P and S waves

WOMAN What do we do?!

MAN We gotta find out where these earthquakes are coming from!

DYLAN What?! We KNOW where it's coming from! Look up!

OWAIN Hey, give the film a chance...it's a *classic*!

DYLAN Seriously? "We gotta find out where these earthquakes come from"

ADA Hello Dylan. Scientists detect earthquakes using the waves they produce.

An earthquake produces two main types of wave. Primary waves, which occur first after an earthquake, and Secondary waves, which happen second.

P waves can travel all the way through the centre of the Earth, including solids and liquids, S waves can only travel through solids. This is how geologists figured out that the Earth's core was liquid; by S-waves' inability to pass through it – revealing a shadow.

If you see here the seismometer detects two disturbances. This first one is the P wave, and the one further along is the S wave. To work out how far away an earthquake's epicenter is, we can use the time-gap between the P and S waves.

DYLAN We don't need to work it out Ada, the Earthquake monster is totally right there.

ADA The time-gap between the P wave and the S wave is called "lag-time". Here it says that 8 minutes have passed between the p wave and s wave, which is the

lag time. We can use this information on a travel-time graph.

Line a piece of paper up with the Y axis, which represents the travel time. On the paper draw a line from 0 to 8 minutes, then move the paper along until both ends of the line are touching both curves. Check where this is above the X axis, which measures the distance from the epi-centre! 6,500 kilometers!!

WOMAN If we take into account the lag-time…

MAN We'll find the distance from the epi-centre!

ADA I've seen this one before.

They all escape in the end.