Topic/Objectives: 3-2 Properties of Seawater; Identify and explain the chemical and physical properties of seawater that affect life in the oceans	**Name:**
	Date:
	Period:

Essential Question: How do the varying properties of seawater affect the types of organisms living there?

Questions:	**Notes:**
	Ions Entering Seawater
	◦ The characteristics of seawater are due to the nature of ＿＿＿＿＿＿＿ ＿＿＿＿＿＿＿ and to the materials ＿＿＿＿＿＿＿ in it.
	◦ Ions dissolved in seawater come from chemical ＿＿＿＿＿＿＿ of rocks on land, materials from Earth's interior, and materials released into the atmosphere by volcanoes.
	The ＿＿＿＿＿＿＿ properties of seawater shape life in the oceans.
	◦ Fundamental properties such as light level, ＿＿＿＿＿＿＿, and transmission of light and sound are drastically different in the oceans than on land.
	Transparency
	◦ Water is relatively ＿＿＿＿＿＿＿ (one can see through it).
	◦ This means that sunlight shining on the surface can penetrate the surface (crucial for the ＿＿＿＿＿＿＿ organisms living underwater).
	◦ This level of penetration varies greatly depending on the materials ＿＿＿＿＿＿＿ in the water.
	◦ Different ＿＿＿＿＿＿＿ of light penetrate to different depths in the ocean.
	Pressure
	◦ Pressure increases dramatically with ocean ＿＿＿＿＿＿＿.
	◦ Organisms on land are under ＿＿＿＿ atmosphere of pressure at sea level.
	◦ Marine organisms are under the weight of the atmosphere and the weight of the ＿＿＿＿＿＿＿.
	◦ With each ＿＿＿＿＿＿ of increased depth, another atmosphere of pressure is added.
	◦ As pressure increases, gases are ＿＿＿＿＿＿＿.
	◦ Changing pressures affect marine organisms and the scientists that study them.
	Sound Propagation
	◦ Water is ＿＿＿＿＿＿＿ than air.
	◦ The higher density of water causes sound to travel ＿＿＿＿＿＿ times faster in water than in air (340 m/s in air and about 1,520 m/s in the shallow ocean).
	◦ In the ＿＿＿＿＿＿＿ ＿＿＿＿＿＿＿ ＿＿＿＿＿＿＿, low-frequency sound waves can travel uninterrupted for thousands of kilometers.
	◦ Animals like fishes, marine mammals, and shrimps use sound for communication, ＿＿＿＿＿＿＿, reproduction, and predator and prey detection.
	The chemical properties of seawater, such as ＿＿＿＿＿＿＿, distinguish it from freshwater habitats.
	◦ Most of the ＿＿＿＿＿＿＿ (dissolved materials) are made up of a small number of ions; with only six ions compose more than 99% of the material dissolved in seawater.
	◦ Salinity is the total amount of salt dissolved in water and is usually expressed as the number of ＿＿＿＿＿＿＿ of salt dissolved into 1,000 grams of seawater.

	◦ The relative percentage of the major ions in seawater remains constant even though the total amount of salt varies slightly from place to place (_____ _____ _____ _____). ◦ Proportions can vary near hydrothermal vents, where rivers flow into the ocean, and where there is intense biological activity; but for the most part, the oceans are chemically well _____ (averaging about 35‰. ◦ Variations to ocean salinity are usually the result of the _____ or _____ of pure water.
	Salinity, Temperature and Density ◦ The _____ the water is, the denser it is. ◦ The density of seawater depends on _____ and salinity. ◦ _____ in the ocean varies considerably more than salinity; so density is usually controlled more by temperature than salinity.
	Trace Elements, Nutrients and Organics ◦ <u>Trace elements</u>, usually metals and metalloids, are present in tiny amounts in the ocean. ◦ Trace elements usually enter the ocean through river runoff, groundwater seeps, the _____, hydrothermal activity, and human-derived inputs. ◦ Most trace elements are removed from the ocean when they are incorporated into _____ _____. ◦ Many of these elements are also _____ for marine life.
	Dissolved Gases ◦ Many gases are also dissolved in seawater including oxygen, carbon dioxide, and _____. ◦ Gases from the atmosphere dissolve at the sea <u>surface</u>. Occasionally, the reverse happens. ◦ Oxygen is produced through photosynthesis by marine plants and _____. ◦ Many organisms in the ocean utilize _____ and release carbon dioxide.
	The Carbon Cycle ◦ The carbon that forms the backbone of all organic molecules starts in the atmosphere as _____ _____, and then it dissolves in the ocean. ◦ Carbon dioxide is converted into organic compounds by _____. ◦ _____ by consumers, decomposers, and producers breaks down the organic compounds and makes the carbon dioxide available to producers again.

Summary: