Unit 6.6: We are AI developers

5 words to remember

artificial intelligence (AI): the study of automated systems that perform functions that require intelligence when performed by humans

decision tree: a branching sequence of questions used to identify the category an item belongs to

machine learning: an AI approach where computerised systems use training and test data to learn from the input and output relationship, continually improving their learning based on this method

neural network: a type of machine-learning algorithm, based loosely on the brain, that recognises patterns

sentiment analysis: a language-processing application that attempts to identify the emotional tone of a piece of text

Knowledge check

Test yourself: Which of the following is not essential for a self-driving car?

a) Cameras
b) Sensors
c) Heated seats
d) Seatbelt

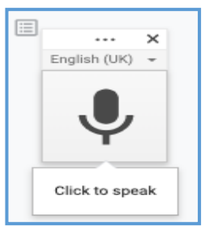
Test yourself: What different purposes may **sentiment analysis** be used for?

Test yourself: List three reasons for and three against the continued growth of **AI** in society.

People: Stephen Hawking

Stephen Hawking (1942–2018) was a celebrated English scientist. He is known for his studies about the universe and black holes. At the age of 21, Hawking was diagnosed with a disease that weakened his muscles and caused paralysis, which led to difficultly in speaking. As a result, he made use of technology to communicate with others. This included a speech-generating device that was able to select inputs based on the smallest movements from a clicker. This was then used to select words on a tablet computer that was fixed to his wheelchair. The output came in the form of the device using a speech synthesizer to play the words or sentences out loud.

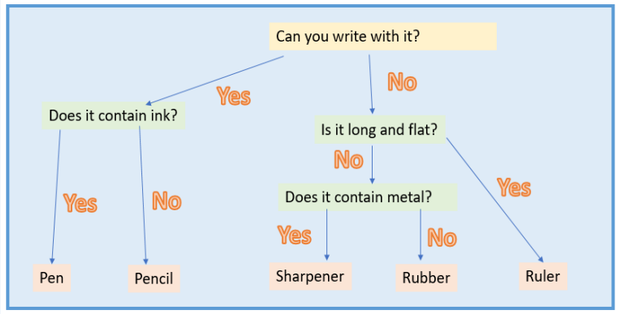
Speech recognition is an area of **machine learning** where speech is typed out as text. This can be seen in tools such as the Google Voice Type function in Google Docs.



Test yourself: How else can AI or technology be used as an assistive tool to support people with disabilities?

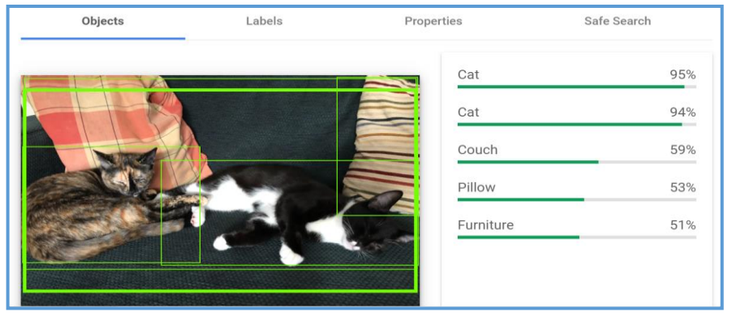
Key takeaways

- There are many forms of artificial intelligence (AI) that are used in everyday life, such as speech and image recognition.
- Computer scientists have found ways to program and train computers to learn. One approach to machine learning can be visualised in the form of a **decision-tree** classifier (also known as a 'branching database') where questions are used to see whether certain criteria are met.



This decision tree uses questions to explain the criteria for each item of stationery. In machine learning, training data would be used for this purpose.

- Machine learning involves the use of both training and test data to develop the accuracy of the system.
- Tools such as Google QuickDraw and Vision AI (see below) provide good examples of a **neural network** where the AI system is constantly improving by being trained to recognise drawings or images.



The Vision AI tool can recognise each item in this photograph by using its neural network of previous training.

- Machine-learning algorithms can also be used to classify words or comments depending on their tone. This is known as 'sentiment analysis' and allows companies to identify opinions and data patterns.
- As AI continues to grow, people are increasingly discussing its ethics; in other words, whether it is good for society and individuals, for example there is a lot of debate around the advantages and disadvantages of self-driving cars and language-processing writing tools.