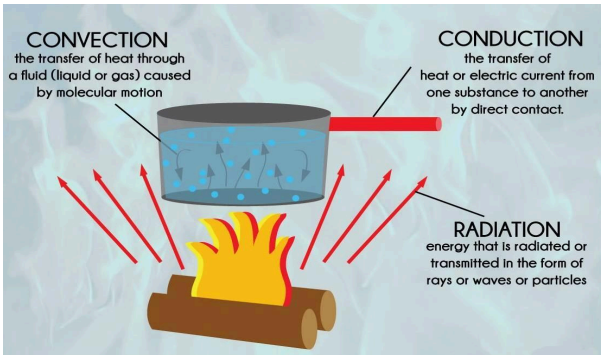
Science Practice Test 1
"More Practice" Answer Key

1. **A**



Source:https://me-mechanicalengineering.com/wp-content/uploads/2015/11/heat-transfer.jpg

Convection is the heat transfer through a fluid. The differences in temperature produce convection currents. The less dense or hotter parts of the fluid rise while cooler or denser areas sink. Birds and gliders make use of upward **convection** currents to rise.

2. **C**

Heat is first transferred from the flames to the metal steamer by conduction. Water particles near the bottom of the steamer are also heated through conduction. After some time, the density of the heated water decreases and will thus rise. Cool water will then sink. This heat transfer occurs through convection.

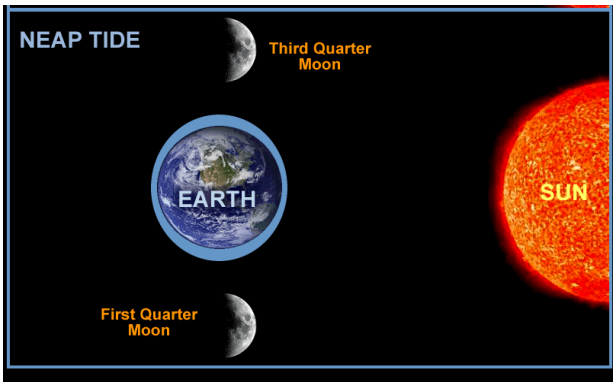
3. **D**

When the moon is in its New or Full phase, the Sun, Moon and Earth *form a line.* This circumstance causes the Sun to intensify the Moon's tidal pull to Earth's waters. This leads to higher tides which are called **spring tides**.

(Note: Since the distance between the Moon and Earth is much smaller than that of the Sun and Earth, the Moon has a much greater attraction to Earth and has more effect on tides than the Sun.)

4. **A**

When the moon is at its 1st or 3rd Quarter, the Sun, Earth and the moon form a *right angle.* This circumstance causes the Sun to cancel some of the Moon's tidal pull to Earth's waters. This leads to lower-than-normal tides which are called **neap tides.**



Source:http://www.windows2universe.org/earth/Water/images/tides_lg_gif_image.html&edu=elem

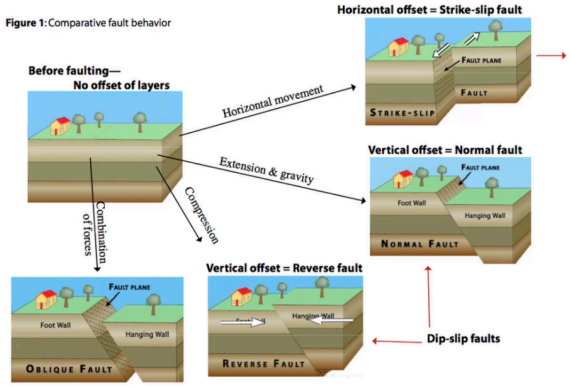
5. **C**

There are three types of faults: normal fault, reverse fault and strike-slip fault.

When two plates move in different directions, one plate slides downwards away from the other due to crustal stretching, it is called **normal fault**. This fault is defined when a hanging wall moves downward as a footwall moves upward.

Opposite the normal fault is the **reverse fault**, where two plates move towards each other, causing one plate to slide underneath another or slide upward due to colliding pressure. For this type, the hanging wall moves upward as the footwall moves downward.

Strike-slip fault, the third type of fault, occurs when two plates slide side by side instead of going up or down.



Source:https://www.livescience.com/37052-types-of-faults.html

6. **A**

Magnitude measures the energy released by an earthquake at the focus (origin of the earthquake). A seismograph is used to determine the magnitude.

Intensity measures the strength of ground shaking at specific locations on the Earth's surface. It also describes the effect and damage of the earthquake on people, buildings, and the natural environment.

