

Unit 4

“Measurement”

JEM/ENG

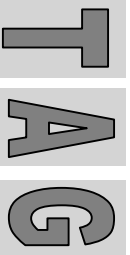
Mesleki Yabancı Dil

(Professional English)

Dr. Veysel Işık

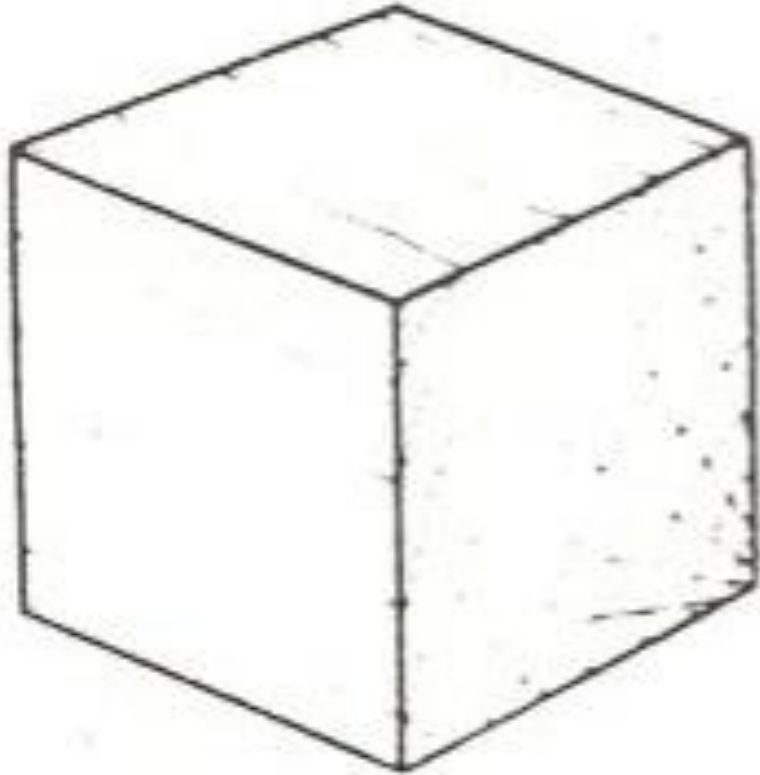
Professor

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Measurement

Spatial measurements



This block of wood has various properties:

for example,

it is shaped like a cube;

its material is wood;

the material burns easily.

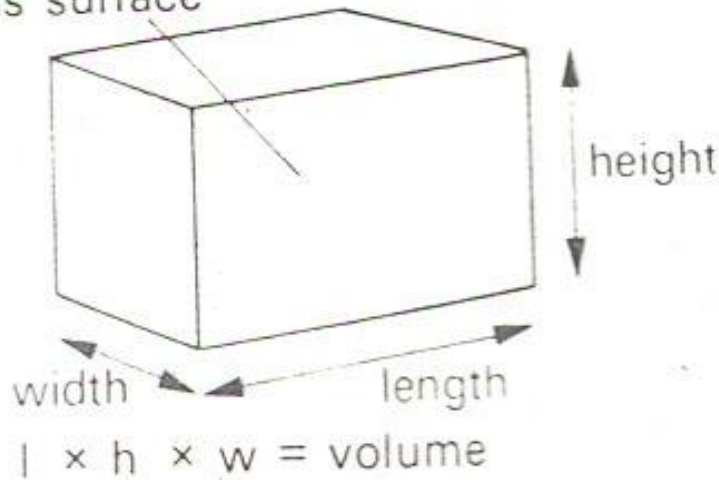
you cannot see through it.

the block is difficult to bend, etc.

T
A
G

Now read this:

$l \times h = \text{area}$
of this surface



This block has other properties which are measured.

It has *height*, *length* and *width*.

Each surface has *area*.

The area of the cross-section is the *cross-sectional area*.

The area of all the surfaces is the *surface area*.

The volume of the block = length x height x width (equals length *times* height *times* width).

