Teacher's notes 1

Level: Intermediate (B1)

Age: Teenagers

Time: This lesson can be divided up in various ways to suit the time you have with your students. Below are three time options which you can choose from depending on the length of your class. However, these are just suggestions and there are plenty of other ways you could divide the lesson up.

90 minutes – Complete all activities in Einstein quiz, Scientific discoveries, Famous inventions and Your invention.

60 minutes – Complete all activities in Einstein quiz, Scientific discoveries and Famous inventions.

45 minutes – Complete all activities in Scientific discoveries and Famous inventions.

Aims: This lesson is divided into four sections: Einstein quiz, Scientific discoveries, Famous inventions and Your invention. In the lesson, students will:

1. test their memories / knowledge;
2. read about scientific discoveries;
3. read about inventions;
4. invent something new;
5. complete a patent form for a new invention.

Key skills: reading, speaking, writing

Subskills: word-building, passives, describing the function of something

Materials: one copy of the Einstein quiz cut up; one copy of the Scientific discoveries worksheet Student A for half the class and one copy of the Scientific discoveries worksheet Student B for the other half of the class; one copy of the remaining worksheets per student

Note: This lesson works well in conjunction with other *Beyond* lesson *The brain*.

EINSTEIN QUIZ

1. If you studied the lesson entitled The brain with your class prior to this lesson, this will work as a revision activity. If not, then it will work just as well as a quiz.

Give each student one slip of paper from the Einstein quiz. Tell the student with question fragment 1 (*What famous formula …*) to read it aloud to the class. Students should check their slips of paper and, if they think they have the fragment that completes the question, they should read it out. Then, they nominate someone to try and answer the question.

2. You could either confirm the correct answers yourself or have a strong student read back over the text from The brain (Einstein's life), while the other students are constructing the questions, and then this student can confirm the answers. Continue with each numbered question until all of them have been answered.

Key: *1. … did Einstein invent? – $E = mc^2$; 2. … an exceptional student at university? – No, he wasn't; 3. … a good job when he left university? – No, he didn't; 4. … win the Nobel Prize? – in 1921; 5. … was a big fan of Einstein's? – Marilyn Monroe; 6. … did Einstein play? – the violin; 7. … invent in 1926? – a fridge that worked with alcohol; 8. was Einstein's brain? – It was smaller than average.*

SCIENTIFIC DISCOVERIES

1. Ask students to tell you what they consider to be the greatest scientific discoveries of the last 500 years. Do they know more or less when the discoveries were made and who made them? Make a list on the board.

2. Split the students into pairs. In each pair, hand out the Student A version of the Scientific discoveries worksheet to one student and the student B version to the other. Students will have to ask each other questions to complete the gaps on their sheets. They must talk to each other to find the information, not look at their partner's sheet. Before they begin, go over the Phrasebook with them. This will provide them with some of the language they need for the activity.

3. Check the answers with the class. How many of the discoveries in the activity coincide with those on the board?

FAMOUS INVENTIONS

1. Write the following on the board in four columns, but note that it is in the correct order so jumble it as you write it up. Ask one student to come up and draw lines connecting a name of their choice with the correct invention, country and date. Then, ask another

student to either correct any mistakes the previous student made, if they know better, or connect another name with the correct information.

Names: *Louis-Sébastien Lenormand; Gottlieb Daimler; Simon Lake; John Walker*

Inventions: *parachute; motorcycle; submarine; matches*

Countries: *France; Germany; USA; England*

Dates: *1783; 1885; 1894; 1827*

2. Once all the information has been correctly connected, ask a student to produce a sentence using all the information for one of the names. For example: *Louis-Sébastien Lenormand, who was French, invented the parachute in 1783.*

3. Introduce the idea of important inventions that we use all the time in our everyday lives and elicit a few examples.

4. Put students into groups and give them the following categories:

- *the kitchen*
- *the office*
- *medicine*
- *transport*
- *communications*
- *food and drink*

Ask them to make a list of as many inventions and innovations as they can think of in each area. Feed back to the board.

5. Hand out the Famous inventions worksheets. Tell students to read the texts about the origins of everyday items. They should read each paragraph and, in pairs or small groups, try to identify what is described.

6. When most groups have finished, write the answers on the board in random order. Tell students to check their answers and try to complete the gaps with any inventions that were missing.