An earthquake only has one value for magnitude (e.g. magnitude 7.1). The magnitude remains the same regardless of the distance from the epicenter. In contrast, intensity varies from place to place. Areas closer to the epicenter generally experience stronger shaking and greater damage, resulting in higher intensity values, while areas farther away experience lower intensity.

7. **D**

The presence of active faults in an area indicates a risk of future earthquakes.

Liquefaction occurs when sediments saturated with water experience shaking causing the ground to behave as semi-liquid. As a result, buildings and other structures can tilt or sink on the ground.

Ground subsidence is the gradual or sudden sinking of the Earth's surface. This can be caused by groundwater extraction or a fault movement.

Rock discontinuities are breaks in rock, such as fractures, joints, fissures, or faults. The presence of these features may indicate past or ongoing fault activity.

8. **D**

As seen in the map of the Philippines, Dinagat island is closest to the Southeastern Philippine Plate boundary.

9. **C**

The soil, sand and small rocks occupy small spaces and sink to the bottom of the lake. Since big rocks occupy more space, they will lessen the space available for water in the lake.

10. **B**

The correct measurement of the **speed of light** in a vacuum is "exactly 299, 792, 458 metres per second" which is equal to $2.99792458\ x\ 10^{8}\ m/s$.

11. **C**

Mass is the amount of matter in an object. It is constant and will not change regardless of the location. Thus, the astronaut's mass remains the same on the earth and the moon.

Weight is the force of gravity acting on the mass. Since it takes into account acceleration due to gravity, weight varies depending on the location. The earth has a stronger gravitational pull than the earth due its larger mass. Hence, the astronaut will have greater weight on the earth.

12. **A**

Magnitude measures the energy released by an earthquake at its source while intensity measures the localized effect and damage caused by the earthquake. **Intensity is affected by magnitude**– the greater the magnitude, the greater the intensity, Meanwhile, magnitude is not affected by intensity.

13. **B**

As the earth rotates on its axis, the gravity of the moon and sun pull the ocean's water causing tides. Since the moon is closer to the earth, the moon has a greater effect on tides than the sun.

14. **C**

The temperature of the different layers of the atmosphere varies depending on the altitude. The thermosphere has the widest range of temperature, ranging from -90°C to greater than 30°C.

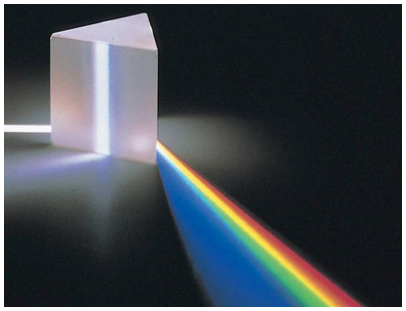
15. **C**

The ozone layer is found in the stratosphere. It absorbs the ultraviolet (UV) radiation from the Sun which is converted to heat. The higher part of the stratosphere absorbs more heat leading to higher temperature.

Science Practice Test 2
"More Practice" Answer Key

1. **B**

The seven colors of the visible spectrum are formed by the refraction of a composite light, such as white light, when it passes through a transparent medium.

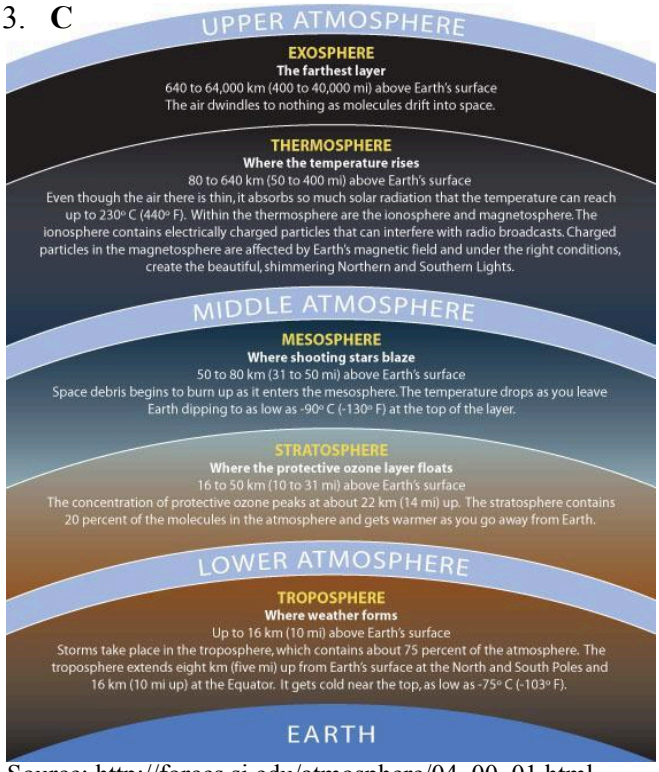


Source:http://apollo.lsc.vsc.edu/classes/met130/notes/chapter19/sundogs.html

2. **B**

Plant photosynthesis occurs in leaves and green stems. Since green objects reflect the color green and absorb all the other components of white light (ROYBIV), then the plants can only use these components in photosynthesis. Thus, if a plant is placed under green light, minimum photosynthesis will occur.

