

The web of ideas

Level: Intermediate–advanced

Time: 90 minutes +

Summary: This lesson is about inventions that we probably now take for granted but that we would find it hard to live, or do business, without. In this lesson, students will:

1. match inventors with their inventions;
2. study a text about influential inventions;
3. discuss which inventions have had the greatest impact on their lives and which they could least live without.

Materials: One copy of the worksheet per student; one copy of the vocabulary record per student

Group size: Any

5. *fascination*
6. *patent*
7. *body armour*
8. *faith*
9. *determined*
10. *pioneer*
11. *credit*
12. *infrastructure*
13. *talent*
14. *initiative*

Extension: Ask students to decide which of the key words can be both verbs and nouns, then to say in which form they were used in the article.

Key:
impact; patent; pioneer; credit (all nouns)

Overview

This lesson plan is for both pre-experience and in-work business students based on a shortened version of the original article first published in Business Spotlight issue 2/2015.

Quiz

Students do the quiz individually or in teams. Set a time limit of three minutes on this task. After that, students should scan the article to see how many answers they got right.

Key:
1. *d*; 2. *g*; 3. *h*; 4. *b*; 5. *f*; 6. *c*; 7. *e*; 8. *a*

Key words

Students read the definitions and match them to the key words. Then, they should read the article to find them and see how they are used in context. The definitions are listed in the order that the words and phrases appear in the article.

Key:
1. *impact*
2. *urban*
3. *ingenuity*
4. *milestones*

Teaching and learning strategy: verbification

In English, verbification typically involves simple conversion of a non-verb to a verb. Although many trainers do not 'approve' of this process, it occurs very often in Business English. Words that were formerly used as simple nouns or adjectives are, these days, commonly-used new verbs in Business English. Here are just a few examples:

- **green** – *We need to **green** our image.*
- **pencil** – *I'll **pencil** in our appointment for 10am.*
- **message** – ***Message** me when you get back to the office.*
- **table** – *We should **table** that point in our next meeting.*
- **impact** – *That's going to **impact** our sales figures.*
- **dialogue** – *We'll **dialogue** about this later.*

The challenge for teachers and trainers is not to cringe when you hear these words but to keep up with the changes!

Understanding the article

Students answer the questions; if possible, without referring back to the article at first.

Key:
1. *Without them, the building would be too hot and people would not be able to get to the higher floors or levels.*

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2. 1903; Kitty Hawk, North Carolina
3. The live broadcast of the first moonwalk in 1969.
4. computers and hearing aids
5. It was intended for use in car tyres but it is known today for its use in protective body armour in law enforcement.
6. Ed Roberts, Konrad Zuse, Charles Babbage, Alan Turing, Steve Wozniak and Steve Jobs
7. at CERN, near Geneva

Business collocations

Students match the words to make useful business word pairs. They should check their answers in the text and find out what the collocations were used to talk about.

Key:

1. d – used to talk about a Persian Gulf emirate
2. c – used to talk about a Persian Gulf emirate
3. e – used to talk about business in the Burj Khalifa skyscraper in Dubai
4. h – used to talk about the progress in planes and flying
5. g – used to talk about a usage for transistors
6. b – used to talk about the main use of Kevlar
7. a – used to talk about the profession of the inventor of the World Wide Web
8. f – used to talk about how the internet is able to expand

Expressions

Students find the expressions in the article and read them again in context to decide what they mean. They should then use them in sentences of their own.

Key:

1. If a building, organization or country opens its doors, it allows people to enter, especially for the first time.
2. continues to progress
3. used to say that you will now explain something in an easy way
4. in the process of becoming

Working with the list

Preferably working in pairs or groups of three, students decide on three further inventions that they think are important enough to be added to the list. If possible, they should add their three suggestions to the list in chronological order, according to when they were invented. In class, get the students to talk about the inventions they chose, justifying why they believe them

to deserve inclusion.

Extension: Using the article as a model, students write a short paragraph about each of their three additional inventions. This task can be set as homework.

Discussion

Students discuss the questions in class.

Vocabulary record

Here, students should be encouraged to record all of the new and useful vocabulary they have learnt during the lesson, not only in the form presented in the article but also in related forms.

Related topics on onestopenglish

The following lesson plan is based on a Guardian article on the topic of inventions their creators regret:

www.onestopenglish.com/skills/news-lessons/monthly-topical-news-lessons/monthly-news-lesson-inventions-their-creators-regret/553506.article

This Business Spotlight lesson is about cutting-edge technological developments:

www.onestopenglish.com/business/business-spotlight/the-skys-the-limit/552509.article

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1 Quiz

Match these inventors with their inventions. Then, scan the article to check your answers.