Key: *1. lift; elevator; 2. false teeth (or dentures); 3. Aspirin; 4. golf; 5. ketchup; 6. dry-cleaning; 7. Coca-Cola; 8. trolleys (or shopping carts); 9. coffee; 10. Post-it notes (or sticky notes); 11. toothpaste; 12. bikini; 13. beer; 14. iron*

7. Confirm the correct answers for the class.

8. Next, have students work in pairs or small groups, creating as many true sentences as they can using the table in the worksheet.

9. Explain to the students that one of the texts is not a true account of the invention. Which of the texts do the students think is most unlikely? Take a vote.

10. Reveal the correct answer.

Key: *The story that isn't true is number 4 – golf. The sport was invented in Scotland but not as this story describes. The true origins of the game are unclear and much debated.*

PATENT PENDING

1. Ask students what they would create if they were in a position to invent anything they liked. Elicit some suggestions. It could be something serious such as a new form of transport or something to help developing countries. Alternatively, it could be something funny such as a teacher eradicator or a homework doer! Explain that in order to protect their idea, they will need to fill in a patent application form. This will stop someone stealing and using their invention.

2. Get students, individually or in pairs, to complete the patent application form on the Your invention worksheet.

3. When they have finished, divide the students into two groups. Tell one group that they are inventors and the other that they are financiers. The inventors have to try to persuade the financiers that their invention is workable and useful, and that it deserves financial backing. The financiers have to ask questions to decide if they will invest in the development of the invention. Elicit possible questions they should ask, such as:

- *What can it do?*
- *How will it work?*
- *What benefits will it bring?*

4. When they have completed the interview, the students can swap roles.

5. Finally, hold a vote to find out which of the inventions the class considers:

- *the most useful*
- *the most likely to exist in the near future*

- *the most unlikely ever to exist*
- *the most imaginative*
- *the most dangerous*

HOMEWORK TASK

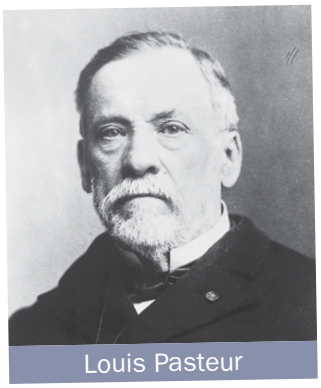
Students research an invention or discovery and write a short text about it. It should be in the style of the descriptions in Famous inventions, giving just clues to the invention or discovery but not revealing what it is. In the next lesson, students read out their texts and their classmates guess what it is they're describing.

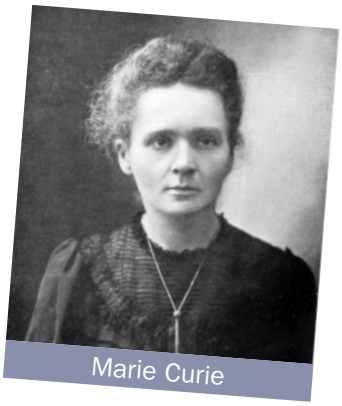
Einstein quiz

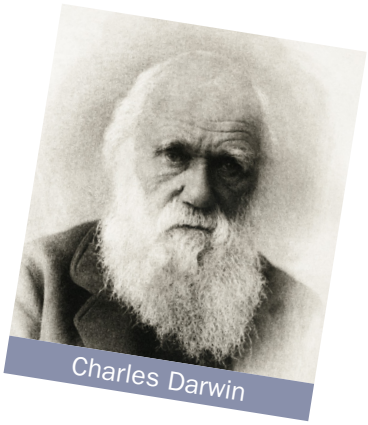
1. WHAT FAMOUS FORMULA …	… DID EINSTEIN INVENT?
2. WAS EINSTEIN …	… AN EXCEPTIONAL STUDENT AT UNIVERSITY?
3. DID EINSTEIN FIND …	… A GOOD JOB WHEN HE LEFT UNIVERSITY?
4. WHEN DID EINSTEIN …	… WIN THE NOBEL PRIZE?
5. WHICH FAMOUS PERSON …	… WAS A BIG FAN OF EINSTEIN'S?
6. WHAT INSTRUMENT	… DID EINSTEIN PLAY?
7. WHAT DID EINSTEIN …	… INVENT IN 1926?
8. HOW BIG …	… WAS EINSTEIN'S BRAIN?

SCIENTIFIC DISCOVERIES

Your partner has the information you need to complete the gaps below. Ask them questions to find the missing information. Also, answer their questions so that they can complete their gaps.