3. **C**



Source: http://forces.si.edu/atmosphere/04_00_01.html

The coldest layer of the atmosphere is the mesosphere.

4. **A**

Weather is formed in the troposphere. It is also where most clouds and 99% of the water vapor are found. Since rain is water condensed from water vapor and falls as drops from clouds, then we can say that rain comes from the troposphere.

5. **D**

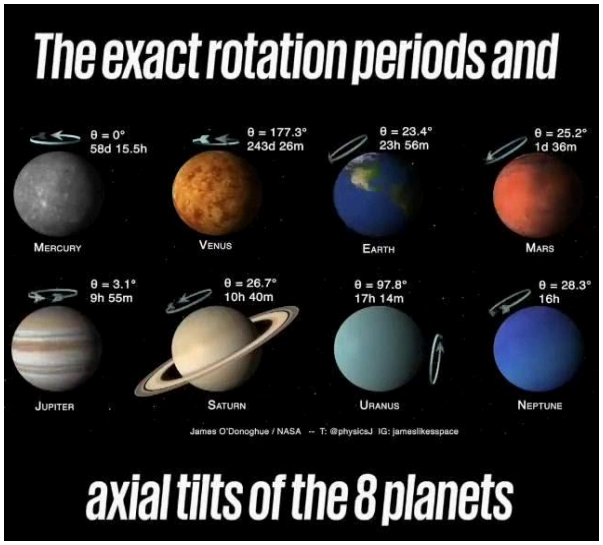
A transmitter radiates energy upwards toward the thermosphere where it will be refracted by ions, downwards to the surface of earth. Radio signals can be sent to farther places through this method than if propagated through the surface of the Earth, since there are many obstructions in the surface of Earth.

6. **A**

Weather is formed in the troposphere. It is also where most clouds and 99% of the water vapor are found. Since rain is water condensed from water vapor and falls as drops from clouds, then we can say that rain comes from the troposphere.

7. **C**

Most of the planets in the Solar System orbit the sun like a top spinning across the floor, with their spin-axes more or less vertical to their direction of motion; however, Uranus rolls along its orbital plane like a wheel when it rotates.



Source:https://lifeboat.com/blog.images/uranus-is-a-real-oddball-in-our-solar-system.jpg

8. **B**

Planet	Radius (km)
Mercury	2440
Venus	6052
Earth	6378
Mars	3397
Jupiter	71492
Saturn	60268
Uranus	25559
Neptune	24766
Pluto	1150

9. **B**

A shadow appears on a surface behind somebody or something blocking the light. The length of a shadow is proportional to the cotangent of the angle of the light source relative to the horizon. During sunrise and sunset, angle is almost 0 (cot 0 = undefined ~ ∞) and shadows are very long. However, during noon, the sun is directly overhead and angle is about 90° (cot 90° = 0) and shadows are beneath the object. Thus, as time approaches 12 noon, the shadow shortens.

Also, since a shadow appears behind a light obstruction, we can say that its position is on the opposite side of the light source. While the sun rises in the east (morning), shadows point to the west. While the sun sets in the west (afternoon), shadows point to the east.

Thus, if a shadow is short and points west, then the time approaches 12 and it is in the morning (11 am).

10. **A**

All planets, except Venus and Uranus, rotate to the East. As an effect, the stars and satellites rise in the East and set in the West. Also, areas in the East experience a 12-hour time difference to those areas that are directly opposite (180° longitudinal difference) them.

