



SUFFERING FOR SCIENCE

Throughout history scientist have risked their health and their lives in their search for the truth ...

- A.** Sir Isaac Newton, the seventeenth century scientist was a genius, but that didn't stop him from doing some pretty stupid things. In his laboratory in Cambridge he often did the most bizarre experiments. Once, while investigating how lenses transmit light he inserted a long needle into his eye, pushed it to the back, and then moved it around just to see what would happen. Miraculously, nothing long-lasting did. On another occasion he stared at the sun for as long as he could bear, to discover what effect this would have on his vision. Again he escaped suffering permanent damage, though he had to spend some days in a darkened room before his eyes recovered.
- B.** In the 1750 the Swedish chemist Karl Scheele was the first person to find a way to manufacture phosphorus. He in fact discovered eight more elements including chlorine, though he didn't get the credit for any of them. He was a brilliant scientist, but his one failing was a curious incidence on tasting a little of every substance he worked with, including mercury and cyanide. This risky practice finally caught up with him, and in 1866 he was found dead in his laboratory surrounded by a large number of toxic chemicals, any of which might have been responsible for his death.
- C.** In the early 1900s when Pierre and Marie Curie discovered radiation, nobody realized what a dangerous and deadly phenomenon it was – in fact most people thought that it was beneficial. There was even a hotel in New York which, in the 1920's, advertised 'the therapeutic effect of its radioactive waters'. Both Pierre and Marie Curie experienced radiation sickness and Marie Curie died of leukemia in 1934. Even now, all her papers from the 1890s, even her cookbooks, are too dangerous to touch. Her laboratory books are kept in special lead boxes and people who want to see them have to wear protective clothing. Marie's husband Pierre, however, did not die from radiation – he was run over by a carriage while crossing the street in Paris.
- D.** Eugene Shoemaker was a respected geologist. He spent a large part of his life investigating craters on the moon, and how they were formed, and later did research into the comets of the planet Jupiter. In 1997 he and his wife were in the Australian desert where they went every year to search for places where comets might have hit the earth. While driving in the Tanami desert, normally one of the emptiest places in the world, another vehicle crashed into them and Shoemaker was killed instantly. Some of his ashes were sent to the moon aboard the Lunar Prospector spacecraft and scattered there – he is the only person who has had this honour.

A. Read the extracts and answer the questions.

Which scientist ...?

1. had a very dangerous way of working with chemicals
2. was injured twice while he/she was doing experiments
3. discovered something which slowly killed him/her
4. was very unlucky to die doing his/her job
5. needed some time to recover from an experiment
6. was granted a special honour after his/her death
7. wasn't as famous as he/she should have been
8. left something behind which is still dangerous today

B. Vocabulary

1. Match the different kinds of scientists with what they study.

A biologist - a chemist - a geneticist - a geologist - a physicist

- _____ natural forces, e.g. light, sound, heat etc.
- _____ living things, e.g. animals and plants
- _____ the structure of substances, what happens in different situations, and when they are mixed with each other
- _____ the cells of living things (genes) that control what a person or plant is like
- _____ rocks and how they are formed

2. Complete the table.

Person	Adjective	Subject
a. Scientist		
b. Chemist		
c. Biologist		
d. Physicist		
e. Geneticist		
f. Geologist		
g. Mathematician		
h. Gynaecologist		

3. Complete the sentences with the correct form of a verb from the list.

Develop discover do (x2) invent make prove volunteer

- Pierre and Marie Curie _____ radiation in 1900.
- Archimedes _____ an important discovery in his bath.
- Isaac Newton's experiments _____ his theory that gravity existed.
- The telephone was _____ in the 1870s.
- Pharmaceutical companies try to _____ new drugs to cure illnesses and diseases.
- Scientists have to _____ a lot of research into the possible side effects of new drugs.
- Before a company can sell a new drug, they have to _____ tests and trials to make sure they are safe.
- People can _____ to be guinea pigs in clinical trials.

4. Collocations in plastics

Some words are often used together. Fill the gaps in sentences 1-6 with a word from the list that often goes with the word in bold.

appliances	industry	moulding	components	materials	process
a. Oil and natural gas are the main raw _____ used in the production of plastics.					
b. Compression moulding is one example of a production _____.					
c. Plastics are used in the production of a wide range of household _____.					
d. Reinforced plastics are a major building material in the construction _____.					
e. The car industry uses high-precision _____ in their vehicles.					
f. The majority of plastics parts are manufactured using injection _____.					

C. LANGUAGE IN USE

1. Report the following dialogues.

- a. 'I'm the new technician.' He said...
- b. 'I'll be back to the lab in a few minutes.' The doctor said...
- c. 'I've been stuck in traffic.' Mara told us...
- d. 'He won't be away for long.' She said...
- e. 'I'll carry the equipment for you.' He said...
- f. 'We're going to the conference next week.' She told us...

2. Complete the text about the history of tractors. Put the verbs in brackets in the correct tense, Past Simple or Present Perfect Simple, active or passive.

Tractors _____¹ (use) on farms since the start of the twentieth century. The first mechanical implements _____² (draw) by horse. Around 1920, petrol-engined tractors _____³ (begin) to replace the horse. These early tractors _____⁴ (pull) implements from a drawbar. Around 1940, tractors _____⁵ (begin) to use a hydraulic lift system. In addition, it _____⁶ (be) possible for farmers to use a power take-off shaft for trailed implements, such as manure spreaders. Since the early 1950s, there _____⁷ (be) many improvements in design. There _____⁸ (be) changes in the tractor cab, making it safer and more comfortable. Computer systems _____⁹ (make) it possible for farmers to check on operations. The engine power for tractor _____¹⁰ (increase) over the years. For many years it _____¹¹ (be) 20-40hp, but it _____¹² (rise) to over 120 hp, and sometimes over 200 hp.

3. Read the following text and fill gaps 1-8 using the best option: a, b, or c, to complete the text.

The Red Apes of Borneo

Almost everybody in the world has heard of orang-utans. These tree-climbing primates have been glamorised by the media, appeared in Hollywood and can be seen in most zoos 1.....The 'orang-utan', 2.....means 'Man of the Forest' in Malay, is the largest tree living mammal and 3..... great ape in Asia. It isn't hard to understand 4..... the Malays call this primate 'orang-utan'. The orang-utan is 5.....human in behaviour - gentle, curious and playful - they live 6.....the vast tropical forests and, under ideal conditions, roam the forests in search of widely distributed food sources such as fruits, plants and insects. The same size 7..... a human baby when it is a toddler, an orang-utan can weigh 8.....90 kilograms upon reaching adulthood. Unfortunately, not many do.

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|---|-----------------|--------------------|-----------------|
| 1 | a) everywhere, | b) widespread, | c) worldwide |
| 2 | a) it, | b) that, | c) which |
| 3 | a) exclusively, | b) one, | c) the only |
| 4 | a) because, | b) the reason for, | c) why |
| 5 | a) incredibly, | b) invariably, | c) impossibly |
| 6 | a) in, | b) between, | c) at |
| 7 | a) like, | b) as, | c) such as |
| 8 | a) up to, | b) totally, | c) heavier than |