SET English

TODAY:

1. **Why vocabulary?**
2. **Context: Listening & Reading practice**
3. **Vocabulary**

Homework: *complete* the table and email alain@set-english.com

Why is vocabulary so important in OET study?

Helps understanding for Part B & C in Reading & Listening.

It's the key to passing.

What do people usually fail?

Reading.

Vocabulary more anything else will give you the answers.

Context: situation

SET English

LISTENING:

Sara-Jane Dunn: The Next Software Revolution

1. **What comparison is made at the beginning of the presentation?**
   Computers / biology

2. **She says 'its impact will be so enormous that'**

   A We will all be afraid
   B Its difficult to see its consequences
   C Seem much less serious and important

3. **In order to learn how to use these new tools requires… what?**

4. **We can't study flying but only studying feathers and therefore**

   A We can't only study computers
   B We must take a holistic approach
   C We should focus not just on cells

5. **The speaker suggests:**

   A. Houseplants are modest
   B. Houseplants are not computers
   C. Houseplants are like computers

6. **If we understand the mechanism of biology we can:**

   A. Fix them (debug)
   B. Heal them
   C. Purify them

7. **What does the speaker mean by 'naive' at the end of the talk?**

SET English

Sara-Jane Dunn: The Next Software Revolution

to give instructions to a computer verb

The second half of the last century was completely defined by a technological revolution: the software revolution. The ability **to program** electrons on a material called silicon made possible technologies, companies and industries that were at one point unimaginable to many of us, but which have now fundamentally changed the way the world works. The first half of this century, though, is going to be transformed by new **paradigm shift**: the living software revolution. And this will be powered by the ability to program biochemistry on a material called biology. And doing so will enable us to **harness** the properties of biology to generate new kinds of therapies, to repair damaged tissue, to reprogram faulty cells or even build programmable operating systems out of biochemistry. If we can realize this -- and we do need to realize it -- its impact will be so enormous that it will make the first software revolution **pale in comparison**.

change the way things at deepest level possible

noun

faded when you compare / much less important

What comparison is made at the beginning of the presentation?
Biology / computing

She says 'its impact will be so enormous that'

A We will all be afraid
B Its difficult to see its consequences
C Seem much less serious and important

section / part / division usually of society

noun

to make it LOOK small verb

01:11
And that's because living software would transform the entirety of medicine, agriculture and energy, and these are **sectors** that dwarf those dominated by IT. Imagine programmable plants that fix nitrogen more effectively or resist emerging fungal pathogens, or even programming crops to be **perennial** rather than annual so you could double your crop yields each year. That would transform agriculture and how we'll keep our growing and global population fed. Or imagine programmable immunity, designing and **harnessing** molecular devices that guide your immune system to detect, **eradicate** or even prevent disease. This would transform medicine and how we'll keep our growing and aging population healthy.

all year without stopping

adjective

remove completely

verb

to control
to tak
the power of something

ING / verb

SET English

to discover
to find out
verb / ING

01:59
We already have many of the tools that will make living software a reality. We can precisely edit genes with CRISPR. We can rewrite the genetic code one base at a time. We can even build functioning synthetic circuits out of DNA. But **ascertaining** exactly how and when to wield these tools is still a process of trial and error. It needs deep expertise, years of specialization. And experimental protocols are difficult to discover and all too often, difficult to **propagate**. And, you know, we have a **tendency** in biology to focus a lot on the parts, but we all know that something like flying wouldn't be understood by only studying feathers. So programming biology is not yet as simple as programming your computer. And then to make matters worse, living systems largely **bear no resemblance** to the engineered systems that you and I program every day. In contrast to engineered systems, living systems self-generate, they self-organize, they operate at molecular scales. And these molecular-level interactions lead generally to robust macro-scale output. They can even self-repair.

prone to /
very possible
noun

to produce /
to spread out
verb

In order to learn how to use these new tools requires… what?
Trial & error / deep expertise / years of specialization

to carry / to have
no similarily
phrase

We can't study flying but only studying feathers and therefore
~~A We can't only study computers~~
B We must take a holistic approach
C We should focus not just on cells (?) – partially

03:07
Consider, for example, the **humble** household plant, like that one sat on your mantelpiece (shelf above the fireplace) at home that you keep forgetting to water. Every day, despite your neglect, that plant has to wake up and figure out how to allocate its resources. Will it grow, photosynthesize, produce seeds, or flower? And that's a decision that has to be made at the level of the whole organism. But a plant doesn't have a brain to figure all of that out. It has to make do with the cells on its leaves. They have to respond to the environment and make the decisions that affect the whole plant. *So somehow there must be a program running inside* these cells, a program that responds to input signals and cues and shapes what that cell will do. And then those programs must operate in a distributed way across individual cells, so that they can coordinate and that plant can grow and flourish.

not telling everyone you amazing
even if you are in some way

The speaker suggests:

A. Houseplants are modest
B. Houseplants are not computers
C. Houseplants are like computers – main idea

03:59

Flourish: to do well in life

Good career, family, nice house - living life as it should be

03:59
If we could understand these biological programs, if we could understand biological computation, it would transform our ability to understand how and why cells do what they do. Because, if we understood these programs, we could **debug** them when things go wrong. Or we could learn from them how to design the kind of synthetic circuits that truly exploit the computational power of biochemistry.
If we understand the mechanism of biology we can:

A. Fix them
B. Heal them
C. Purify them

fix a error / mistake (usually in a computer)

verb

04:25
My passion about this idea led me to a career in research at the interface of maths, computer science and biology. And in my work, I focus on the concept of biology as computation. And that means asking what do cells **compute**, and how can we uncover these biological programs? And I started to ask these questions together with some brilliant collaborators at Microsoft Research and the University of Cambridge, where together we wanted to understand the biological program running inside a unique type of cell: an embryonic stem cell. These cells are unique because they're totally **naïve**. They can become anything they want: a brain cell, a heart cell, a bone cell, a lung cell, any adult cell type. This **naïvety**, it sets them apart, but it also **ignited** the imagination of the scientific community, who realized, if we could tap into that potential, we would have a powerful tool for medicine. If we could figure out how these cells make the decision to become one cell type or another, we might be able **to harness** them to generate cells that we need to repair diseased or damaged tissue. But realizing that vision is not without its challenges, not least because these particular cells, they emerge just six days after conception. And then within a day or so, they're gone. They have set off down the different paths that form all the structures and organs of your adult body.

to calculate (1+1=2)
to think verb

see above

1. innocent
2. Without experience

3. 'Can be anything you want' - scientific jargon?

noun / adjective

What does the speaker mean by 'naive' at the end of the talk?

Usually it means innocent.

Here it means: 'you can be anything you want'

start a fire
verb

Want to hear the rest? Click here: [The Next Software Revolution]

Homework: complete the diagram with example sentences:

WORD	TYPE	MEANING	**EXAMPLE**
To program			
paradigm shift			
pale in comparison.			
Sector			
perennial			
harnessing			
ascertaining			
propagate			
tendency			
bear no resemblance			
humble			
debug			
compute			
naïve / naivety			
ignited			
to harness			

Email to: alain@set-english.com (famous!)