    C. They all use other organisms for food.
    D. They all find mates to reproduce.

22. A cell can be seen by looking through a microscope. Seeing which of these organelles would let you know that you are looking at a plant cell? **SC.6.L.14.4**

    A. mitochondria
    B. chloroplast
    C. cell membrane
    D. nucleus

23. Sandra measured her heart rate and her breathing rate at rest and again after doing 50 jumping jacks.

    What is the main reason that both her heart rate and her breathing rate went up with exercise? **SC.6.L.14.5**

    A. They both sped up to supply her working muscles with enough oxygen to remain in homeostasis.
    B. Her lungs and heart ran short on oxygen while she was exercising and sped up to maintain homeostasis.
    C. Her muscles were out of shape and required extra blood and oxygen in order to maintain her jumping pace.
    D. They both increased in order to carry heat away from her working muscles more efficiently.

24. The infection-fighting cells that are produced by the immune system are manufactured in specific places around the body, for example, in the lymph nodes and the spleen. However, an infection can occur anywhere in the body. How do these infection-fighting cells manage to move around the body and get to the sites of infection? **SC.6.L.14.5**

    A. There are lymph nodes every few millimeters all over the body.
    B. They are excreted and float freely around the body, hunting infections.
    C. They are carried around the body in the circulatory system.
    D. They are moved around the body as muscles squeeze against them.

25. Which characteristic is shared by all cells? **SC.6.L.14.2**

    A. They need energy.
    B. They reproduce sexually.
    C. They make their own food.
    D. They move from place to place.

26. Which of the following are the three main classification domains? **SC.6.L.15.1**

    A. Fungus, Plants, and Animals
    B. Bacteria, Archaea, and Eukarya
    C. Protist, Fungus, and Plants
    D. Bacteria, Virus, and Eukarya

27. According to the modern classification system, which list is written correctly from least specific to most specific? **SC.6.L.15.1**

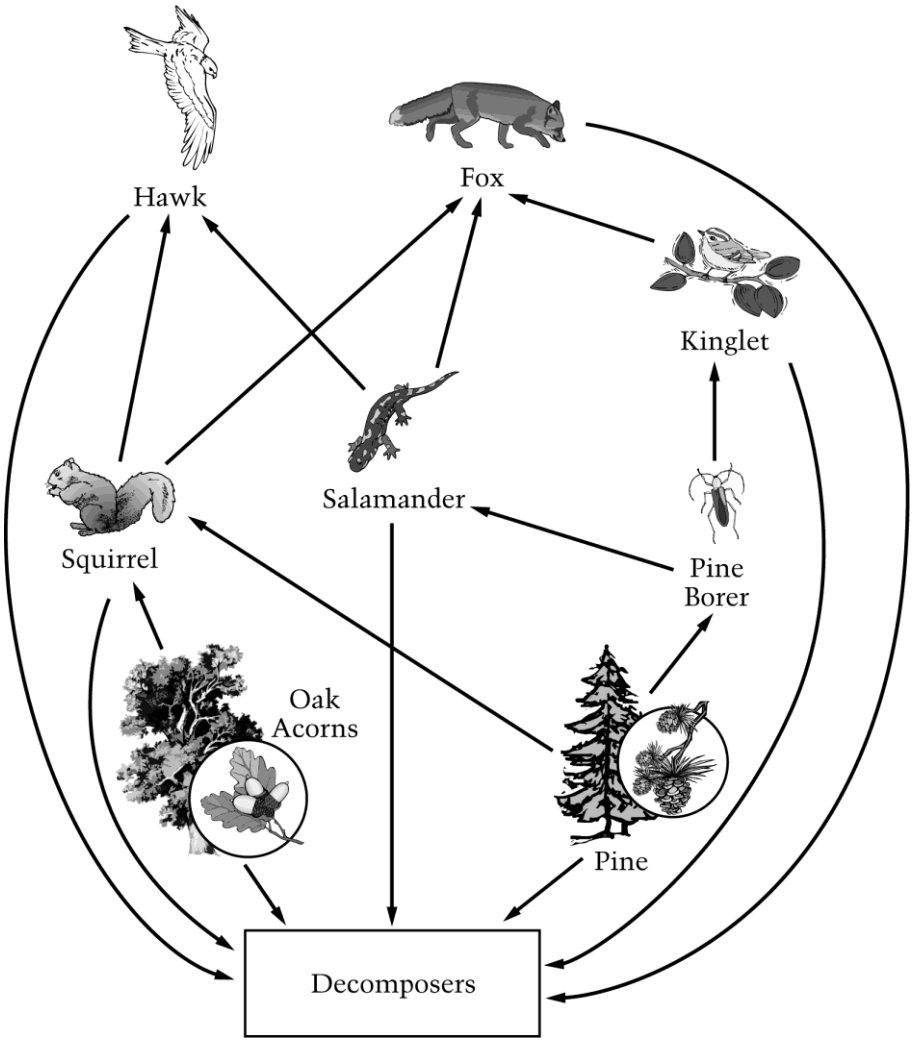
A. species, genus, family, order
B. phylum, class, genus, order
C. class, order, genus, species
D. phylum, order, species, family

28. Joe has a cat with black fur (BB) and a cat with white fur (bb). What would be the genotype of their offspring? **SC.7.L.15.2**

A. BB
B. Bb
C. bb
D. Bbbb

Refer to the diagram below, showing a food web. The arrows show the direction of energy flow. Each arrow points from the organism that is consumed to the organism that consumes it. Use the information in the food web to answer the questions that follow.

