a) Write out the equivalents in pairs:

1. to create, to occur, to contain, to consist of, to affect, rapid, frequent, uppermost, interplay, inland, top, solid, to make up.
2. hard, summit, often, to include, to tare place, to produce, to be composed of, to act on, quick, to interact, interior, to build, topmost.

b) Write out the opposites in pairs:

1. to appear, uppermost, to be similar, to solidify, to harden, to weaken, summit, terminus, thick, marginal, single.
2. to soften, to differ, thin, inland, numerous, beginning, foot, to strengthen, to melt, innermost, to disappear.

c) Give English equivalents of the following:

тектонические плиты; астеносфера; оболочка из твердых, сильных пород; быть взаимозаменяемыми; составлять верхние части плит; происходить на границе плит; конвергентная, дивергентная, трансформная границы;

boundary	['baundərɪ]	*n* граница, линия раздела, межа, *a* пограничный
convergent boundary		конвергентная граница
divergent boundary		дивергентная граница
plate boundary		граница плиты
transform boundary		трансформная граница

AN OVERVIEW OF PLATE TECTONICS

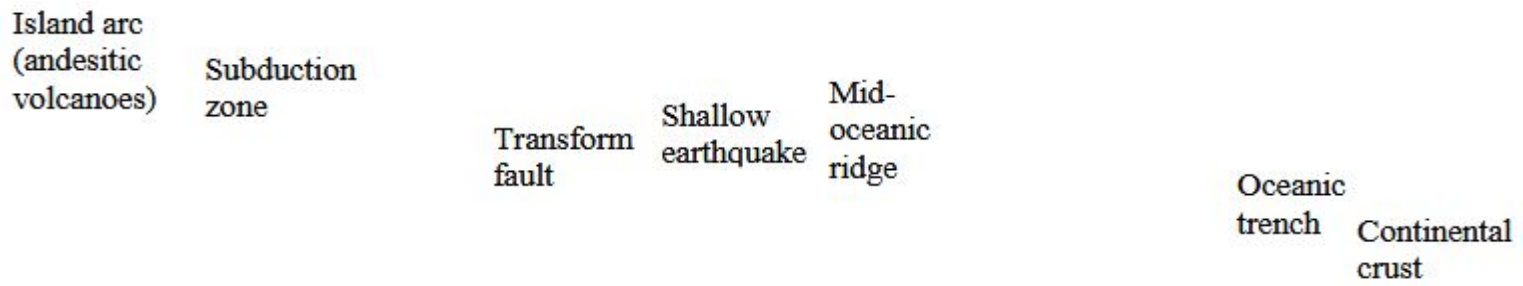
Like most great, unifying scientific ideas, the plate tectonics theory is simple. Briefly, it describes the Earth's outer layer, called the **lithosphere,** as a shell of hard, strong rock. This shell is broken into seven large (and several smaller) segments called **tectonic plates.** They are also called lithospheric plates, and the two terms are interchangeable. The tectonic plates float on the layer below, called the **asthenosphere.** The astheno-sphere, like the lithosphere, is rock. But the asthenosphere is so hot that 1 to 2 percent of it is melted. As a result, it is plastic, and weak. The lithospheric plates glide slowly over the asthenosphere like sheets of ice drifting across a pond. Continents and ocean basins make up the upper parts of the plates. As a tectonic plate glides over the asthenosphere, the continents and oceans move with it.

Most of the Earth's major geological activity occurs at **plate boundaries,** the zones where tectonic plates meet and interact. Neighboring plates can move relative to one another in three different ways

DIVERGENT PLATE BOUNDARIES

At a divergent plate boundary, also called a **spreading center** and a **rift zone,** two lithospheric plates spread apart (Fig. 1). The underlying asthenosphere then oozes upward to fill the gap between the separating plates. As the asthenosphere rises between separating plates, some of it melts to form molten rock called **magma.**[1] Most of the magma rises to the Earth's surface, where it cools to form new crust, the top layer of the lithosphere. Most of this activity occurs beneath the seas because most divergent plate boundaries lie in the ocean basins.

Both the asthenosphere and the lower lithosphere (the part beneath the crust) are parts of the mantle and thus have similar chemical compositions. The main difference between the two layers is one of mechanical strength. The hot asthenosphere is weak and plastic, but the cooler lithosphere is strong and hard. As the asthenosphere rises, it cools, gains mechanical strength, and, therefore, transforms into new lithosphere. In this way, new lithosphere continuously forms at a divergent boundary.



