

## PLATE TECTONICS WITH AN ORANGE

### STANDARDS

See summary of National Science Education Standards.

Original: <http://books.nap.edu/readingroom/books/nses/>

Standard concept	General Standard	Specific Standard	General Standard	Specific Standard	General Standard	Specific Standard
Grade Level		K-4		5-8		9-12
Science as inquiry (A)	Abilities ... to do ... inquiry	A.1.4.1				
		A.1.4.5				
	Understandings about ... inquiry	A.2.4.1	Understandings about ... inquiry	A.2.8.1		
		A.2.4.2		A.2.8.2		
Earth and Space Science (D)	Properties of Earth materials	D.1.4.1	Structure of Earth system	D.1.8.1		
				D.1.8.2		



## PLATE TECTONICS WITH AN ORANGE

### INTRODUCTION

The Earth's crust is not a continuous piece, but consists of separate "plates" some of which abut each other. These plates slowly move around on the Earth's surface.

### PURPOSE

To acquaint the student with the concept of plate tectonics.

### MATERIALS

- oranges
- toothpicks
- clay or play dough (optional)

### PROCEDURE

- 1) Have the students peel the orange in as few pieces as possible, without the use of a knife. This peel represents the Earth's crust. The crust is in pieces just like the orange peel.
- 2) Have the students lay the orange peel out on their work surfaces and record their observations.
- 3) Tell the students to replace the peel on the orange, securing the peel with toothpicks.

DISCUSSION to accompany each step in the procedure

- 1) Peel orange
  - a) The Earth is spherical like the orange although it is difficult to see the roundness of the Earth except from space.
  - b) What did the students observe when the orange peel was lying on their work surfaces? Did they notice that the pieces flattened out? The pieces didn't appear to be as round as they were when attached to the orange.
- 2) Put peel back onto orange
  - a) Now that the peel is back on the orange, this better represents the Earth's crust. The cracks between the plates are called faults. Convection of heat from the interior of the Earth causes movement of the plates (represented here by the orange peel pieces) and related volcanoes.

### EVALUATION:

- 1) How do the continents fit into this model that represents the plate theory?
- 2) How can the model be modified to represent the spaces between the continents, the oceans? Remember that the crust actually covers the whole earth, not just the continents.



## OPTIONS

Since most of the fault lines on the earth's crust are not visible, the students may wish to roll out a thin piece of clay (or play dough) and cover the orange. They should carefully remove the toothpicks as the clay is placed.

