Topic/Objectives: 4-1 A	Atmospheric Circulation; (1) Describe the results of the	Name:	
relationship between the sun, the atmosphere, and the oceans.		Date:	
(2) Explain how the uneven heating of the ocean is responsible for winds and currents.		Period:	
Essential Question: Ho	w does the sun affect the behavior of the atmosphere and	l ocean?	
Questions:	Notes:		
	affects marine organisms and their		
	habitats, Earth's climate, and all terrestrial habitats.		
	The atmosphere and the ocean are closely	The atmosphere and the ocean are closely linked, and their interactions create	
	and over Earth's surface.		
	Earth's consists of 90 km of well-mixed gases above its land		
	and water.		
	The gas molecules get farther apart as altit	The gas molecules get farther apart as altitude increases.	
	The atmosphere is divided into four disting	The atmosphere is divided into four distinct layers (troposhere,	
	, mesosphere, and thermosphere) separated by three distinct		
	boundaries (tropopause, stratospause, and mesopause).		
	Heating the Atmosphere		
	 Our climate is ultimately controlled by light energy from the 		
	·		
	 Some of the Sun's light energy is reflected back into space, but most is 		
	by Earth's atmospheric	ere and surface (including the ocean)	
	and converted from light to heat.		
	I ne Sun's light energy is not distributed across Earth's		
	 Because the angle of the Sun's rays changes with Earth's latitude, radiation is at the equator and it declines toward the poles. The Sun's rays are most 		
			 The sun strays are most when they are perpendicular to Earth's surface (at the equator when the Earth is not tilted)
	Pays that strike the Earth's surface fart	her from the equator spread out	
	• Rays that stille the Earth's surface fait	and are not as concentrated	
	• The combination of rays spreading over	r a larger surface area and traveling	
	through more atmosphere with latitud	e is what causes the tropics to be	
	the poles	e is what causes the tropics to be	
	• This uneven heating of Earth is the driv	ving force behind	
	and		
	gacas are gases in the a	tmosphere that block heat from	
	transmitting back to space		
The most important greenhouse gases are: water vapor,		water vapor	
	Greenhouse gases keen Farth warm and	for life	
	Greenhouse gases keep Larth wallh and		

	Because different are influenced by	
	specific environmental factors, they can be used to directly compare ancient	
	atmospheric composition and air temperatures.	
	Antarctic ice cores show that over the last 400,000 years and incorporating	
	multiple ice ages, atmospheric CO ₂ between about 180 and	
	300 parts per million.	
	The air in the atmosphere is constantly in	
	The uneven heating of Earth's surface, as well as its	
	, are responsible for the wind and weather patterns	
	experienced on land and at sea.	
	Vertical Circulation	
	• is the movement of molecules in the air.	
	• The winds in our atmosphere are driven by energy from	
	the Sun.	
	 Air near the equator absorbs increased solar radiation and 	
	. Air from higher latitudes moves in to replace the	
	air, causing wind.	
	In the hemisphere, the Coriolis effect always deflects things to	
	the right when you are looking at a globe.	
	In the hemisphere, things are deflected to the left when you	
	are looking at a globe.	
	The magnitude of the increases as you	
	move toward the poles.	
	Global Circulation	
	• The of the Earth causes the winds to not move straight	
	from the equator to the poles.	
	 Three distinct convection cells form over each hemisphere: the 	
	the westerlies and the nolar	
	easterlies	
	customes.	
Summary:		
Summary.		