FOOD WEB



29. Which statement best explains why decomposers are an important part of this food web? **SC.7.L.17.2**

    A. They use sunlight to make their own food.
    B. They give off oxygen for animals to breathe.
    C. They provide camouflage for small animals.
    D. They make nutrients available to plants.

30. Which of the following living things in the pond system uses the energy from sunlight to make its own food? **SC.8.L.18.4**

A. Insect
B. Frog
C. Water lily
D. Small fish

31. Andrea is training to run in a marathon—a 26.2-mile race. For one of her training runs, she will be running for several hours. She plans to eat several energy bars during the run. Why is it important for Andrea to eat during her run? **SC.8.L.18.4**

A. The protein in the energy bars will help her to build stronger muscles.
B. The energy bars will replace the sugars her body is breaking down for energy.
C. The energy bars will deliver important vitamins her body needs during the run.
D. The carbohydrates in the energy bars will replace the oxygen her cells use in the run.

32. Which of the following is NOT a way carbon dioxide returns to the atmosphere? **SC.8.L.18.4**

A. decay of organisms
B. emissions by factories
C. photosynthesis
D. respiration

33. If air pollution causes the rain that falls on this pond to become much more acidic, after two years how will this acidity affect the living things in this pond? **SC.7.L.15.2**

A. There will be more plants and animals because the acid is a source of food.
B. There will be fewer plants and animals because the acid will dissolve many of them.
C. There will be fewer plants and animals because many of them cannot survive in water with high acidity.
D. There will be more plants and animals because the acid will kill most of the disease-causing microorganisms.

34. Male crickets chirp to attract a mate. Chirping is dangerous because it can attract predators of the crickets like birds or bats. Sometimes, other male crickets will wait quietly and intercept the female on her way to a chirping male. How is the cricket that intercepts the female cricket at an advantage? **SC.7.L.15.2**

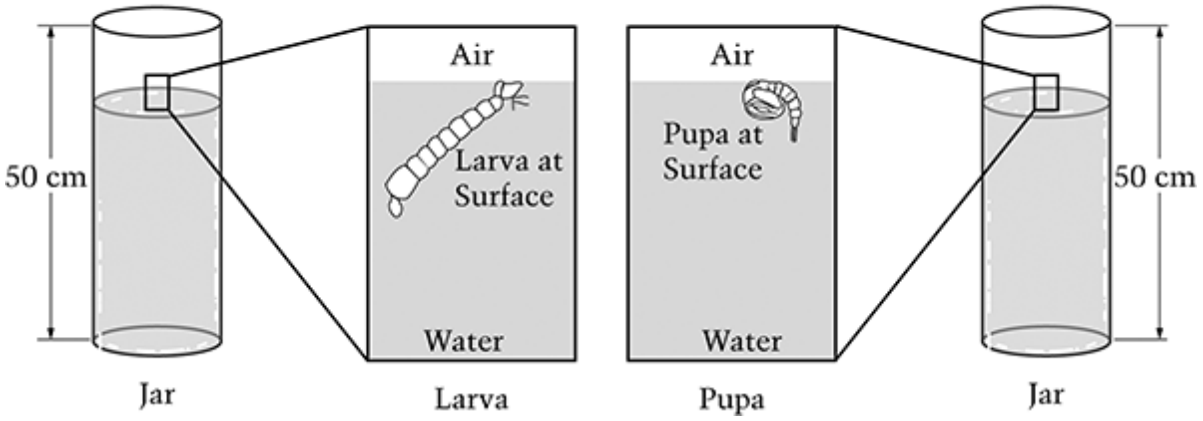
A. The male will be more attractive to females and predators.
B. The female is more attracted to the male and the predator.
C. The female is less likely to get eaten and less likely to reproduce.
D. The male will be less likely to attract predators and more likely to reproduce.

Questions 35 - 36 refer to the following investigation.

Some students were studying the life cycle of mosquitoes. They learned that mosquito larvae and pupae spend part of their time at the surface of water.

The students wanted to find out how a larva and pupa behaved when the jars they were in were disturbed. They put one larva and one pupa in identical tall jars of water at 20°C as shown below.

JARS WITH LARVA AND PUPA



The students tapped on the jars when the larva and pupa were at the surface of the water. The larva and pupa dove down into the jars, and then slowly came to the surface.

The students measured the depth each larva and pupa reached and the amount of time each stayed underwater. The students repeated this step five times and calculated the average of each of their measurements.

Their results are summarized in the table below.

DATA TABLE

Number of Trials	Larva		Pupa	
	Average Depth Reached (centimeters)	Average Length of Time Underwater (seconds)	Average Depth Reached (centimeters)	Average Length of Time Underwater (seconds)
5	22	90	38	120

35. Larvae have a breathing tube and must come to the surface of the water to breathe. **SC.7.L.15.2**

    If a layer of an oily substance completely covers the surface of the water for several days, what will most likely happen to the larva?

