

GRADE 8 SCIENCE REVIEW AND STUDY BOOKLET KEY

This resource is intended to be used as a
YEAREND Tool for STUDENTS AND TEACHERS
in association with the

POWERPOINT SCIENCE UNITS

The review questions have been designed to direct the students to review concepts and find the answers within the PowerPoint Units

The sample practice questions are provided, not as specifics that will be tested on the FINAL EXAM, but, as examples of further exploring the Science Concepts in each of the units covered.

This is the Answer Key for the REVIEW questions.

The intent of this review process for the students and teacher (parent) is to work together to gather information and share this information in class (at home).

All questions were developed so that recollection and mastery of concepts will occur as the Science PowerPoint are reviewed

ANSWER KEY SAMPLE PRACTICE QUESTIONS SELECTED FROM SECTION & UNIT TESTS

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MIX and FLOW of MATTER

Scientists identify **infectious and toxic materials** using what **WHMIS** symbol?



Describe how **slurries** are made.

Slurries are made by adding water to different solids to make them flow more easily

How are substances tested to determine if they are **pure substances** or **mixtures**?

Paper chromatography is the test that determines whether a substance is a pure substance or a mixture ...

How is the **concentration** of a substance determined?

When comparing concentrations of different solutions, it is necessary to compare the concentrations of the same amount of the same solute in the same volume of solvent.

In what solutions are the **solute** and **solvent** both gases?

air

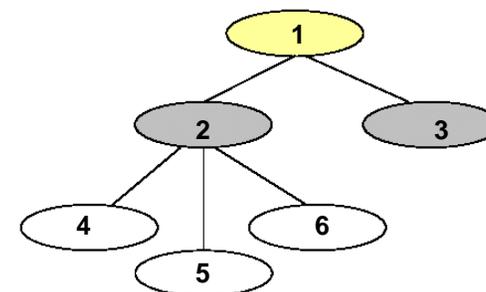
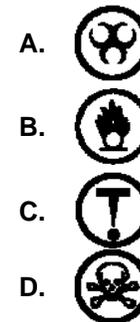
What is a solution called if it contains **water as the solvent**?

aqueous

PRACTICE/Review Questions

For each of the following hazardous products match the correct **WHMIS** symbol

- (C) Materials that are infectious and cause other toxic effects
- (D) Material that is poisonous and infectious with immediate toxic effects
- (A) Material that is infectious
- (B) Material that will react when exposed to oxygen



In this organizational chart for Matter, Number 3 indicates ...

Pure Substances

When comparing concentrations of different solutions, it is necessary to compare the concentrations in the same volume. Which of the following solutions would have the lowest concentration?

- A. 16% (16g/100ml)
- B. 1.2g per 25ml (4.8 g/100ml)
- C. 2.3g per 50ml (4.6 g/100ml)
- D. 3.6g per 20ml (10.6 g/100ml)

What is happening when the **particles** of a solute are filling the spaces between the particles of a solvent?

When the particles of a solute fill the spaces between the particles of the solvent diffusion is happening

How does **temperature** affect **viscosity**?

As temperature increases viscosity decreases
High viscosity is associated with very thick (cooler) substances (that flow very slowly)

How do you compare substances to water using a **mass to volume** relationship?

Density = mass divided by volume **Density of water is 1 g/ml**
If the substance you are comparing is less than 1g/ml it will float (positive buoyancy) and if it is more than 1g/ml then it will sink (negative buoyancy).

What is the purpose of the **Plimsoll Line** that is put on ship?

All cargo ships have a special line called the Plimsoll Line that shows how much the ship should be loaded so it won't sink as it goes between freshwater and saltwater

Why is it necessary to have a **closed system** when working with hydraulic fluids?

When a force is applied to a substance and the particles cannot be forced closer together, they transfer this force equally in all directions throughout the substance. The substance can do this in a closed system because it is incompressible

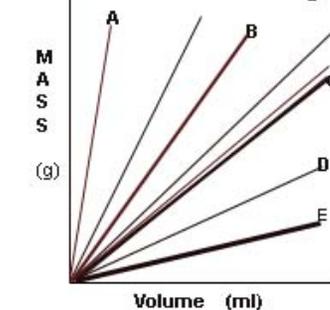
What is **Pascal's Law**?

Pascal's Law states that an enclosed fluid transmits pressure in all directions equally

When the particles of a solute fill the spaces between the particles of the solvent this is happening ...

- A. fusion**
- B. diffusion**
- C. occlusion**
- D. dissipation**

Densities of common substances @ 20^o



Substance	Density (10 ³ kg/m ³)
Gold	19.3
Copper	8.92
Aluminum	2.70
Seawater	1.025
Water	1.00
Ethyl alcohol	0.79
Air	0.0012

If C in the graph above is **water**, then D and E are likely to be ...

ethyl alcohol and air

There are three factors that can affect the rate of dissolving. From the list of answers for this question, one does not belong. Identify which one it is.

- A. stirring**
- B. temperature**
- C. size of pieces**
- D. reaction time**

When a force is applied to a substance and the particles cannot be forced closer together, they transfer this force equally in all directions throughout the substance. The substance can do this in a closed system because it is...

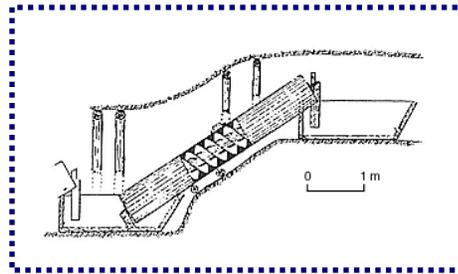
incompressible

How does a **hyperbaric chamber** work?

A diver can get a condition, known as 'the bends', which is treated in a special pressure chamber, called a hyperbaric chamber. The chamber enables nitrogen 'bubbles' to redissolve the nitrogen back into the blood and tissue of the body.

