

Name _____

Date _____

The Pacific Ocean

About seventy percent (71.1% to be exact) of the earth's surface is covered by ocean, and the Pacific Ocean is the largest of the five oceans, extending some 64 million square miles and accounting for one-third of the earth's surface area. This vast area of ocean is larger than the landmass of all the continents combined and contains about forty-six percent of the world's water. Not only is the Pacific the largest of the world's oceans, it is also the deepest with an average depth of 13,000 feet. The Pacific Ocean is bounded by the following major geographic features: North and South America to the east; Asia and Australia to the west; the Arctic Ocean to the north; and the Southern Ocean to the south.

Volcanic Activity

The area covered by the Pacific Ocean is the location of significant earthquake and volcanic activity. The Pacific Ocean is home to around 300 volcanoes. The perimeter of the Pacific is called the Pacific Ring of Fire due to the prevalence of volcanic activity there. The Ring of Fire includes volcanoes along the west coast of South America, Central America, North America, and west across the Aleutian Islands of Alaska. It encompasses the string of volcanoes east of the islands off the east coast of Asia and Australia. All of these volcanoes exist at the edges of a tectonic plate, the Pacific Plate.

Geologists have determined that the earth's crust is composed of individual pieces that move in response to the interaction of forces from the earth's core and those found on the surface. These individual irregularly shaped pieces of the earth's crust are called tectonic plates. Tectonic plates are in constant motion, even if this motion is imperceptible to humans except through sophisticated seismic measurement devices. Seismic devices measure the waves of force generated by the movement of tectonic plates, earthquakes or pending volcanic activity.

Volcanoes also exist in the vicinity of weak spots in the earth's crust referred to simply as hot spots. Volcanoes corresponding to hot spots in the middle of the Pacific basin created the Pacific islands, including the Hawaiian Islands, which continue to experience active volcanoes.

Volcanic activity and earthquakes in the Pacific Ocean are responsible for most of the tsunamis that predominantly affect islands of the coast of Asia. The

Name _____

Date _____

energy released by the underwater geological activity is transferred to the ocean water, creating giant waves. These waves travel in concentric circles from the location of the earthquake or eruption. The huge waves will dissipate in the open ocean but will overwhelm coastal areas if they reach land, causing devastation.

Physical Features

Among the superlatives associated with the Pacific Ocean is the fact that it is home to the deepest location on earth, the Mariana Trench. An ocean trench is a long, narrow depression in the ocean floor, which corresponds to the junction of two tectonic plates. The Atlantic Ocean has three trenches; the Indian Ocean, one; the Pacific Ocean, eighteen. Of these, the Mariana Trench is the most significant, being 1,580 miles in length and 43 miles in width.

At its deepest point, the Mariana Trench plunges more than 36,000 feet, which is nearly seven miles. This area is about 210 miles southwest of the island of Guam and is named Challenger Deep. The U.S. Navy acquired a Swiss-designed bathyscaphe (a submersible capable of deep diving) named Trieste and this is the only vessel that has ever explored the depths of the Mariana Trench. The historic voyage occurred in 1960.

The Pacific Ocean contains about 25,000 islands and these islands vary in their origin. For example, the Hawaiian Islands exist due to hotspot volcanoes. Many islands, including New Guinea and the Philippines, are called continental islands because of their proximity to continents. Additional island formation is related to the activity of coral. The Great Barrier Reef, the world's largest coral reef system contains 900 islands formed by coral.

The salinity or saltiness of the Pacific Ocean varies over its vast area. The Pacific is less salty near the equator because of the amount of rainfall experienced in that part of the world. Geographers use the equator to divide the Pacific Ocean into two portions, the North Pacific and the South Pacific. Ocean currents of the North Pacific Ocean flow in a clockwise direction while the currents in the South Pacific flow in a counterclockwise direction. The areas of the Pacific Ocean closest to the poles, both the North Pole and the South Pole, experience sea ice.

Tropical cyclones that spawn in the Pacific Ocean reach continents and are called typhoons in Asia and hurricanes in the Americas.

Name _____

Date _____

Circle True or False after analyzing each of the following statements.

1. True False About one-third of the earth's surface is covered by ocean.
2. True False The perimeter of the Pacific is called the Pacific Ring of Fire due to the prevalence of volcanic activity there.
3. True False The Aleutian Islands of Asia are included in the Pacific Ring of Fire.
4. True False The Pacific Ring of Fire is related to the geological phenomenon called plate tectonics.
5. True False The Hawaiian Islands are an example of islands in the Pacific Ocean that were formed by coral activity.
6. True False Earthquakes in the Pacific Ocean are responsibility for most of the typhoons that predominantly affect islands off the coast of Asia.
7. True False An ocean trench is a short, wide depression in the ocean floor, which corresponds to the junction of two submerged mountains.
8. True False At its deepest point, the Mariana Trench plunges more that 36,000 feet, which is nearly seven miles.
9. True False Ocean currents of the North Pacific Ocean flow in a clockwise direction while the currents in the South Pacific flow in a counterclockwise direction.
10. True False The islands of the South Pacific Ocean are known for their tropical climate and the South Pacific never experiences ice or snow.

Name _____

Date _____

Answers

1. False
2. True
3. False
4. True
5. False
6. False
7. False
8. True
9. True
10. False