TAG

Make sentences from the table below:

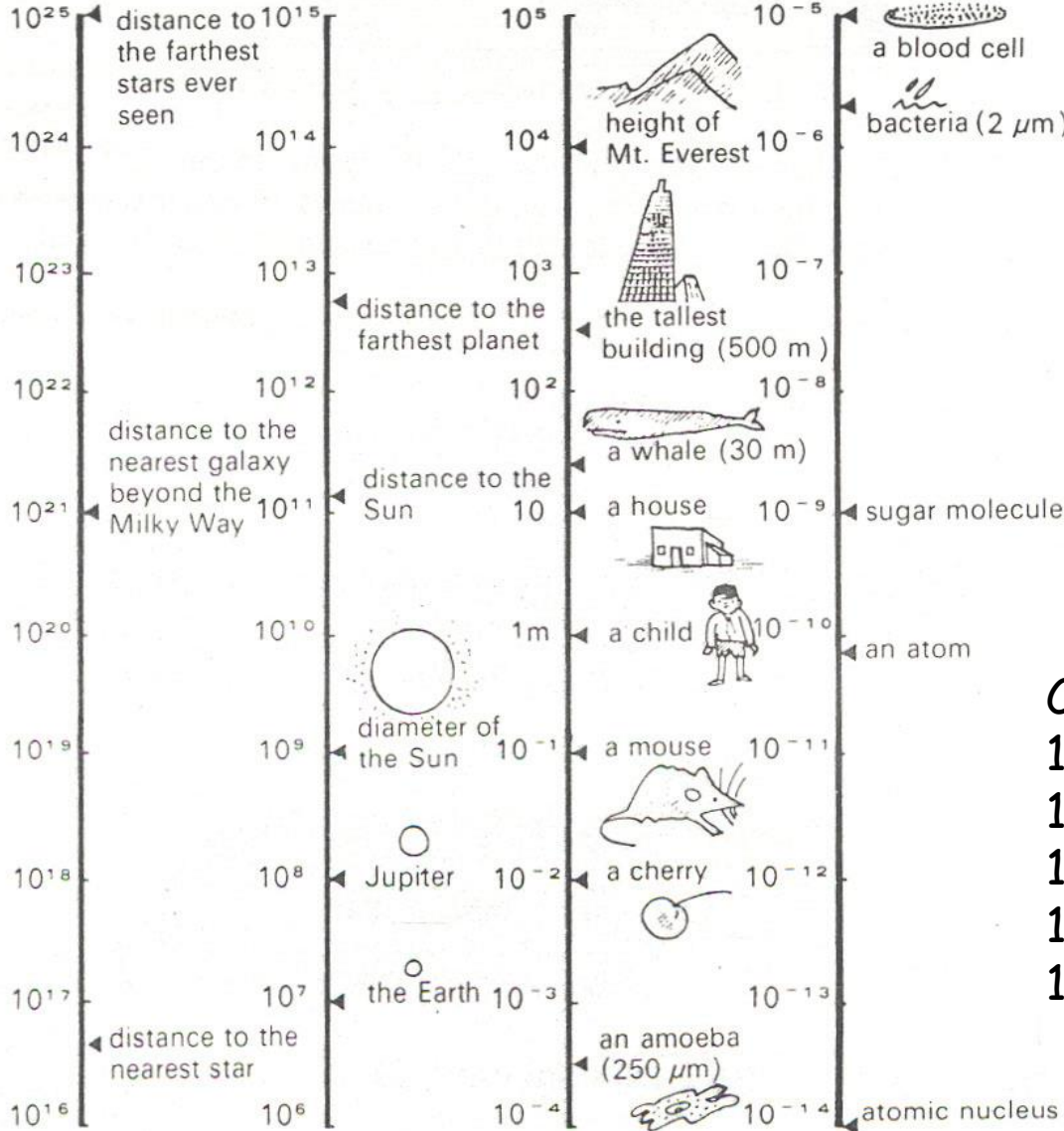
The	height	of	large	objects	is	m
	volume					cm
	area				measured	mm
	width		small		in	μm
	surface area		very small			m^3
	length		minute			cm^3
	radius		cylindrical			mm^3
	cross-sectional area					m^2
	diameter					cm^2
	circumference					mm^2
	distance	between		places		km

Example:

The height of large objects is measured in meters.

