

GRADE 8 SCIENCE REVIEW AND STUDY BOOKLET

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

SCIENCE 8 ALBERTA CURRICULUM UNITS

The review questions have been designed to direct the students to review concepts and find the answers within the PowerPoint Units, Review Booklets and the Science in Action textbook we have reviewed.

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.

There is an Answer Key available for the practice questions, but there is no KEY provided for the REVIEW questions, as it is the intent of this review process for the students and teacher (parent) 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, your Review Booklets and your Science in Action Textbook are reviewed.

SAMPLE PRACTICE QUESTIONS SELECTED FROM SECTION & UNIT TESTS

MIX and FLOW of MATTER

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



Describe how **slurries** are made.

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

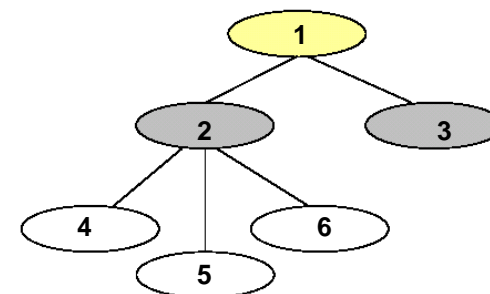
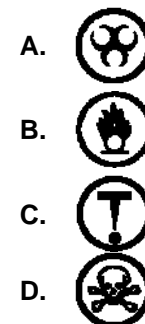
How is the **concentration** of a substance determined?

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

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

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

- _____ Materials that are infectious and cause other toxic effects
- _____ Material that is poisonous and infectious with immediate toxic effects
- _____ Material that is infectious
- _____ Material that will react when exposed to oxygen



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

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?

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

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

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

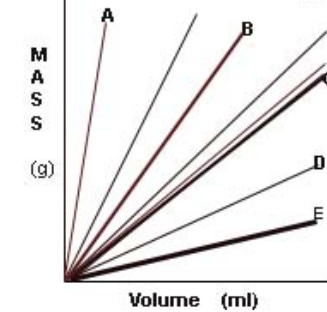
Why is it necessary to have a **closed system** when working with hydraulic fluids?

What is **Pascal's Law**?

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°



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 ...

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...

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 ...

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

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 ...

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

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 ...

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

Illustrate it!



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

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



Cells and Systems

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

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

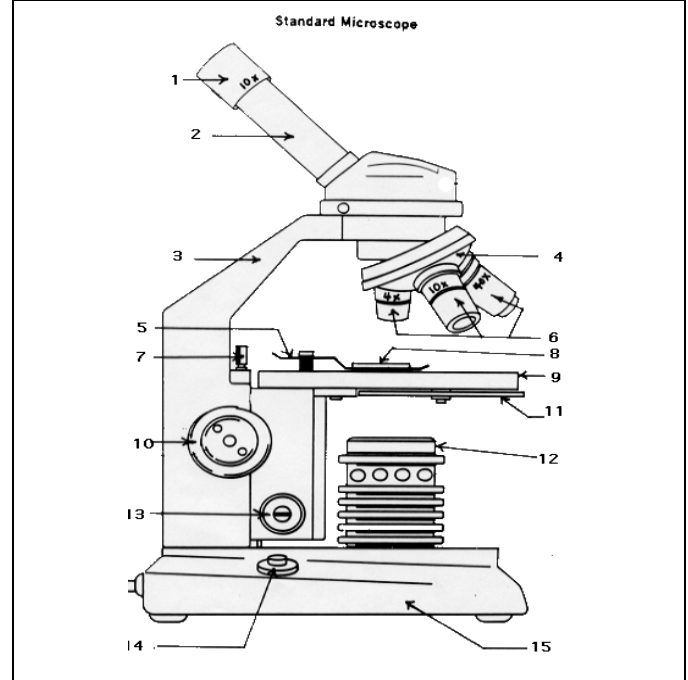
Identify and label the locations of different **adjustment knobs** on a microscope.



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

How does an **amoeba** move around?

Identify the parts of the microscope:

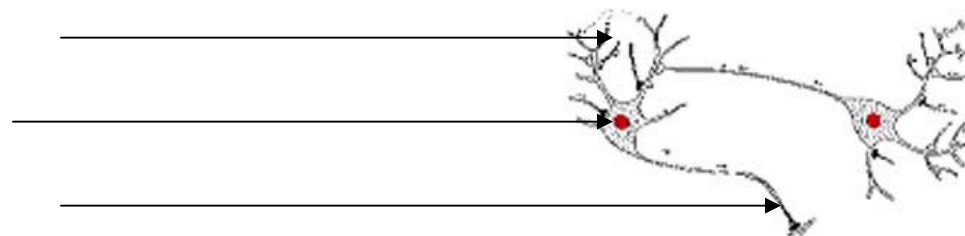


2.	_____
6.	_____
9.	_____
10.	_____
12.	_____


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 ...

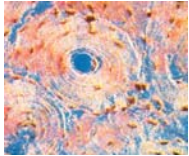
Illustrate the process of **osmosis**, showing and explaining where the water moves from and where it moves to.