What **simple machine** device is used to move water vertically using rotational motion?

A device that uses rotational motion to move a liquid vertically is called an Archimedes screw

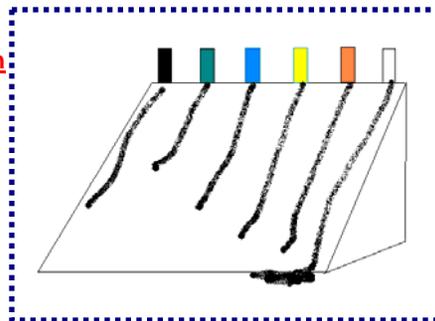


What purpose would be served to add air to the **ballast tanks** in a submerged submarine?

When air is added to the ballast tanks in a submerged submarine it is able to resurface because its overall density decreases giving it more positive buoyancy

Describe and illustrate the '**Ramp Method**' experimental design to compare viscosities of different substances

The 'RAMP METHOD' is a technique that utilizes different fluids in the same containers flowing down an inclined plane to determine the flow rate of each fluid (thereby comparing the viscosity of each fluid).



A diver can get a condition, known as 'the bends', which is treated in a special pressure chamber, called a **hyperbaric chamber**. The chamber enables nitrogen 'bubbles' to ...

re-dissolve back into the blood and tissues

What type of instrument is used to measure the **pressure** of a fluid?

manometer

All cargo ships have a special line called the **Plimsoll Line** that shows how much the ship should be loaded so it won't sink as it ...

goes between saltwater and freshwater

A device that uses rotational motion to move a liquid vertically called a ...

Archimedes screw

When air is added to a submerged submarine it is able to resurface because its overall ...

- A. buoyancy decreases
- B. pressure increase
- C. density decreases
- D. viscosity increases

Using the ramp method to determine viscosity, a student found out that Fluid A has a flow rate of 10.5 ml, per second. Fluid B has a flow rate of 11.3 ml, per second. Compared to fluid B, fluid A is ...

more viscous

Cells and Systems

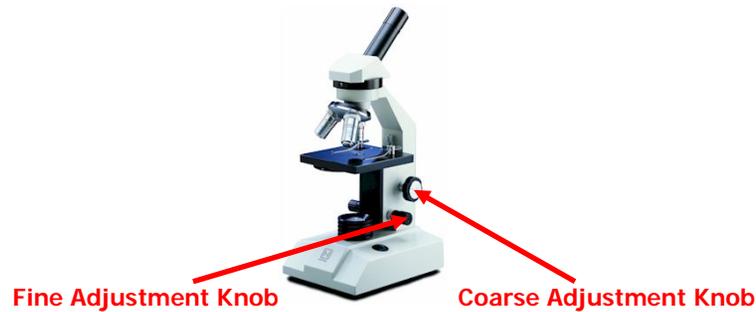
Explain what **metabolism** represents in an organism.

Energy is the ability to do make things move or change and is needed by all organisms. The sum of all the different processes that happen in an organism is referred to as the organism's metabolism.

Describe **different structures** that organisms have that perform **similar functions**.

Function	Plant	Animal
food gathering	roots	claws, hands, tentacles, mouths, tongues
breathing	leaves, needles	gills, lungs, spiracles, skin
moving	usually plants don't move from place to place	wings, legs, fins, tails

Identify and label the locations of different **adjustment knobs** on a microscope.

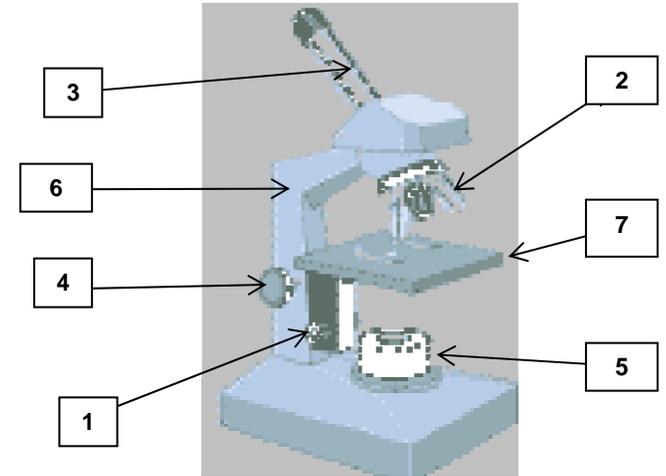


Explain the function of the **mitochondria** in an animal cell.

Mitochondria - chemical reactions occur that convert energy into useable forms
 'Powerhouse' (small circular structure with little stringy bits inside)

How does an **amoeba** move around?

Amoeba are common unicellular organisms that live in water. They move around using foot-like projections called pseudopods (false feet). They extend a pseudopod and the cytoplasm fills it.



- 1. Fine Adjustment Knob**
- 2. OBJECTIVE LENS**
- 3. TUBE**
- 4. Coarse Adjustment Knob**
- 5. LIGHT SOURCE**
- 6. ARM**
- 7. STAGE**

Energy is the *ability to do make things move or change* and is needed by all organisms. The sum of all the different processes that happen in an organism is referred to as the organism's ...

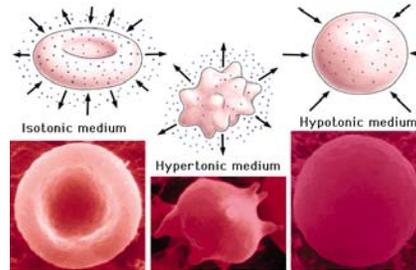
Metabolism

Illustrate the process of **osmosis**, showing and explaining where the water moves from and where it moves to.

The diffusion of water through a selectively permeable membrane is called osmosis.

Certain materials are allowed to pass through while others are prevented from passing through.