T
A
G

Scales and averages



Very large and very small quantities are expressed like this:

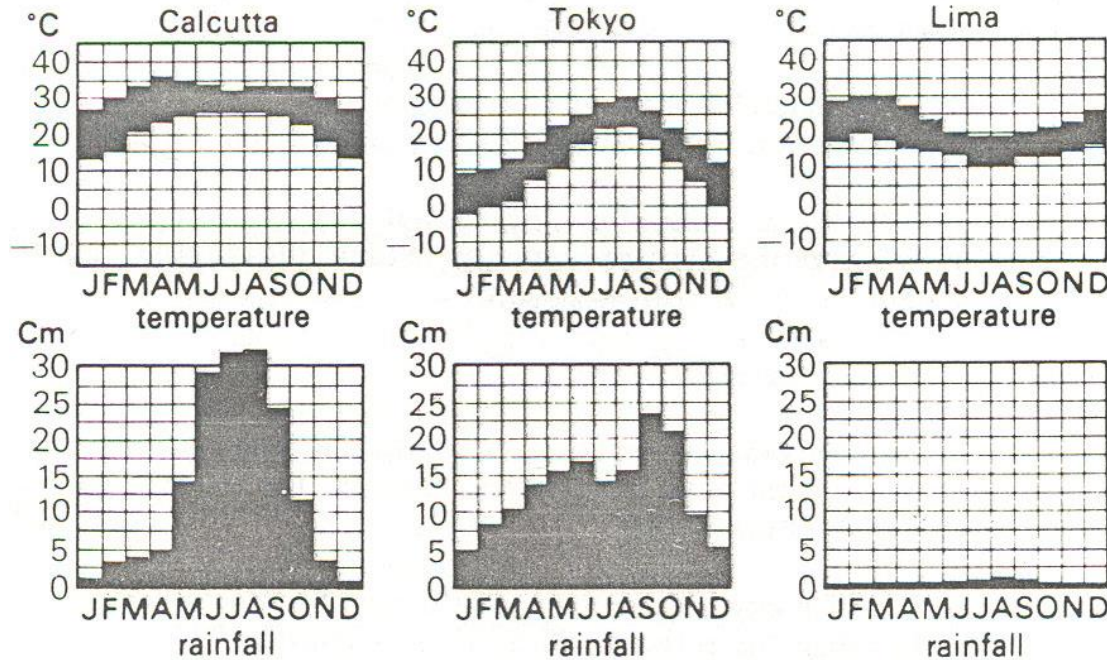
$10^6 = \text{ten to the power of six} = \text{one million.}$

$10^{-6} = \text{ten to the power of minus six} = \text{one millionth.}$

Complete this:

- 10^2 =
- 10^3 =
- 10^8 =
- 10^{-2} =
- 10^{-5} =

Look at these histograms:



The histograms in the top row show the average *range* of temperature (in degrees Centigrade) for each month in three cities.

The histograms in the bottom row show their average monthly rainfall (in centimeters).

In Calcutta in January the temperature *ranges* from 27°C to 13°C; that is, the *maximum* temperature is 27°C and the *minimum* temperature is 13°C. These are the two *extremes* of temperature.