    A. It will not survive because of lack of fresh food sources.
    B. It will not survive because of lack of oxygen.
    C. It will skip the pupa stage and hatch immediately to break out of the water.
    D. It will hold its breath until the oily substance naturally breaks down in the water.

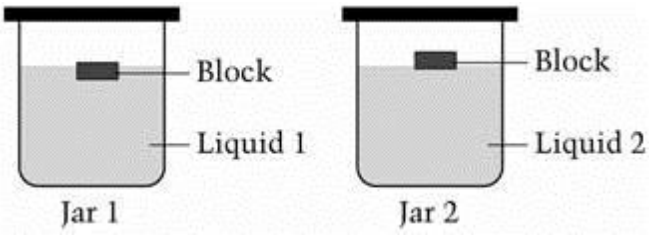
Physical Science

36. Larvae and pupae normally float. They must use their muscles in order to dive down through water. What type of energy is used by the muscles? **SC.7.P.11.2**

    A. Sound energy from the air
    B. Thermal energy from the water
    C. Chemical potential energy from their cells
    D. Gravitational potential energy from Earth

Physical Science

37. Look at the two pictures below. They show what happened when two solid blocks were each put in a jar containing a liquid. Based just on what you can see in the pictures, what can you say about the blocks and the jars? **SC.8.P.8.4**



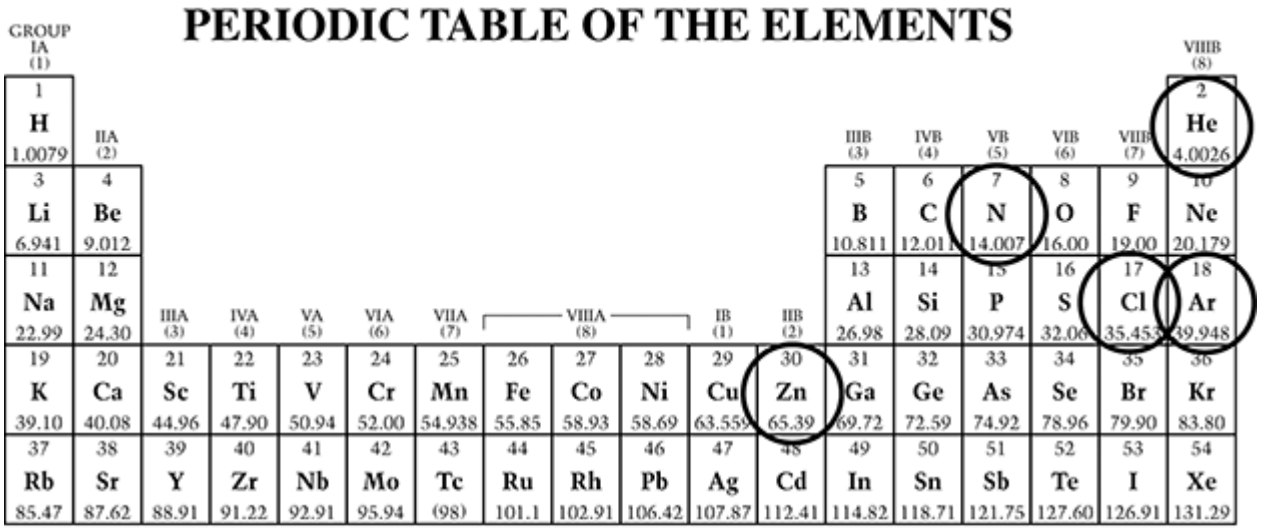
A. The liquid in the jars must be water.
B. The block in jar 1 weighs more than the block in jar 2.
C. The block in jar 1 is floating lower in its liquid than is the block in jar 2.
D. The block in jar 1 must be made of metal and the block in jar 2 must be made of wood.

38. Which of the following is NOT made up of atoms? **SC.8.P.8.5**

A. Heat
B. A gas
C. A cell
D. A solid

CONTINUE

39. Based on its location on the partial periodic table shown below, which element would you predict has chemical properties that are most similar to argon (Ar)? **SC.8.P.8.5**



Element	Symbol
Argon	Ar
Chlorine	Cl
Helium	He
Nitrogen	N
Zinc	Zn

A. Chlorine (Cl)
B. Helium (He)
C. Nitrogen (N)
D. Zinc (Zn)

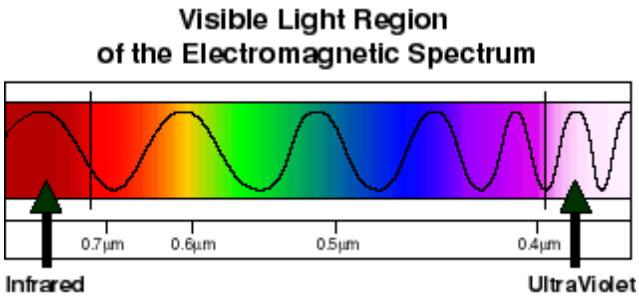
40. What atoms combine to make up a molecule of water (H_2O)? **SC.8.P.8.5**

A. 1 hydrogen, 1 oxygen
B. 1 hydrogen, 2 oxygen
C. 2 hydrogen, 1 oxygen
D. 2 hydrogen, 2 oxygen

41. All of the following would be helpful in separating a mixture of sand and salt EXCEPT **SC.8.P.8.5**

A. a magnet
B. a glass cup
C. a filter paper and funnel
D. water

42. The chart below shows part of the electromagnetic spectrum. Which statement is true regarding this part of the spectrum? **SC.7.P.10.1**



A. Violet has the longest wavelength.
B. Violet has the highest frequency.
C. Violet has the lowest energy levels.
D. Violet is not able to be seen by humans.

