ENGINEERING THAT CHANGED THE WORLD

Queen Elizabeth Prize
for Engineering

GPS

2019 QEPrize

The Global Positioning System is the world's first global satellite navigation system.

HOW IT WORKS

A signal is sent from a satellite to a GPS receiver, such as a phone.

The signal is used to calculate the distance between the phone and the satellite.

Distances from four satellites can be used to find the location.

4
satellites needed to find a location

120 kg
the weight of some of the first GPS receivers

DOT *to* DOT

What do you see?

31
satellites supported by the GPS system

4
billion people use GPS

The ENGINEERS

Professor James Spilker, Jr
Dr Bradford Parkinson
Richard Schwartz
Hugo Fruehauf

DIGITAL IMAGING SENSORS

Digital imaging sensors have enabled the widespread use of digital cameras and smartphone photography.

CCD

the first memory system for digital images

1973

the first digital colour image was produced using a CCD

CMOS

the miniature sensor used in most cameras and smartphones today

HOW IT WORKS

Light reflects off an object and into the lens of the camera.

The digital imaging sensor in the camera converts light energy into an electrical signal, creating an image.

The digital image is stored on a memory card.

2017 QEPrize

SPOT *the* DIFFERENCE

1.2

trillion digital photos are taken per year

The
ENGINEERS

Dr George Smith
Professor Eric Fossum
Dr Michael Tompsett
Professor Nobukazu Teranishi

CONTROLLED DRUG DELIVERY

2015 QEPrize

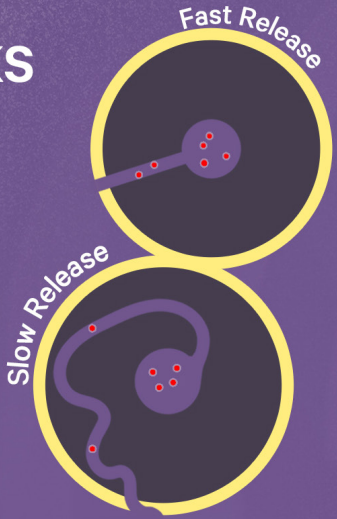
Delivering medicines slowly over a period of time using special molecules to treat cancer and diabetes.

HOW IT WORKS

Most medicines use small molecules, but large molecules are better at treating diseases like cancer.

Large molecules are difficult to deliver into the body. A special material called a polymer allows them to be used.

The polymer contains pathways of different lengths to slow down the release of medicine. This means that people need less frequent doses.



The ENGINEER

Dr Robert Langer

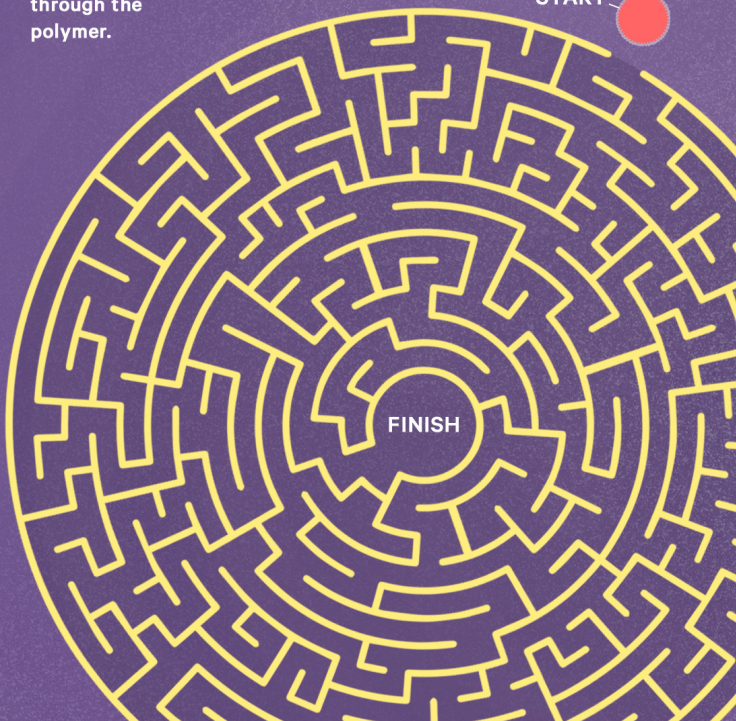
1996
first controlled drug delivery treatment approved for public use

20,000
number of atoms in a large molecule, used for controlled drug delivery

2
billion lives improved

MAZE

Find the large molecule's pathway through the polymer.



THE INTERNET AND THE WEB

A global network that has transformed communication.

