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1.3 Science and Technology

Science is concerned with gathering knowledge about the natural world. When we apply this knowledge for practical purposes, we have what we call **technology**. New technologies often arise from scientific discoveries. In biology, scientific discoveries have led to advances in genetic and medical technologies, among other areas. New technologies, in turn, can be of assistance to scientists in conducting their research. So technology arises from science, but technology also supports progress in science—the two are different from each other but very much related.

Technology is a double-edged sword that can be both helpful and harmful. We have the technology, for example, to extract fossil fuels from the ground and then to burn the fossil fuels for the production of energy. Energy production from fossil fuels has benefited our society in countless ways. On the flip side, the burning of fossil fuels warms the planet and endangers the environment. It is tempting to blame technology itself for problems such as pollution, resource depletion, and even overpopulation. But ultimately, it is humans who are developing the technology. Humans must constantly think about how to use technology responsibly.

Remarkably, we already possess the technology to solve many environmental problems. In this 21st century, we are seeing a switch from fossil fuels to more sustainable energy sources, such as photovoltaics, hydroelectric, wind, solar thermal electric generation, and biomass conversion. Whereas



most paper printed comes from trees, there is also paper available from fast-growing weeds, and less of even these materials will be needed as e-books gain popularity. In some parts of the world, progress is being made to stem the rapid growth of our human population, which is an issue that aggravates almost every problem faced by humans today. We live on a finite planet, and Earth's population carrying capacity is being acknowledged. The greatest obstacle to solving today's problems lies more with social inertia than with a lack of technology. Technology is our tool. What we do with this tool is up to us.



READING CHECK

Is technology helpful or harmful?

CHECK YOUR ANSWERS

Technology can be either helpful or harmful depending on how it is used. Using technology responsibly, and in helpful ways, should be one of the goals of society.

You will read more about biology and technology later in this book, but here's a website with more information if you would like to learn more now:

<https://www.pnas.org/content/98/18/10051>