43. Francesca is drawing a picture of the electromagnetic spectrum. She needs to order the types of electromagnetic radiation from the lowest to highest frequency.

Which of the following shows the correct order of the electromagnetic spectrum, from lowest to highest frequency? **SC.7.P.10.1**

A. visible, UV, infrared, X-ray, microwave, radio, gamma
B. radio, visible, microwave, infrared, UV, X-ray, gamma
C. gamma, UV, microwave, infrared, radio, X-ray, visible
D. radio, microwave, infrared, visible, UV, X-ray, gamma

44. Warren is tuning his guitar. He notices that as he tightens the string, the pitch of the string increases. Which best explains why tightening the string raises the pitch? **SC.7.P.10.3**
A. It makes the string more flexible.
B. It improves the string's ability to make sounds.
C. It increases the frequency of the string's vibration.
D. It allows sound waves to move along the string more easily.

45. Arianna is experimenting with different materials to see which one will transmit sound the fastest.

Through which of the following materials will sound waves travel the fastest? **SC.7.P.10.3**

A. air
B. concrete
C. oil
D. water

46. On a sunny day, Heidi and some of her classmates are playing kickball during PE. She kicks the ball past second base, and it rolls uphill to a stop. She runs to first base, but before she gets any farther, the bell rings and everyone has to go back inside. **SC.7.P.11.2**

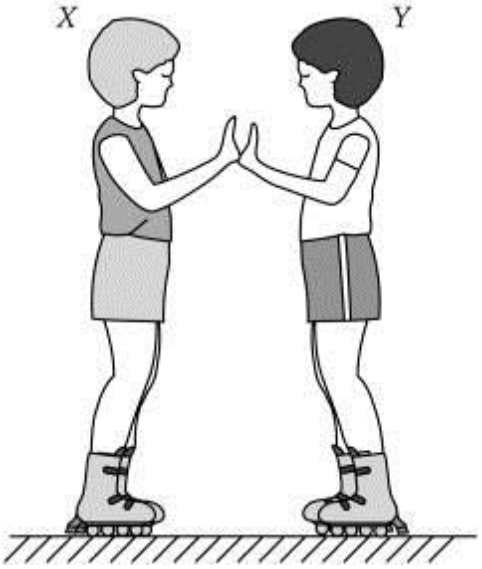
Which of these is an example of kinetic energy changing to potential energy?

A. the ball rolling uphill to a stop
B. the bell ringing inside the school
C. the Sun warming the playground
D. the players running from base to base

47. Vinnie places his cold drink on the roof of a hot car. Which of the following correctly describes what happens next? **SC.7.P.11.4**

A. The temperature of the drink increases as it sends cold into the hot metal of the car.
B. Heat is transferred from the car into the drink and increases the temperature of the drink.
C. Cold is transferred from the drink into the metal of the car, decreasing the temperature of the roof.
D. The temperature of the area under the drink decreases until it is the same temperature as the cold drink.

48. Two boys wearing in-line skates are standing on a smooth surface with the palms of their hands touching and their arms bent, as shown below. If Boy X pushes by straightening his arms out while Boy Y holds his arms in the original position, what is the motion of the two boys? **SC.6.P.13.1**



A. Boy X does not move and Boy Y moves backward.
B. Boy Y does not move and Boy X moves backward.
C. Boy X and Boy Y both move backward.
D. The motion depends on how hard Boy X pushes.

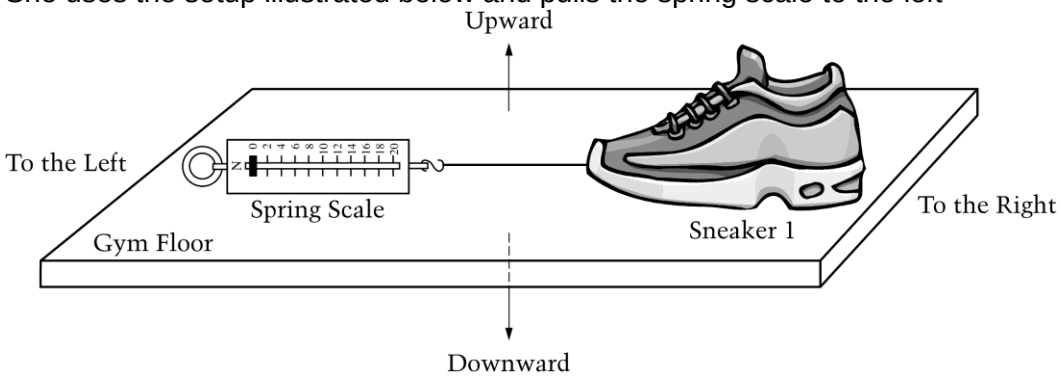
CONTINUE

Meg designs an experiment to see which of three types of sneakers provides the most friction.

