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Lesley Miles

THE ROYAL SOCIETY

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Public Attitudes to Science Survey 2014
Ipsos MORI report on behalf of BIS

- **84%** agree science is a big part of our lives/**72%** agree important to know about it.
- **55%** of people do not feel informed about science vs **45%** who do.
- **51%** think they hear and see too little.
- **69%** of people think that scientists should listen more to what ordinary people think.
- **75%** of people think that Government should act in line with people's concerns about science.
- **70%** think that 'experts' not the public should advise Government.
- Very high levels of trust in scientists relative to politicians or media.

People want to know more about science and they want that advice from scientists

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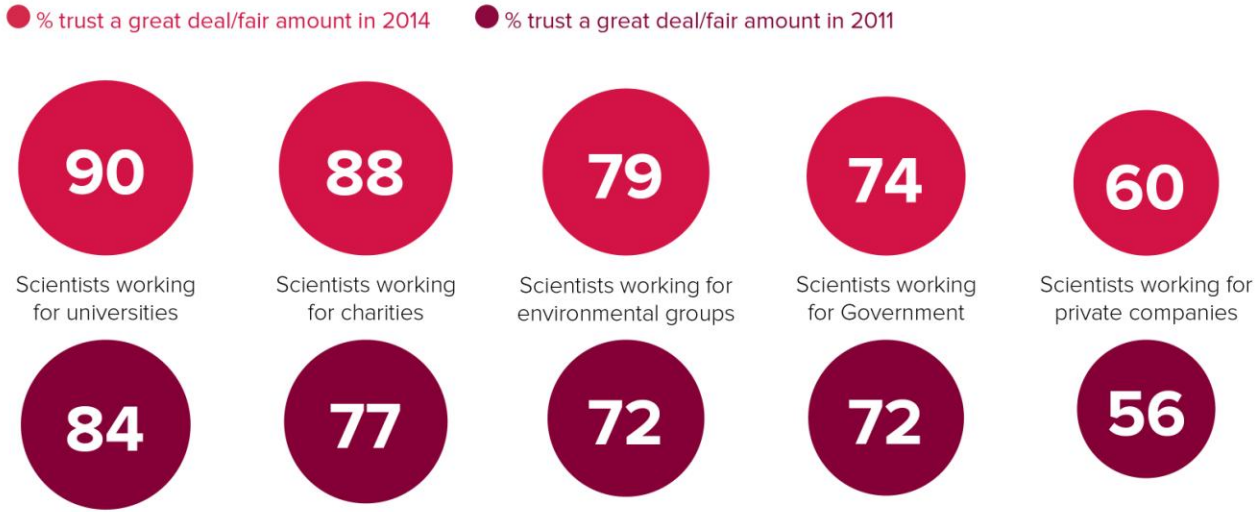
Q. How much, if at all, do you trust each of the following to follow any rules and regulations which apply to their profession?



Base: (for 2014): 858 UK adults aged 16+

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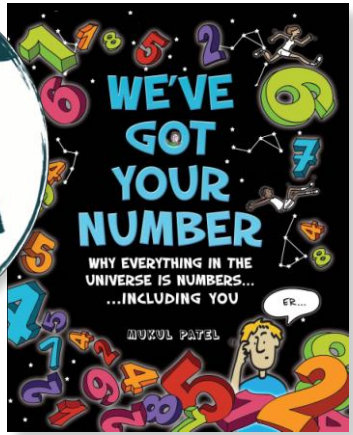
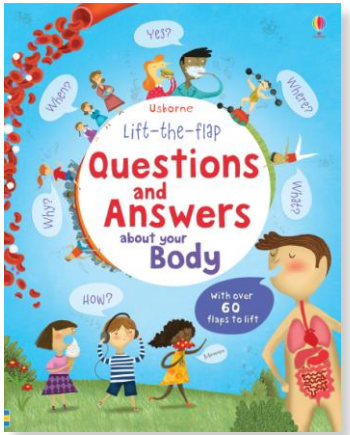
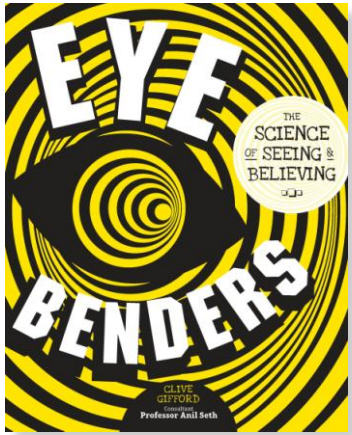
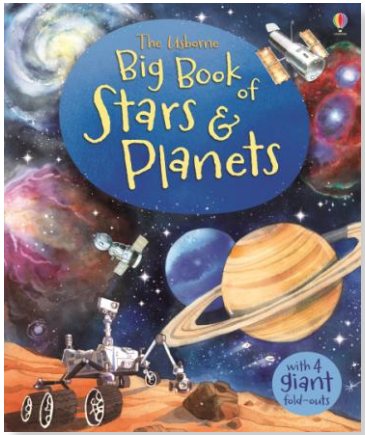
SHORTLIST

