

Questions in science

What is Bad Science?

Narrator:

What is 'bad science'? To know what we mean by bad science, we first need to know what good science is!

Scientists would say that good science is where scientific investigations are conducted using the scientific method. What they mean is, they identify something of interest and define a research question. They then make observations, which leads them to formulate a hypothesis. They can then carry out an experiment, and this generates data that they analyse and interpret, and draw conclusions from. Often this process is repeated, many times, each time adding further understanding towards answering the research question.

But every experiment is different. Technical, resource and time considerations are a really important part of how each experiment is planned and carried out. Scientists also have an important moral and ethical responsibility to consider whether their experiment should even proceed in the first place. For example, experiments could bring risks to people and other living organisms, or to the environment, and so need considering carefully before proceeding.

Today there are various checks in place to ensure scientists fulfil their responsibilities, but there haven't always been and the experiments behind some of science's greatest discoveries may today be considered unethical.

Edward Jenner first tested the Smallpox vaccine on children, whereas vaccines today go through rigorous testing before release to people and vulnerable populations.

Today science is faced with moral dilemmas such as 'should we alter the genome of a human embryo?' or 'should we land machines, or humans, on an extraterrestrial body?'. It's important that scientists act with integrity when undertaking scientific research.

So - bad science is science that can't be repeated. Bad science doesn't consider ethical or moral issues, and ignores the potential for impacts to society and humanity.

To discover more about how to do good science, explore our introductory science module Questions in Science.

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