She uses the equipment listed below.

1. Sneaker 1
2. Sneaker 2
3. Sneaker 3
4. Spring scale

She uses the setup illustrated below and pulls the spring scale to the left



49. In what direction does the force of friction act? **SC.6.P.13.1**

    A. To the left
    B. To the right
    C. Upward
    D. Downward

50. Gordon is making a list of forces for his science class. Which of the following should Gordon NOT list as a force? **SC.6.P.13.1**
    A. gravity
    B. friction
    C. a push or pull
    D. mass

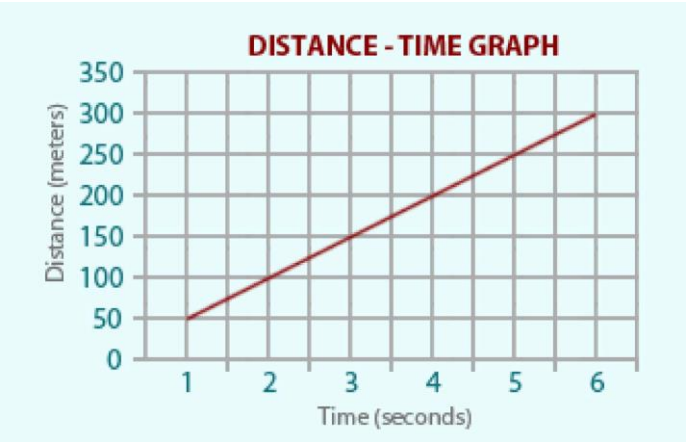
51. Ignoring mass and weight contributed by fuel, what happens when the space shuttle takes off and moves away from Earth? **SC.6.P.13.1**
    A. Its mass decreases and weight increases.
    B. Its mass increases and weight decreases.
    C. Its mass remains constant and weight decreases.
    D. Its mass remains constant and weight increases.

52. Gravity is a force that every mass exerts on every other mass. When you jump up in the air, not only does the Earth exert a gravitational force on you, but you also exert a gravitational

force on the Earth. You, of course, fall back down to the Earth. Which of the following explains why the Earth is not moving toward you when you jump up in the air? **SC.6.P.13.1**

A. Earth exerts a gravitational force on itself.
B. You don't weigh enough to affect Earth's surface.
C. Your mass is very small compared to Earth's mass.
D. Earth's fixed orbit around the Sun keeps it from moving.

53. An object travels at constant speed, and its distance and time are shown in the graph. What is the average constant speed of the object between 3 and 5 seconds? **SC.6.P.13.3**



A. 25 m/s
B. 50 m/s
C. 150 m/s
D. 300 m/s

54. An object travels at constant speed, and its distance and time are shown in the graph. What is the average constant speed of the object between 2 and 5 seconds? **SC.6.P.13.3**

A. 25 m/s
B. 50 m/s
C. 150 m/s
D. 300 m/s

55. What happens when the forces applied to an object at rest produce a net force of zero? **SC.6.P.13.3**

A. The object will move at constant speed.
B. The object will have positive acceleration.
C. The object will have negative acceleration.
D. The object will not move at all.

56. Jacob went down to the lake on a very still day. The water's surface was completely smooth and he could see a tree reflected perfectly in the water. A breeze came up and disturbed the surface of the water and the reflection of the tree disappeared. Why could he see the tree's reflection when the water was still, but not when it was disturbed? **SC.7.P.10.3**

A. The disturbed surface made the light waves reflect in many directions, breaking up the image.
B. The disturbed surface allowed some of the light waves to penetrate into the water, making gaps in the image.
C. The disturbed surface kept the light waves from reflecting, making it impossible to see an image.
D. The disturbed surface changed the light waves' wavelengths, changing the reflected image.

57. Andrea held her hand up in front of a light and a shadow in the shape of her hand appeared on the opposite wall. What property of light explains why the shadow appeared? **SC.7.P.10.3**

A. Light passes through all objects.
B. Light travels in a straight line.
C. Light bends around objects in its path.
D. Light waves are refracted by solid objects.

58. When Charlie came home from school, he turned on a garden hose that had been sitting in the sun all day. The water that came out of the hose was so hot, he could hardly touch it. What happened to the water molecules that made the water feel so hot? **SC.7.P.11.2**

A. The solar energy hitting the hose made the water molecules move faster.
B. The individual water molecules got larger as they absorbed the solar energy.
C. The warmth of the soil around the hose made the water molecules move slower.
D. The heat energy from the Sun was stored as chemical energy in the water molecules.

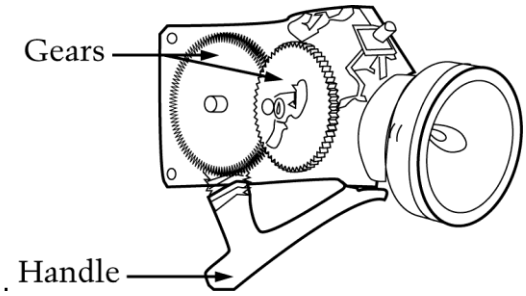
59. Hilary put some ice cubes in a glass of water, and the ice cubes melted. What is the best evidence she can use to show that the melting of the ice is a purely physical change and not a chemical change? **SC.8.P.9.2**

A. Even though the ice and the liquid water look different, they can be shown to be made of the same molecules.
B. When liquid water is put into the freezer and cooled long enough, it will change into a solid form.
C. She did not need to add any extra heat in order to get the ice to melt in the glass of water.
D. Although ice is more difficult to see through than liquid water, it does not change color when it melts.