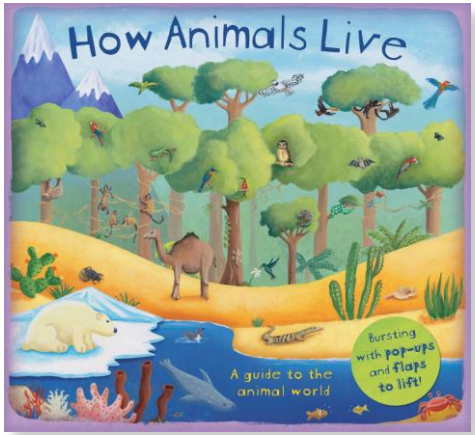
ROYAL SOCIETY YOUNG PEOPLE'S BOOK PRIZE 2014

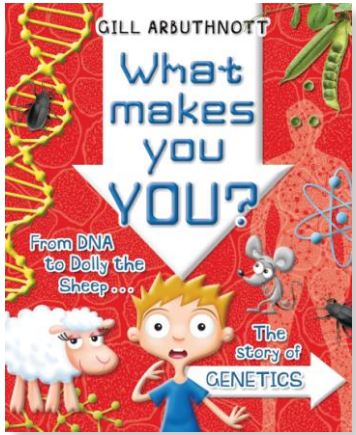












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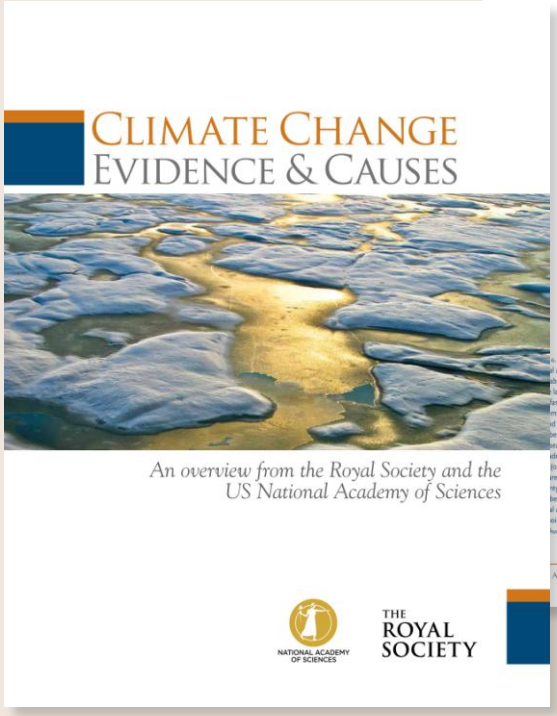
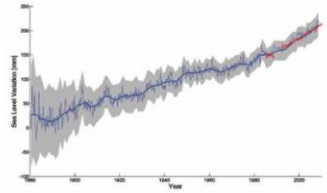


14 How fast is sea level rising?

Long-term measurements of tide gauges and recent satellite data show that global sea level is rising, with best estimates of the global-average rise over the last two decades centred on 3.2 mm per year (0.12 inches per year). The overall observed rise since 1901 is about 20 cm (8 inches) [FIGURE 6].

This sea-level rise has been driven by (in order of importance): expansion of water volume as the ocean warms, melting of mountain glaciers in most regions of the world, and losses from the Greenland and Antarctic ice sheets. All of these result from a warming climate. Fluctuations in sea level also occur due to changes in the amounts of water stored on land. The amount of sea level change experienced at any given location also depends on a variety of other factors, including whether regional geological processes and rebound of the land weighted down by previous ice sheets are causing the land itself to rise or sink, and whether changes in winds and currents are piling ocean water against some coasts or moving water away.

