

GCSE Physics A (Gateway)

J249/04 Physics A P5-P8 and P9 (Higher Tier)

Question Set 12

1*

The Earth contains a crust, mantle and core as shown in **Fig. 1.1**.

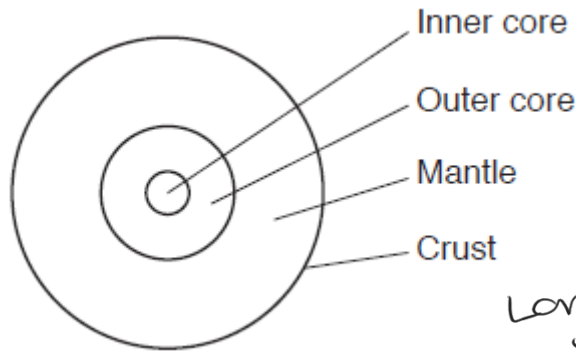


Fig. 1.1

Longitudinal wave

transverse wave

Table 1.1 gives some data about seismic waves and the Earth.

	Density (g/cm ³)	P wave speed (km/s)	S wave speed (km/s)
Top of crust	2.2	5.55	3.25
Top of mantle	3.4	7.97	4.55
Top of outer core	9.9	8.10	-
Bottom of outer core	12.2	10.30	-

Table 1.1

Describe what information the data in **Table 1.1** gives about the structure of the Earth.

In your answer you should explain any trends in the data in **Table 1.1**.

P waves are longitudinal, which travel faster in denser materials, shown in the table. [6]

S waves are transverse,

The Earth's structure (shown from Table 1.1) is that the further in the Earth you go, the denser it gets (2.2 → 12.2 g/cm³).

P wave speed increases, the denser it gets.

S wave increases from the crust to the mantle, however cannot travel through the outer core. This highlights that the outer core is liquid, as the waves are refracted as they travel through the Earth due to a change in density of the medium. P waves are not affected by liquid ∴ can travel through the outer core.

Total Marks for Question Set 12: 6

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