When water is lost (moves out of the cell) it leaves behind a high concentration of the dissolved substances – when water moves back into the cell, the substances become more diluted and can be used by the cell for its life functions.



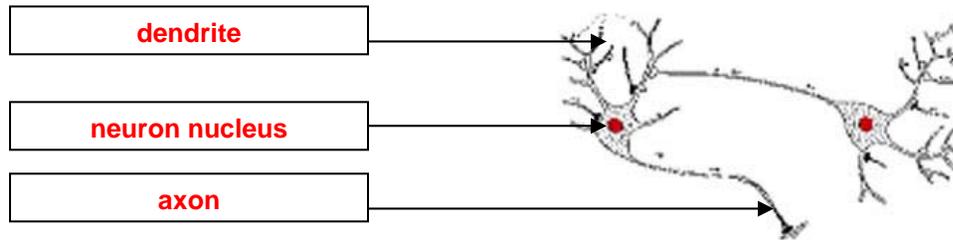
Certain materials are allowed to pass through this and others are prevented from passing through. The type of cell membrane that is present in a plant and animal cell is called a ...

selectively permeable membrane

Osmosis is the diffusion of water through a selectively permeable membrane. This process occurs because water will move from an area of ...

- A. low concentration to high concentration
- B. high concentration to low concentration
- C. low concentration to low concentration
- D. high concentration to high concentration

Label the parts of a **nerve cell**.



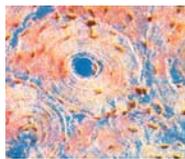
The liver converts this highly toxic substance into a less harmful substance – urea ...

- A. ammonia
- B. gastric juice
- C. sodium chloride
- D. hydrochloric acid

Identify the different types of **cells**.



blood



bone



nerve



muscle

Peristalsis is caused by contractions of muscles in this structure of the digestive system ...

esophagus

Gastric Juice is composed of mucus, hydrochloric acid, water and digestive enzymes. The purpose of the mucus is ...

prevent the gastric juice from digesting the stomach

Explain the muscular action called **peristalsis**.

Food is pushed down the esophagus by contractions of muscle tissue.

Why is the **epithelial tissue** in capillaries only one cell thick?

Capillaries allow the exchange of nutrients and gases.

What is the function of the **bladder** in the excretory system?

The bladder is the urine storage compartment of the body. It expands and then releases the urine out through the urethra.

What body systems work together to **exchange gases**?

Circulatory – Respiratory and Integumentary

What is **bronchitis**?

If the lining of the lungs becomes inflamed, it can lead to bronchitis (which makes breathing more difficult), which can further lead to damage of the lung tissue, causing emphysema (shortness of breath), which is a permanent condition.

Why is **cholesterol** bad for you?

High cholesterol level – builds fat in the arteries and restricts blood flow, which can lead to high blood pressure (hypertension), heart attacks (damage to heart muscle) and strokes (brain damage).

The transportation of nutrients in plants is the role of the plant's tissue. Specialized tissue connects the roots to the leaves. The Phloem tissue transports sugars that is manufactured in the ...

leaves to the rest of the plant

Each body system works with other body systems to perform its function effectively. When the body feels hot and cold on the skin, the systems working together are the ...

- A. Circulatory and Respiratory
- B. Sensory and Integumentary
- C. Sensory and Muscular
- D. Integumentary and Circulatory

Oxygen-rich air is drawn into the lungs through tube-like passageways called bronchi. The bronchi are lined with tough connective tissue in order to ...