1.5
billion websites on the internet

2010
Finland became the first country to make internet access a legal right

1991
the first website was published

2.4
billion emails sent over the internet per minute

HOW IT WORKS

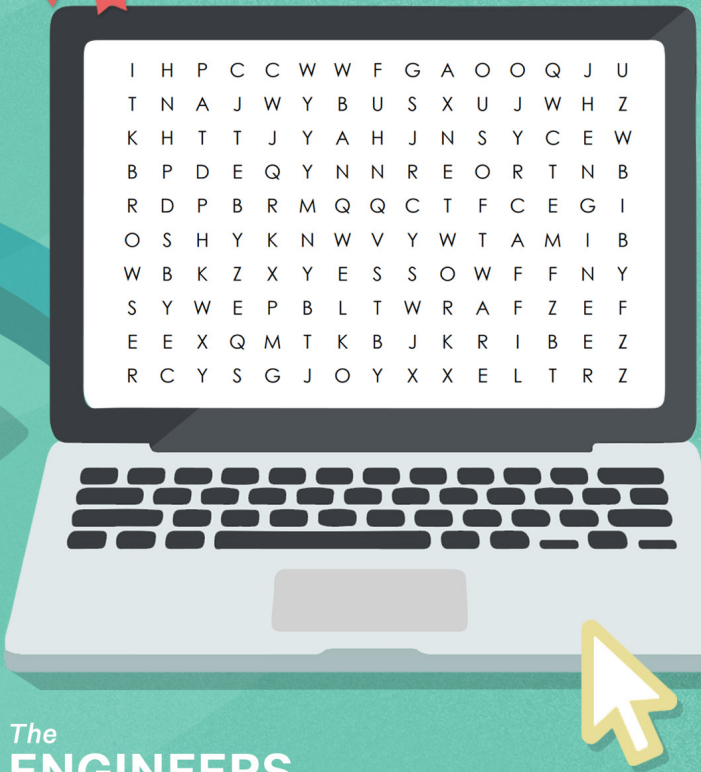
The internet is a global network that links computers together.

The World Wide Web is the collection of linked pages that you see when you browse the internet.

Software that allows you to look at web pages is called a browser.

2013 QEPrize

WORD SEARCH



The
ENGINEERS

Louis Pouzin
Robert Kahn
Sir Tim Berners-Lee
Vinton Cerf
Marc Andreessen

Queen Elizabeth Prize for Engineering

Diverse, multifaceted, and continually evolving, engineering creates the solutions to global challenges and improves billions of lives. Engineers have enabled us to work together across the planet, explore the smallest cells and the most distant stars, and navigate our way through the world.

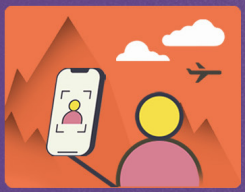
Awarded every two years, the Queen Elizabeth Prize for Engineering (QEPrize) champions bold, groundbreaking engineering innovation which is of global benefit to humanity.

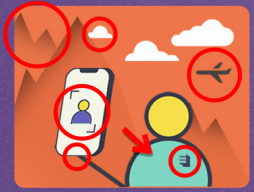
The £1 million prize celebrates engineering's visionaries, inspiring young minds to consider engineering as a career choice and to help to solve the challenges of the future.

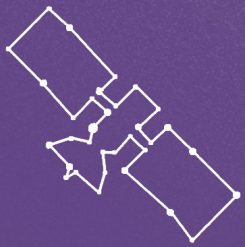
The prize also encourages engineers to help extend the boundaries of what is possible across all disciplines and applications.

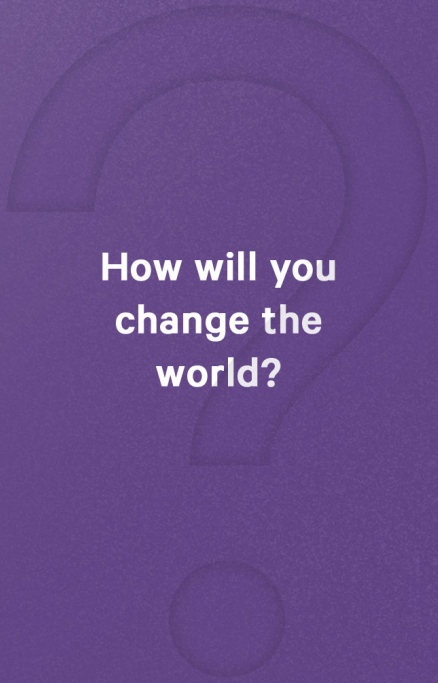
ANSWERS

H P C C W W F G A O O Q J U
T N A J W Y B U S X U J W H Z
K H T T J Y A H J N S Y C E W
B P D E Q Y N N R E O R T N B
R D P B R M Q Q C T F C E G I
O S H Y K N W V Y W T A M I B
W B K Z X Y E S S O W F F N Y
S Y W E P B L T W R A F Z E F
E E X Q M T K B J K R I B E Z
R C Y S G J O Y X X E L T R Z









How will you change the world?

@QEPrize qeprize.org