11. **D**

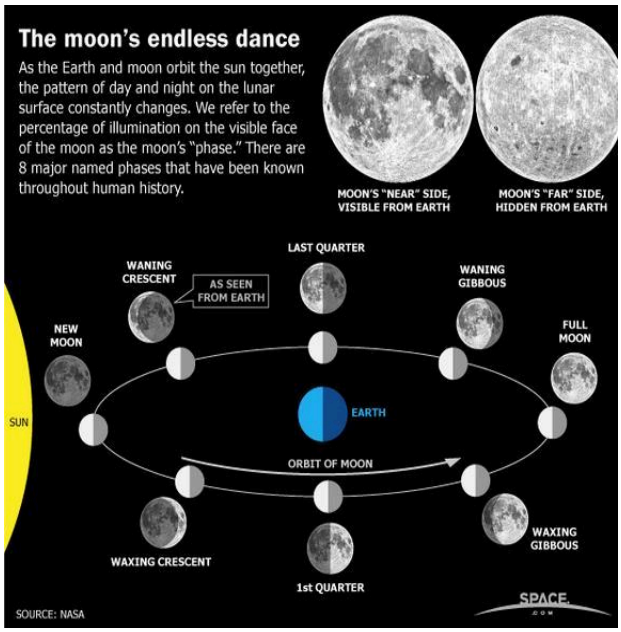
P waves and S waves are seismic body waves. P waves can travel in both solid and liquid mediums so it can pass through the liquid outer core. S waves can only travel in a solid medium so it cannot pass through the liquid outer core.

12. **B**

P (primary) waves travel faster than S (secondary) waves so P waves will be recorded first via a seismograph.

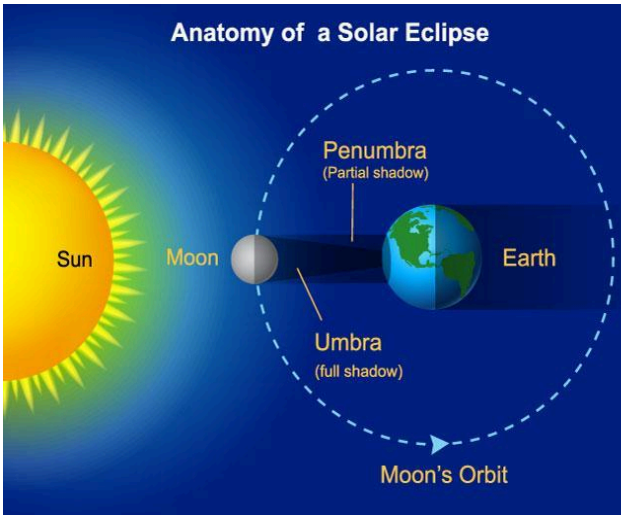
Science Practice Test 3
"More Practice" Answer Key

1. **C**



Source:http://www.space.com/62-earths-moon-phases-monthly-lunar-cycles-infographic.html

2. **B**



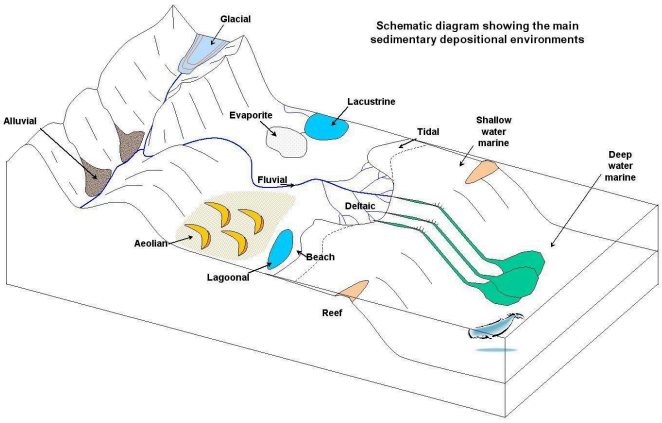
Source:https://cdna.allaboutvision.com/i/resources-2017/solar-eclipse-anatomy-330x248@2x.jpg

A solar eclipse occurs when the moon passes in front of the sun, blocking it out partially or completely. The eclipse results in parts of the earth being covered in the shadow of the moon. Therefore it occurs when the moon is between the earth and the sun.

3. **A**

During a total solar eclipse, the Moon appears to completely block the light from the Sun from reaching the Earth. Because of this, an observer can only see the outer layer of the Sun's atmosphere which is the corona. However, during normal days, the corona is not visible because it is really dark compared to the photosphere.

4. **D**



Source:http://opengeology.org/textbook/wp-content/uploads/2017/02/SedimentaryEnvironments.jpg

Mountain > Valley > Gulf > Lagoon

Water is an integral part of all sedimentary rock formation. Weathering and erosion are common predecessors of sediments.

