*“Rotation”*

**Resource Title:** *Torrey Pine Study*

**Resource Summary:** Students will be presented with two images of Torrey Pines (one from Santa Rosa Island and one from La Jolla, California). They will list all of the tree’s similarities and differences. Students will then research where Torrey Pines are found (Santa Rosa Island and La Jolla, California) and come up with their own conclusions on the trees distribution. Then, students will watch the rotation portion of the film and take notes. Finally, in groups, students will create a demonstration model of the process using evidence from the film and research and finally present it to the class.

**Subject Areas:** Science

**Grade Level Range:** 6th - 8th

**Standards**:

Common Core English Language Arts

SL.6-8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6-7-8 topics, texts and issues, building on others’ ideas and expressing their own clearly.

RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

Next Generation Science Standards

MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes and seafloor structures to provide evidence of the past plate motions.

MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

**Resource Provided By:** Suzanne Squires, Science/Agriculture/Multimedia/PE, Los Olivos School, Los Olivos School District

**Resource Details:**

1. Students are broken into groups of four and each group is given a set of two images of Torrey Pines (one from Santa Rosa Island and one from La Jolla, California). Using the observation sheet attached or any recording template, students discuss with their group the similarities and differences of the two images of Torrey pines and then research the distribution of the trees. Students then come up with conclusions as to why the trees are only found in San Diego and on Santa Rosa Island.
2. Watch the Rotation Tale in *The West of the West*. Students take notes. With this tale it would be beneficial to pause the video every now and then so that the students can record the diagrams as well as the dialogue.

From the tale students learn how the islands broke off from California and were turned around clockwise 90-120 degrees and because of the depth of the continental shelf, the Channel Islands show as mountaintops that happen to stick up above present sea level. The four northern Channel Islands presently occupy the southern edge of a rotated block called the “Transverse Ranges Block” and started out on a north-south line west of San Diego.

1. Have groups brainstorm on using materials that could be used to demonstrate the formation of the islands (paper, manila folders, cardboard, paper plates, etc.). Students then plan their demonstration idea and build it. Summary of the tale can also be given to the students to use as reference material when planning out their presentation. Once all of the projects are made, the groups present their model to the class, demonstrating their understanding of how the islands were formed.

Supplemental Activities:

1. Visit the Northern Channel islands: Island Packers, Ventura, CA, (805) 642-1393, info@islandpackers.com
2. Use the [Anacapa Island Cam](https://www.nps.gov/chis/learn/photosmultimedia/anacapa-landing-cove-webcam.htm) to study some of the features of Anacapa Island, an eagle nest and life under the ocean.
3. Visit Torrey Pines State Natural Reserve, 12600 N. Torrey Pines Rd, La Jolla, CA 92037, [www.torreypine.org](http://www.torreypine.org)

**TORREY PINES**

**OBSERVATION**

**NAME:**

**Observe the two species of Torrey Pine. Record the characteristics in the table below.**

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| **Similarities** | **Differences** |
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**Research the distribution of Torrey Pines.**

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**Discuss the possible reasons for the unique distribution of Torrey Pines.**

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**Additional Resources:**

Native Plants, Torrey Pines State Reserve and Nearby San Diego County,

 Margaret Fillius (book)

Torrey Pines; Landscape and Legacy, Bill Evarts (book)

California’s Channel Islands, Marla Daily (book)