

Web Demo - Topics

Science Grade 9 Part 1

1) Sulfur dioxide gas in the air combine with water vapor to form acid rain, which kills plants and plant life. The effect of acid rain can be reduced by

1. increasing the amount of water vapor in the air
2. develop more accurate procedures to predict the weather
3. put more fish into the lakes and ponds
4. prevent the sulfur dioxide from entering the air

2) What's in the Midwest states that neutralizes much of the acid rain precipitation that falls in that area?

1. scrubbers
2. fertilizer
3. alkaline soils
4. Clean Air Act

3) Some acids are mild, such as citric acid in oranges or acetic acid in vinegar. Stronger acids such as sulfuric acid are so corrosive they can even dissolve metals. One way to distinguish acids from bases is to test them with an indicator, such as red cabbage water. Red cabbage water can be made by soaking red cabbage leaves in water. When an acid is added to the red cabbage water, it turns from purple to bright red. This color change can be reversed by adding a base to neutralize the acid. Adding more base will eventually turn the solution blue and then green.

You are conducting an experiment in which you add an unknown solution to red cabbage water. What can you say about the unknown solution if it turns the water green?

- 1) Its acidic qualities are observed.
- 2) Its basic qualities are observed.
- 3) Its acidic qualities are inferred.
- 4) Its basic qualities are inferred.

4) All vertebrate animals require oxygen to stay alive. One of the functions of the circulatory system and respiratory systems is to provide cells with oxygen and remove carbon dioxide, a waste product.

Fish use gills for gas exchange. As water flows over the feathery gills, oxygen dissolved in the water diffuses into the blood and carbon dioxide from the blood diffuses into the water. The oxygen-rich blood then travels to the rest of the body. The heart's action circulates blood from the body to the gills.

Mammals use lungs for gas exchange from the blood into the lungs. The heart's action circulated oxygen-rich blood to the rest of the body.

From the information provided, you would hypothesize that the air entering the lungs, compared to air leaving the lungs contains

- 1) less oxygen and more carbon dioxide
- 2) less oxygen and carbon dioxide
- 3) more oxygen and less carbon dioxide
- 4) more oxygen and carbon dioxide

5) The nucleus of a cell is often described as the "director" of the cell. The nucleus has been given this name because it

- 1) sits directly in the center of the cell.
- 2) is the largest structure in the cell.
- 3) contains the cell's cytoplasm.
- 4) contains the cell's genetic material.

6) Aristotle thought that a moving object would stop because its natural state was to be at rest. Newton thought that friction is a force that opposes all motion and eventually stops moving object. Suppose you were coasting on a level surface on a bicycle and there was NO friction. What would happen to your speed, according to Aristotle and according to Newton?

- 1) Aristotle: maintain speed; ----Newton: maintain speed
- 2) Aristotle: slow and stop; ----Newton: maintain speed
- 3) Aristotle: slow and stop; ----Newton: slow and stop
- 4) Aristotle: maintain speed; ----Newton: slow and stop

7) Aphids are small insects that use their piercing mouthparts to suck fluid from the sugar-conducting vessels of plants. They extract a certain amount of the sucrose and other nutrients from this fluid. However, much of the fluid-so-called honeydew-runs out in an altered form through their anus. Certain ants have taken advantage of this fact and "milk" the aphids for the honeydew, which they use as food. The ants in turn, protect the aphids against insect predators.

- 1) neither ants nor aphids benefit from this interaction.
- 2) both ants and aphids benefit from this interaction.
- 3) ants, but not aphids, benefit from this interaction.
- 4) aphids, not ants, benefit from this interaction.

8) Your science teacher asks you to classify the animals in your area according to their diet. A study of which of the following characteristics would be most helpful to you?

- | | |
|-------------------------|------------------------|
| 1) type of teeth | 3) average life span |
| 2) method of locomotion | 4) type of hair or fur |

9) The classification of living things is based on both similarities and

- | | |
|-------------------|----------------|
| 1. classification | 3. differences |
| 2. taxonomy | 4. genus |

10) Chemical weathering refers to process that change the chemical composition of rocks, forming new minerals. Physical weathering refers to processes that break rocks down into smaller pieces without changing the chemical composition in of the rocks. Which of the following processes is an example of chemical weathering?

