

STRAIGHT LINES

COMPOSER'S NOTES

THE SONG IN A SENTENCE (or two...)

Light can only travel in straight lines, no matter what sort of light it is. Even it appears to be curving or going round a bend it's because it's passing through space curved by the effects of gravity.

HISTORY & MAIN POINTS OF THE SONG

Like *Living light* and several other songs, this was written in response to Gatehouse School's Science Week in 2001. I wrote half-a-dozen songs encapsulating what I'd learnt by attending the inspiring talks and workshops by real scientists at the school. I went to a really fun 30-minute show given in an inflatable planetarium in the school hall. The two young presenters gave us a video-tour of the solar system and the galaxy, but the one message they kept repeating and repeating was that light travels in straight lines. Then the very last thing they did was undermine their own message by showing us light travelling through a curved piece of carbon fibre tube, without explaining that even in this case, the light is still travelling in a whole series of straight lines as it reflects from side to side of the interior of the tube on its way from one to the other. So worried was I by this mixed message that I thought I'd write a very simple song that rammed home the one message that light really does travel in straight lines at all times. This is what became the second, fast section of the song.

Some years later I decided to extend what was a very short song by adding an introduction giving just a little more detail about light and putting it into an astronomical context. I particularly wanted to bring up the point about light moving in a straight line through curved space. This phenomenon was the basis of the physical proof of Einstein's Theory of Relativity as a result of Eddington's observations of the solar eclipse in 1919 from the island of Principe. Whilst working on the lyrics, I had the thrill of phoning a real string theorist, Washington Taylor, in Cambridge, Massachusetts, just to check that I'd got my facts right!

STYLISTIC POINTS

Straight Lines was originally written as just a melody with piano (fast section only). I later wrote some simple harmonies that worked with the piano part. Having discovered that the harmonised version worked well without accompaniment, I then added the slower introductory section for voices only so that the whole extended version could be sung *a capella*. The final stage in the story has been adding the piano accompaniment to the slow introduction which I did yesterday (17th May 2009). So the song *should* work equally well accompanied or unaccompanied. Try to make a big contrast in mood and tempo between the two halves of the song. The second half should be as dynamic and lively and vivid as possible, with big dynamic contrasts, strong accents and a driving rhythm.

OTHER ACTIVITIES

- Use *Straight Lines* as your starting point for a study of light and optics. Remember that light is just one minute part of the spectrum of electromagnetic waves which encompasses radio, microwaves, infrared, ultraviolet, X-rays and gamma rays. Don't be afraid to introduce even young children to the idea of the duality of light – the fact that it can be considered as particles (photons) or waves depending upon how you observe it. This sort of science 'magic' is fascinating to children and I think we should be introducing the more bizarre and enthralling concepts of science to children much, much earlier in the educational process than tends to happen currently.
- This song could really do with one or two extra verses. I will get around to writing them eventually, but you could try and beat me to it – write a verse or two telling the listener something else interesting about light!