**B2. Modals future could, will, predictions Units 4, 5**

Read the text and answer the questions.

**A Graphene Discoverer Speculates on the Future of Computing**

January 23, 2015

<http://www.scientificamerican.com/>

In 2010 two physicists at Manchester University in the U.K. shared a [Nobel Prize in Physics](http://www.scientificamerican.com/article/geim-novoselov-physics-novel/) for their work on a new wonder material: [graphene](http://www.scientificamerican.com/article/carbon-wonderland/), a flat sheet of carbon just one atom thick. Konstantin Novoselov and Andre Geim, both Russian émigrés, discovered the material by applying plain old sticky tape to simple graphite.

Graphene is highly conductive and transparent and is also the strongest material known to science. One day it could [revolutionize electronics](http://www.scientificamerican.com/article/stacks-of-atom-thin-form-materials-the-world-has-never-seen/). Novoselov tells us about the possibilities of this 2-D material and how it could transform the industry.

*Translate into English*

*Las características del grafeno permitirán a los científicos y los investigadores transformar la industria.*

***The characteristics of graphene will allow scientists and researchers to transform the industry.***

[*An edited transcript of the interview follows.*]

**What does graphene mean for the future of computing?**  
**It** is certain that silicon will be used for transistors—semiconductor devices that are the building blocks of modern computers—for at least the next five to 10 years. But people are already thinking about possible alternative materials and technologies to replace silicon when **it** will fail to deliver for increasingly smaller and smaller transistors. A graphene transistor is one of the alternatives.

I’m also looking into other one-atom-thick 2-D materials that were obtained soon after graphene and at heterostructures based on those 2-D crystals. Potentially they can provide an alternative to silicon technologies, but here we’re talking about completely new architecture rather than just introducing a new material into the system. **It’**s hard to predict how it will develop because when you introduce one new material into a process, **it**’s already quite a complicated step, and if you want to change the whole architecture, **it** requires years of research. That’s why research should start now if we want to achieve something like that in 10 years’ time.

1. *Decide whether the following statements are true (T) or false (F) according to the text.* ***If they are false make the necessary changes so that they become true. Indicate the lines of the text that show them to be true or false.***
2. *In the future, it will not be easy to use silicon in very small transistors.* ***T (3-14)***
3. *In 10 years’ time we will have a completely new architecture.* ***F if we start research now. (28-30)***
4. *Find synonyms for the underlined words.* ***Sure, substitute, possibilities, difficult, evolve, entire, needs.***
5. *What does* ***it*** *in bold type refer to?* ***that silicon...years; silicon; to predict...develop, when you introduce...process, to change the whole architecture.***
6. *Rewrite the sentence using two other expressions expressing certainty:*

*It is certain that silicon will be used for transistors for the next five years.*

1. ***Silicon will certainly be used for transistors for the next five years.***
2. ***Silicon is sure/certain to be used for transistors* *for the next five years.***
3. *Translate into Spanish*

*I’m also looking into other one-atom-thick 2-D materials that were obtained soon after graphene.*

***También estoy investigando otros materiales 2-D de un átomo de espesor que se obtuvieron poco después del grafeno.***

**What do you think computers of the future could look like?**  
Computers are much more than just a display, interface and software: they are mainly about computing power and microprocessors—also known as the central **processing** unit [CPU], or the “brain” of a computer. In the future, we’ll probably expand the parallel computations, utilizing microprocessors with larger number of cores, when several CPUs will be working **together** on the same chip, enabling the computer to **perform** many more tasks with a much **greater** overall system performance. At the same time more specialized computers will **start** to appear because the cost won’t be so prohibitive anymore.

1. *Fill in the gaps with the adequate word.*
2. *Find synonyms for the underlined words.* ***principally, various, complete, come out, as/since***
3. *There are five comparisons of superiority in this extract (much more, larger, many more, much greater, more specialised). If we wanted to give the opposite meaning, in which of them could we use “ far fewer”?* ***many more***
4. *Translate into English*

*En el futuro, los computadores especializados no serán tan caros como ahora.*

***In the future, specialized computers will not be as expensive as they are nowadays.***

**Do you think that in the future we will still think in terms of separate entities called computers?**  
Microprocessors will still exist. You won’t get rid of them. How parallel the computations can be and how many computers will be linked into a large network, into a cloud, that’s a different question. And with advances in telecommunications, with the speed getting higher and higher, it’s much easier to link many computers into a large network. That’s definitely what we’ll see more and more of. We’re seeing it already now, when a lot of our data is stored not on our desktop but in the cloud—and cloud computations will be more and more popular. But the basis will still be microprocessors and electronics and the current architecture.

*Rewrite the sentences according to the new beginnings*

1. *The number of computers linked into a large network will constantly increase.*

*There will be* ***more and more computers linked into a network.***

1. *Cloud computing will be more and more popular.*

*The popularity of* ***cloud computing will gradually increase.***

1. *There is a steady rise in the speed of telecommunications.*

*The speed of telecommunications* ***is getting higher and higher.***