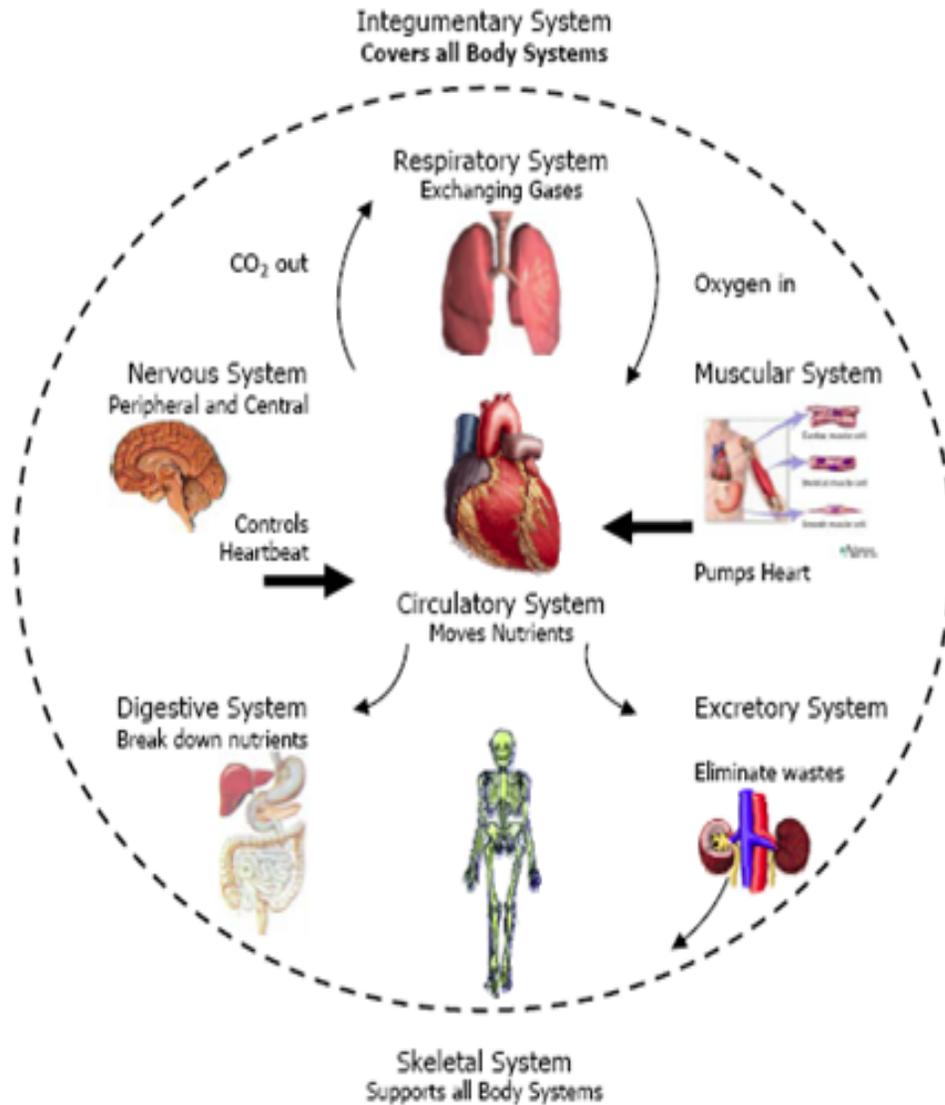
keep the walls from collapsing

Capillaries have two adaptations for exchanging gases and nutrients: they are made of specialized epithelial tissue that is only one cell thick and they ...

- A. reverse the flow of gases
- B. are reinforced with a double membrane
- C. are very narrow, so the blood cells have to pass through in single file
- D. collapse on bacteria, preventing it from getting to the heart

BODY SYSTEMS

Identify (illustrate and label) the main organ associated with each body systems. Complete the relationship diagram.



This organ is the key organ in the body that coordinates all other organs ...

- A. Skin
- B. Brain
- C. Heart
- D. Small Intestine

These organ systems remove wastes from the body. They are the...

Respiratory, Integumentary and Excretory systems

The small holes on the sides of an insect's abdomen, which enable the insect to breath are called ...

- A. 'Sportacles'
- B. 'Spiracles'
- C. 'Spectracles'
- D. 'Spirals'

Organs work together to make a system or network that performs a specialized function. Plants have only two main systems. They are the ...

- A. shoot and the roots
- B. roots and the leaves
- C. stems and the leaves
- D. leaves and the shoot

This organ system carries nutrients throughout the body, so that specialized cells can perform specialized functions. This body system is the ...

- A. digestive system
- B. muscular system
- C. respiratory system
- D. circulatory system

Light and Optical Systems

Describe **Sir Isaac Newton's** experiment to show that light is made up of different colors.

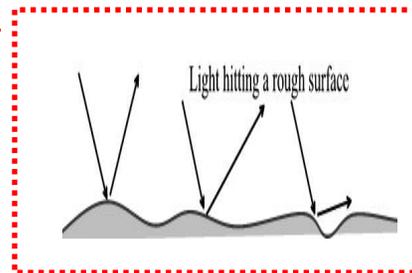
He beamed light through a prism

How does a **refracting telescope** work?

In a refracting telescope, light from a distant object is collected and focused by a convex lens called the objective lens. A second lens, called the eyepiece lens, works as a magnifying glass to enlarge the image.

Describe and illustrate **diffuse reflection**.

diffuse reflection occurs when light hits a rough or uneven surface, the light is scattered.



What is the **Law of Reflection** and why is it a **LAW**?

The LAW OF REFLECTION states that: the angle of incidence equals the angle of reflection. It is a law because it always happens this way.

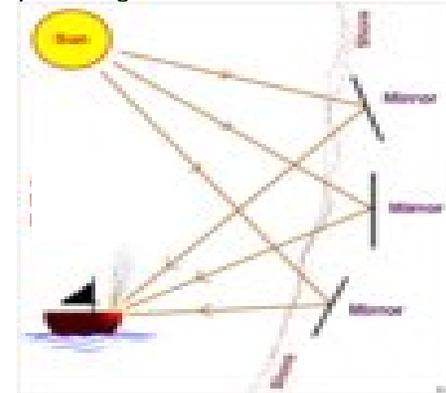
What are some **practical applications of concave mirrors**?

Concave mirrors form an image that appears to be closer than it actually is and can be useful because it can also reflect light from a large area - security devices, flashlights, telescopes, cosmetic mirrors and car headlights

Thoughts about light have changed over time as we learn more about it. Our eyes causing vision to occur were proven wrong because it was impossible to see in the dark. This theory of light was presented to the people of his time by ...

Pythagoras

Because Archimedes' understood that light travels in straight lines and can be reflected, his military plan, using these principles of light looked like this and was used to ...



sink enemy war ships using large mirrors

The invention of the microscope enabled scientists to study micro-organisms. This area of science is called ...

- A. Genetics
- B. Microbiology
- C. Cell Structure
- D. Animal Science

Cosmetic mirrors, flashlights, reflecting telescopes, and the headlights in a car are all examples of practical applications for these type mirrors ...

- A. plane mirror
- B. bubble mirror
- C. convex mirror
- D. concave mirror

When light moves from **one medium to another** in what direction is it bent in relation to the **normal**?

The **Law of Refraction** states that when light travels from one medium, to a denser medium, the light will be bent toward the normal, and when it exits the denser medium into a less dense medium it will bend away from the normal.

Diverging rays of light occur when light passes through what kind of lens? (Illustrate)

A double concave lens is thinner and flatter in the middle than the edges. Light passing through the thicker more curved areas of the lens will bend more than light passing through the thinner areas, causing the light to spread out or diverge

Referring to the wave model of light - how is **frequency** determined?

The frequency is the rate at which the crest and the trough move up and down. The number of cycles in a period of time - which is usually measured in hertz, or cycles per second.

What type of electromagnetic rays do **modern radar devices** use?

In active radar systems scientists send out microwaves and examine what comes back.