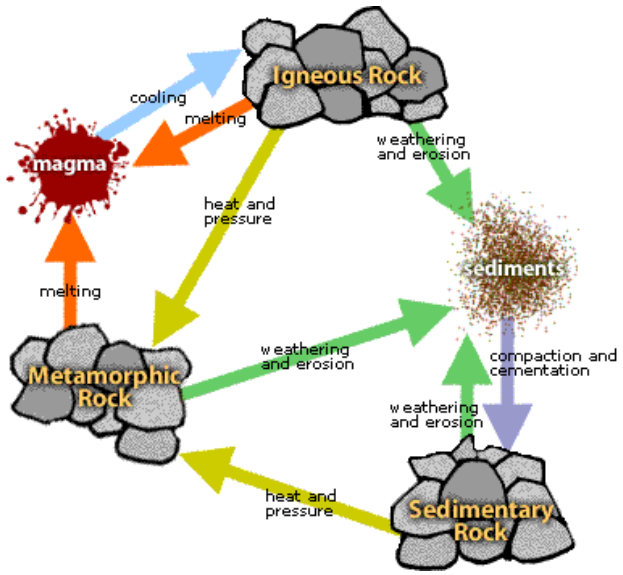
Sedimentary rocks can be formed in gulfs.

Sedimentary rocks can also form in lagoons because of solidified coal deposits.

Erosion causes sediments from mountains to erode into valleys.

In the mountain, sedimentary rocks are least likely to be found because they can be made up of a mixture of the three types of rocks.

5. **D**



Source:http://www.cotf.edu/ete/images/modules/msese/earthsysflr/EFCycleP2.gif

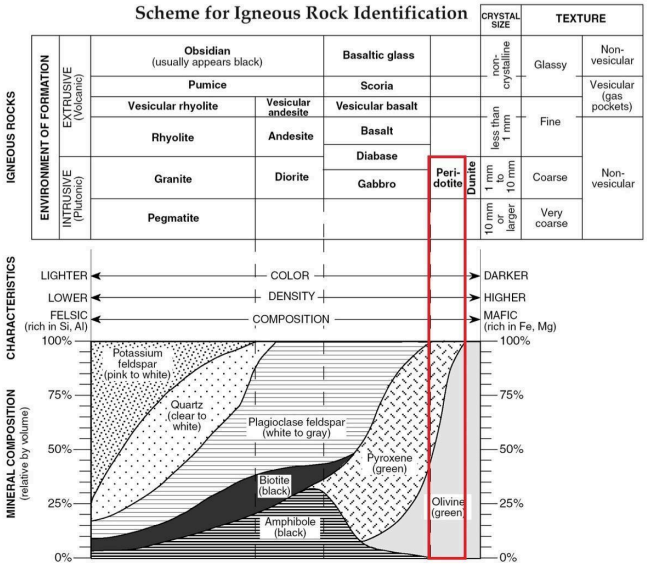
Igneous rocks and sedimentary rocks can be transformed directly to metamorphic rocks through heat and pressure. On the other hand, igneous, sedimentary and metamorphic rocks can be converted directly to sediments through weathering and erosion.

Sedimentary rocks cannot be directly transformed into igneous rocks because they have to change into metamorphic rocks first before they change into igneous rocks. As shown in the figure above, there is no direct connection between sedimentary and igneous rocks.

6. **A**

Mercury is a metallic element that is liquid in room temperature. It is used in thermometers and barometers. Zirconium is a grayish-white metallic element used in coating fuel rods in nuclear reactors. Carbon dioxide is a compound consisting of two oxygen atoms and a carbon atom that are covalently bonded. Milk on the other hand is a mixture of water and milk solids such as carbohydrates, proteins, fat and minerals.

7. **D**



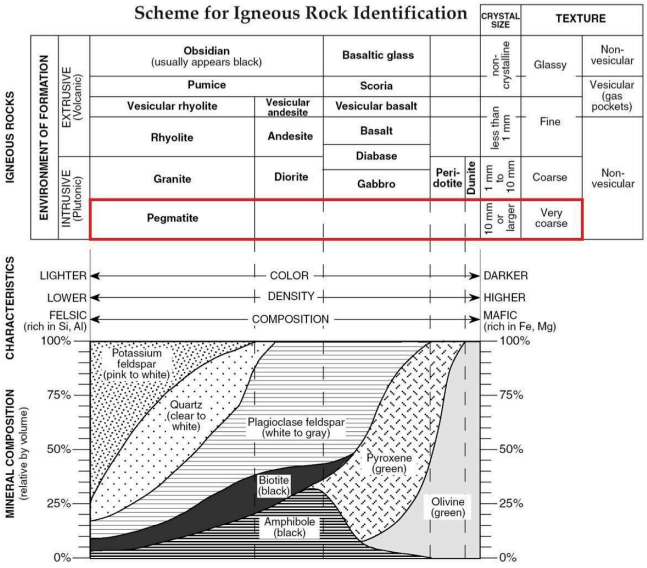
Source:https://cdn.thinglink.me/api/image/720668688289628162/1240/10/scaletowidth

Based on the graph, peridotite is a coarse-grained igneous rock composed of Pyroxene and Olivine.