Now read this:

The *average* monthly rainfall in Calcutta during the first six months of the year is:

January	1 cm
February	3 cm
March	4 cm
April	5 cm
May	14 cm
June	28 cm

Total 55 cm / 6 = 9.2 cm

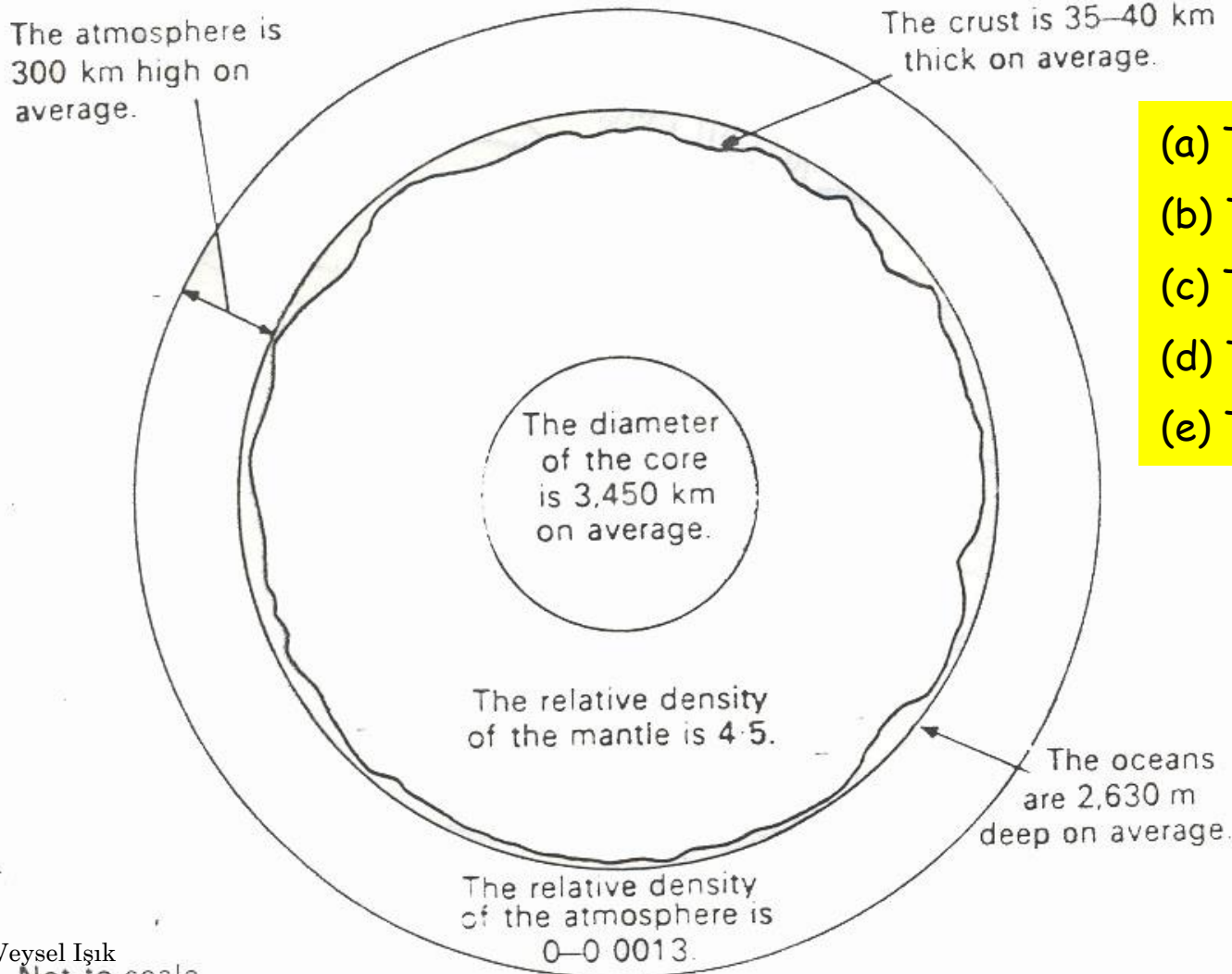
Now ask and answer questions about the Earth

Example:

What is the average height of the atmosphere?