How do **glow in the dark** objects get their light?

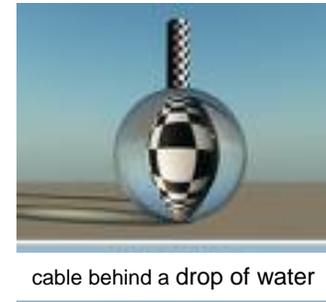
The most common way of making an object glow in the dark is to use chemicals called phosphors to produce light. These kind of glow-in-the-dark objects need to be exposed to light, or charged, in order to glow. The light energizes the phosphors and excites their electrons. As the electrons lose this extra energy, they release it as a light of their own.

Refraction is the bending of light when it travels from one medium to another. What direction does the light bend when it travels from a medium of greater density to one of lesser density?

_____ **away from the normal** _____

When **the sky is refracted by warm air** an illusion of a watery surface is created. This illusion is called a ...

_____ **mirage** _____



cable behind a drop of water

During refraction, an object in a denser material (like the water drop, will appear to be ...

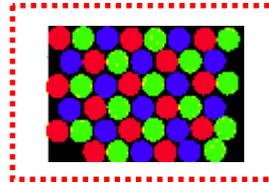
- A. smaller
- B. invisible
- C. larger
- D. inverted

Radar is an acronym for **radio detection and ranging**. These devices send out waves, which bounce off objects and return (obeying the law of reflection). Older radar devices used radio waves, whereas modern radar devices use ...

- A. microwaves
- B. gamma rays
- C. infrared waves
- D. ultraviolet waves

You will see - if you look very closely on the screen - what makes the picture on a **television** possible. (Describe and illustrate what you see)

A television set puts the theory of color addition into practice.



If you look closely at the screen, you will see that it is actually made up of rows of blue, green and red dots

Describe the function of **rods** (the photoreceptor cells that make up one part of your retina).

Photoreceptor cells in the retina detect light (rods are highly sensitive to light and cones detect color), they produce small electrical impulses from the retina to the brain, by way of the optic nerve.

Why is the image green in **night vision** goggles?

In night vision goggles, light is focused onto an image intensifier. Inside the intensifier, the light energy releases a stream of particles, which hit a phosphor-coated screen. These glow green and the person looking in the goggles can view a green image.

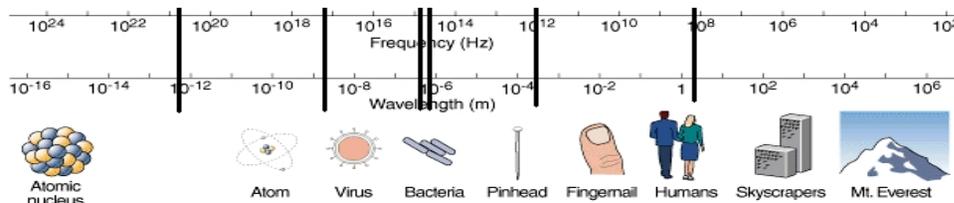
Describe the surface of the **ommatidia** in an insect eye.

An ommatidia is a long tube-like structure with a lens on the outer surface, a focusing cone below it and a light sensitive cell below that. Insect eyes have ommatidia facing in almost all directions because their eyes tend to have a rounded convex shape.

How is **digital information** in a computer stored?

A computer stores digital information by converting the information into numbers

Know where the different kinds of light can be located on the **electromagnetic spectrum**



Doctors use **MRI** (magnetic resonance imaging) machines to create pictures of the tissues inside the human body. The MRI machine uses these types of electromagnetic waves to produce images ...



- A. X-rays
- B. microwaves
- C. radio waves
- D. infrared waves

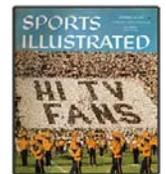
Nocturnal animals, such as cats and owls have very large pupils to allow them to collect as much light as possible. The purpose of the thin layer inside their eyes, called the **tapetum lucidum**, is to act as this inside their eye – a ...

- A. magnifier
- B. mirror
- C. lens
- D. filter

The greatest advantage to **digital imaging** is that the pictures don't have to be ...

- A. translated
- B. recovered
- C. processed
- D. transmitted

The process of creating a big picture, or a message, out of smaller pictures, or colored tiles, is similar to the process of digital imaging. The small elements that make up a picture, or a **stadium image**, are called **pixels**. The more pixels that make up a picture the higher the ...



resolution

Mechanical Systems

Illustrate a diving board and identify the location of **the load**, the **effort force** and the **fulcrum**.



In a second class lever the input effort is located at one end of the bar and the fulcrum is located at the other end of the bar, opposite to the input, with the output load at a point between these two forces

In most **simple machines** what is the advantage and what is the disadvantage?

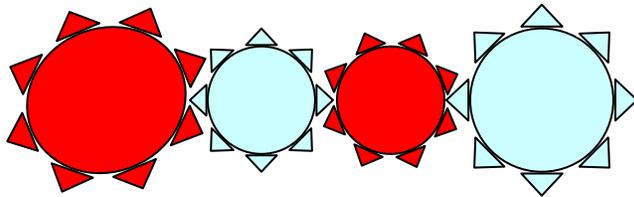
ADVANTAGE

- You gain **FORCE** - allowing you to move more with less force

DISADVANTAGE

- You lose **DISTANCE** – meaning you have to move the object much further

Illustrate a **gear train** that has **multiplying, parallel** and **reducing** gears in the correct order



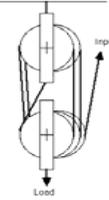
Illustrate a pulley system that would have a **mechanical advantage** of 4.



Count the ropes

supporting the **LOAD**

Block and tackle pulley system is used to lift heavy machinery in the CTS room.



One machine is 79kg. To lift it into place where it is going to be used, it has to be raised 90cm off the floor.