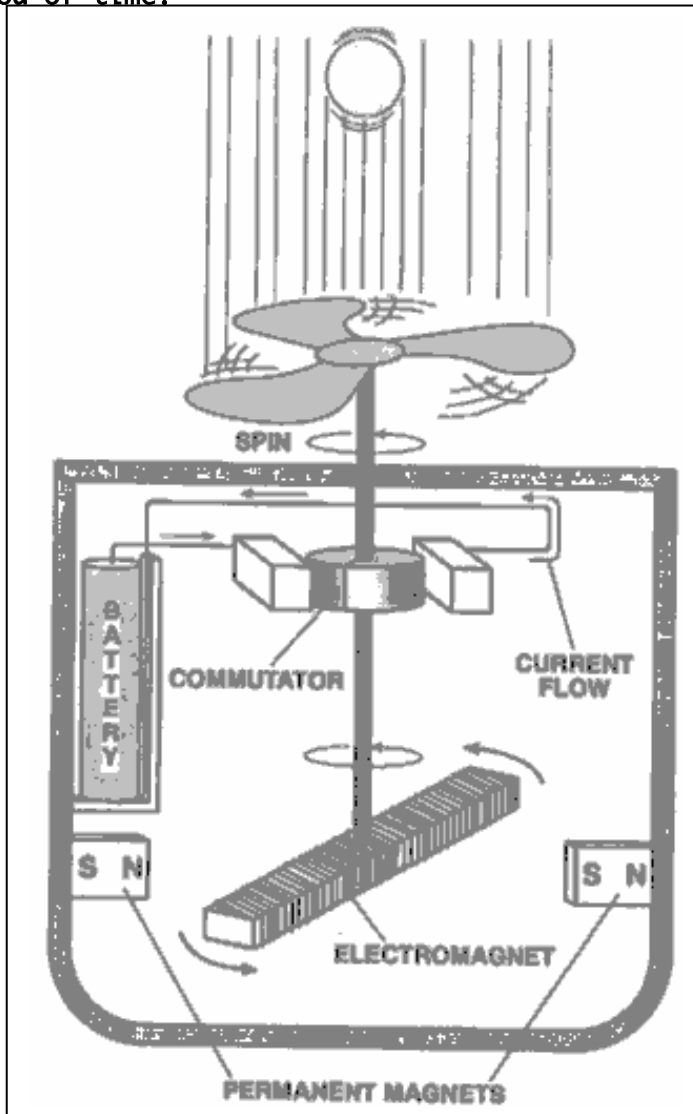
- 1) the scouring or by windblown sand
- 2) the expansion and contraction of rocks as temperatures change
- 3) the rusting of iron-rich rocks
- 4) the widening of cracks in rocks by tree roots

11) Weathering is a process by which

1. oceans form
2. mountains are formed
3. rocks undergo mechanical changes
4. valleys are formed

12) In a fan motor, an electric current runs from the battery to an electromagnet. Electric current passing through coiled wire within the electromagnet creates magnetic poles. This electromagnet is positioned between opposite poles of permanent magnets. Because opposite poles attract and like poles repel, the repulsion and attraction cause the electromagnet to rotate. To keep it rotating, the commutator changes the direction of the current every half rotation. This change causes the poles of the electromagnet to switch, which keeps the electromagnet rotating.

This continual rotation of the electromagnet is what keeps the blades of the fan moving, This also allows the fan to generate enough force to keep a Ping-Pong ball suspended in air for a short period of time.