60. Andy stirred 100 grams of salt (sodium chloride, NaCl) into a pot of water until he could no longer see any grains of salt. If he allows all the liquid to evaporate, how much salt will he find in the pot? **SC.8.P.8.9**

A. 0 grams
B. 50 grams
C. 100 grams
D. 200 grams

61. The flashlight shown below has no batteries. It is operated by squeezing and letting go of the handle. Inside the body of the flashlight are gears, which are shown below



Which sequence best identifies the energy transfers that take place within the flashlight to produce light? **SC.7.P.11.2**

A. Kinetic ⟶ electrical ⟶ light
B. Kinetic ⟶ chemical ⟶ light
C. Chemical ⟶ kinetic ⟶ light
D. Chemical ⟶ electrical ⟶ light

Earth and Space Science

62. Jason thinks that global climate change is not happening because a city in Northern Florida received snow one day in January. Which statement explains what is wrong with Jason's reasoning? **SC.6.E.7.4**

    A. Northern Florida would need to get snow for at least a week for this to be true.
    B. Jason has confused the weather for one day with the climate of a region.
    C. Jason does not realize that Southern Florida would also need to receive snow to make this true.
    D. The climate of Northern Florida would be unaffected since it's already warm in Florida.

63. When a warm air mass and cold air mass come together, like a warm front and cold front, a typical outcome is rain. What explains why rain forms in this situation? **SC.6.E.7.4**

    A. The cold air causes the moisture in the warm air to condense and precipitate as rain.
    B. The cold air is moving faster than the warm air, which causes rain.
    C. Because the cold air is denser, it causes rain.
    D. The two air masses neutralize each other, which results in clouds that produce rain.

64. Convection currents in the atmosphere influence many weather patterns. What property of the air has the most influence on convection currents? **SC.6.E.7.4**

    A. the direction of the wind
    B. the velocity of the wind
    C. the temperature of the air
    D. the mass of the air

65. If you visit the beach on a hot summer day you will probably feel a sea breeze coming off the water onto the land. Which of the following causes this sea breeze? **SC.6.E.7.5**

    A. During the day, solar radiation warms the land more than the water.
    B. The water is warmer than the land during the day.
    C. Earth is tilted toward the Sun, causing air to move inland from the water.
    D. Hurricanes that form in the oceans blow air into the shore.

66. If you walk barefoot on hot asphalt, energy is transferred by which process? **SC.6.E.7.5**

    A. convection
    B. radiation
    C. conduction
    D. reflection

67. Both Ocala, Florida, and Lexington, Kentucky, are good places to raise racehorses, in part because of the limestone near the surface in both places. Calcium from the limestone helps make a horse's leg bones stronger and better able to withstand the pounding stress of

running. Knowing that the Bluegrass Region around Lexington also sits on top of limestone, what other land features are also likely to be found there? **SC.7.E.6.2**

A. sand dunes, lakes, and springs
B. prairies, swamps, and marshes
C. sinkholes, caves, and aquifers
D. shallow rivers, flat land, and quartz sand

68. What must happen in order for a metamorphic rock to be transformed into an igneous rock? **SC.7.E.6.2**

A. It must be compressed by high temperatures and pressure within Earth's crust.
B. It must be soaked in water until it dissolves and reforms in a different shape.
C. It must be pulled under Earth's crust, melted, and forced out above the crust to cool.
D. It must be weathered into sand grains and compressed into multiple layers.

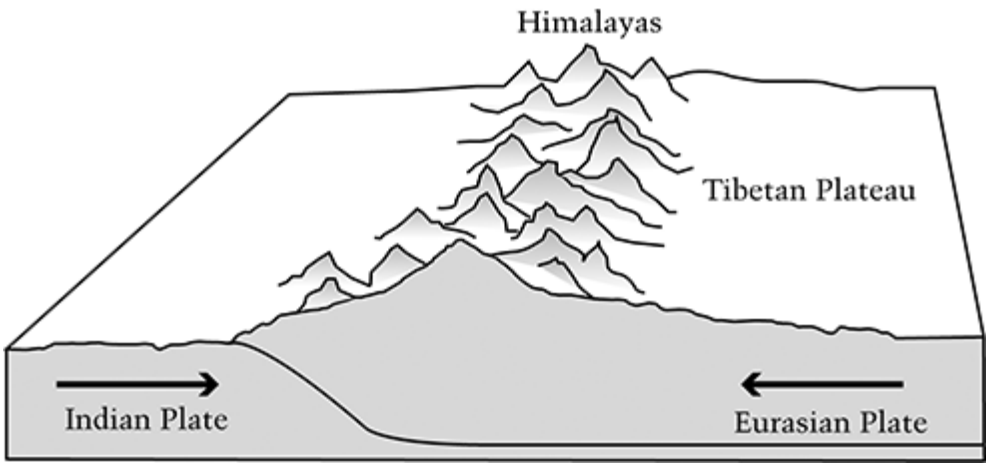
69. Water evaporates and falls back to Earth as rain or snow. What is the primary energy source that drives this cycle? **SC.6.E.7.5**

A. The wind
B. The Sun
C. Air pressure
D. Ocean currents

70. Which of the following is true about wind and water changing the size of mountains over many millions of years? **SC.7.E.6.2**

A. The continuous movement of wind and water changes the size of mountains over many millions of years
B. Nothing can change the size of mountains over many millions of years, not even the continuous movement of wind and water.
C. The continuous movement of wind and water changes the size of some mountains, but not all mountains.
D. Even though mountains change in size over many millions of years, the changes are not due to the continuous movement of wind and water.