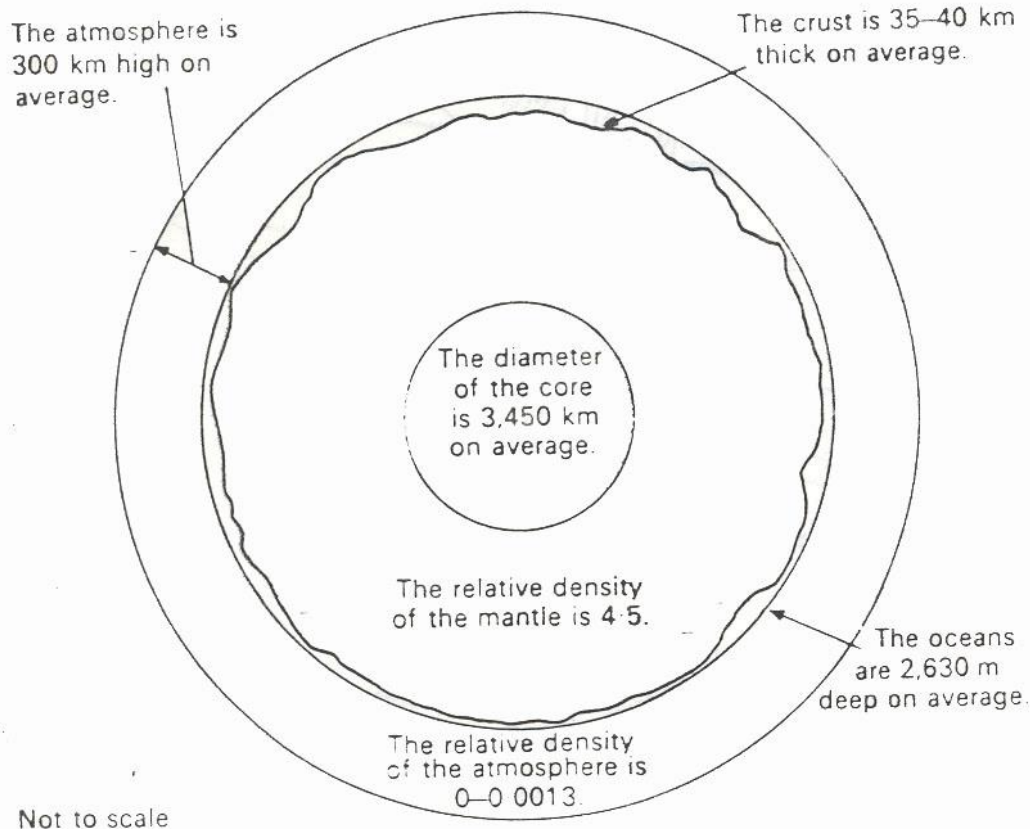
The atmosphere has an average height of 300 km

Look at this diagram



- (a) The crust / thickness
- (b) The mantle / density
- (c) The core / diameter
- (d) The atmosphere / density
- (e) The oceans / depth

Look at this diagram



Write complete sentences about the different parts of the Earth:

What is the average thickness of the crust?

The crust has an average thickness of 30-40 km

What is the relative density of the mantle?

The mantle has relative density of 4.5.

What is the average diameter of the core?

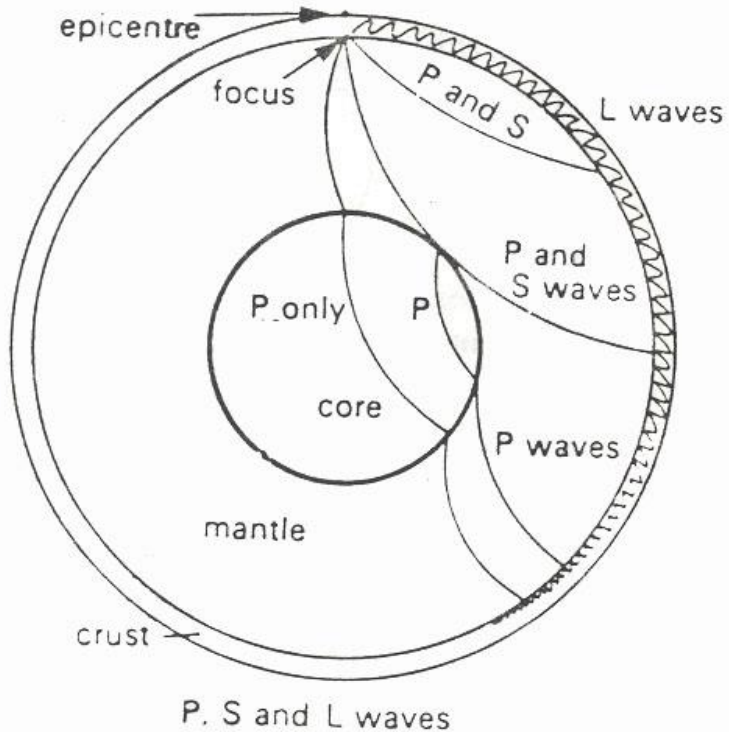
The core has an average diameter of 3.450 km.