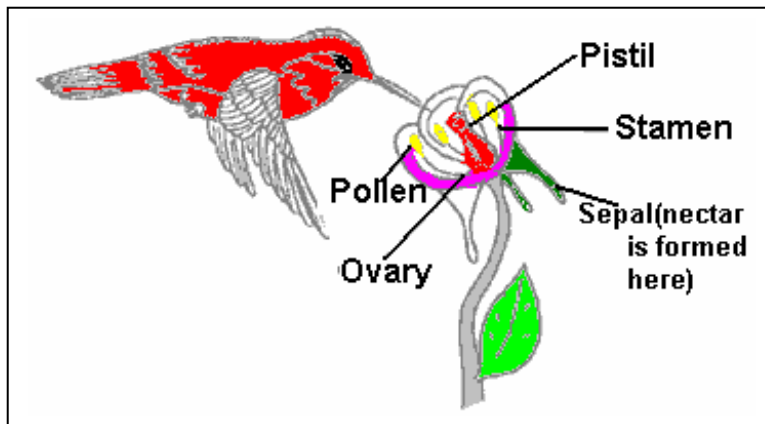
Since the Ping-Pong ball does NOT fall into the fan, the upward force acting on the ball equals

- 1) the amount of energy used to power the fan.
- 2) the downward force of air pressure.
- 3) the downward force due to gravity.
- 4) the velocity of the Ping-Pong ball.

13) The Earth's movement around the Sun is called its

1. orbit
2. revolution
3. precession
4. rotation

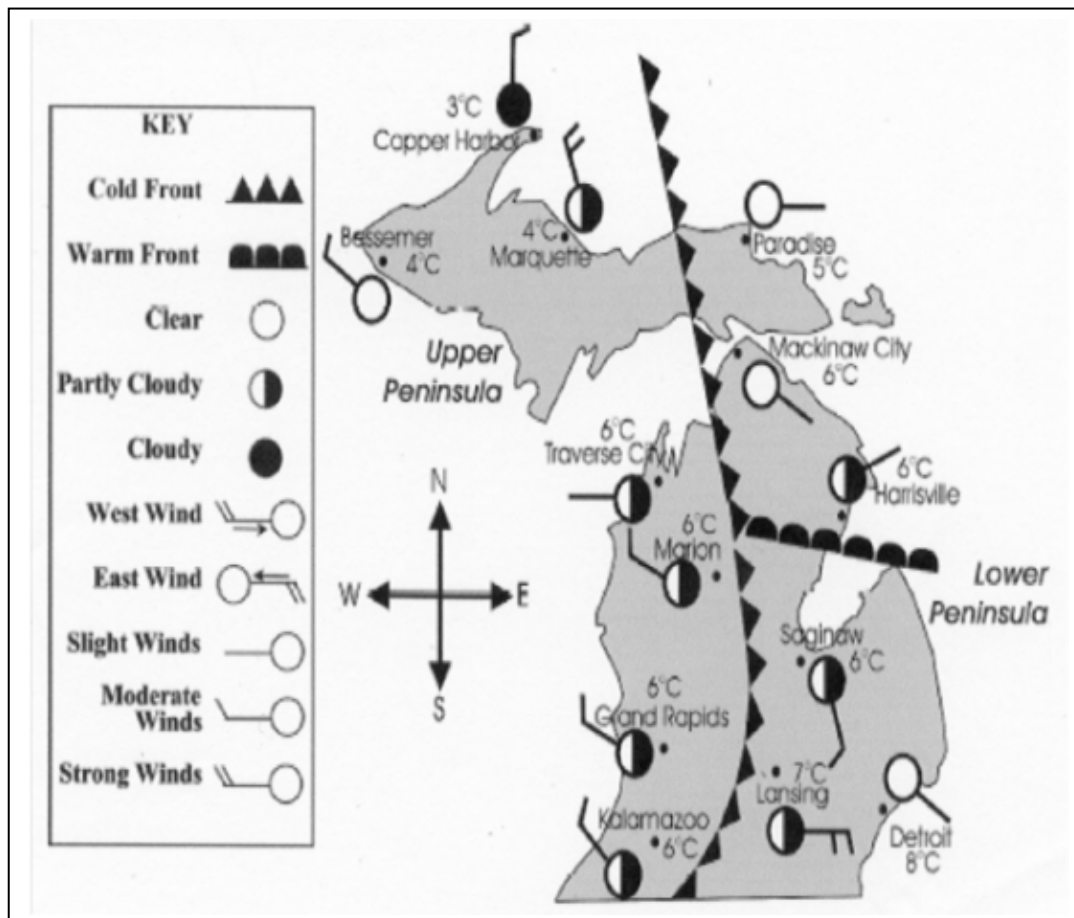
14) This species of plant is dependent upon the hummingbird for pollination. The plant attract the hummingbird with its flower, and the hummingbird sips the sweet nectar inside the flower. Pollen from the flower's stamens collects on the hummingbird's head and is the carried to other flowers.