Louis Pasteur


Marie Curie


Charles Darwin

1. In 1543, Nicolaus Copernicus told the world that _____.
2. In 1666, Isaac Newton came up with the theory of gravity.
3. In _____, Charles Darwin published a book on his theory of natural selection.
4. In 1864, Louis Pasteur explained to a group of famous scientists his belief that germs cause many diseases.
5. Marie Curie conducted research on radioactivity. In 1903, she became the first woman to _____ _____.
6. In 1928, Alexander Fleming discovered the antibiotic penicillin.
7. In 1929, Edwin Hubble formed his theory that the universe is _____.
8. In 1953, James Watson and Francis Crick discovered the structure of the DNA molecule.

PHRASEBOOK

Asking someone for missing information

- What did … discover / invent in …?
- In what year did …?
- Let me guess. He / She / They … Is that right?
- I remember learning about this. Was it …?
- How do you spell that?

Giving someone a clue

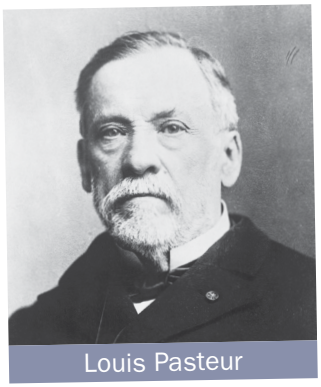
- I'll give you a clue. It begins with …
- Let me give you a hint. It's something to do with …

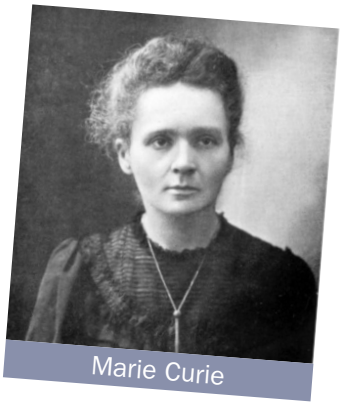
Giving someone missing information

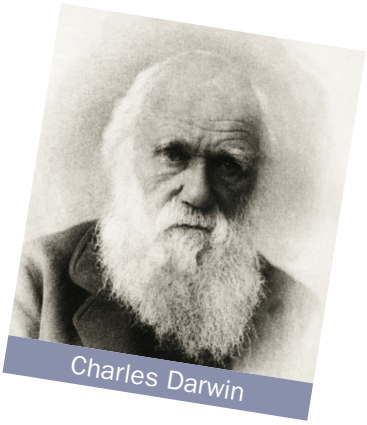
- It was in the year …
- He / They invented / discovered that …
- It's spelled …

SCIENTIFIC DISCOVERIES

Your partner has the information you need to complete the gaps below. Ask them questions to find out about the famous discoveries. Also, answer their questions so that they can complete their gaps.


Louis Pasteur


Marie Curie


Charles Darwin

1. In 1543, Nicolaus Copernicus told the world that the Earth moves round the Sun.
2. In 1666, Isaac Newton came up with the _____.
3. In 1859, Charles Darwin published a book on his theory of natural selection.
4. In 1864, Louis Pasteur explained to a group of famous scientists his belief that _____ cause many diseases.
5. Marie Curie conducted research on radioactivity. In 1903, she became the first woman to win a Nobel Prize.
6. In 1928, Alexander Fleming discovered the antibiotic _____.
7. In 1929, Edwin Hubble formed his theory that the universe is expanding.
8. In _____, James Watson and Francis Crick discovered the structure of the DNA molecule.

PHRASEBOOK

Asking someone for missing information

- What did … discover / invent in …?
- In what year did …?
- Let me guess. He / She / They … Is that right?
- I remember learning about this. Was it …?
- How do you spell that?

Giving someone a clue

- I'll give you a clue. It begins with …
- Let me give you a hint. It's something to do with …

Giving someone missing information

- It was in the year …
- He / They invented / discovered that …
- It's spelled …

FAMOUS INVENTIONS

Read these descriptions of how some everyday objects were invented.

1. King Louis XV of France was the first person to have one. It was constructed on the outside of his palace at Versailles. He used it to go from the first floor to the second. Today, it's called a _____ in the UK and an _____ in the US.

2. The earliest ones were found in a sixteenth-century grave in Switzerland. They were made from animal bone, and the upper and lower sections were joined with metal wire. It was common to use animal bones until the nineteenth century. Unfortunately, the bones had to be replaced every few years because they turned brown and smelt bad. Today we call them _____.

