The age of the Earth: can you believe everything you read?

Throughout history people have been fascinated by how the Earth was created. More recently science has been used to find an accurate age for the Earth. The most commonly accepted value is 4.6 billion years based upon the decay of radioactive minerals found in some rocks. However a quick skim of internet websites reveals a whole host of information on this subject - some of which is very contradictory and claims to prove that the Earth is far younger than scientists calculate. Some websites claim that there is scientific evidence that the Earth is only as old as told in the Bible.

For example some websites point out that helium is accumulating in the atmosphere as a result of alpha decay of radioactive materials. They say that helium is not light enough to escape from the Earth's gravity (unlike hydrogen) so it accumulates over time. If you work out how much helium there is in the atmosphere and the rate at which it accumulates, it is simple to work out that it would only take about 200 000 years for this much helium to accumulate. This, they claim, proves that the Earth is only 200 000 years old and not 4.6 billion years old.

However they overlook the fact that helium *can* escape from the atmosphere. In fact the polar wind causes helium to escape at almost the rate at which it is created. This explains why there is so little helium in the atmosphere.

Others base their estimate of the age of the Earth on the Earth's magnetic field. They have noted that the strength of the Earth's magnetic field has decreased in the 130 years since it was first measured. They then work backwards and show that even around 8000 years ago the strength of the Earth's field would have been ridiculously high and enough to liquefy the planet completely. Therefore, they argue, the Earth must be less than 8000 years old.

This argument forgets that the Earth's field has reversed itself many times so anything that relies on the changing strength of the field in one direction has to be looked at cautiously. This argument also forgets that the Earth's field is not caused by a giant bar magnet at the centre of the Earth. In fact although one component of the Earth's field has reduced in strength over this time, another component has increased in strength by enough to compensate.

Another argument looks at the amount of dust on the moon. It claims that dust from meteorites lands on the moon at a rate of about 4 million tonnes per year. It then looks at pictures from moon landings and note that the dust layer is only a few centimetres thick. This, it claims, shows that the moon is only a few thousand years old.

The problem with this idea is that the amount of meteoritic dust is far less than 4 million tonnes per year. It is probably more like 5000 tonnes per year. Moreover, the dust layer on the moon is not the whole story. Meteoritic dust has been compacted onto the lunar surface to form a hard layer between 5 and 10 metres deep.

These are just a few of the most popular ideas. Others include claims that the Earth's rotation is slowing down so it should have stopped by now if it were billions of years old; or that all the natural gas and oil buried under ground would have escaped by now; or that the planet should have cooled down to about 4 K if it started life as molten rock; or that there would be sediments up to 100 miles thick on the ocean floors; or that the Mississippi delta would have eroded back as far as the North Pole.

These are all very good examples of people taking evidence and using it selectively to prove their point. The real message is that it is dangerous to rely on a single source of information. All information should be read cautiously and cross-checked

against other sources before you can be sure it is reliable. The fact that something appears in print is no guarantee of accuracy.

Questions:

Q 1.	Make a chart of the various arguments suggesting that the Earth is very young together with reasons why the evidence seems unreliable.
Q 2.	Why do you think these ideas have been put on the internet? Do you think the people who wrote them believe they are accurate? How do you think they justify to themselves the fact that they have ignored some of the counter evidence?
Q 3.	Have you ever read something on the internet and wondered whether it was true or not? Do you or did you believe it must be true if it has appeared on the internet? Do you think that print media such as books or newspapers are more reliable than the internet for information? Explain your answer.