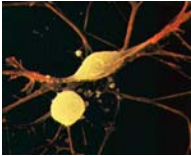
Label the parts of a **nerve cell**.

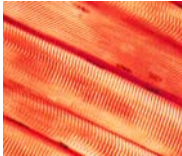


Identify the different types of **cells**.









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 ...

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

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

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

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

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

Explain the muscular action called **peristalsis**.

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

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

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

What is **bronchitis**?

Why is **cholesterol** bad for you?

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 ...

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**

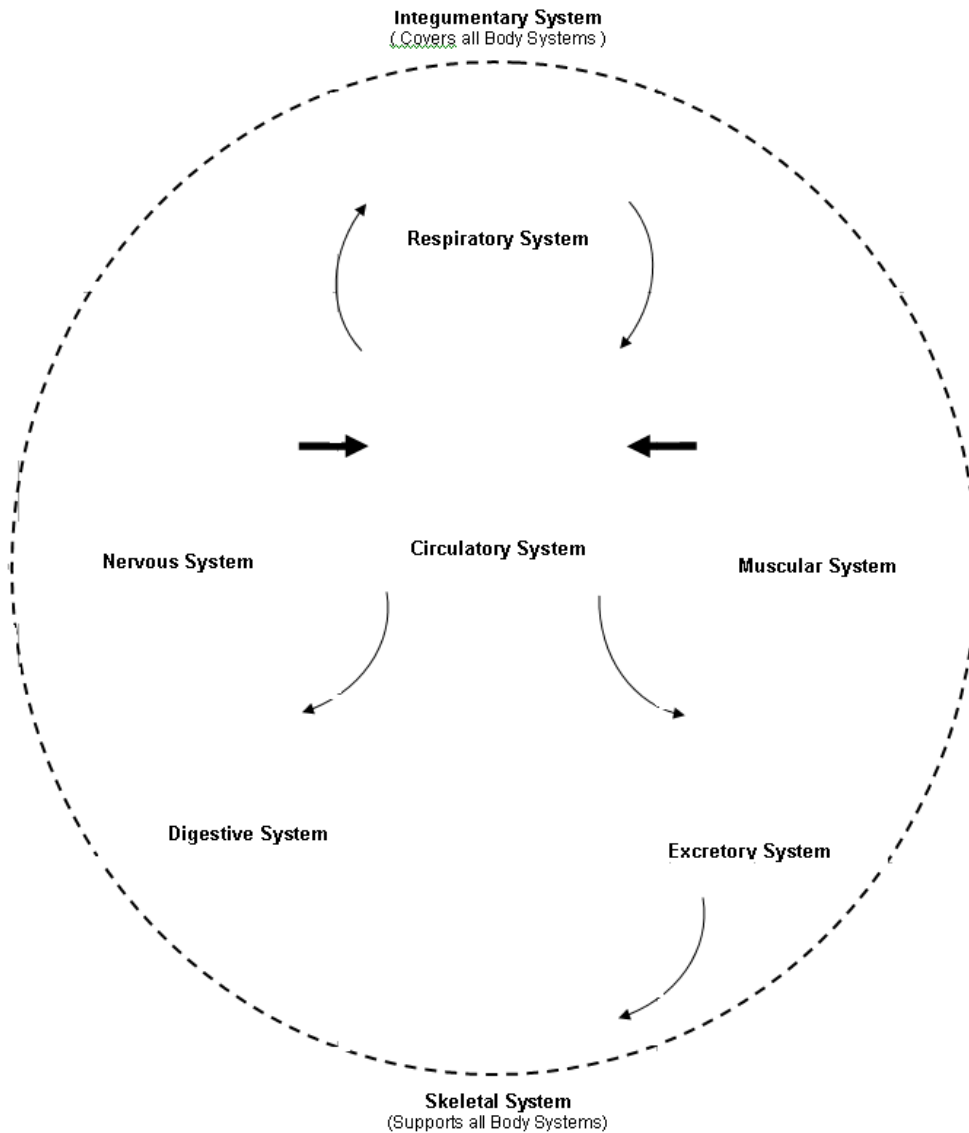
Oxygen-rich air is drawn into the lungs through tube-like passageways called bronchi. The bronchi are lined with tough connective tissue in order to ...

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, by completing 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...

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.

How does a **refracting telescope** work?

Describe and illustrate **diffuse reflection**.

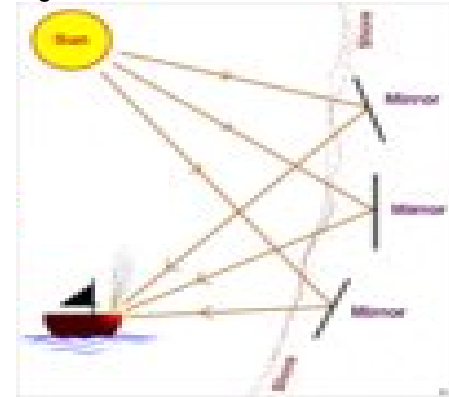


What is the **Law of Reflection** and why is it a **LAW**?

