50 READING PRACTICE

You are going to read about some little robots that can assemble themselves. Six sentences have been removed from the article. Choose from the sentences A-G the one which fits each gap 37-42. There is one extra sentence which you do not need to use.

- ☐ A The scientists involved in the project have been dreaming of achieving this for many years.
- ☐ B That would allow the robot to move in any direction.
- ☐ C The little robot has yet to reach that level of technical trickery.
- ☐ D They also claim that the equipment needed to manufacture the robot on a larger scale would cost relatively little.
- ☐ E And those are not the only options.
- ☐ F The scientists say they could easily modify this so that the process is triggered by something else.
- ☐ G Each is different and has a particular function.

SELF-ASSEMBLING ROBOT

In some science films, 'transformer' robots can disguise themselves as ordinary everyday objects and then change shape to turn back into robots again. Scientists have built the world's first working robot that can transform itself in this way.

Alien robots that so often feature in science fiction movies hide their true nature by, for example, taking on the form of vehicles.
37) .... Instead, it disguises itself - for now, at least - as a flat, nondescript object. Video footage from the research laboratory shows a circuit board mounted with batteries and sandwiched between paper and plastic. Without human intervention, this contraption is able to unfold itself into a small working machine and then walk away.

38) .... Their flat-pack robot uses special chemicals called 'shape memory polymers' which contract like muscles when they are heated. The robot takes about four minutes to assemble itself from scratch and once this process is complete, it can walk at a speed of around 5cm per second. The team used computer design tools to create the robot from three layers. **39)** .... A layer of paper provides protection for the flexible electronic circuit underneath and a layer of pre-stretched plastic covers the working parts. Mechanisms that allow the robot's legs to move into position contain tiny circuits, which heat up on command. These mechanism are programmed to ensure that the limbs unfold at specific angles. To work out where the folds need to go, the scientists used computer software inspired by origami, the Japanese art of folding paper into different shapes.

The robot has a built-in timer and starts to fold itself into shape 10 seconds after its batteries have been fitted.
40) .... For example, an environmental sensor, sensitive to temperature or pressure, could set the process in motion instead. Around four minutes after assembly, the robot's folding mechanisms cool down enough to set hard and the robot's folding mechanisms could down enough to set hard and the robot's micro controller sends signals to the legs to make it walk.

They scientists were pleased to discover that the energy stored in just one AA battery was enough to allow the robot to unfold itself and move away. **41)** .... That could have a major impact on its further development.

The invention could even pave the way for flat-packed machines for use in space. Dozens of robotic satellites could be sandwiched closely together so that they could be sent up to space and then assemble themselves remotely once they get there. They could take images, collect date and more. **42)** .... They could be used in hazardous environments on Earth, for example to deal with problems in mines deep underground so that people do not have to put themselves at risk.