

DNA DISCOVERY

1. Which verb is correct in the following sentences?

The first antibiotic drug, penicillin, was *invented* / *discovered* **by** ...

The electric bulb was *invented* / *discovered* **by** ...

2. Discuss which inventions / discoveries in the history of mankind are the most important (e.g. writing / telephone / fire / wheel / electricity / printing / cooking ...or other)

3. Put the discoveries / inventions in the order of importance. Be ready to justify your decision.

4. Connect words that go together. There are more possible options.

1) invent	d) mass / density
2) discover	g) research
3) formulate	f) a new law / principle
4) calculate	c) a theory / hypothesis
5) develop	e) a new technique
6) propose	b) a new drug
7) carry out	a) a new machine

5. Do you know the names that are connected with some other inventions and discoveries?

What was invented / discovered / developed / formulated ... and by whom?

- | | |
|-----------------------------------|--|
| a) the law of gravity | 1. John Dalton, chemist |
| c) the structure of DNA | 2. Darwin, biologist |
| d) the modern theory of evolution | 3. Marie Curie, chemist and physicist |
| e) the theory of relativity | 4. Newton, mathematician, physicist |
| f) steam engine | 5. James Watt, inventor |
| g) radioactivity | 6. Watson, Crick and Wilkins, scientists |
| h) x-rays | 7. Wilhelm Conrad Roentgen, physicist |
| i) atomic theory | 8. Einstein, physicist |

Now check your answers in pairs. Ask and answer questions. Choose the right verbs.

Example:

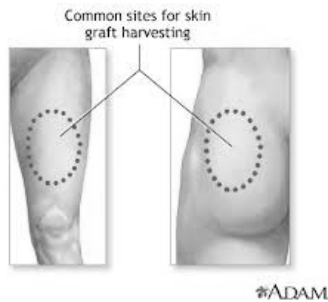
A: Who **formulated** the law of gravity?

B: The law of gravity **was formulated by** Newton. He was a mathematician and a physicist.

6. The following article explains the impact of DNA discovery. Put the parts A - F in logical order.

The story of DNA¹

A In the 1990s the 'Human Genome Project', lead by Watson, set out to map the location of every single one of the 30,000 – 35,000 genes in the chromosomes in every cell of the human body. The project involved hundreds of scientists working in 18 teams and the first draft was produced in 2000. Scientists have identified certain genes that pass on specific hereditary conditions. There are new techniques for skin grafts better production of insulin for diabetes, and better vaccines.



B At present scientists are looking at a number of key areas of research. They are trying to repair the faulty genes identified as responsible for causing breast cancer. Furthermore, they are modifying cells in the lungs to protect against breathing problems. Additionally, they are modifying cells in bone marrow to send out stem cells more quickly to repair tissue damaged in heart attacks. Finally, they are using stem cells in the gut to create cells that can manufacture insulin, helping the body to combat diabetes.

C The study of genetics began in the 19th century, when Mendel showed how characteristics can be passed down from one generation to the next. During the 20th century, scientists could take photographs of human cells through improvements in technology, like the use of electron microscopes and x-rays.



D There has been further research to develop techniques to alter faulty genes within the body and prevent genetic illnesses from developing. The discovery has been made that stem cells (found in the bone marrow of long bones and the pelvis) can transform into various types of cells used around the body. This offers a chance of replacing faulty cells with healthy ones. Research into genetic conditions requires very specialized knowledge and expensive high-tech equipment but it offers exciting possibilities.

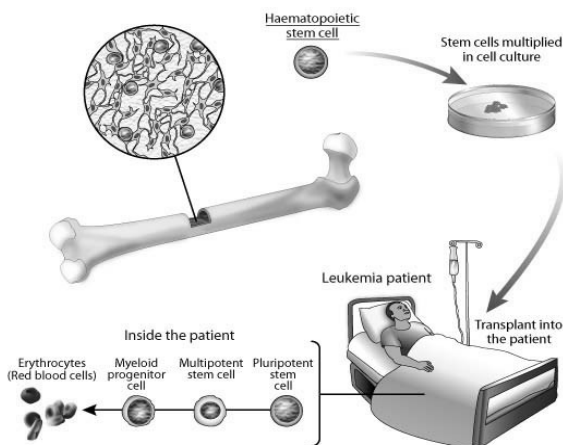


Illustration by Cell Imaging Core of the Center for Reproductive Sciences.

