



Tutors notes:

We want to introduce children to the world of engineering using an interesting and refreshing approach. The role of the engineer needs to be described and awareness raised about what engineers do and where to find them in the world that surrounds the children.

The Engineer

Let's start with the word engineer which is an ancient word. It derives from the Latin word 'ingeniosus' meaning skilled. The word 'ingenious' derived from the same Latin word and an engineer is indeed a clever practical problem solver often dealing with ingenious solutions. The engineer's skill includes the use of scientific methods and there are close connections between the workings of engineers, scientists and artists. One example perhaps is the many beautiful bridges with great spans and the ability to carry huge volumes of traffic. Certainly an example of the ingenious use of resources but there are many and you can choose your own example.

Engineers affect every day life.

Topics that come to mind –

The delivery of gas and electricity to the house, the supply of water and the disposal of waste are all every day experiences that we have come to expect but rarely think of the engineering that makes it all possible.

Inside the house we continue to use the supply of power for central heating, telephones, washing machines, fridges, cleaners, televisions, cookers and many more devices. Even carpets and furniture have engineering systems behind them to make it all possible.

Outside the house look around - we find roads, lorries, vans, buses, trains, cars and bicycles. The roads are lit by street lighting, and are kept clear by drains that carry away the surface water. The traffic is carried over rivers by bridges and tunnels and the flow and direction is controlled by road signs, traffic lights, islands and junctions.

And look at the buildings – not just the houses although they are good examples of the use of different materials and engineering techniques. Bigger buildings and famous buildings through out the world use steel, glass and natural materials to create great architecture. With out the engineering knowledge and skill none could exist.

Engineers connecting the world and exploring the galaxy.

If we look into the sky we can see Jet airliners and if we could see further we would see satellites. These satellites have many uses such as global communication networks,

monitoring weather and watching for storms, checking land erosion by the sea and the loss of our forests world wide. Modern communication tools: cell phones, email, radio, television, and more have been made possible through engineering. Engineers working in businesses, government labs, and universities are constantly improving technologies and thinking of new and better ways to connect people around the globe

There is also an international space station high above our world and space craft travelling to far off stars. The information they return to us helps us understand the nature of the universe we are part of. From designing and building space vehicles, to walking on the moon, engineers have always played an important role in space exploration. In the future, engineers will be help to continue exploring and perhaps even creating human settlements other planets.

Engineers helping people.

The hospital is an example of engineering endeavour not just in the lay out and buildings but within the human body. Medical progress is aided by delicate instruments that can enable us to see deep into the smallest cell structures within the body. Engineers have been instrumental in advancing the practice of medicine. New imaging techniques, better surgical tools including microscopic cameras and lasers, and even artificial joints and organs are all engineering achievements that have allowed doctors to treat more patients more successfully

Engineers protecting the environment.

Think for a minute of the Thames barrier. It spans the river Thames in London and is used to prevent the sea flooding the city. Engineers are actively involved world wide with flood control and disaster relief. You find engineers are helping to protect the environment by improving recycling techniques, designing more energy-efficient cars and appliances, protecting water, developing less resource-intensive method of farming, and more. Engineering is critical to making cleaner, safer technologies less expensive and more readily available - helping everyone do more to protect our environment.

Summary

Engineers are into everything. Engineering offers more career options than any other discipline. It's a profession that can take you from the depths of the ocean to the far reaches of outer space, from within the microscopic structures of the human cell to the top of the tallest skyscrapers. Whether it's cell phones, digital cameras, DVDs, or facial recognition devices that can pick out a terrorist in a crowded football stadium, engineers are behind almost all of today's exciting technology. Engineers are problem solvers who search for quicker, better, and less expensive ways to use the forces and materials of nature to meet today's challenges.

Imagineering paper
World of Engineering



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Here are a few examples to set the imagination moving -----

Helicopter [aeronautical engineering]- **Reactor research** [search for energy] - **water hydraulics** [Thames barrier largest river barrier in the world] –**aerospace** [space shuttle] - **Satellites** [global positioning and communication technology] - **auto design** [Jaguar] – **engine development** [more and more efficient use of fuel and increased performance] - **power distribution** [many and smaller generators linked to the grid to get local power distributed to where there is a demand] – **transportation** [High speed trains is a good example]–**petrochemical industry** [research and the practical application of mechanics to bring the liquid or gas to the user] -- **nanotechnology** [using engineering methods too small for the eye to see - tiny machines made from molecules]– **London eye** [Tourism and entertainment] - **nautical engineering** [boats yachts launches submarines and ships] – **women in science and engineering**