Mantle Motions

Modified from Elvia Solis (Arlington High School, Indianapolis, IN)

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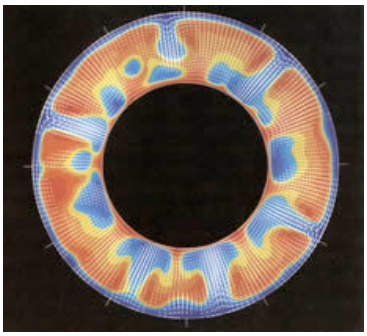

Key Point:

Students will be able to identify and understand vocabulary associated with the motion and transformation of the Earth's lithosphere due to the movement of plates and resulting formation of earthquakes, volcanoes, trenches, and mountains.

Materials:

- paper and pen for students
- large open space such as football field, parking lot or gym

Procedure:

1. Students brainstorm, look in book, or are given a copy of major vocabulary words associated with lithospheric plate motions.
2. For each vocabulary word students create and write down a motion that can be done with 2 people to show the definition of the vocabulary word. The more simplistic the motion the better for the activity.
3. The teacher or class decides on the most appropriate activity for each vocabulary word. This ensures each student knows the motion associated with the vocabulary word.
4. Students find a partner and from a large circle around the teacher.
5. The teacher calls out the vocabulary word and each set of partners must do the action associated with that word. After a few practice examples the teacher officially starts the game.
6. After each word the last team to do the motion is out. This continues until only one team is left.

Extension

- Connecting across the Curriculum: Fine Arts – make a diagram, model, danc, rap/song, play or some other artistic example of a specific plate movement.
- Incorporating Technology – students use Internet to fide a digital example of plate movements which allows students to "see" the crust being altered.
- Meeting Individual Needs (for special needs, gifted and talented, etc) – students who are unable or uncomfortable participating can be the caller in the center of the judge to determine which group was the slowest to complete the movement. Also all motion should be modified so every student in the classroom can physically do them.

Objectives

1. Understand and discuss continental drift, sea-floor spreading, and plate tectonics. Include evidence that supports the movement of the plates, such as magnetic strips on the ocean floor, fossil evidence on separate continents, and the continuity of geological features.
2. Investigate and discuss the origin of various landforms, such as mountains and rivers, and how they affect and are affected by human activities.
3. Recognize and explain that in geological change, the present arises from the materials of the past in ways that can be explained according to the same physical and chemical laws.
4. Explain that the theory of plate tectonics was finally accepted by the scientific community in the 1960's when further evidence had accumulated in support of it. Understand that the theory was seen to provide an explanation for a diverse array of seemingly unrelated phenomena, and there was a scientifically sound physical explanation of how such movement could occur.

Examples of Vocabulary and Motions

Continent / continent collision - hands meet fingertips us to form an arc (mountain), or partners put hands together (horizontal to the floor) and then arch them upwards

Ocean / Continent - 1 partner holds arms straight out in front of second partner who faces partner with arms held at a downward angle

Divergent boundary - partners back to back with arms held up and pointed away from other partner

Transverse boundary - partners grab opposite hands and pull past each other

Trench - both partners face each other and make a downward V holding arms straight

Asthenosphere - each partner does waves with their arms.

Volcanic Eruption - partners squat and quickly rise waving their hands above their heads.