

Audit feedback: sound

Do read about light and sound in the **Science Resource Pack** to help with your understanding here.

13.7

Aeroplane

The issue here is the difference between the speeds at which sound and light travel. Because light travels so much faster than sound (sound takes about 5 seconds to travel one mile whereas light travels almost instantaneously) the aeroplane can usually be seen before it is heard. By the time the sound of the plane reaches the observer the plane will have travelled partway across the sky (unless the plane is very close to the observer). If the plane is some distance away an observer will therefore need to look in front of where the sound seems to be coming from in order to see the plane.

Unless you live near an airport or on a flight path it will be difficult to investigate the situation with aeroplanes. However a similar effect can be observed with thunder and lightning, where the lightning is seen before the thunder is heard. The difference in the speed of light and sound can also be observed over much shorter distances. Any situation where a sound is produced by some visible event (eg bashing cymbals together) can be used to check whether the sound and light arrive simultaneously at an observer.

13.10

Moon Walk

Unlike visible light or radio waves, sound can only travel through a medium. Since there is no air on the moon there is nothing to carry the sound, so no sounds will be heard when the astronauts take off their helmets (though they will die if they leave their helmets off for long). If the astronauts put their helmets together so they are touching then they should be able to hear through the helmets. Normally they would communicate by radio.

Creating a situation where there is no air is difficult. It is possible to demonstrate that no sounds are carried through a vacuum if suitable equipment is available (eg a large bell jar and vacuum pump). Video footage of this demonstration is available (eg in the *Making Sense of Science* video material: Software Production Enterprise 1995). Alternatively this may be tackled as a thought experiment, using knowledge about how sound is transmitted in other situations.