



Science and society

Scientific developments sometimes raise ethical questions that can't be answered by experiments, though gathering data can help people make informed decisions. The answers to questions such as the examples below depend on people's opinions, not on science.



Key facts

- ✓ Some scientific developments raise ethical questions.
- ✓ Questions about what is right or wrong cannot be answered by experiments and depend on people's opinions.



Cheap meat

Selective breeding can be used to produce farm animals that give better meat, cows that produce more milk, or hens that lay more eggs. However, changes that cut costs for farmers may be harmful to the animals. Chickens bred to grow very fast, for example, may be too heavy to walk. Are cheap meat and higher profits more important than animal welfare?



Clean energy

Climate change is happening because humans are adding too much carbon dioxide to the atmosphere. Tidal power generates electricity without producing carbon dioxide, but this sometimes involves building a barrage dam across a river estuary, preventing fish from migrating and changing natural habitats. Is clean energy more important than preserving wildlife habitats?

This golden rice is genetically engineered to produce extra vitamins.

Normal white rice



Genetic engineering

Genetic engineering can provide cures for diseases or alter crops to provide additional nutrients. These bring benefits to many people's lives, but genetically modified organisms are not natural. Is it wrong to modify life in this way?

Biofuel power station



Biofuels

Biofuels are fuels made from crops. Burning these fuels reduces carbon dioxide emissions compared to burning fossil fuels, as the crops absorb carbon dioxide as they grow. However, growing them uses land that could be used for food. Is clean energy more important than food supplies?



Risks and benefits

Science and technology can produce inventions that improve people's lives, but some technologies bring risks, too. Benefits and risks need to be weighed up, taking all the evidence into account. Often the option that we think is more dangerous turns out not to be.

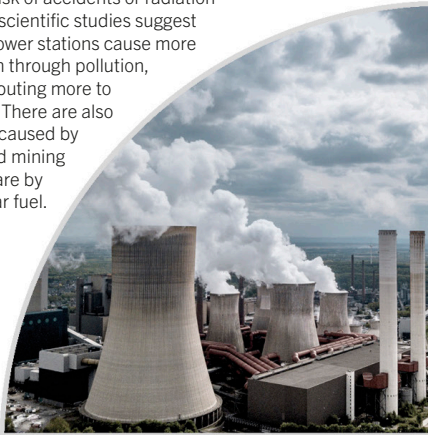


Key facts

- ✓ **Modern technology can have great benefits, but some technologies can also cause harm.**
- ✓ **The risks and benefits of different technologies need to be assessed before deciding whether or not to use them.**

Nuclear power or fossil fuels

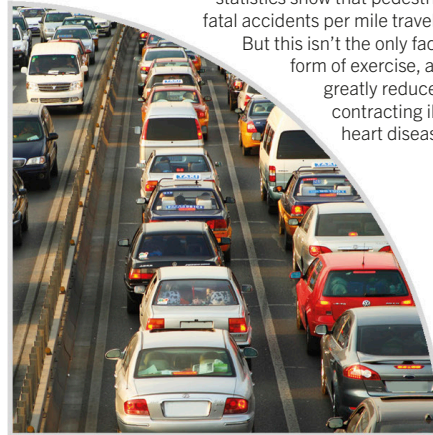
Many people think nuclear power is dangerous because of the risk of accidents or radiation leaks. However, scientific studies suggest that fossil fuel power stations cause more illness and death through pollution, as well as contributing more to climate change. There are also more accidents caused by drilling for oil and mining coal than there are by obtaining nuclear fuel.



Walk or drive?

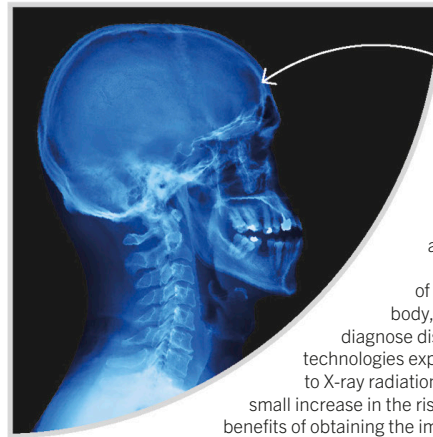
Which is safer—walking or driving? Accident statistics show that pedestrians suffer more fatal accidents per mile traveled than drivers.

But this isn't the only factor. Walking is a form of exercise, and exercise can greatly reduce your chance of contracting illnesses such as heart disease and diabetes.



Flight safety

Air crashes are always big news and make some people afraid to fly. However, traveling by car is much more dangerous. For example, between the years 2000 and 2009, car occupants in the US were more than 100 times more likely to have a fatal accident per mile traveled than passengers on commercial airliners.



X-ray
of head

X-rays

X-ray machines and CT scanners produce images of the inside of the body, helping doctors diagnose disease, but these technologies expose living tissue to X-ray radiation, causing a very small increase in the risk of cancer. The benefits of obtaining the images in order to treat the condition usually outweigh the risks.