

Directionality of an impact

Key
stage
4/5

The scenario

Scientists working on Insight will use the directionality of the traces from two accelerometers on the lander to determine the bearing from the lander of the impact. This can then be combined with the S-P time and imagery from orbital craft to work out the exact location of an impact on the surface of Mars.

The activity

Note: The tablet needs to run a suitable wave recording App. There are number of these available which work fairly simply. It is helpful if the App chosen shows the traces separately rather than on top of each other and has the facility to turn the Z axis (up-down) off.

1. Stick the piece of A3 paper to the table.
2. Place the tablet centrally on the paper and draw around it — this is its starting orientation.
3. Using a pen, draw an arrow to show which direction you will push the tablet first. Use a protractor to measure the angle (as shown in the diagram). An angle of 60° or 30° works best for this as it makes it clear which wave is x and which is y.
4. Shake the tablet back and forth along this line and observe the trace.

Data processing

The files can be sent by Email to other computers. These files can be downloaded into Excel and a graph drawn of the X and Y traces with time. This allows the part of the recorded data where the action happens to be determined.

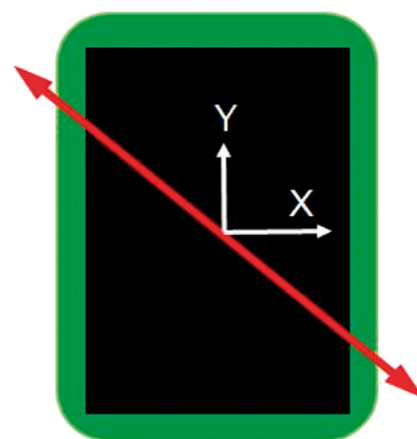
A graph of Y against X is plotted from which the direction of the wave can be estimated. It is important that the scales are equal to show the angle to scale rather than letting Excel choose its own scales.

Learning objectives

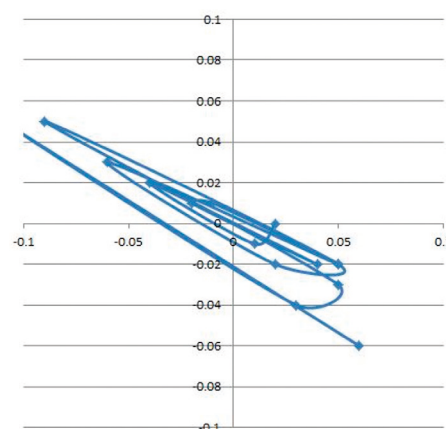
- longitudinal and transverse waves
- vectors

Equipment needed

- tablet computer
- webcam
- A3 paper
- sticking tape



Caption required.



Caption required.