How much work is being done to raise the machine onto its platform?

(Show your work)

$79\text{kg} \times 0.9\text{m} = 71.1 \text{ Joules}$

7	1	.	1
	.	.	
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

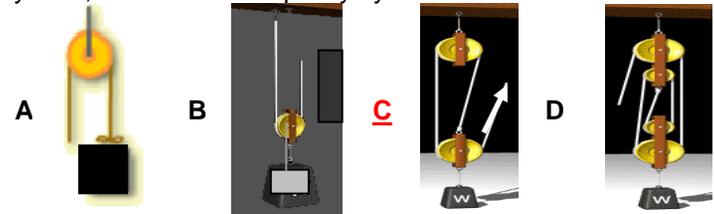
Transmissions are special types of linkages. It is used to transfer energy fro the engine to the wheels in a car. A transmission contains a number of these that allow the driver to apply a large force to move objects slowly or a small force to move objects quickly. They are ...

- A chains
- B fan belts
- C gears
- D linkages

On a bicycle, gears are made up of flat, toothed disks called ...

_____ **sprockets** _____

If it takes 30 N of force to lift a 90 N carton using a pulley system, what would the pulley system look like ...



How do you calculate **work**?

40cm is the distance moved and 50 N of force is used.

The amount of work is calculated by multiplying the force times the distance the object moves.

$$W = F \times d$$

$$50N \times .4M = 20 \text{ Joules}$$

Force is measured in Newtons and distance is measured in meters.

What gives a **hydraulic system** its mechanical advantage?

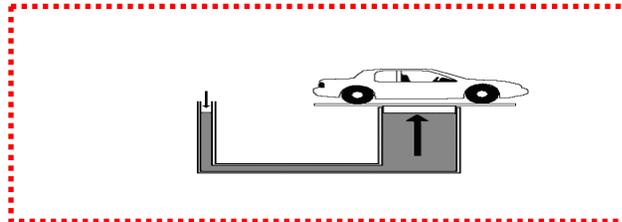
The mechanical advantage in a hydraulic system is provided by the pressure in the fluid

How is **mechanical advantage** calculated and illustrated in a hydraulic lift?

50N in

1500N out

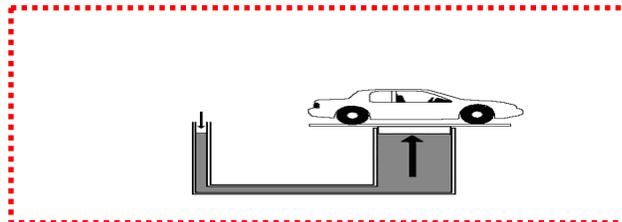
$$1500 / 50 = 30$$



Calculate the **area** of the **output piston** in a hydraulic lift.

Mechanical Advantage is 30
Area of **input piston** is 5 m²

$$30 \times 5 = 150m^2$$



How do you calculate **efficiency**?

1600 J are used to get 1200 J from a machine.

Efficiency can be calculated using work input and work output.

$$\text{Efficiency} = \frac{\text{Work}_{\text{output}}}{\text{Work}_{\text{input}}} \times 100$$

$$1200J / 1600J = 75\%$$

Work is calculated using the formula – $W = F \times d$. If you lift a box onto your desk that is .4 meters off the floor, using 50 Newtons of force, how much work are you doing?

20 joules of work

Using a machine does not mean that less work is done. This is because ...

work input equals work output

Efficiency is a measure of how well a machine does work. Dividing the mechanical advantage by the speed ratio and multiplying the result by 100 will determine the efficiency of the machine. A pulley system that has a speed ratio of 3 and a mechanical advantage of 2 has an efficiency of

- A. 33%
- B. 67%
- C. 60%
- D. 30%

Using the scientific definition of work, which statement below describes work being done.

- A. Tommy worked very hard to get all his homework done.
- B. Doing science is hard work when you learn formulas.
- C. It was hard work for Jessie to move the desk two meters.
- D. It was hard work but Rick couldn't move the car at all.

The mechanical advantage in a hydraulic system is provided by the ...

pressure in the fluid

What are the **criteria** for evaluating mechanical devices and how would convenience fit into these criteria?

The criteria might include:

Use (Function)	Purpose
Cost	Esthetics
Workmanship	Reputation
Effectiveness	Efficiency
Convenience (least)	

What influences the **design and creation** of a complex machine?

Mechanical devices are evaluated so that the consumer who is ultimately going to use it can make a better choice. Another important reason to carefully evaluate a mechanical device is to determine how it can be improved

What **applications** can a simple machine, like the lever be used for?



Change the direction of a force (a pulley on a flagpole)



Multiply force (a screwdriver)



Increasing or decreasing speed (scissors)



Transferring force (removing staples)

How is the **mechanical advantage** of a pulley system calculated?

To calculate the MA of a pulley system, count the number of ropes/cables supporting the load.

What is the science of **ergonomics**?

The science of designing machines to suit people is called 'ergonomics'. This science has improved the design and comfort of machines we use. The testing systems that designers use provide scientific information to researchers, allowing them to decide what type of modification is best for its designed purpose. Comfort is an important criterion that is evaluated.

How can the **efficiency** of a pulley system be calculated if you know the force and distance?

Efficiency is a measure of how well a machine or a device uses energy. The more energy that is lost, the less efficient a machine is. Efficiency is represent in %.

$$\text{Efficiency} = \frac{\text{Mechanical Advantage}}{\text{Speed Ratio}} \times 100$$

During the research phase, when a device is improved upon, certain criteria are taken into account. Of the criteria listed below, which would be least important ...

