

Complete the text below by writing a suitable word from the list in each space provided. There are 15 gaps but 20 words are given. Use each word once only. There is an example (0) for you. Indicate your answers on the separate answer sheet.

The computer age

In the nineteenth century, machines changed the world. Suddenly, people *could*(0) travel more easily and communicate ...(1)... quickly. Work changed, too, and ...(2)... people got jobs in factories. It ...(3)... the start of the Industrial Age.

The ...(4)... half of the twentieth century saw the start ...(5)... the Computer Age. At first, computers were ...(6)... difficult to use, and only few people understood ...(7)... . But, soon, computers began to appear both ...(8)... offices and homes. Today, they are everywhere. Some people still say that they ...(9)... never used a computer, but they probably use computers ...(10)... day – they just don't realize it. This is ...(11)... there are computers in so many ordinary things: cars, televisions, CD-players, washing machines.

When ...(12)... first computers were built in the 1940s and 1950s, they ...(13)... enormous. In fact, they were as big ...(14)... a room. Now, computer chips can be very small. Over the past fifty years computers have changed much more ...(15)... people thought possible.

*Information Technology
Oxford Bookworms 3*

all	
as	second
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Read the text and fill in the table that follows in English.

Nano-welds herald new era of electronics

The world's smallest construction site is taking shape in a laboratory in Switzerland, thanks to the development of new welding techniques that work at scales of a billionth of a metre.

The researchers behind the techniques say they can be used to assemble electronic components at smaller scales than have ever been possible.

One technique, called "nanorobotic" spot welding, uses molten copper to join up objects in the same way that a human electrician might use solder. It was developed by Brad Nelson and Lixin Dong at the Institute of Robotics and Intelligent Systems, Zurich.

"We position a 50-nanometre-wide carbon nanotube which is filled with copper inside a nanorobotic manipulator, and run a small voltage through it to melt the copper," explains Dong. In experiments the researchers positioned the manipulator so that the melting metal connected one carbon nanotube to another.

Dong says he expects the technique to be useful for building electronic devices. The copper can be used to make electrical connections with low resistance. That could connect nanotubes into tiny transistors, the current-switching building blocks of most electronic devices.

Multiple joins

The circuits can be made by running voltage through a copper-filled nanotube which is lying across two electrodes – the melting copper would then cement the nanotube in place. "That would be easier and take less energy than putting extra electrodes on top, as people do now," says Dong.

Because electricity drives the welding technique it could be possible to make lots of joins at once, says Dong. "We could run a voltage through a structure of nanotubes which are put together by self assembly or using electric fields," he explains: "It would weld them all into place."

Amorphous carbon

Sergey Gordeev, along with colleague Andy Moskalenko (Bath University), has developed another nanowelding method. "It only requires an electron microscope," he explains.

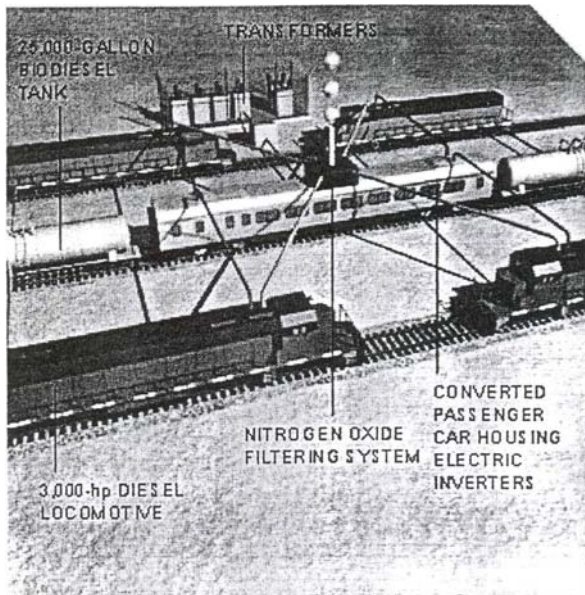
It exploits an effect that is usually a problem for researchers who use electron microscopes. Inside the microscope, the electron beam transforms tiny amounts of carbon-based contaminants into unwanted amorphous carbon around the sample which is examined.

"We realised that could actually have interesting applications," explains Gordeev, who has shown that the effect can be used to weld nano-sized objects onto a surface or even to build objects from scratch.

Electrons from the microscope's beam are scattered by the sample and the surface the sample stands on. "They transform the contaminants into amorphous carbon – it's quite similar to diamond," says Gordeev.

	“Simple” nano-welds	Multiple joins	Amorphous carbon
Developers			
Material and device used	<ul style="list-style-type: none"> a) copper b) c) 	<ul style="list-style-type: none"> a) b) 	<ul style="list-style-type: none"> a) carbon-based contaminants b)
Agent		voltage / electricity	
Application	building electronic devices		building objects from scratch / weld objects onto a surface

Read the text below and answer the questions which follow in Hungarian:



Power train by Rob Barnett

WORKING ON THE RAILROAD

California's Sierra Railroad has designed a system to provide electric power.

It uses railroad equipment. Each of the 12-cylinder diesel engines generates 2.1 megawatts of electricity. Its fuel is based on vegetables.

"It was the end of civilization as we know it," says Mike Hart, CEO (Chief Executive Officer) of California's Sierra Railroad, of the blackouts that devastated California last year. But the crisis also gave Hart an idea. "I looked at one of our locomotives and thought: We could supply an entire town with power."

The Sierra Railroad, a freight and tourism line in central California, has decided to modify 48 of its diesel-powered locomotives to generate power. Each locomotive's diesel generator will be linked to an electric inverter, a standard device which is used to create electrical energy in equipment like windmills or solar cells. Together, the 48 trains will produce 100 megawatts of electricity, enough for 100,000 homes. In a crisis, they could deliver power anywhere in the country.

But what made Hart's good idea better was his decision to use biodiesel as the fuel. Biodiesel is made from agricultural sources such as soybeans, rapeseed, or even recycled cooking oil. Unlike other alternative fuels, it can power existing diesel engines with little or no modification. Biodiesel is currently used only by a few federal agencies, municipalities, and universities, because it's more expensive than regular diesel. But researchers found that this fuel could reduce carbon dioxide emissions by as much as 78 percent. Hart's goal is to use the fuel to bring about a 95 percent decrease in net pollution, making his operation "cleaner than most coal-fired power plants."

The first locomotive will begin supplying power in 2003, but already Hart has won a 2002 Environmental Award from the U.S. government. He insists it's just the beginning. "Railroads," he says, "are the largest source of untapped electricity in the country."

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1. Milyen céllal hozta létre Mike Hart az áramszolgáltató vonatot?
2. Hogyan fog a „Sierra Vasúti Társaság” áramot termelni?
3. Milyen berendezésekben használnak még elektromos átalakítókat?
4. Vészhelyzetben a Sierra vonatai által termelt elektromos áram hol használható fel?
5. Milyen üzemanyagot használ az áramszolgáltató vonat?
6. Miből nyerik ezt az üzemanyagot?
7. Mi az üzemanyag haszna az üzemeltetés szempontjából?
8. Mi az üzemanyag haszna környezetvédelmi szempontból?
9. Milyen célt akart Mike Hart elérni?
10. Mit nyert el Mike Hart tervével?

Íráskészség

Időtartam: kb 30 perc

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Write a **letter of inquiry** in **80-100 words** to the manufacturer.

- say why you are writing
- ask for technical details (capacity of machine, quality of water)
- ask for a specification brochure

Assessment Criteria	Points max	Points
Communicative value	5	
Expressiveness	5	
Accuracy	5	
Total:	15	