This plant is different from animals in many ways. Identify one way in which it is similar to animals.

- 1) It contains chlorophyll.
- 2) It reproduces sexually
- 3) It has cell walls.
- 4) It is herbivorous.

15) How are the winds shown in this map different from winds caused directly by Earth's rotation (called global winds)?



- 1) The wind on the map move in a more circular direction than global winds.
- 2) The wind on the map do not move in regular motions like global

winds.

- 3) Warm air rises in the winds on the map, but sinks in global winds.
- 4) The wind on the map depend on convection; global wind do not.

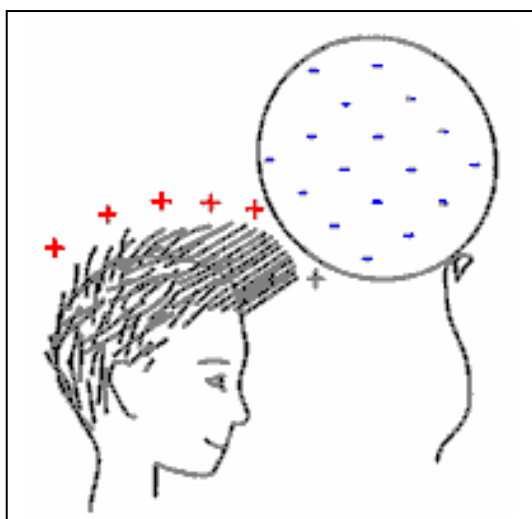
16) The Long Valley caldera is a 200 square mile crater in California that some times receives hundreds of earthquakes per day. The crater was formed when a volcano erupted hundreds of thousands of years ago.

These days, scientists are worried that the volcano might erupt again. A large dome in the center of the crater has grown 80 cm since 1979. Underground heat is released into hot springs, as well as through natural volcanic vents called fumaroles. Also, scientist think that these earthquakes, often too weak to detect without a seismograph, are caused by magma slowly forcing its way to the surface.

Which of the following would be evidence AGAINST the claim that the Long Valley caldera will erupt soon?

- 1) live volcanoes having a similar earthquake before erupting
- 2) non-volcanic areas having similar earthquakes
- 3) non-volcanic areas located in craters
- 4) live volcanoes located on fault lines

17) If you rub a balloon in your hair on a dry day, you will notice two things. Your hair will stand up with the hairs pushing away from each other, and hair near the balloon will be strongly attracted to the balloon. The balloon rubbed off some electric charges from the hair. The balloon is now negative, and each hair is positive (see figure below). Use these ideas to answer the following question about electric charge.