8. **D**

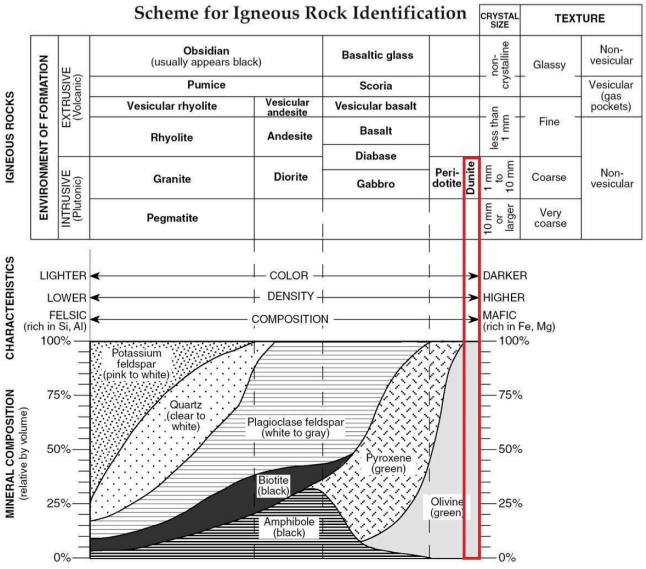
The extrusive igneous rocks (underwent solidification while on the earth's surface) are made up of the minerals plagioclase feldspar, biotite, amphibole, and a little quartz are andesite and vesicular andesite.

9. **D**



The lightest in color, least dense, and coarsest is pegmatite.

10. **A**



Dunite is made up of olivine.

Science Practice Test 4
"More Practice" Answer Key

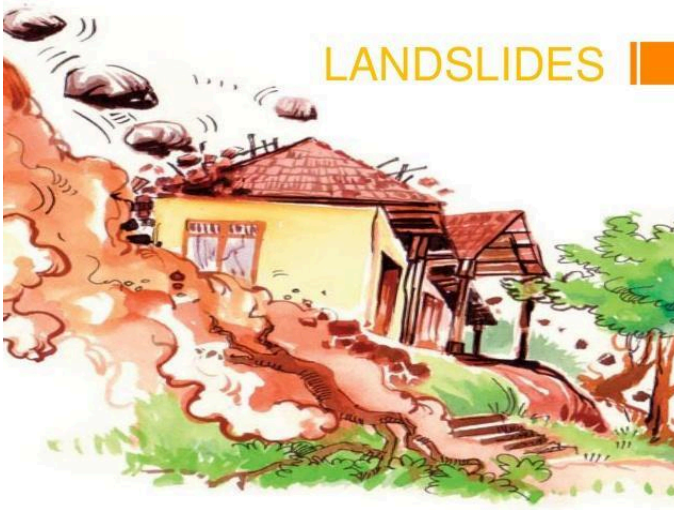
1. **D**

For a combustion reaction to occur, it requires oxygen, heat, and fuel. When the candle is covered with a metal pan, the candle will be put out once the oxygen supply runs out. The product of combustion is CO_2. When CO_2 accumulates in the covered set-up, it will displace the available oxygen causing the fire to burn out.

2. **D**

"Cloudiness" on glass windows can be intensified by blowing on it. This is due to the temperature gradient outside and inside the room. When hot air inside the room (or from the mouth) touches the cold glass, it condenses and thus forms small water droplets on the surface of the glass that will cause the "cloudiness". After some time, these water droplets may accumulate.

3. **D**.



Source:https://image.slidesharecdn.com/group3-160527110134/95/geological-disaster-10-638.jpg?cb=1464347040

Landslide is the movement of large masses of rocks, debris, mud and soil. It encompasses five modes of slope movement: falls, topples, slides, spreads, and flows. Landslides are caused by both natural and human-related activities. It can be initiated in slopes already on the verge of movement by rainfall, snowmelt, changes in water level, stream erosion, changes in ground water, earthquakes, volcanic activity, disturbance by human activities, or any combination of these factors. Earthquakes can trigger landslides underwater which are called "submarine landslides". On the other hand, quarrying the stones that lie underneath the soil reduces the strength and stability of the soil.

