Earth, our home, is the third planet from the sun. It is the only planet known to have an atmosphere containing free oxygen, oceans of liquid water on its surface, and, of course, life. Earth is the fifth largest of the planets in the solar system — smaller than the four gas giants, Jupiter, Saturn, Uranus and Neptune, but larger than the three other rocky planets, Mercury, Mars and Venus.

Earth spins on an imaginary line called an axis that runs from the North Pole to the South Pole, while also orbiting the sun. It takes Earth 23.934 hours to complete a rotation on its axis, and roughly 365.24 days to complete an orbit around the sun.

The Earth's axis of rotation is tilted in relation to the ecliptic plane, an imaginary surface through Earth's orbit around the sun. This means the northern and southern hemispheres will sometimes point toward or away from the sun depending on the time of year, varying the amount of light they receive and causing the seasons.

**Earth's Natural Satellite**

Earth's moon is 3,474 km wide, about one-fourth of Earth's diameter. Earth has one moon, while Mercury and Venus have none and all the other planets in our solar system have two or more.

**The Composition of Our Atmosphere**

The most abundant gases found in our atmosphere are nitrogen and oxygen. Nitrogen makes up around 78% of the total atmosphere, while oxygen makes up 21%. The remaining 1% is made up mostly of a gas called argon. This means that with each breath you take you are breathing 78% nitrogen, 21% oxygen and 1% argon, with trace amounts of other gases, such as methane, hydrogen, helium, neon, krypton, carbon dioxide, and a form of oxygen known as ozone.

**Layers of the Earth's Atmosphere**

The atmosphere is divided into five layers. It is thickest near the surface and thins out with height until it eventually merges with space.

1) The **troposphere** is the first layer above the surface and contains half of the Earth's atmosphere weather occurs in this layer.

2) Many jet aircrafts fly in the **stratosphere** because it is very stable. Also, the ozone layer absorbs harmful rays from the Sun.

3) Meteors or rock fragments burn up in the **mesosphere**.
4) The **thermosphere** is a layer with auroras. It is also where the space shuttle orbits.  
5) The atmosphere merges into space in the extremely thin **exosphere**. This is the upper limit of our atmosphere.

### Chemical Composition

Oxygen is the **most abundant element in rocks in Earth's crust**, composing roughly 47 percent of the weight of all rock. The second most abundant element is silicon at 27 percent, followed by aluminum at 8 percent, iron at 5 percent, calcium at 4 percent, and sodium, potassium, and magnesium. The Earth's core consists mostly of iron and nickel and potentially smaller amounts of lighter elements such as sulphur and oxygen. The mantle is made of iron and magnesium-rich silicate rocks.

### Internal Structure

<table>
<thead>
<tr>
<th>CRUST</th>
<th>MANTLE</th>
<th>CORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The crust is the outer hard layer of the Earth, and is less than 1% of Earth's volume.</td>
<td>The mantle is a layer between the crust and the outer core.</td>
<td>The <strong>Earth's core</strong> is the part of Earth in the middle of our planet. It has a solid inner core and a liquid outer core.</td>
</tr>
<tr>
<td>The crust is made up of different types of rocks; igneous, metamorphic, and sedimentary rocks.</td>
<td>The mantle encloses the hot core rich in iron and nickel, which occupies about 15% of Earth's volume</td>
<td>Eddy currents in the nickel iron fluid of the outer core are believed to influence the Earth's magnetic field.</td>
</tr>
<tr>
<td>The temperature of the crust increases with depth. Where the crust meets the mantle the temperatures can be between 200 °C to 400 °C.</td>
<td>Temperatures range between 500 to 900 °C</td>
<td><strong>Inner core</strong> is believed to be an iron–nickel alloy, and may have a temperature similar to the Sun's surface, approximately 5505 °C.</td>
</tr>
</tbody>
</table>
The crust is of two different types. One is the continental crust (under the land) and the other is oceanic crust (under the ocean). The continental crust is thicker, and the oceanic crust is thinner. Thicknesses of the crust vary from 5–70 km.

Typical mantle rocks have higher magnesium to iron ratio and a smaller proportion of silicon and aluminium than the crust.

About 75% of the Earth's crust is composed of two elements, oxygen and silicon. These usually occur in combination with common metals such as aluminium and iron.

Earth's mantle is a silicate rocky shell about 2,900 kilometres thick that constitutes about 84% of Earth's volume.

The inner core of the Earth, as detected by seismology, is a solid sphere about 1,216 km in radius, or about 70% that of the Moon.

The outer core of the Earth is a liquid layer about 2,266 kilometers thick. It is made of iron and nickel.

**EXERCISES**

**Q1. Fill in the blanks.**

1. The Earth spins on an _______________ called ____________________.
2. The lowest layer of the atmosphere is known as ________________.
3. The crust is made up of ______________, ______________ and ____________ types of rocks.
4. __________ layer prevents most of the sun's harmful ultraviolet radiation from reaching the Earth's surface.
5. The outer core of the Earth is a liquid layer made up of __________ and ____________.
6. The ______________ is a layer between the crust and the outer core.
7. ________________ currents are believed to influence the Earth's magnetic field.
8. The second most abundant element on the earth is ______________.

9. Many jet aircrafts fly in the ______________ as it is the most stable layer of the atmosphere.

10. The ______________ layer is made of iron and magnesium-rich silicate rocks.

Q2. Answer the following questions.

1. How are seasons caused?

2. Write a difference between inner core and outer core.

<table>
<thead>
<tr>
<th>INNER CORE</th>
<th>OUTER CORE</th>
</tr>
</thead>
</table>

3. Name the gases found in the Earth’s atmosphere.

_________________________________________________________________________

_________________________________________________________________________