- A function**
- B efficiency**
- C effectiveness**
- D convenience**

Mechanical devices are evaluated so that the consumer who is ultimately going to use it can make a better choice. Another important reason to carefully evaluate a mechanical device is to ...

determine how it can be improved

Use the pulley illustrated to complete this question (Show your work in the space provided)



What is the **Mechanical Advantage** of this pulley system

4

How much of a load could you lift if you pulled on the rope with 100 N of force?

$$100\text{N input} \times 4 \text{ (MA)} = 400\text{N output}$$

$$1\text{kg} = 10\text{N} \text{ so, } 400\text{N} = 40 \text{ kg}$$

How much work are you doing if the rope is pulled 4 M?

$$W = f \times d \quad 100\text{N} \times 4\text{m} = 400\text{Joules}$$

CSA is a non-government association that tests and approves a wide range of products to ensure they are safe for use by the consumer. CSA stands for ...

Canadian Standards Association

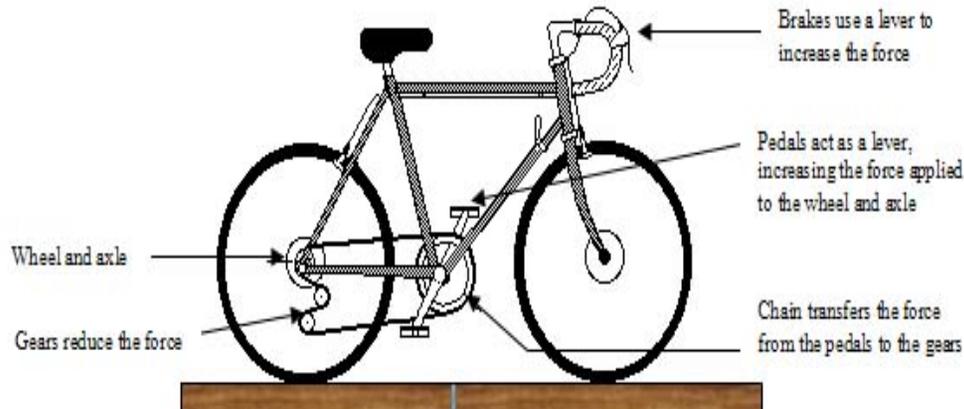
Input force = 20N
 Output force = 100N.
 Input distance = 3m
 Output distance = 0.5 m.

MA	SR	Efficiency
$\frac{100N}{20N} = 5$	$\frac{3m}{0.5m} = 6$	$\frac{5}{6} = 83.33\%$

The design of mountain bikes to handle the rough terrain they would be used in, is considered to be evaluating a function because of this influence ...

- A mass appeal
- B mass demand
- C environment
- D ergonomics

Identify the simple machines present in a bicycle.



Your grandfather loaned you his bicycle to experiment with. As you push down on the pedals you find that you are exerting 797N of force. The resulting load force causing the bicycle to move forward is 104N.

What is the mechanical advantage of your grandfather's bicycle?

Show your work

$$104 \text{ N} / 797\text{N} = 0.13$$

The mechanical advantage of your grandfather's bicycle is 0.13 (less than 1)

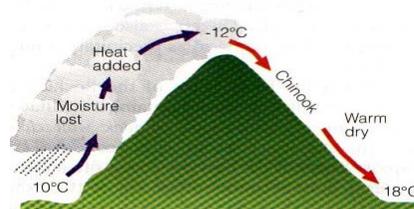
Why is it useful to have a mechanical device (like a bicycle) with a mechanical advantage of less than 1?

If a machine has a mechanical advantage that is less than 1, it is useful for tasks that don't require a large output force. A bicycle is a machine with a mechanical advantage of less than 1. Even though it has a mechanical advantage of less than 1, the output force causes the bicycle to move faster than the rider could walk, so it is a very useful machine.

Fresh and Saltwater Systems

Why does the eastern side of the Rockies receive a *Chinook*?

The rain shadow that is created by the Rockies makes the climate very dry in Southern Alberta.

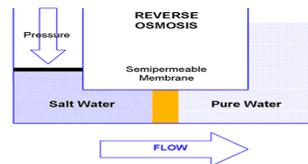


What is in water that makes it hard?

Hard water can cause pipes that carry it to become clogged with scales of minerals. Hard water is water that contains high concentrations of Calcium and Magnesium dissolved in it.

How does the process of reverse osmosis change saltwater into freshwater?

Reverse Osmosis – forces saltwater through a filter (membrane) allowing water to pass but not salt.



How far does the water itself travel in a wave?

Although waves can move a very long distance, the water doesn't move – it acts as the medium for the wave action to occur. Within each wave the particles of water move in a circular motion.

What is the main reason that tides occur on the Earth?

The gravitational force of the moon and the rotation of the Earth on its axis cause tides.

What is included in a river's sediment load?

A river's sediment-load is the amount of water-borne materials (rock, soil, organic matter) it carries. The faster the river flows, the more water-borne materials it can carry. As it slows these water-borne materials are deposited as sediment.

Models are often used to help explain a concept that is important to visualize, so you can understand and relate to it more easily.

This glass of lemonade models the distribution of all kinds of water on the Earth (like the chart illustrated above). All of the **freshwater** on the Earth (like in the graph above) is represented in the lemonade model by the ...



_____ **melted ice cubes** _____

Hard water can cause pipes that carry it to become clogged with scales of minerals. Hard water is water that contains high concentrations of dissolved ...



- | | |
|-------------------------|--------------------------|
| A. Gold and Silver | C. Hydrogen and Oxygen |
| B. Calcium and Chlorine | D. Calcium and Magnesium |

Waves are movements on the surface of the water.



Waves made by boats as they travel across the surface of the water are called **wash**.

Why would you see a sign, such as this one, on an open waterway that is used for recreational purposes?



to protect the shoreline from excess erosion

What glacial effect indicates that a glacier has advanced and retreated because of the gouges and scrapes it has made in the bedrock?

striations

What is the main climate effect that large bodies of water have on a particular area?