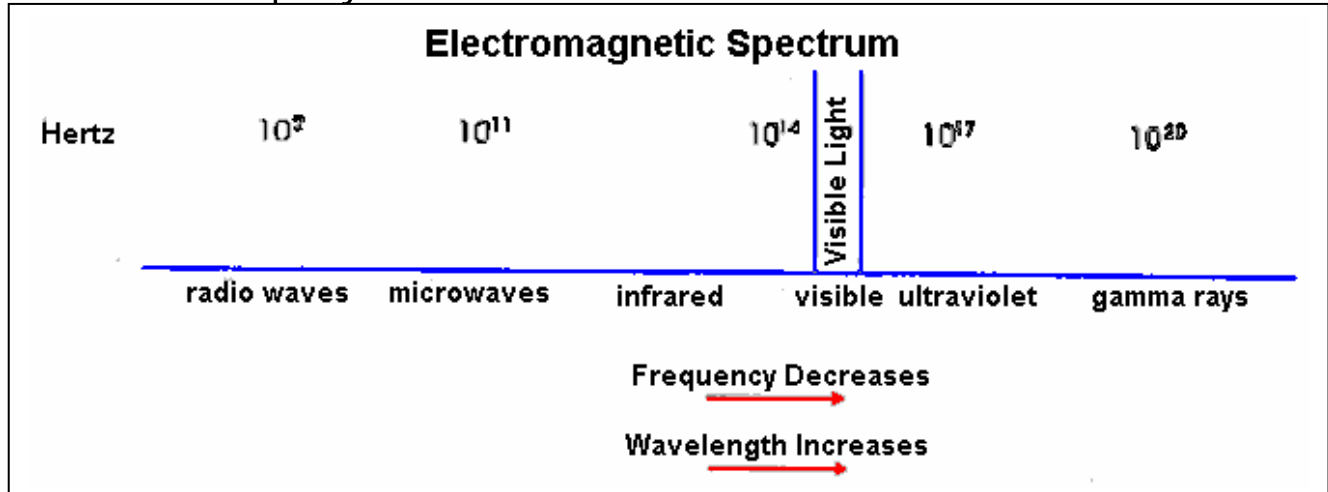
Some people used to believe that electricity was a fluid that flowed from one object to another. A positive object has more electricity; a negative object has less electricity. According to this idea, what would happen if a positive and negative object touched?

- 1) Electricity would flow between the objects.
- 2) Electricity would flow from negative to positive, then from positive to negative.
- 3) Electricity would flow from positive to negative.
- 4) Electricity would flow from negative to positive.

18) What causes the change in seasons in the Southern Hemisphere?

- 1) The tilt of Earth's axis as it travels around the Sun.
- 2) The elliptical shape of earth's orbit.
- 3) The distance of Earth from the Sun.
- 4) The rotation of Earth on its axis.

19) All waves in the electromagnetic spectrum can travel through empty space at the speed of light. Wavelength is the distance from any [point on a wave to an identical point on the next wave. Frequency is the number of complete waves that pass a point in one second (1 hertz = 1 wave/sec). radio waves have the longest wavelength and the shortest frequency.



Which of the following describes the relationship between visible light and the electromagnetic spectrum?

- 1) Visible light occurs throughout the electromagnetic spectrum but colors are only found in a small band.
- 2) Visible light and electromagnetic waves can only be separated by a prism.
- 3) Visible light is a very small section of the electromagnetic spectrum.
- 4) The longest wavelength occur within the visible light band.

20) Which of these instruments would be used to analyze the probable composition of the surface of a star?

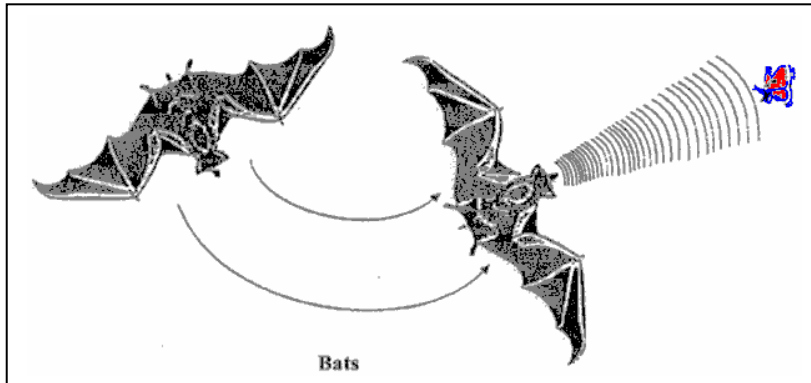
- 1) an optical electroscope
- 2) a radio telescope
- 3) an oscilloscope
- 4) a spectroscope

Science Grade 9 Part 2 Essay Questions

1) Edward Jenner (1749-1823) was a British physician whose research led to the elimination of the disease smallpox. Smallpox is a contagious viral disease that infects the bloodstream of its victims. Smallpox was not always deadly, but it often left scars on its victims, who afterward were immune to the disease. Jenner noticed that farm workers who had been infected with a similar, but more mild, disease known as cowpox never caught smallpox. He administered a small dose of cowpox to a child, who proved immune to smallpox when he was exposed to smallpox for two months later. Which of the following is a way to determine if the body has a bacterial infection?