- | | |
|---------------------------------|-----------------------|
| 1. Elisha Otis | a. World Wide Web |
| 2. Willis Carrier | b. television |
| 3. the Montgolfier brothers | c. Kevlar |
| 4. Philo Farnsworth | d. lift / elevator |
| 5. Bardeen, Brattain & Shockley | e. nylon |
| 6. Stephanie Kwolek | f. transistor |
| 7. Wallace Carothers | g. air conditioning |
| 8. Sir Tim Berners-Lee | h. hot-air ballooning |

2 Key words

Match the key words to the definitions. Then, find the key words in the article to read them in context.

body armour	credit	determined	faith	fascination
	impact	infrastructure	ingenuity	initiative
milestones	patent	pioneer	talent	urban

- effect or influence
- relating to towns and cities, or happening there
- the ability to solve problems in new and clever ways
- achievements that mark important stages in a process
- the power to interest or attract people very strongly
- an official document that gives someone who has invented something the legal right to make or sell that invention for a particular period of time and prevents anyone else from doing so
- special clothes that soldiers and police officers wear to protect themselves against bullets in extremely dangerous situations
- belief in a god or gods
- not willing to let anything prevent you from doing what you have decided to do
- one of the first people to do something important that is later continued and developed by other people
- praise for something you have done or achieved
- the set of systems that affect how well something operates
- a natural ability for being good at a particular activity
- the ability to decide in an independent way what to do and when to do it

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by Eamonn Fitzgerald



Our planet is getting warmer, say the climate-change experts. So why, then, are hot places more popular than ever? In some of the world's warmest regions, megacities are growing fast: Bangkok, Chennai, Jakarta, Karachi, Lagos, Manila, Rio de Janeiro. Between them, these seven will have more than one billion new residents by 2025.

There are many reasons for the current dramatic rate of urban growth in the developing world but Elisha Otis and Willis Carrier are central to how it is happening. The two New Yorkers never met – Otis died in 1861 and Carrier was born in 1876 – and, yet, they are very much connected. The best place to learn about their impact is an extraordinary steel and glass tower in a Persian Gulf emirate that has transformed itself from a regional trading centre into an international marketplace in less than a generation.

Rising 830 metres into the sky above downtown Dubai, the Burj Khalifa became the world's tallest building when it opened its doors in January 2010. Daily operations inside the skyscraper depend on hundreds of technologies but two are essential for doing business in Dubai's desert climate: lifts and air conditioning.

The Burj Khalifa has a total of 57 lifts, many of which have video screens to entertain people while they travel up and down, and the cooling comfort generated by the air-conditioning system is equal to the daily melting of about 12,000 metric tons of ice.

All of this brings us back to Elisha Otis, who developed the lift in 1853, and Willis Carrier, who invented air conditioning in 1902. The ability to control temperatures and construct "smart" buildings is shaping the increasingly global, urban, vertical face of the twenty-first century but, without the interconnected web of human inventiveness that has spread across the globe during the past 150 years, this progress would not have been possible.

Like the inventions of both Otis and Carrier, the six examples of ingenuity listed here are milestones along the way from past to present, from then to now.

The aeroplane

Daedalus made wings of wax and feathers for his son, Icarus, and told him not to fly near the sun. But Icarus flew too high and the wax melted so he fell into the sea and drowned. This Greek myth is a warning about hubris and a reminder of the fascination of flight. In 1483, Leonardo da Vinci drew a sketch of a parachute; in 1783, the Montgolfier brothers invented the hot-air balloon; and, on 17 December 1903, Wilbur and Orville Wright, inspired by the work of German engineer Otto Lilienthal, used the world's first engine-powered aeroplane to make four short flights in Kitty Hawk, North Carolina. Their invention has been followed by more than a century of aviation innovation that led to the development of the Airbus A380, which can carry 853 passengers at 900 kilometres an hour.

Television

"That's one small step for [a] man, one giant leap for mankind," said the first man on the moon, Neil Armstrong, on 20 July 1969. Here on earth, 600 million people saw the moonwalk live on television and one of those watching was 62-year-old Philo Farnsworth from Utah. "This has made it all worthwhile," said Farnsworth to his wife, Pem, as Stephanie Sammartino McPherson wrote in her book *TV's Forgotten Hero: The Story of Philo Farnsworth*. When Farnsworth filed a patent for the first electronic television, in 1927, one of the most powerful forms of mass media in history was created. TV has always had its critics – the educator Neil Postman wrote one of the harshest analyses of the industry, *Amusing Ourselves to Death* – but it marches on. A recent trend is "binge-viewing", which is when people watch several hours of the same TV series at one time, either online or via DVD.