4. **C**

$50 > m$;
$m + m > 30 + 50$;
$2m > 80$;
$m > 40$;
$50 > m > 40$;

5. **D**

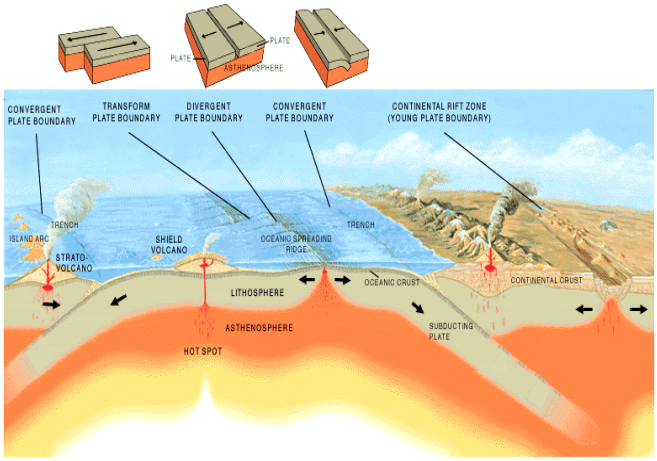
Top to Bottom: A D B E C
Bottom to Top: C E B D A

6. **B**

Air travels from an area of high pressure to an area of low pressure to 'even out' the pressure difference and to produce equilibrium.

Science Practice Test 5
"More Practice" Answer Key

1. **C**



Source:http://www.eoearth.org/article/Mid-ocean_ridges?topic=50013

Mid-ocean ridges are formed when two tectonic plates diverge or move away from each other. When this forms, magma rises up and cools down, forming new rocks.

2. **D**

Pangaea began to break apart in the Triassic period, the first period during the Mesozoic Era.

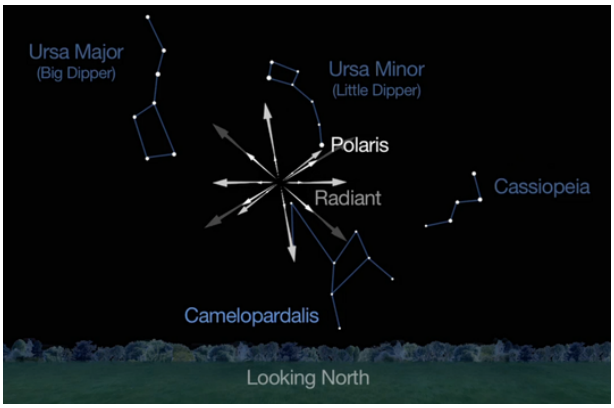
3. **B**

A plant material was found under ice in Antartica. It can be inferred from this that Antartica was once a tropical region.

"An unexpectedly warm period about 15 million years ago temporarily thawed Antarctica, turning the continent green around its edges, a new study says." (Dell'Amore, 2012)

To read more about the article, kindly visit this link:https://news.nationalgeographic.com/news/2012/06/120620-green-antarctica-trees-global-warming-science-ancient/

4. **A**



Source:https://pbs.twimg.com/media/BoRh3p9CUAEVOwT.png

A constellation is a group of stars that, when seen from Earth, form a pattern. The stars in the sky are divided into 88 constellations. There are also asterisms, a group of stars and patterns within a constellation, like the Big Dipper (in Ursa Major), the Little Dipper (in Ursa Minor), Keystone (in Hercules), and the Pleiades (in Taurus).

The constellation Little Dipper is part of the bigger constellation "Ursa Minor".

5. **B**

Source:http://www.astronomy.org/programs/seasons/

The star which all other stars revolve around is known as the North Star or the Polaris.

6. **A**

Ursa Minor, also known as the Little bear, is a constellation which contains both the polaris and the little dipper.

7. **D**

Spectral Class	Color	Temperature
O	blue	28,000 - 50,000
B	blue-white	9900- 28,000
A	white	7400-9900
F	yellow-white	6000-7400
G	yellow	4900-6000
K	orange	3500-4900
M	orange-red	2000-3500

Source:http://www.windows2universe.org/cool_uff/HR_spectralclass.html&edu=high

8. **D**

The Sun, which is our nearest star, is found approximately 150 million kilometers from the Earth. It is also about 250,000 times closer to Earth than **Proxima Centauri –** the next closest star. Proxima Centauri is found more than 30 trillion kilometers from Earth

9. **C**

A sound wave is formed by a disturbance or vibration and is transmitted through collisions of matter. Since particles in a solid are compact, sound waves immediately propagate to the neighboring particle. Thus, sound waves can be transmitted faster throughout a solid object.