71. The diagram below shows the collision of two tectonic plates in Asia.



What is a result of this collision? **SC.7.E.6.5**

A. Volcanoes erupt periodically.
B. The Tibetan Plateau slowly sinks.
C. The Himalayas increase in height each year.
D. Glaciers on the Tibetan Plateau melt.

72. Which of the following is TRUE about how environmental conditions have changed since the time life began on earth? **SC.7.E.6.4**

A. Conditions have remained about the same everywhere on earth, with only minor changes from year to year.
B. Conditions have remained the same in the oceans but have changed on land.
C. Conditions have remained the same except for a few sudden changes in certain locations due to disasters, such as a meteorite striking the earth.
D. Conditions have changed in significant ways everywhere on earth, with some of these changes happening suddenly and others more gradually.

73. An unusual type of fossil clam is found in rock layers high in the Swiss Alps. The same type of fossil clam is also found in the Rocky Mountains of North America. From this, scientists conclude that **SC.7.E.6.4**

A. glaciers carried the fossils up the mountains
B. the Rocky Mountains and the Swiss Alps are both volcanic in origin
C. clams once lived in mountains, but have since evolved into sea-dwelling creatures
D. the layers of rocks in which the fossils were found are from the same geologic age

74. Thomasine has a sample of materials and needs to determine its age. She can determine its relative-age by comparing the rock layer the sample came from to another rock layer.

Why is it sometimes difficult to determine the age of materials in this way? **SC.7.E.6.4**

A. The oldest layers of rock are too close to the Earth's liquid mantle.
B. The youngest layers of rocks do not contain enough materials to evaluate.
C. The sequence of rock layers can be disturbed by erosion and earthquakes.
D. The rock layers have too many different types of rocks to determine their age.

75. Scientists hypothesize that 66 million years ago an enormous asteroid hit Earth, sending out a cloud of dust into the Earth's atmosphere. Which of the following would be evidence to support this hypothesis? **SC.7.E.6.4**

A. Fossils show that all plant and animal life became extinct.
B. The fossils of ancient trees show very little growth during this time.
C. A large portion of the asteroid is still embedded in the Earth's crust.
D. An identical layer of sediment can be seen in different parts of the world.

76. All of the following are examples of erosion **EXCEPT**

SC.6.E.6.1:

A. The wind in the desert blows sand against a rock.
B. A glacier picks up boulders as it moves.
C. A flood washes over a riverbank, and the water carries small soil particles downstream.
D. An icy winter causes the pavement in a road to crack.

77. Which layer of Earth is divided into plates? **SC.7.E.6.1**

A. Mantle
B. Crust
C. Inner core
D. Outer core

78. Convection currents occur in which of Earth's layers? **SC.7.E.6.5**

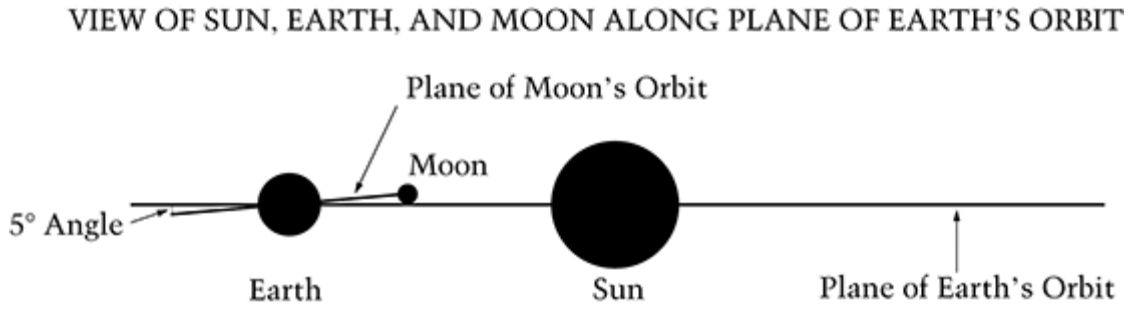
A. crust
B. lithosphere
C. mantle
D. solid core

79. What causes the phases of the Moon? **SC.8.E.5.9**

A. the tilt of Earth on its axis

B. Earth's shadow being cast on the Moon
C. the relative positions of the Sun, Moon, and Earth
D. the elliptical orbit that Earth travels around the Sun

80. Earth revolves around the Sun, and the Moon revolves around Earth. The Moon's orbital path is sometimes above and sometimes below the plane of Earth's orbit, as shown in the diagram below.