E It became known that each cell in the body contains DNA. DNA is a set of codes controlling the genes that decide eyes colour, hair colour, or height. If scientists could work out how these codes fitted together in a DNA strand, they might be able to identify which genes were responsible for certain conditions, such as sickle-cell anaemia, cystic fibrosis or conditions like Down's syndrome.

F Francis Crick and James Watson, two Cambridge scientists, worked together to investigate the structure of DNA. Crick was a physicist and Watson a zoologist, but their work also made use of X-ray crystallography by Maurice Wilkins and Rosalind Franklin at King's College Hospital in London. In fact, it was one of Franklin's photographs that suggested that genes were arranged in a double helix structure. In 1953, Crick and Watson discovered the structure of DNA.



7. Find the English equivalents for these phrases:

předávat znaky

rentgenové paprsky

řetězec DNA

uspořádané do dvojité šroubovice

projekt lidského genomu

první návrh

změnit vadné geny

kmenové buňky

kostní dřev

obnovit poškozené tkáň

dědičné předpoklady

bojovat s cukrovkou

LIFE OF A SCIENTIST

8. Work with your neighbour (A/B). Read a text about James Watson, who discovered the molecular structure of DNA (together with Crick and Wilkins) and who is still alive today.

James Watson



molecular biologist, geneticist,
zoologist

Francis Crick



molecular biologist,
biophysicist

Maurice Wilkins



molecular biologist,
biophysicist

You don't have the same information. Ask and answer questions to complete the facts.

Example:

A: James Dewey Watson was born ... (*When?*)

When was James Dewey Watson born?

Student A

James Dewey Watson was born (*When?*). He started studying at the University of Chicago at the age of fifteen. Then he studied (*Where?*). He received a PhD in Zoology in 1950. Then he worked (*Where?*). Together with Crick and Wilkins he discovered the structure of the DNA. He was awarded the Nobel Prize in Physiology or Medicine (*When?*). Since then, he has received 14 honorary degrees from different universities.

During his lifetime, James Watson has written (*How many?*) books. Their names are: Molecular Biology of the Gene, The Double Helix, The DNA Story, Molecular Biology of the Cell, and Recombinant DNA: A Short Course.

James Watson has been working as a head of Cold Harbor Laboratory since 1994. He published his genome online (*When?*). At the moment he is carrying research on autism.

James Watson lives (*Where?*). Since childhood, he has been interested in bird-watching.

Student B

James Dewey Watson was born on April 6, 1928, in Chicago. He started studying at the University of Chicago (*When?*). Then he studied at Indiana University. He received a PhD in (*What?*).

Then he worked at Cavendish Laboratory at the University of Cambridge. Together with Crick and Wilkins he discovered (*What?*). He was awarded the Nobel Prize in Physiology or Medicine in 1962. Since then, he has received (*How many?*) honorary degrees from different universities.

During his lifetime, James Watson has written five books. Their names are: Molecular Biology of the Gene, The Double Helix, The DNA Story, Molecular Biology of the Cell, and Recombinant DNA: A Short Course.

James Watson has been working as a head of Cold Harbor Laboratory since (*Since when?*). He published his genome online on May 31, 2007. At the moment he is carrying out research on (*What kind of research?*)

James Watson lives in Cold Spring Harbor, a village on the North Shore of Long Island. Since childhood, he has been interested in (*What?*).

9. Listening. The DNA Story – 1973.

Listen to Francis Crick speaking about his work at the Cavendish Laboratory and fill in the gaps with the missing words.²

Crick: I wasn't so sure, I think, at that time, as to whether DNA or was the genetic material. Of course I knew about Avery's, and they were very suggestive, but you could that they weren't watertight. I knew Maurice Wilkins, I'd known him before I went to the Cavendish, and he on DNA and I'd gone to talk to him, but I didn't actually myself work on it, mainly because at the Cavendish they were working on protein So I learnt about polypeptide, x-ray diffraction, and things of that sort, and essentially continued to be interested in rather than doing any experiments or

10. Prepare a short presentation about a famous scientist or about an important invention/discovery.

Use these phrases:

Hello. I would like to talk about...

First ... Next... Finally...

That's all. Thank you for your attention.

Sources: ¹ adopted from <http://www.youtube.com/watch?v=3dozVXh7hi8>

² Available at: <http://osulibrary.oregonstate.edu/specialcollections/coll/pauling/dna/videos/dnastory01.html>

Based on wikipedia.org and nobelprize.org