10. **D**

Jupiter is a gas giant made up mainly of hydrogen and helium which are the two lightest elements.

The Earth is a terrestrial planet having a solid surface of rocks and metals. Its mantle is mostly made up of silicates while the inner core is made up of iron and nickel. Since the earth is composed of denser materials, earth is denser than Jupiter.

11. **C**

Sound travels fastest in denser, more rigid medium since the particles are closer together and can transmit vibrations more efficiently.
Thus, sound travels fastest in solids, followed by liquids, and slowest in gases. Sound cannot travel in a vacuum because there are no particles to vibrate.

Therefore, sound will travel fastest in copper since it is the densest.

12. **A**

Sound is a mechanical wave that requires a medium to travel. It cannot travel through a vacuum.

13. **D**

A magma with **higher viscosity** flows slower causing dissolved gases to be trapped inside it. The greater the amount of dissolved gases in the magma, the greater the build up of pressure inside the volcano. This leads to a more explosive volcanic eruption.

14. **D**

A **steeper slope** is more prone to erosion due to greater gravitational pull compared to a gentle slope.

When there is a **sparse amount of vegetation**, there are less trees available that serve as anchorage of the soil. This makes the soil looser and more prone to landslide.

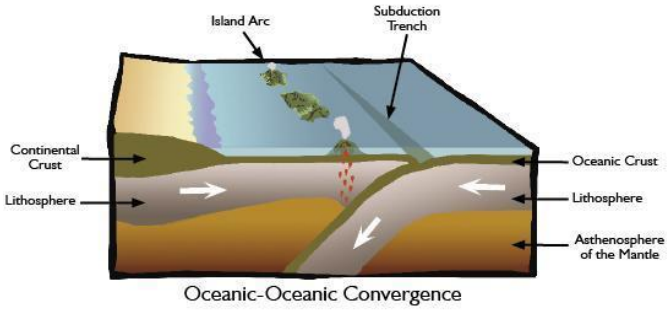
Strong rainfall makes the soil “loose” making it easier to be eroded.

Thicker **topsoil** allows absorption of more rain which reduces the amount of soil that can be eroded.

Among the given factors, the degree of slope (50%) and amount of vegetation (40%) has the greatest effect on the occurrence of landslides. Since Town D has a steep slope, sparse vegetation and thin soil, it is the most susceptible to landslides.

Science Practice Test 6
"More Practice" Answer Key

1. **B**



http://www.ncgeology.com/Eno_interactive_webs/Geologic_Principles_Geologic_story.html

When two oceanic plates converge, the older and thus, cooler and denser, will sink to the asthenosphere. An **oceanic trench** will form where the denser plate is subducted beneath the less dense plate.

2. **C**

When looking for earth-like planets, astronomers consider factors such as the presence of water and oxygen since these are substances that support life. The planet's distance is also considered. If a planet is too far or too near to the sun, its environment will be too cold or too hot to sustain life.

3. **D**

Natural erosion from Mt. Makiling, discharge of sewage and wastes from factories, and run-off fertilizers and animal wastes from farms will cause the infiltration of excess minerals to Laguna de Bay, which in turn, can cause eutrophication.

4. **C**

Almost all of marine life is found between the shoreline and the edge of the continental shelf. Sunlight cannot penetrate deeper areas of the ocean. Without sunlight, photosynthetic aquatic plants would not be able to undergo photosynthesis and thus, die. As a result, all consumers will not be able to thrive.

5. **A**

According to scientists, the Earth is 4.5 billion years old with the first sign of life emerging approximately 3.7-3.5 BYA. Since the collision of Theia with the Earth happened 4.5 BYA, it could not have caused the extinction of life on earth.

6. **D**

The eruption of Mt. Pinatubo in 1991 led to global cooling wherein the temperature decreased by approximately 0.5°C for 18–36 months. The eruption emitted tons of volcanic aerosols and sulfur dioxide (SO_2) into the stratosphere. These particles reflected sunlight back into space.

7. **B**

Two tectonic plates that slide past each other are called transform boundaries. This causes the plate boundaries to collide which leads to an earthquake.

8. **B**

During **compaction**, sediments are squeezed together due to pressure causing space between sediments to lessen.

During **cementation**, minerals precipitate from water fill the spaces between loose sediments forming rocks.