EARTHQUAKE RACE

Earthquake Wave Speeds

For the 3 main types of waves - surface waves, P waves and S waves - which do you think is the fastest, and which is the slowest? You can have a race to find out! For this activity you need a big group of people (at least 15 or so).

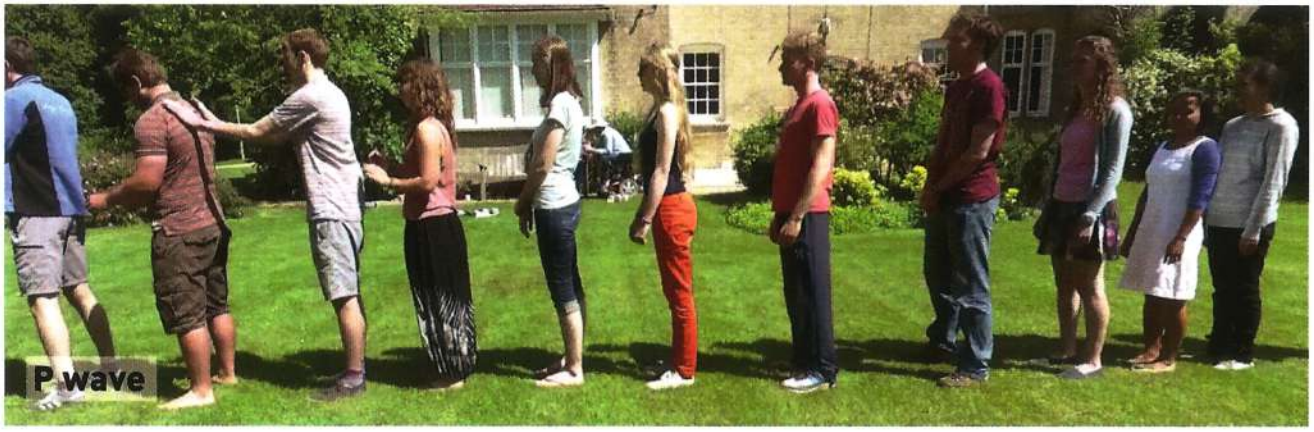
Instructions

Split your group of people into 3 different teams. Each team will be a different wave (P, S or Surface). All 3 teams need to line up in 3 lines all facing forwards. The person at the back will start the "wave" motion which will get passed on until it reaches the person at the front, who can shout out the name of their wave. But each wave group has to pass on their wave as a different motion...

P waves are compressional, so this wave is passed on just by tapping the person in front.

S waves are transverse, so this wave is passed on by reaching out as far as possible first to one side then the other side, before passing it on by tapping the shoulders of the person in front.

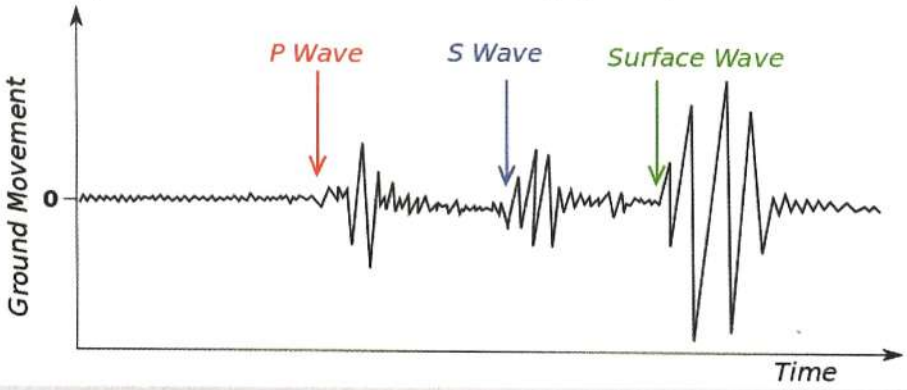
Surface waves have a backwards circular motion (retrograde ellipse), so for this wave you need to reach up in the air, reach far back behind you, bend down and touch the ground before reaching out to touch the person in front and passing on the wave (tracing out a backwards circle).



Begin your race with "On your marks, get set, go!" and see which wave reaches the front first. Try swapping teams to make sure one team is not just faster than everyone else. If you don't have enough people you can try timing each type of wave motion individually, along a single line.

What's happening?

You should notice that the P wave is always the fastest, then the S wave then the surface wave. We record the shaking of the ground on special instruments called SEISMOMETERS, we often see 3 big spikes in the signal. These relate to the P wave arriving (first), then the S wave arriving (second) and finally the surface wave arriving (third).




Seismometer

KEY POINTS

- Energy from an earthquake moves outwards in all directions in waves.
- Surface waves travel just along the earth's surface with a retrograde elliptical (backwards circle) motion.
- Body waves travel down inside the earth. The 2 types of body waves are **P waves** (compressional), and **S waves** (transverse).
- P waves travel fastest, then S waves and Surface waves are the slowest.

INFO FOR INTERESTED ADULTS

What other types of earthquake waves are there?
How do seismometers work?

UNIVERSITY OF CAMBRIDGE

OCR
Oxford Cambridge and RSA