In Edward Jenner's day, smallpox scars were often required for employment as a nurse. Give three reasons why this was so.

2) Bats are not blind. On the other hand, some species of bat use sound waves to hunt and navigate while flying especially at night. Bats (which are mammals) produce pulses of sound at extremely high frequencies through their mouths. These pulses are separated by short period of silence during which the bats listen for these sounds to bounce off objects and return. Bats have highly developed ears, which pinpoint objects and prey by detecting these echoes, even if these echoes are .1% as strong as the original sound.



Few animals can hear the high frequency sounds of bats. A certain species of moth, which bats prey upon, had evolved to hear these sounds.

- How does the ability to hear the bats' sounds help the moth survive?
- Explain how, through natural selection, this species of moth evolved to be able to hear the bats.

3) The Long Valley caldera is a 200 square mile crater in California that some times receives hundreds of earthquakes per day. The crater was formed when a volcano erupted hundreds of thousands of years ago.

These days, scientists are worried that the volcano might erupt again. A large dome in the center of the crater has grown 80 cm since 1979. Underground heat is released into hot springs, as well as through natural volcanic vents called fumaroles. Also, scientist think that these earthquakes, often too weak to detect without a seismograph, are caused by magma slowly forcing its way to the surface.

Suppose the flask in method 2 also contained the element argon(Ar).

- A) Would the argon and nitrogen have similar properties?
- B) Explain your answer.
- C) Name an other element that you would expect to have properties similar to nitrogen?

Grade 9 Science - Part 1 Topics

Acid Rain
Acids and Bases
Animal Circulatory
Animal Respiration
Animals and Plants
Aristotle - Newton
Balance and Unbalanced Forces
Bernoulli's Principal
Cells - Plant and Animal
Classification
Climate - Ocean Currents
Commensalism and Mutualism
Dependance - Plants - Animals
Destructional Forces: Weathering
Destructional Forces: Chemical
Destructional Forces: Plants
Earthquakes
Earth's Movements
Earth's Rotation
Earth's Tilted Axis
Ecosystems
Electric Canary
Electromagnet Energy
Endoscope
Energy Transformations
Erosion
Erosion - Wind
Environmental Change
Environmental Adaptation
Environmental Management
Environmental Recycling
Environmental Solutions
Environment & Humans
Evolution
Falling Objects
Fan Motor
Food Pyramid
Food Web
Force Units
Friction
Geothermal Energy
Gravity
Heredity
Heat Flow
Immune System
Inclined Plane
Interpreting Graph - Chart
Interpreting Information
Interpreting Lab
Interpreting Map
Interpreting Tables
Isolines
Levers
Metric System
Mixture Separation
Objects at Rest
Optical Fibers

Parallel and Series Circuits
Phase Change
Direction of Phase Change
Plants - Photosynthesis
Physical and Chemical Changes
Physical Properties
Pollution
Pollution - Air
Pollution - Land
Pollution - Nuclear
Pollution - Thermal
Pollution - Water
Refraction
Renewable and Nonrenewable Resources
Revolution of Earth
Rock Cycle
Safety - Electricity
Safety - Laboratory
Satellites
Scientific Process
Seasons
Spectrum
Stars
Static Electricity
System Efficiency
Tropisms
Volcanoes
Weather Forecasting
Weathering
Wedge

Science Grade 9 Part 2 Essay Topics

Environment
Immunity
Interpreting Lab
Natural Selection
Scientific Process
Volcanoes
Weather