We have created a guide to get you started. This is designed to be a starting point that can be tweaked to your individual style/needs. Included in the general plan are the standards/access points, vocabulary, key questions and links to a variety of resources including tutorials, informational text, videos, experiments and sample activities. All of the links in this file are live and clicking on the standard will take you directly to C-Palms.

PowerPoints for Oceans and Climate:

Visual Vocabulary [Click here](http://accesstoflsresources.weebly.com/uploads/2/3/7/3/23739164/4._oceans_and_climate_visual_vocab.pptx)

Key Questions [Click here](http://accesstoflsresources.weebly.com/uploads/2/3/7/3/23739164/4.__oceans_and_climate.essential_questions.pptx)

*Drafted by Sarasota County Teachers Dawn Byrne, Jeremy Johnson and Elizabeth Lewis, piloted 2016-17 in 5 classes and general education content review by Betsy Summerlee.*

|  | Oceans and Climate |
| --- | --- |
| **Unit/Topic Standard** | [SC.912.E.6.5:](http://www.cpalms.org/Public/PreviewStandard/Preview/1891) Describe the geologic development of the present day oceans and identify commonly found features.[SC.912.E.7.2:](http://www.cpalms.org/Public/PreviewStandard/Preview/1894) Analyze the causes of the various kinds of surface and deep water motion within the oceans and their impacts on the transfer of energy between the poles and the equator  |
| **Access Points** | [SC.912.E.7.In.2:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8236) Recognize that there are circular movements of ocean water (surface and deep-water currents) which move cold water from the poles toward the tropics and vice versa.[SC.912.E.7.Su.2:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8237) Recognize that currents move the ocean water around Earth. [SC.912.E.7.Pa.2:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8238) Recognize waves in the ocean.  |
| **Vocabulary** | oceans, north pole, south pole, ocean water temperatures, *El Nino, La Nina,* ocean circulation, ocean current, surface current, Coriolis Effect, upwelling, deep current, Global Conveyor Belt, Thermohaline Circulation, gulf stream, waves, rip currents |
| **Key Concepts** | * What are the Features of the Ocean Floor?
* What are Surface Ocean Currents?
* What are Deep Ocean Currents?
* What Forces Drive the Global Conveyor Belt?
* How Do Ocean Currents Affect the Earth’s Climate?
* What is the Gulf Stream? Why is it Important?
* What is El Nino and How Does it Affect the Earth’s Climate?
* What is La Nina and How Does it Affect the Earth’s Climate?
 |
| **References** | * Interactive site, features on the ocean floor: [Click Here](http://www.harcourtschool.com/activity/science_up_close/518/deploy/interface.html)
* Video and slides ocean currents: [Click Here](http://www.montereyinstitute.org/noaa/lesson08.html)
* Thin Ice: the Southern Ocean, Thermohaline, video 6 minutes: [Click Here](https://www.youtube.com/watch?v=vGBaL3udkHI)
* The Gulf Stream Explained, video 5 minutes: [Click Here](https://www.youtube.com/watch?v=UuGrBhK2c7U)
* What are El Niño and La Niña? 2 minute video and article: [Click Here](http://oceanservice.noaa.gov/facts/ninonina.html)
* Analyzing Antarctic Ice Sheet Movement to Understand Sea Level Changes, video: [Click Here](http://www.cpalms.org/Public/PreviewResourcePerspectivesVideo/Preview/155008)
* Assessment of Antarctic Ice Sheet Movement Rate by Sediment Core Sampling, video: [Click Here](http://www.cpalms.org/Public/PreviewResourcePerspectivesVideo/Preview/155009)
* Assessment of Past and Present Rates of Sea Level Change, video: [Click Here](http://www.cpalms.org/Public/PreviewResourcePerspectivesVideo/Preview/155010)
* Where are the fish? Video 6 minutes: [Click Here](http://www.cpalms.org/Public/PreviewResourcePerspectivesVideo/Preview/155366)
* Lesson plan formation of oceanic features: [Click Here](http://www.cpalms.org/Public/PreviewResourceLesson/Preview/29756)
* Lesson plan, making the ocean floor, exploring tectonic plates and how they impact the ocean: [Click Here](http://www.cpalms.org/Public/PreviewResourceLesson/Preview/75627)
* Challenge: Melting Ice and its Effect on Life experiment looking at melting ice patterns: [Click Here](http://www.cpalms.org/Public/PreviewResourceLesson/Preview/155238)
* Causes of Surface Currents, Lesson plan plotting major ocean gyres on a map: [Click Here](http://www.cpalms.org/Public/PreviewResourceLesson/Preview/129998)
* Grape Suspension, experiment looking at ocean water density: [Click Here](http://www.cpalms.org/Public/PreviewResourceLesson/Preview/128979)
* How El Niño and La Niña Affect the Weather, informational text and lesson plan: [Click Here](http://www.cpalms.org/Public/PreviewStandard/Preview/1894)
* Does the Rotation of the Earth Affect Toilets and Baseball Games? Examines the Coriolis effect-how the Earth's rotation affects moving objects: [Click Here](http://www.cpalms.org/Public/PreviewStandard/Preview/1894)
* 3 Perspectives Video: found at this link: [Click Here](http://www.cpalms.org/Public/PreviewStandard/Preview/1894)
	+ Hurricane Dennis & Failed Math Models: What happens when math models go wrong in forecasting hurricanes?
	+ KROS Pacific Ocean Kayak Journey: Waves: When your classroom is the open ocean, which is the longest period? The one from the tsunami.
	+ Mathematically Modeling Eddy Shedding : COAPS oceanographer Dmitry Dukhovskoy describes the process used to mathematically model eddy shedding in the Gulf of Mexico.
* Will an ice cube melt faster in salt water or fresh water, video guide for experiment: [Click Here](http://www.cpalms.org/Public/PreviewResourceUrl/Preview/108992)
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