The Unconscious Machinery of the Brain

Before Reading

Unconscious machinery

- With a partner, brainstorm examples of:
  - Actions which have always been unconscious, since birth (such as blinking)
  - Actions which had to be learned, but have now become unconscious (such as talking)
  - Actions which are still controlled mostly by your conscious brain (such as a sport you have recently learned to play).

Reading the Text

Read the whole text on pages 87-88.

After Reading

Sympathy and empathy: the writer in the picture

Word definitions:

Sympathy: a feeling of compassion or pity for someone else's difficulties

Empathy: putting yourself in someone else's shoes, imagining what it would be like to experience what they are going through.

- Working in a pair, you are going to create a frozen image (statue) to represent the article. One of you should take up a position as Ian, performing the tricky task of walking. The other person is going to be the writer. Together, discuss how to put the writer in the picture. For example, is the writer trying to see things through Ian's eyes? Or standing at a distance taking notes? What is his facial expression?
- As a class, take a look at some of the frozen images. The pair in the picture should not speak, but the rest of the class should comment on what they think the image suggests about the writer's attitude towards Ian's situation.
- On your own, think about whether the article makes you feel sympathy or empathy for Ian's situation. Write a few sentences explaining what you think about this.
- Share some of your ideas as a class.

Boxed information

- With a partner, discuss why the information about proprioception has been put in a box, using the prompts below to help you if you wish.
  - Is the information in the box different to the information in the rest of the article? How?
  - What does the information in the box add to the extract? Is it essential to understanding the rest of the extract?

Describing sentences

- With your partner, re-read the passage thinking about the way the writer uses sentences. Find an example of a sentence to fit each of the descriptions, below.

A.	A short, simple sentence sums up the paragraph.
B.	A long, multi-clause sentence adds layers of information.
C.	A complex sentence draws attention to the contrast between Ian's situation to that of most people who might be reading the article.
D.	Unusual word order makes this sentence stand out.
E.	A rhetorical question invites the reader to engage with the information in a personal way.
F.	The final clause in the sentence makes a particularly strong impression on the reader.

- On your own, choose a favourite sentence and think about why you like it. Draw on the sentence descriptions to help you to explain what it is you like, for example:

  - » Simple sentence
  - » Multi-clause sentence
  - » Unusual word order
  - » Final clause
  - » Rhetorical question
  - » Long sentence
  - » Short sentence
  - » Contrast

- Share your explanations as a class.

Your own writing

Choose one of the following writing tasks:

- Write to David Eagleman explaining how effectively you think he told Ian's story, using evidence from the text to back up your views.
- Write a piece of short fiction inspired by Ian's situation. Your story does not have to be about Ian.

THE UNCONSCIOUS MACHINERY OF THE BRAIN

BY DAVID EAGLEMAN

This extract is from *The Brain*, a best-selling book about the latest brain research, known as 'neuroscience'. The book was also made into a series for television.

The unconscious machinery of our brains is at work all the time, but it runs so smoothly that we're typically unaware of its operations. As a result, it's often easiest to appreciate only when it stops working. What would it be like if we had to consciously think about simple actions that we normally take for granted, such as the seemingly straightforward act of walking? To find out, I went to speak with a man named Ian Waterman.

When Ian was nineteen years old, he suffered a rare type of nerve damage as a result of a fierce case of gastric flu. He lost the sensory nerves that tell the brain about touch, as well as the position of one's own limbs (known as proprioception). As a result, Ian could no longer manage any of the movements of his body automatically. Doctors told him that he would be confined to a wheelchair for the rest of his life, despite the fact that his muscles were fine. A person simply can't get around without knowledge of where his body is. Although we rarely pause to appreciate it, the feedback we get from the world and from our muscles makes possible the complex movements we manage every moment of the day.

PROPRIOCEPTION

Even with your eyes closed, you know where your limbs are: is your left arm up or down? Are your legs straight or bent? Is your back straight or slumped? This capacity to know the state of your muscles is called proprioception. Receptors in the muscles, tendons and joints provide information about the angles of your joints, as well as the tension and length of your muscles. Collectively, this gives the brain a rich picture of how the body is positioned and allows for fast adjustments.

You can experience your proprioception fail temporarily if you've ever attempted to walk after one of your legs has gone to sleep. Pressure on your squeezed sensory nerves has prevented the proper signals from being sent and received. Without a sense of the position of your own limbs, simple acts like cutting food, typing, or walking are almost impossible.

Ian wasn't willing to let his condition confine him to a life without movement. So he gets up and goes, but the whole of his waking life requires him to think consciously about every movement his body makes. With no sense of awareness of where his limbs are, Ian has to move his body with focussed, conscious determination. He uses his visual system to monitor the position of his limbs. As he walks, Ian leans his head forward to watch his limbs as best he can. To keep his balance, he compensates by making sure his arms are extended behind him. Because Ian can't feel his feet touch the floor, he must anticipate the exact distance of each step and land it with his leg braced. Every step he takes is calculated and coordinated by his conscious mind.

Having lost his ability to walk automatically, Ian is highly cognisant of the miraculous coordination that most of us take for granted when going on a stroll. Everyone around him is moving around so fluidly and so seamlessly, he points out, that they're totally unaware of the amazing system that's managing that process for them.

If he is momentarily distracted, or an unrelated thought pops into his head, Ian is likely to fall. All distractions have to be tucked away while he concentrates on the smallest of details: the slope of the ground, the swing of his leg.