Topic 8 – People and Machines

Science and technology have given us many different amazing machines that have made our daily tasks easier. The automobile caught on very quickly, but the ideal machine soon demonstrated its greatest flaw. Pollution of the environment was a result of more and more fossil fuels being burned, in larger vehicles. Improving machines brought lots of positives, but there were also some negative side effects (like pollution).

The Industrial Revolution

The invention of the steam engine transformed society. Simple machinery replaced hand labor since 1700. Water-driven spinning machines were used in 1769 and could the work of 12 workers. James Watt's efficient steam engine and Henry Cort's use of coal for fuel (instead of wood) to make iron started the Industrial Revolution.

Mass production industries began and soon small towns became industrialized cities, leading to social change.

People flocked to the cities to get work in the factories – the shift from rural living to urban dwellers began.

Which Came First?

The question of whether technology changes society or society changes technology is still a challenge today. The automobile uses cheap fuel and therefore more vehicles are being used. With cities so large, people need a vehicle to travel from place to place. OR, is the convenience of having a vehicle just societies' reason to have larger cities?
Because of the impact of scientific knowledge on society preferences for styles and sizes of vehicles changed. Larger vehicles polluted more and cost more to operate, so society wanted more compact fuel efficient vehicles. Today alternative fuel sources (solar-powered, electricity, hybrids, propane and hydrogen fuel cells) are being tested and are utilized to a very small extent.

What Is It For?

When a new technology is being designed or an old technology improved upon the starting point must be the function – what is it that you want the technology to do? Scientists often have to ask themselves difficult questions, weighing the positive and negative effects of the technology. The ethical issues must be reviewed and considered in the decision to go ahead. Nuclear power is just one example – clean and efficient power generation VS nuclear accidents can devastate the environment. Consumers must also make smart choices when purchasing goods or services. Certain considerations must be taken into account, including how much energy is needed to make the goods or services available?

Designing for Comfort

How do inventors use their understanding of scientific concepts to design a new device, or modify an old one? Many of the principles of design rely on the physics principles of Force, Area and Pressure (Topic 4).

The Science of Comfort

The science of **ergonomics** was introduced in Topic 1. The testing systems that designers use provide scientific information to researchers, allowing them to decide what type of modification is best for its designed purpose.
C*omfort* is an important criterion that is evaluated.

The wheelchair has gone through many improvements over the years. These changes happened because of the research into ergonomic designs and pressure put on the designers by the consumer.