The effects of rising sea level are felt most acutely in the increased frequency and intensity of occasional storm surges. If CO_2 and other greenhouse gases continue to increase on their current trajectories, it is projected that sea level may rise by a further 0.5 to 1 m (1.5 to 3 feet) by 2100. But rising sea levels will not stop in 2100; sea levels will be much higher in the following centuries as the sea continues to take up heat and glaciers continue to retreat. It remains difficult to predict the details of how the Greenland and Antarctic Ice Sheets will respond to continued warming, but it is thought that Greenland and perhaps West Antarctica will continue to lose mass, whereas the colder parts of Antarctica could start to gain mass as they receive more snowfall from warmer air that contains more moisture. Sea level in the last interglacial (warm) period around 125,000 years ago peaked at probably 5 to 10 m above the present level. During this period, the polar regions were warmer than they are today. This suggests that, over millennia, long periods of increased warmth will lead to very significant loss of parts of the Greenland and Antarctic Ice Sheets and to consequent sea level rise.

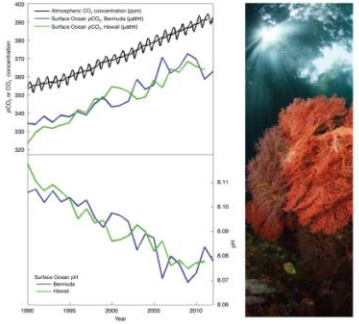


15 What is ocean acidification and why does it matter?

Direct observations of ocean chemistry have shown that the chemical balance of seawater has shifted to a more acidic state (lower pH) [FIGURE 7]. Some marine organisms (such as corals and some shellfish) have shells composed of calcium carbonate which dissolves more readily in acid. As the acidity of sea water increases, it becomes more difficult for them to form or maintain their shells.

CO_2 dissolves in water to form a weak acid, and the oceans have absorbed about a third of the CO_2 resulting from human activities, leading to a steady decrease in ocean pH levels. With increasing atmospheric CO_2, the chemical balance will change even more during the next century. Laboratory and other experiments show that under high CO_2 and in more acidic waters, some marine species have misshapen shells and lower growth rates, although the effect varies among species. Acidification also alters the cycling of nutrients and many other elements and compounds in the ocean, and it is likely to shift the competitive advantage among species, with as-yet-to-be-determined impacts on marine ecosystems and the food web.

FIGURE 7. As CO_2 in the air has increased, there has been an increase in the CO_2 content of the surface ocean (upper box), and a decrease in the seawater pH (lower box). *Source: adapted from Dore et al. (2009) and Bates et al. (2012).*



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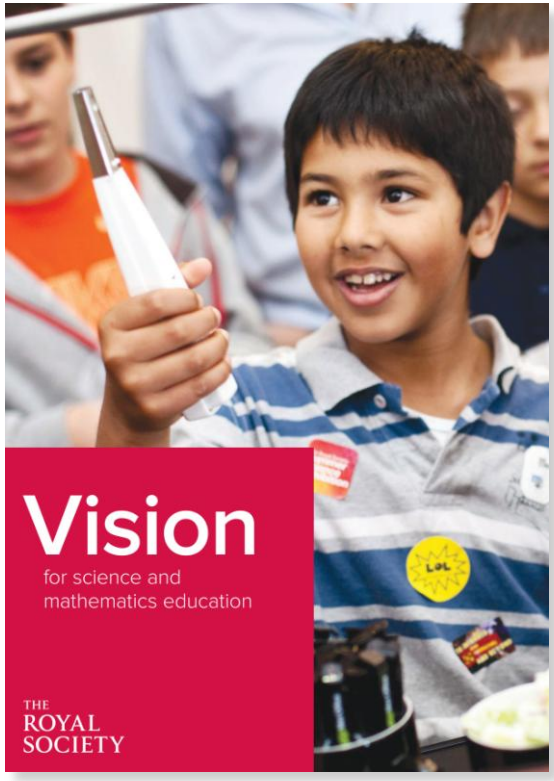
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