# Frankenstein: Exploring the edges of science



**It's alive:** Boris Karloff and Lon Chaney Jr star in the 1944 movie House of Frankenstein

**Mary Shelley's Frankenstein is perhaps society's most famous story about overreaching human knowledge. As the science of artificial intelligence advances, has humanity ignored its warning? (1)**

*'How dangerous is the acquirement of knowledge, and how much happier that man is who believes his native town to be his world, than he who aspires to become greater than his nature will allow.' (2)*

When Victor first began to seek out the secret of life in Mary Shelley's novel, Frankenstein, he was **consumed** with passion for the project. He was desperate to bring the 'man' he had created to life. The novel was written in 1818, at a time when scientists were experimenting with electricity. Many believed that the power to **reanimate** a lifeless body was within humanity's grasp. (3)

But the moment Victor succeeded, 'breathless horror and disgust filled my heart.' So begins the terrifying chain of murder and abandonment which finally leads him to chase his creature through the Arctic and towards the North Pole. (4)

At its core, Frankenstein is a story about humanity grappling with the edges of science. 200 years later, scientists are no longer confused about how electricity works, but they are still debating whether it can ever produce life. (5)

The 'Turing Test' of artificial intelligence (AI) has already been passed. So when does that intelligence become consciousness? Some scientists have argued that it depends on an awareness of self and identity. After all, this is what makes Frankenstein's creature so **compelling** — entire chapters are written from his point of view, so we see him develop, learn language, and experience emotions. We also see that humanity's treatment of him turns his kind heart cruel. (6)

In July this year, scientists in New York recorded what they believe to be the first sign of self-awareness in humanoid robots. If they are right, they must begin to face the question of when their creations become 'alive', and what responsibilities humanity has towards them. (7)

**'Miserable Monster'**

Frankenstein shows us the darkest consequences of human knowledge, often using religion and nature as a **counterpoint**; by creating life, Victor tried to elevate himself to a God and suffered the terrible consequences. Since then, similar stories of man-made creations with disastrous results have often been told. We should heed these warnings, many say; just because we can do something, does not mean that we should. (8)

Others argue that the benefits of scientific invention far outweigh the risks. Of course we should proceed with caution, but AI is being developed to solve problems, not create them. Computers can already find the quickest route to an airport in under a second — what if they could also find the best cure for a disease, or an answer to the world's energy crisis? Stories depend on exaggerated risk and dramatic effects: but that is no reason to hold back in real life. (9)

## Q & A

1. **What made Frankenstein so special?**
   The very fact that it tapped into one of humanity's greatest anxieties — whether we will be destroyed by our own inventions — is part of what has helped it to endure for almost 200 years. It is also an excellent piece of writing; it has all the horror and drama of a Gothic ghost story, but its careful reflections on human nature make it so much more than that.

2. **Could science also extend human life?**
   Bio-engineering is one of the fastest growing areas of scientific study, as researchers integrate technology further into medicine. There are now bionic legs, for example, which can be controlled by thought alone. Some, such as Google's director of engineering Ray Kurzweil, think that bio-engineering could allow humans to live for thousands of years.

## WORD WATCH

### Electricity
In 1803, Giovanni Aldini used electricity to induce movement in the muscles of a recently executed murderer's corpse. With such dramatic experiments firmly in the public consciousness, Frankenstein's monster did not seem so far-fetched.

### North Pole
While scientists studied electricity, explorers were beginning to travel to the Arctic. They would not reach the North Pole until 1908 or 1909, when Frederick Cook and Robert Peary both claimed to be the first.

### Turing Test
A test of computer intelligence, proposed by the computer scientist Alan Turing. He argued that if a human studying a five-minute written conversation between two parties cannot tell that one of them is a machine, the machine is 'thinking'. It is claimed that 'Eugene Goostman', a programme posing as a 13-year-old Ukrainian boy, passed it last year.

### Self-awareness
Asked whether it had been given a 'dumbing pill' which would mute its voice, a Nao robot stood and said 'I don't know'. On hearing its own voice, however, it apologised. 'Sorry. I know now. I was able to prove that I was not given a dumbing pill'.

**ACTIVITIES:**

a) ***Vocabulary*** – Can you guess the meaning of the words in blue? Look up any words that are new to you.

b) What was so relevant about Mary Shelley's novel *Frankenstein* when it was written in 1818? (Paragraph 3)

c) How do scientists think we can determine whether artificial intelligence (AI) in robots becomes consciousness?

**d**) Summarise the two arguments put forward in paragraphs 8 and 9. **Which of these points of view do you agree with the most? Should humanity set limits on its own pursuit of knowledge? Discuss.**