# Text 1. 'Melt in the body' electronics devised

**1.Read the article and answer the following questions.**

# 1. Where could electronic devices invented in the US be used?

# 2. What happens to these devices after doing their job?

# 3. What components do the devices consist of?

# 4. What is the difference between such devices and traditional electronics?

# 5. What scientific developments is the electronics mentioned based on?

# 6. Why do researchers use nanomembranes in “melt in the body” electronics?

# 7. What is the role of silk?

# 8. What is the range of new electronics uses?

# 9. How could the device be used in surgery?

# 10. What kinds of tests have already been done?

# 11. What could future applications of the devices be?

Ultra-thin electronics that **dissolve** inside the body have been **devised** by scientists in the US and could be used for a range of medical roles.

The devices can "melt away" once their job is done, according to research [published in the journal Science](http://www.sciencemag.org/content/337/6102/1640).

The technology has already been used to heat a **wound** to keep it free from infection by bacteria.

The components are made of silicon and magnesium oxide, and placed in a protective layer of silk.

It is part of a field termed "transient electronics" and comes from researchers who have already [**developed** "electronic tattoos"](http://www.bbc.co.uk/news/health-14489208) - **sensors** that **bend** and **stretch** with the skin.

They described their vanishing devices as the "polar opposite" of traditional electronics, which are built to be stable and to last.

Getting the electronics to fade away in a controlled manner **relies on** two scientific developments - getting the electronics to dissolve at all and using a shell to control when that happens.

Silicon dissolves in water anyway. The problem is that the size of components in **conventional** electronics means it would take an **eternity**. The researchers used incredibly thin sheets of silicon, called a nanomembrane, which can dissolve in days or weeks.

The speed of melting is controlled by silk. The material is collected from silkworms, dissolved and then allowed to reform. **Altering** the way the dissolved silk crystallises changes its final **properties** - and how long the device will last.

Prof Fiorenzo Omenetto, from Tufts school of engineering, said: "Transient electronics offer robust performance comparable to current devices but they will fully resorb into their environment at a prescribed time, ranging from minutes to years."

A range of uses have already been tested in the laboratory including a 64-pixel digital camera, temperature sensors and solar cells.

John Rogers, a mechanical science and engineering professor at the University of Illinois, said: "It's a new concept, so there are lots of opportunities, many of which we probably have not even **identified** yet." He told that one likely use would be in wounds after surgery.

"Infection is a leading cause of readmission, a device could be put in to the body at the site of surgery just before it is closed up," he said.

"But you would only need it for the most critical period around two weeks after surgery."

The team of researchers have tested on rats a device that heats a wound to kill off bugs.

There are also ideas around using the technology to slowly **release** drugs inside the body or to build sensors for the brain and heart.

It could also be used to make other items such as computers or mobile phones more environmentally friendly.

"Imagine the environmental benefits if cell phones, for example, could just dissolve instead of **languishing** in landfills for years," said Prof Omenetto.

**Do Ex.2 and Ex.2a on the active vocabulary of the text.**

EX.2 Match the items on the right to the items on the left.

|  |  |  |
| --- | --- | --- |
| dissolve |  |  |
| devise |  |  |
| wound |  |  |
| develop |  |  |
| sensor |  |  |
| bend |  |  |
| stretch |  |  |
| rely |  |  |
| conventional |  |  |
| eternity |  |  |
| alter |  |  |
| property |  |  |
| identify |  |  |
| release |  |  |
| languish |  |  |

EX 2a Match the words on the right to the words on the left

dissolve

detector

invent

curve

quality

injury

extend

usual

depend

change

distinguish

decay

decompose

infinity

discharge

evolve

devise

wound

develop

sensor

bend

stretch

rely

conventional

eternity

alter

property

identify

release

languish