3. This drug was first produced by a French scientist in 1853 but he found no use for it. Forty years later, a German chemist used it to treat his father who was suffering from rheumatism. The chemist marketed the drug in 1899 and it went on sale in Britain in 1905. Now, the brand name _____ is known around the world.

4. The game was first played in Scotland as a way of settling a dispute over land. Two gentlemen both claimed that a small green field belonged to them. They made a hole in the field and agreed that the first one to hit a ball into the hole using only a stick would become the owner of the land. And that was how _____ was born.

5. The Chinese were probably the first to make a sauce with this name, using it to accompany fish or shellfish. It was brought to Europe in the seventeenth century and the recipe adapted to use ingredients available in the West. Tomatoes were added to the sauce in the United States in the 1790s. The recipe for _____ was finally perfected by Henry Heinz in 1876.

6. The process was first discovered in 1855 by a Frenchman. He accidentally spilt a bottle of turpentine on someone's dress and was amazed to find that, rather than leaving a stain, it actually made the material cleaner. It was the birth of the process we know as _____.

7. This drink was first made in the United States in 1886. A chemist was developing a soft drink. The drink he made contained cola-nut extract, sugar, caffeine, coca leaves and vegetable extracts. A few months later, his assistant accidentally mixed the drink with soda water and this became the drink we know today as _____.

8. These were invented by an American supermarket owner in 1937 when he noticed that his customers were struggling with their groceries. He converted folding chairs into containers and added wheels to help make shopping easier. Today, every supermarket has _____.

9. Legend says that its quality as a stimulant was discovered by a shepherd in Yemen who noticed that his sheep couldn't sleep after eating the red fruit on the bush. Records show that it was drunk as early as 1420 and later became popular in Syria and Turkey. It became popular in Britain in the eighteenth century. Today, many people can't imagine life without _____.

10. An American research worker discovered a glue that would stick things together so lightly that they could later be removed. At the time, he made no use of the discovery. Ten years later, a colleague needed to mark some pages of his book without damaging it and he had the idea of using the glue on one edge of paper notes. Today, we all use _____.

11. It was a doctor in ancient Rome who first advised people to use a paste made of vinegar, honey, salt and ground glass. Later, urine was recommended as a way to fight decay. Fortunately, this practice ended in the nineteenth century and today's _____ tastes much better!

12. In 1946, a French designer presented this daring two-piece garment in his new collection. He named it after the atomic bomb the US government had exploded four days earlier on the Pacific island of the same name. It was so outrageous that the models refused to wear his _____.

13. The Indians began making this drink in 3200 BC. It was considered the national drink in ancient Egypt, although, at that time, it was very thick and had a high alcohol content. The first non-alcoholic variety of _____ was produced in France about 100 years ago.

14. In the fourth century, the Chinese used hot coals in brass. In the West, the 'smoother', made of wood, glass or marble, was used cold until the fifteenth century. The first electric _____ was produced in 1882, although most houses didn't have electricity at that time.

Without looking at the texts above, combine the information below to make as many true sentences as possible.

For example: *The lift was first used by Louis XV.*

The lift		first made			
False teeth		invented		Switzerland	in 3200 BC.
Aspirin		first used		China	in the 16th century.
Golf		first discovered		Louis XV	in 1853.
Ketchup	was	first found	by	a Frenchman	in 1855.
Dry cleaning	were	first produced	in	Scotland	in 1886.
Coca-Cola		designed		Indians	in 1937.
Supermarket trolleys		first played		an American	in 1946.
The bikini					
Beer					

Your invention worksheet

When you invent something, you need to complete a 'Patent application form'.

What is a patent? A patent is a document that gives someone the legal right to make or sell an invention and stops anyone else from doing the same thing for a specific number of years (in the United Kingdom, it's 20 years).

Do you have an idea that could change the way we live? Explain how you think the invention could work by completing the patent application form and drawing a picture of the invention.

PATENT APPLICATION FORM

(Write clearly in BLOCK CAPITALS.)

Inventor(s) _____

Place of residence_____ Application number | | | | | | Date | D | D | M | M | Y | Y |

Claims

(Write a short summary of what your invention is.)

_____

_____

_____

_____

Description

(Write a short description of how the invention works.)

_____

_____

_____

_____

DRAWINGS WITH BRIEF DESCRIPTION

Use this space to include a drawing of your invention together with a brief description of the drawing.