What would happen if Earth's orbit and the Moon's orbit were in the same plane? **SC.8.E.5.9**

A. Eclipses would occur every month.
B. The Moon would not have phases.
C. All sides of the Moon would be visible from Earth.
D. The same side of the Moon would always face the Sun.

81. Which statement is true regarding measuring distances in space? **SC.8.E.5.3**

A. An astronomical unit (AU) is larger than a light year.
B. The time taken for light to travel through our Solar System is longer than that for light to travel through the Milky Way.
C. The Earth is one astronomical unit (AU) from the Sun.
D. All of the terrestrial planets are more than one astronomical unit (AU) from the Sun.

82. Jill is creating a scale model of the Solar System. She uses a basketball to represent the Sun. Which of the following should she use to most accurately represent the size of Earth? **SC.8.E.5.3**

A. tennis ball
B. ping pong ball
C. marble
D. grain of sand

83. The Sun's energy and composition is provided by which of the following? **SC.8.E.5.5**

A. the burning of fossil fuels within the Sun
B. solar power that produces electricity in the Sun

C. the Sun's magnetic field
D. the fusion of hydrogen into helium

84. Which of the following is the most violent of all solar disturbances? **SC.8.E.5.5**

A. solar winds
B. sunspots
C. prominences
D. solar flares

85. There are many objects that are part of our Solar System including planets, moons, asteroids, and the Sun. Which of those objects has the greatest gravitational force? **SC.8.E.5.7**

A. asteroids
B. the Sun
C. moons
D. planets

86. Saturn is 9.5 astronomical units (AU) from the Sun and Mars is only 1.5 AU from the Sun. Saturn is also much larger than Mars. Based on this information, how does the average surface temperature on Mars compare to the average surface temperature on Saturn? **SC.8.E.5.7**

A. Since Mars is closer to the Sun than Saturn, it has a higher average surface temperature.
B. Saturn is larger than Mars and absorbs more light, so it has a higher average surface temperature.
C. Since both planets are more than 1 AU from the Sun, their average surface temperatures are equal.
D. Even though Saturn is further away, Saturn's rings cause it to have a lower average surface temperature.

87. The current model of our Solar System is called the heliocentric model, which means the Sun is at the center. Before scientists developed the current model, which is best supported by the evidence, what was believed to be the center of our solar system? **SC.8.E.5.7**

A. The Solar System had no center because all the planets' orbits were random.
B. A star other than the Sun was the center of the Solar System.
C. A black hole was the center of the Solar System.
D. Earth was the center of the Solar System.

Anti-Discrimination Policy

Federal and State Laws

The School Board of Miami-Dade County, Florida adheres to a policy of nondiscrimination in employment and educational programs/activities and strives affirmatively to provide equal opportunity for all as required by:

Title VI of the Civil Rights Act of 1964 - prohibits discrimination on the basis of race, color, religion, or national origin.

Title VII of the Civil Rights Act of 1964 as amended - prohibits discrimination in employment on the basis of race, color, religion, gender, or national origin.

Title IX of the Education Amendments of 1972 - prohibits discrimination on the basis of gender.

Age Discrimination in Employment Act of 1967 (ADEA) as amended - prohibits discrimination on the basis of age with respect to individuals who are at least 40.

The Equal Pay Act of 1963 as amended - prohibits gender discrimination in payment of wages to women and men performing substantially equal work in the same establishment.

Section 504 of the Rehabilitation Act of 1973 - prohibits discrimination against the disabled.

Americans with Disabilities Act of 1990 (ADA) - prohibits discrimination against individuals with disabilities in employment, public service, public accommodations and telecommunications.

The Family and Medical Leave Act of 1993 (FMLA) - requires covered employers to provide up to 12 weeks of unpaid, job-protected leave to "eligible" employees for certain family and medical reasons.

The Pregnancy Discrimination Act of 1978 - prohibits discrimination in employment on the basis of pregnancy, childbirth, or related medical conditions.

Florida Educational Equity Act (FEEA) - prohibits discrimination on the basis of race, gender, national origin, marital status, or handicap against a student or employee.

Florida Civil Rights Act of 1992 - secures for all individuals within the state freedom from discrimination because of race, color, religion, sex, national origin, age, handicap, or marital status.

Title II of the Genetic Information Nondiscrimination Act of 2008 (GINA) - prohibits discrimination against employees or applicants because of genetic information.

Boy Scouts of America Equal Access Act of 2002 – no public school shall deny equal access to, or a fair opportunity for groups to meet on school premises or in school facilities before or after school hours, or discriminate against any group officially affiliated with Boy Scouts of America or any other youth or community group listed in Title 36 (as a patriotic society).

Veterans are provided re-employment rights in accordance with P.L. 93-508 (Federal Law) and Section 295.07 (Florida Statutes), which stipulate categorical preferences for employment.

In Addition:
School Board Policies 1362, 3362, 4362, and 5517 - Prohibit harassment and/or discrimination against students, employees, or applicants on the basis of sex, race, color, ethnic or national origin, religion, marital status, disability, genetic information, age, political beliefs, sexual orientation, gender, gender identification, social and family background, linguistic preference, pregnancy, and any other legally prohibited basis. Retaliation for engaging in a protected activity is also prohibited.