What is the average depth of the oceans?

The oceans has an average depth of 2.630 km.

The measurement of earthquakes

Reading Passage



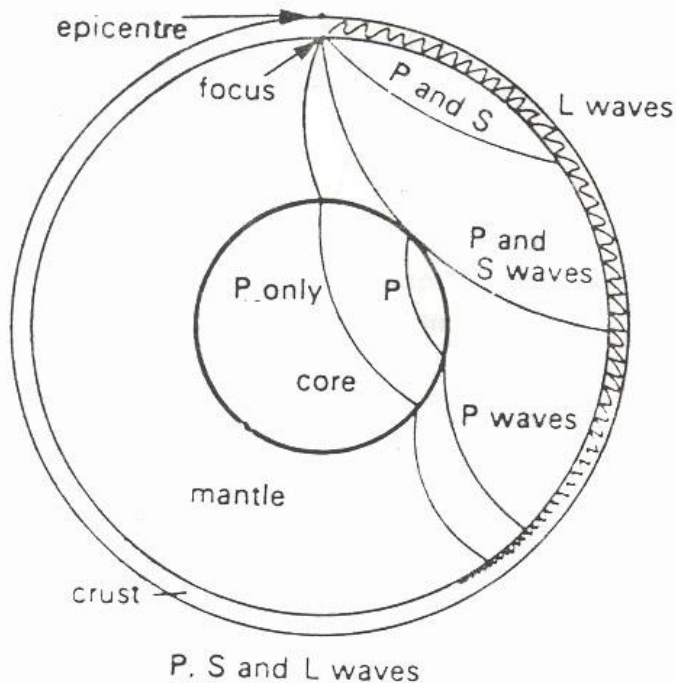
Earthquakes are natural vibrations within the Earth's crust. They show that crustal movements are still taking place today. When rocks move or fracture, great pressures are produced and shock waves are transmitted through the Earth.

The waves are recorded on a seismograph and the intensity can be determined by using a scale which ranges from 1 to 10.

Three kinds of waves are recorded on a seismograph: P, or primary waves; S, or secondary waves; and L, or long waves. P and S waves arrive at the seismograph station first because they travel directly through the Earth. The L waves travel along the surface of the Earth and make the biggest impression.

TAG

The most common way of measuring the intensity of earthquakes is called the Richter scale. This is a scale which ranges from 1 to 10 as follows:



- 1- An earthquake which is recorded by only one instrument.*
- 2- An earthquake which is recorded by several instruments and is felt by a few people.*
- 3- An earthquake which is felt by most people.*
- 4- An earthquake which breaks windows.*
- 5- An earthquake which rings bells.*
- 6- An earthquake which awakens sleeping people and stops clocks.*
- 7- An earthquake which cracks walls and makes objects fall.*
- 8- An earthquake in which chimneys fall.*
- 9- An earthquake in which there is partial or total destruction of buildings.*
- 10- Great disaster.*

TAG

Find words or phrases from the passage which tell you the following:

(a) that earthquakes are movements of the Earth.

(b) that earthquake movements are certainly still occurring.

(c) that earthquakes are the result of pressure.

(d) that P and S waves are not transmitted along the Earth's surface.