CONVERGENT PLATE BOUNDARIES

At a convergent plate boundary, two lithospheric plates move toward each other. Convergence can occur (1) between a plate carrying oceanic crust and another carrying continental crust, (2) between two plates carrying oceanic crust, and (3) between two plates carrying continental crust. Differences in density

determine what happens where two plates converge. Think of a boat colliding with a floating log. The log is denser than the boat, so it sinks beneath the boat.

When two plates converge, the denser plate dives beneath the lighter one and sinks into the mantle. This process is called **subduction.** Generally, only oceanic lithosphere can sink into the mantle. Attempting to stuff a low-density continent down into the mantle would be like trying to flush a marshmallow down a toilet: It will not go because it is too light. In certain cases, however, small amounts of continental crust may sink into the mantle at a subduction zone.

A subduction zone is a long, narrow belt where a lithospheric plate is sinking into the mantle. On a worldwide scale, the rate at which old lithosphere sinks into the mantle at subduction zones is equal to the rate at which new lithosphere forms at spreading centers. In this way, global balance is maintained between the creation of new lithosphere and the destruction of old lithosphere.

The oldest sea-floor rocks on Earth are only about 200 million years old because oceanic crust continuously recycles into the mantle at subduction zones. Rocks as old as 3.96 billion years are found on continents because subduction consumes little continental crust.

TRANSFORM PLATE BOUNDARIES

A transform plate boundary forms where two plates slide horizontally past one another as they move in opposite directions. California's San Andreas fault is the transform boundary between the North American plate and the Pacific plate. This type of boundary can occur in both oceans and continents.

THE ANATOMY OF A TECTONIC PLATE

The nature of a tectonic plate can be summarized as follows:

1. A plate is a segment of the lithosphere; thus, it includes the uppermost mantle and all of the overlying crust.
2. A single plate can carry both oceanic and continental crust. The average thickness of lithosphere covered by oceanic crust is 75 kilometers, whereas that of lithosphere covered by a continent is 125 kilometers.

Lithosphere may be as little as 10 to 15 kilometers thick at an oceanic spreading center.

3. A plate is composed of hard, mechanically strong rock.
4. A plate floats on the underlying hot, plastic asthenosphere and glides horizontally over it.
5. A plate behaves like a large slab of ice floating on a pond. It may flex slightly, as thin ice does when a skater goes by, allowing minor vertical movements. In general, however, each plate moves as a large, intact sheet of rock.
6. A plate margin is tectonically active. Earthquakes and volcanoes are common at plate boundaries. In contrast, the interior of a lithospheric plate is normally tectonically stable.
7. Tectonic plates move at rates that vary from less than 1 to 16 centimeters per year.

Ex.6.

Выберите нужную глагольную форму из предложенных ниже.

1. The integrated concepts of plate tectonics primarily _____ by geographical studies of ocean basins.
   a. proved
   b. [redacted]
   c. were proved
   d. proving
2. The concept of plate tectonics _____ our understanding of continental geology.
   a. revolutionize
   b. have revolutionized
   c. [redacted]
   d. has revolutionized
3. Most volcanic eruptions _____ by plate motions.
   a. produces
   b. are producing
   c. are produced
   d. have produced
4. The distribution of mineral deposits _____ by plate interaction.
   a. has controlled
   [redacted]
   c. are controlled
   d. controls

[redacted]

6. The Earth _____ contrasted areas of land and sea throughout its geologic history.
    a. has
    b. had
    c. has had
    d. have

8. All plates _____ relative to all others.
    a. moves
    b. are moved
    c. are moving
    d. are being moved

Ex.9.

Выберите правильный вариант из предложенных в скобках.

1. All plates are (moved/moving) (relative/relatively) to all (other/others).
2. The velocity of (relative/relatively) motion (between/within) plates (is/are) low by human standards but it is extremely rapid by geologic (one/ones).
3. An ocean plate subducts (beneath/between) a continental plate or (others/another) oceanic plate.

[redacted]

5. Earthquakes are (most/the most) dramatic way in which plate motions (affect/effect) man.

6. [redacted]
7. The Earth (has/has had) contrasted areas of land and sea (although/throughout) its geologic history, [redacted] (differentiated/be