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

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 ...

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 ...



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**?

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

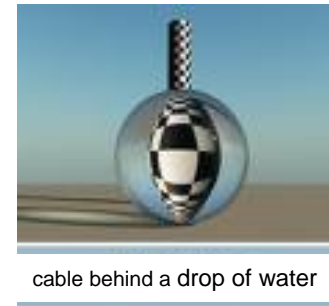
Referring to the wave model of light, how is **frequency** determined?

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

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

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?

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



cable behind a drop of water

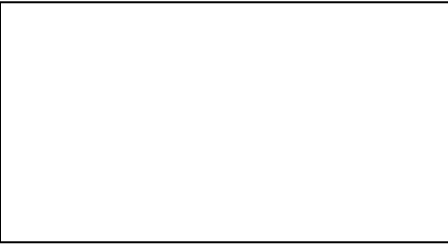
During refraction, an object in a denser material (like the water drop, will appear to be ...

- 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)



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

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

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

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

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 ...



Mechanical Systems

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

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

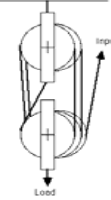
ADVANTAGE _____

DISADVANTAGE _____

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.

A 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)

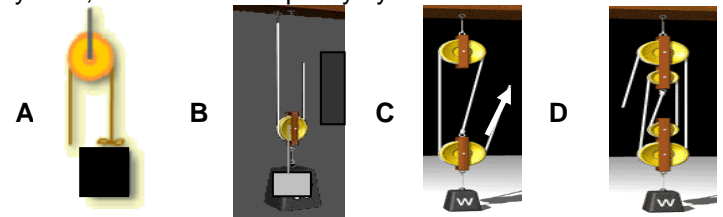
	.	.	
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Transmissions are special types of linkages. It is used to transfer energy from 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 ...

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.

How do you calculate **efficiency**?

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

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?

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

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

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%

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

50N in

1500N out

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.**

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

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

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

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

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

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

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

What is the science of **ergonomics**?

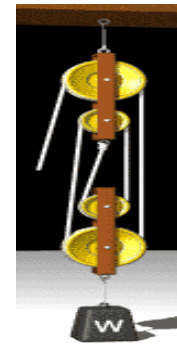
How can the **efficiency** of a pulley system be calculated if you know the force and distance?

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 ...

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



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

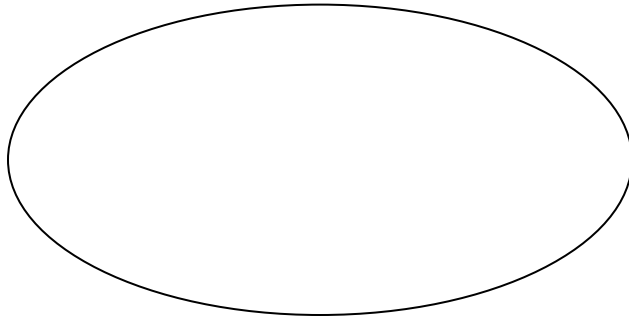
How much of a load could you lift if you pulled on the rope with 100 N of force?

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

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 ...

Find the **efficiency**

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



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



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

Fresh and Saltwater Systems

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

What is in water that makes it **hard**?

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

How far does the water itself travel in a **wave**?

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

What is included in a river's **sediment load**?

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 ...



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?

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

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

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

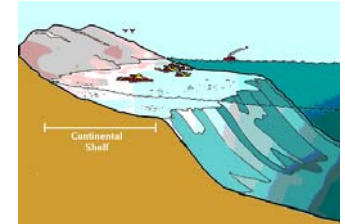
What important zone in the ocean ecosystem enables many of the species that live there to live part of their lives out of the water?

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

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



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 ...

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 ...

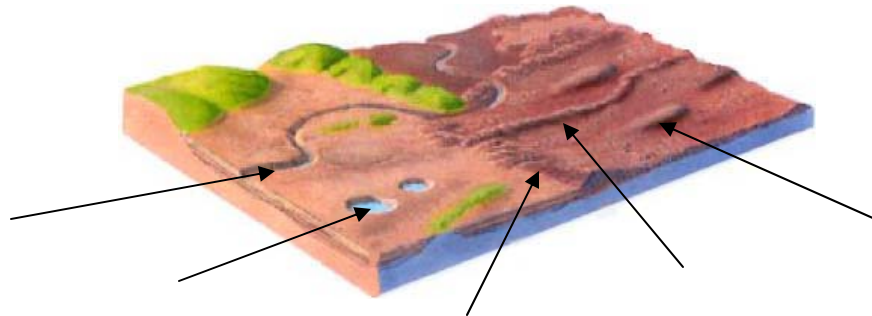
Prairie lakes with high concentrations of **carbonates and bicarbonates** have white coatings on the rocks near the shoreline. These minerals have been dissolved out of the soil and have made the lakes ...

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

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

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

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 ...

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 ...

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?
