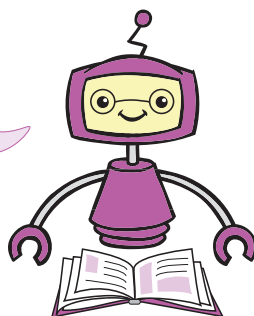


A new invention

Did you know that the English word 'robot' comes from the Czechoslovakian language? It was first used in a science fiction play by Karel Čapek. The first ever robots were probably the figures that decorated an astronomical clock tower made by Chinese inventor, Su Song in 1088 AD. Let's find out more about inventing things ...



LINKS TO:

Stage 3, Module 13

Learning Object 3: *Glue the fins to the bottle*

PRIOR LEARNING:

Stage 2

Module 13 Work Sheet 6: *Many robotic hands make light work*

1 Whose idea was that?

Have you ever imagined inventing a new gadget or device that would transform people's lives?

Throughout history, humankind has continuously sought to invent devices to improve the quality of our lives. What would life be like without scissors, zippers, clocks or the Internet? How different would life be if nobody had invented television, light bulbs or spectacles?

Some inventions radically change the course of history, while others have a more local impact. The inventions of the Industrial Age, such as the steam engine, had a dramatic impact internationally, whereas the invention of the umbrella hat ...

Patenting a dream

In this work sheet, you are going to read a patent application written by an inventor. A patent application is a document in which someone who has invented something describes their invention. The purpose of a patent is to protect the inventor's intellectual property rights. If someone owns the patent for an invention, nobody else can manufacture or sell that invention without their permission.

Patent applications are often very formal and technical. The one you are about to read is a simplified version. Nevertheless, it includes the following key features of a patent application:

- It is written in the third person.
- It is written in formal, impersonal language.
- It is divided into sections, each with a different heading.

A wonderful invention!

The Cakar Ayam foundation system was invented by Professor Ir Sedijatmo in 1961, during the construction of high-voltage electrical towers in the area of Ancol, Jakarta. *Cakar ayam* literally means 'chicken claw'. It is a simple method invented to solve the problems of building in soft soil. At the time, Dr Sedijatmo worked for PLN, the National Electricity Board. He had problems completing the construction of seven high-voltage electrical towers in the swamp area in Ancol. The first two towers had taken a long time to construct because of difficulties using conventional foundations in the area's soft soil. The

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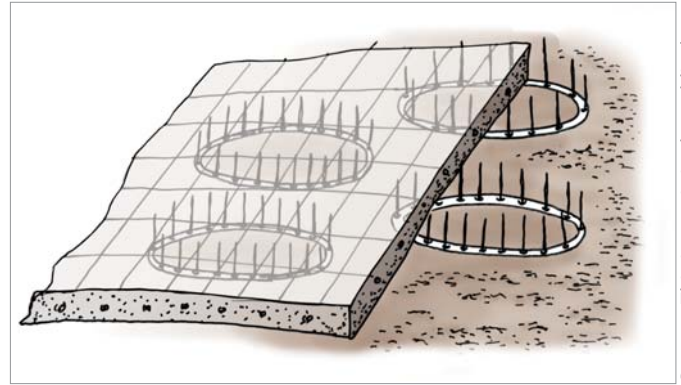
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delays meant that the project fell behind schedule, and a new foundation system was sought.

As a result, Dr Sedijatmo developed the foundation construction system now known as the Cakar Ayam method. Conventional concrete slabs were prone to cracking when soft soils moved under the slabs, so his method involved sinking lightly reinforced concrete pipes (the chicken claws) into the soft soils, about two metres apart, and then attaching a comparatively thin concrete slab on top of the pipes. The slab effectively 'floats' on top of the soil and is much less likely to crack.

The five remaining electrical towers were completed in record time using this method, and are still standing. The system is quicker and cheaper than conventional foundation methods and has been used in large airport runways and hangars, roads and buildings. Currently,

the Cakar Ayam foundation system has been patented in several countries including Indonesia, Belgium, Canada, France, Germany, Great Britain, Italy and America.



Source: This image is in the public domain.

A sketch of the Cakar Ayam foundation system. The concrete pipes, with exposed reinforcing bars, have been sunk into the soft soil and filled with water. The thin concrete slab is then poured on top.

Exercises

The following text is a patent application for a new invention.

Read the text, using all the reading strategies you have already learned in Stage 2.

After you have read the text you will be asked to complete two kinds of reading exercises: comprehension questions and questions about the ethics of water usage.

IKHTISAR

Penghemat Air

Penghemat Air adalah sebuah alat yang mengumpulkan air yang, kalau tidak, akan 'dibuang percuma' sementara Anda menunggu air panas Anda mengalir. Irma Hidayat mengadakan penelitian di 12 rumah tangga mengenai jumlah air yang dibuang percuma di pancuran sementara penggunaannya menunggu sampai air itu mencapai suhu yang diinginkan. Penelitian menemukan bahwa rata-rata 15 liter air dibuang percuma setiap hari untuk setiap orang yang mandi.

Sekilas tentang Penemunya

Irma Hidayat adalah seorang mahasiswa teknik industri dari Jakarta.

Irma Hidayat sangat berminat terhadap lingkungan. Dia senang sekali menghabiskan waktunya di air: berenang, memancing, dan berlayar. Impiannya adalah untuk menemukan sesuatu yang akan berdampak positif terhadap bagaimana orang menggunakan sumber daya kita yang paling berharga: air.

Kontak

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INSPIRASI

Irma Hidayat tinggal di daerah di mana akses terhadap air bersih terbatas, dan seringkali persediaannya menipis. Orang-orang yang tinggal di daerahnya itu selalu berbagi saran dan informasi mengenai bagaimana menghemat air. Dalam salah satu diskusi inilah Irma Hidayat mendapatkan inspirasi untuk penemuannya ini.

CARA KERJANYA

Alat Penghemat Air ini bekerja dengan cara memeriksa suhu air setelah air panas dan dingin bercampur, tapi sebelum air itu disalurkan ke keran. Suhu yang diinginkan bisa ditentukan menggunakan mekanisme papan tombol sederhana yang dipasang di dekat keran. Suhu ini bisa diubah untuk setiap pengguna. Untuk tujuan keamanan, suhu maksimum ditentukan sebesar 45°C.

Air yang sedianya akan dibuang percuma sementara menunggu air mandi mencapai suhu yang diinginkan, dialihkan ke tempat penampungan. Pada waktu alat itu dipasang, pengguna bisa memilih untuk mengalihkan air ke tempat penampungan air atau, kalau pancuran air letaknya dekat dengan kloset, ke dalam tangki air kloset sehingga bisa dipakai untuk membilas.

Exercise 1

Reading comprehension

First, let's have a look at how well you understood the text.

1.1 Summarise, in English, the main ideas from each section of the text.

Overview

Inspiration

How it works

1.2 Were there particular words or phrases you found difficult to understand? What strategies did you use to understand these words or phrases, or to understand the text as a whole?

1.3 What is the name of Irma Hidayat's invention?

1.4 Why has she invented this device?

1.5 How does the device work?

**2.2 What do you think our ethical responsibilities are to future generations of water users?
Give reasons to justify your answer.
Write your answer in English.**

Hint! How do we balance our current usage and needs against the levels of water required in the future? How much water should be available for current users? How much water should we store for the future? Do we have an ethical responsibility to ensure that water supplies in the future will be adequate, clean and accessible?

