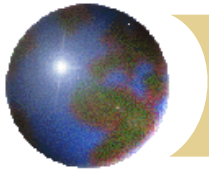
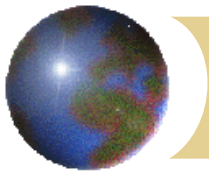


Earth's Interior



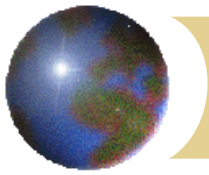
The Earth's Core

- ✚ Much of the information scientists have about the Earth's interior has come not only from complex instruments but also from earthquakes.



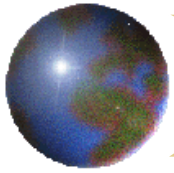
Earthquakes and Seismic Waves

- ✿ Earthquakes are produced when a part of the Earth's uppermost layer moves suddenly. Earthquakes produce shock waves that travel through the Earth, called seismic waves. They are actually waves of energy.

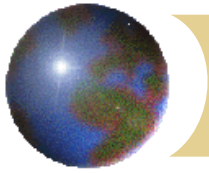


Seismic Waves

- ❖ All earthquakes produce at least two types of seismic waves at the same time: P and S waves. These waves are detected and recorded by an instrument called a seismograph. As seismic waves move through the Earth changes occur in their movement caused by differences in the structure of the Earth's interior.

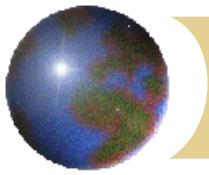


- ✚ After observing the speeds of P waves and S waves, scientists have concluded that the Earth's center, or core is actually made up of two layers with different characteristics.



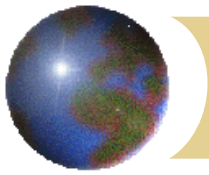
The Earth's Core

- ✚ Both layers of the Earth's core are made of the elements iron and nickel.



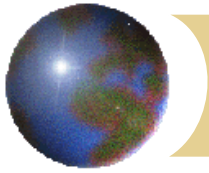
The Inner Core

- ✚ The solid inner layer is called the inner core. The temperature reaches 5000 degrees C, the temperature at which iron and nickel usually melt. The extreme pressure pushes the particles so tightly together that they remain solid. The solid iron produces a magnetic field.



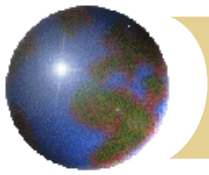
The Outer Core

- ✚ Surrounding the inner core is the second layer of the Earth, called the outer core. The outer core begins about 2900 km below the Earth's surface and is 2250 km thick. The temperatures range from 2200 to 5000 degrees C. The heat makes the iron and nickel molten.



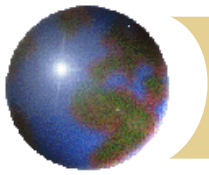
The Earth's Mantle

- ✚ The layer of the Earth directly above the outer layer is the mantle. The mantle extends to a depth of about 2900 km below the surface. About 88% of the volume of the Earth and 68% of the mass are in the mantle.



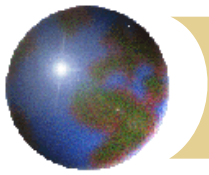
The Moho

- ✚ In 1909, the Yugoslav scientist A. Mohorovicic observe a change in the speed of seismic waves as they moved through the Earth. When the waves reached a depth of 32 to 64 km their speed increased. This indicated a difference in density or composition of the rock. This is the boundary between the outermost layer and the mantle, the Moho.



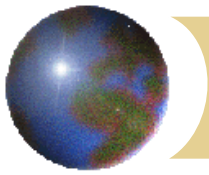
Composition of the Mantle

- ✚ After studying rocks from volcanoes and the ocean floor, scientists think the mantle is made of the elements silicon, oxygen, iron and magnesium. The density of the mantle increases with depth. The high temperature and pressure in the mantle allow the solid rock to flow slowly, thus changing shape. This is the property of plasticity.



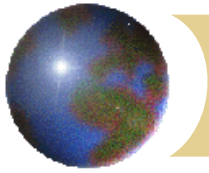
The Earth's Crust

- ✚ The Earth's crust is its thin outermost layer. The crust is much thinner than the mantle and the outer and inner cores. All life on Earth exists on or within a few hundred meters above the crust.



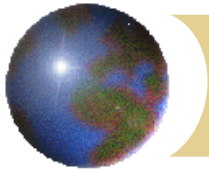
Composition of the Crust

- ✚ The crust is made of three types of solid rocks: igneous, sedimentary and metamorphic rocks. The thickness of the Earth's crust varies. **Igneous Rocks**
 - ✚ Igneous rocks form when hot, liquid rock from deep within the Earth cools and hardens as it reaches the surface. The word igneous means, “born of fire”.



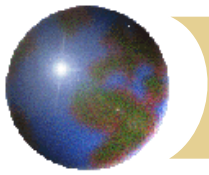
Sedimentary Rocks

- ✚ Sedimentary rocks form when sediments- small pieces or rocks, sand and other materials – are pressed and cemented together by the weight of layers that build up over long periods of time.



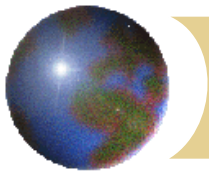
Metamorphic Rock

- ✚ Metamorphic rock forms when igneous and sedimentary rocks are changed by heat, pressure, or the action of chemicals.



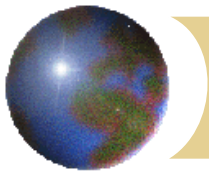
The Oceanic Crust

- ✚ Crust beneath the oceans, called oceanic crust, is less than 10 km thick. Oceanic crust is made mostly of silicon, oxygen, iron and magnesium.



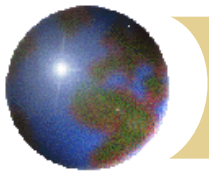
The Continental Crust

- ✚ The crust beneath the continental, called the continental crust, has an average thickness of about 32 km. Beneath mountains, the crust is much thick. Continental crust is made mostly of silicon, oxygen, aluminum, calcium, sodium and potassium.



The Lithosphere

- ✚ The Earth's Crust forms the upper part of the lithosphere. The lithosphere is the solid topmost part of the Earth. It is between 50 and 100 km thick and is broken up into large section called lithospheric plates. There are at least seven major plates.



The Asthenosphere

- ✚ The layer directly beneath the lithosphere is called the asthenosphere. It is 130 to 160 km thick. It is the upper edge of the mantle. It is made of hot, molten material that has the property of plasticity and thus can flow easily. The plates move on the hot molten material that forms the asthenosphere.