The main effect that water has on climate is that extreme temperatures are less likely to occur in cities near large bodies of water (Nanaimo), because water heats up and cools down very slowly – whereas in places where there is not very much water (Lethbridge), the land heats up quickly and cools down quickly – and that is where the extremes are felt.

Describe what you would likely find in the **continental shelf** zone of the ocean.

The continental shelf is a shelf of land that extends out from the edge of a continent below the ocean's surface. The water in this zone of the ocean is Warm and light making it rich in nutrients

What important zone in the ocean ecosystem enables many of the species that live there to live part of their lives out of the water?

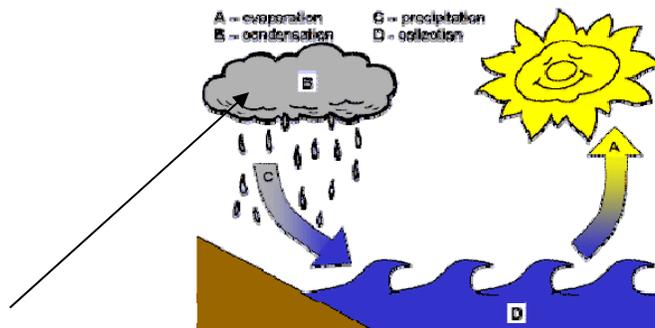
Intertidal Zone

Describe the type of aquatic environment that brine shrimp live in.



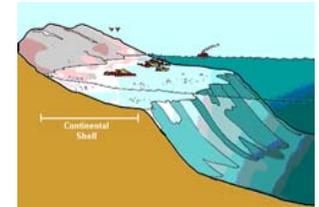
Brine shrimp are microscopic organisms that live in salt lakes and brine ponds. Few other organisms can live in these environments because the environment is so salty.

Illustrate the water cycle and identify that part of the **water cycle** where water vapor forms clouds?



Condensation is where water vapor in the atmosphere forms (B)

The **continental shelf** is a shelf of land that extends out from the edge of a continent below the ocean's surface.



The water in this zone of the ocean is ...

- A Cold and rich in a variety of species**
- B Cold and dark with few species**
- C Warm and light making it rich in nutrients**
- D Warm and dark with few nutrients**

A change in the water level in the ocean is referred to as a **tide**. Tides occur 4 times each day, every 6 hours, every day. There are two types of tides, **high tide** and **low tide**. The main reason that tides occur on the Earth is because of the ...

- A rotation of the earth and tilt of its axis**
- B gravitational force of the Earth on the moon**
- C gravitational force of the moon on the water**
- D moon phases and changing of the seasons**

A **stream, or river profile** is a description of its characteristics. Each stream has a pattern of flow that is shaped by its characteristics. Stream characteristics include ...

rate of flow and degree of slope

Geological features on the ocean floor are a result of the continental plates moving. Where the continental plates are **moving toward each other and moving away from each other** you will find ...

Trenches and mid-ocean ridges

Prairie lakes with high concentrations of **carbonates and bicarbonates** have white coatings on the rocks near the shoreline. These minerals have been dissolved out of the soil and have made the lakes ...

alkaline

What agricultural use of water is hampered with a serious side effect because of dissolved salts, in the soil, deposited on the surface?

Over- Irrigation

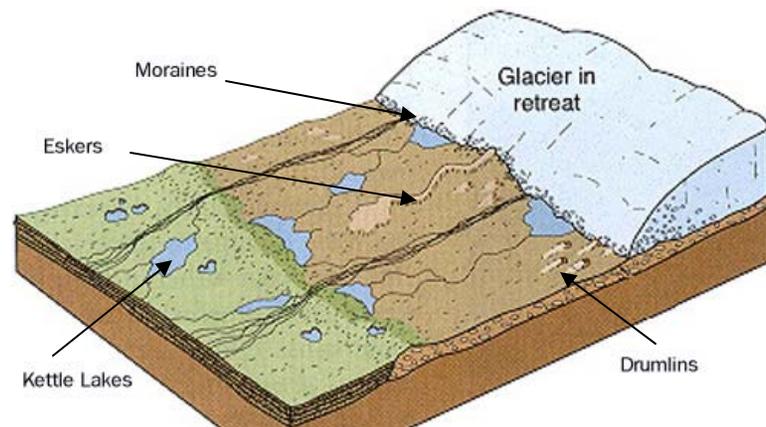
What is the primary source of phosphate and nitrate pollution throughout Alberta's river systems?

Often when too many chemicals are added into an environment, pollution occurs. This is evident when fertilizer (phosphate and nitrate) runoff from farmer's fields increases the growth of green slime in a body of water nearby. This green slime is called algal bloom.

What is another more important way to solve environmental problems that society faces besides science and technology?

Science and technology are two ways to solve many of the environmental problems society faces, but another more important way to solve problems is to get a strong commitment from people to act.

Identify the many different types of glacial landforms in the illustration.



This ocean zone contains water that is a mixture of saltwater and freshwater, called ...

- A pure water
- B saline water
- C algae bloom
- D brackish water

Continental glaciers, or **icecaps** cover large areas of land, forming the coldest regions on the Earth. Glaciers can also form high up in mountain ranges, where snow and ice build up over long periods of time. These glaciers are known as ...

valley glaciers

Adaptations are physical characteristics, or behaviors of a species, that increase its chances of survival. All living things have adaptations that are specific for the environment they live in.

Fish, like this Arctic



Cod, _____ in arctic water have a special adaptation that prevents their blood and body tissue from freezing. It is a natural ...

antifreeze

To revitalize a dead river, so it will once again thrive, needs cooperation from scientists, Industrialists, government and people.



What is the **danger** to the river in this picture?

_____ **thermal pollution** _____