The transistor

The 1956 Nobel Prize in Physics was awarded to John Bardeen, Walter Brattain and William Shockley for creating the transistor, "one of the most important discoveries of the twentieth century". Simply put, a transistor is a semiconductor device that strengthens and switches electronic signals and electrical power. According to the official website of the Nobel Prize, "It has made it possible to send mankind to the moon, build small yet powerful computers, and construct small and efficient hearing aids. These inventions are just a few examples of everyday items containing transistors." All the technology in our personal computers, smartphones and tablets, or in the huge computers in cloud data centres, functions because of the transistor.

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4 Kevlar

Stephanie Kwolek (1923–2014) was working at the DuPont Company in Delaware when she invented a light, stronger-than-steel fibre in 1965. It was intended for use in automobile tyres but Kevlar, as it was called, became famous for saving the lives of thousands of police officers and soldiers thanks to its use in body armour. “My faith protects me. My Kevlar helps,” says the science-fiction writer Jim Butcher. Aside from protective clothing, Kevlar is found in aeroplanes, boats and mobile phones. When Stephanie Kwolek died at the age of 90, DuPont chief executive Ellen Kullman described her as “a creative and determined chemist and a true pioneer for women in science”. In the twentieth century, innovation came to be associated more and more with specific companies: Wallace Carothers, for example, invented nylon at DuPont in 1935.

before him.” One of these was the German engineer Konrad Zuse, who invented a fully functioning modern computer in 1941. However, the nineteenth-century Englishman Charles Babbage and wartime codebreaker Alan Turing (1912–1954) also invented forms of computers, as did two California hippies, Steve Wozniak and Steve Jobs, in 1976. Their Apple I was the first single-circuit board computer.

The internet

“Sir Tim Berners-Lee invented the World Wide Web in 1989 while working as a software engineer at CERN, the large particle physics laboratory near Geneva, Switzerland,” declares the World Wide Web Foundation. The British computer scientist was building on the work of Vinton Cerf and his American colleagues, who had developed the infrastructure of the internet for the United States Department of Defense Advanced Research Projects Agency (DARPA) in the 1970s. As a constantly expanding multimedia platform based on human talent, ingenuity and initiative, it can be argued that the internet is the greatest innovation in human history – more revolutionary even than the personal computer or the transistor. It is on the way to becoming part of everything for everyone, everywhere.

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5 The personal computer

“Computing is not about computers any more. It is about living,” says Nicholas Negroponte, founder of the Media Lab of the Massachusetts Institute of Technology. Who invented the personal computer? Professor Paul E Ceruzzi, author of *A History of Modern Computing*, says that Ed Roberts, designer of the Altair 8800 in 1974, “deserves credit as the inventor of the personal computer”. But he adds that “calling Roberts the inventor makes sense only in the context of all that came

3 Understanding the article

Answer the questions with information from the article.

1. Why are Otis and Carrier’s inventions so important for the Burj Khalifa building?
2. In what year did the Wright brothers first make four short flights successfully and where?
3. According to Philo Farnsworth, which event made his invention worthwhile?
4. Which everyday items contain transistors?
5. What was the first intended use for Kevlar and what is its most well-known use today?
6. Which people are credited as being the main inventors of the personal computer?
7. Where was Sir Tim Berners-Lee working when he invented the World Wide Web?

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4 Business collocations

Match the words to make business collocations. Find them in the article. What are they used to talk about?

- | | |
|------------------|----------------|
| 1. trading | a. engineer |
| 2. international | b. clothing |
| 3. daily | c. marketplace |
| 4. aviation | d. centre |
| 5. cloud | e. operations |
| 6. protective | f. talent |
| 7. software | g. data |
| 8. human | h. innovation |

5 Expressions

Find these expressions in the article to see how they were used. Explain what they mean and then use them in sentences of your own.

1. opened its doors _____
2. it marches on _____
3. simply put _____
4. on the way to becoming _____

6 Working with the list

Decide on three further inventions that you would add to the list. Add them to the list of inventions in the text. If you can, write them into the correct place, depending on when they were invented.

7 Discussion

- Which of the inventions in the article has had the greatest impact on your life at home? Which has had the greatest impact on your work life? Say why.
- If mankind could only keep three of the inventions, which three would you choose?

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Vocabulary record: The web of ideas

verb	noun	adjective (+ opposite)	adverb (+ opposite)
invent			
	pioneer		
		powerful	
			increasingly

Vocabulary record

