**Describing a process**

1. **In pairs, discuss the following questions.**
2. What processes do you need to describe in your field of research: Who do you describe them for?
3. How much detail do you need to include in your descriptions?
4. What do you think are the most important points to remember when describing a process for other scientists?
5. Describe what happens in the picture below:



**2. Nano quiz** <https://www.nanowerk.com/nanotechnology/quiz.php>

What is nanotechnology?

What applications could research in nanotechnology have?

**3. Jennifer, a scientist, is explaining the preparation procedure for working with the AFM microscope. Write down which steps she goes through.** [**https://www.youtube.com/watch?v=jRAqhFdwt20**](https://www.youtube.com/watch?v=jRAqhFdwt20)

a) install……………………………………………………………………………………………………………………………………………………

b) bring ………………………………………………………………………………………………………………………………………………….

c) remove ………………………………………………………………………………………………………………………………………………

d) secure…………………………………………………………………………………………………………………………………………………

e) turn on ………………………………………………………………………………………………………………………………………………

f) isolate ………………………………………………………………………………………………………………………………………………..

g) turn on ………………………………………………………………………………………………………………………………………………

h) use …………………………………………………………………………………………………………………………………………………..

i) turn on ………………………………………………………………………………………………………………………………………………

j) optimize………………………………………………………………………………………………………………………………………………

m) check ……………………………………………………………………………………………………………………………………………..

**Which linking words does she use to explain the procedure?**

**4. Read the time expressions and put the five missing words/phrases in the tables next to their synonyms:**

*while … concludes with prior to this … commences with subsequently*

|  |  |
| --- | --- |
| Firstly, | The first step is |
| First of all, | The first stage is |
| To begin with, | ... begins with |
| Initially |   |
| Beforehand, | Before this, |
| Previously, |   |
| Once |  When this happens |
| At the same time, | During |
| Simultaneously, |   |
| Secondly, Thirdly,  | After this, |
| Next, | Further,  |
| Then, | In the next stage, |
|   | In the following stage,  |
| Later, | Following this, |
| Eventually, | ... until ... |
| Lastly | ... finishes with ... |
| Finally, |   |
| In the last stage, | The last step is ... |

Academic **writing: Rhetorical** functions in academic writing, http://www.uefap.com

**5. Jennifer explains what happens during the process. Complete the following extracts from her talk using the correct forms of words from the box.**

|  |
| --- |
| **record damp out center act on deflect initiate** |

1. ATM microscopy is sensitive to vibration so we must make sure all the vibrations are effectively ……………..
2. The tip follows the contours of structures of the nano surface and the cantilever is ……………...accordingly.
3. The magnitude of this minute deflection is then ………………….. by the position of the reflected laser beam in the position detector.
4. We have a nice strong laser signal ………………….. in our detector.
5. We ……………………….. the approach by hitting the button that says landing.
6. As we approach the surface, the van der Waals force will begin to …………………. our very sharp probe tip.

**6. Draw a diagram of a process you are working on or one you know well. In pairs, check your diagram and explain the process, using phrases in 4. to help you.**

**7. Language practice**

**A. Choose the right words for each gap.** Source: www.floe-joe.co.uk

1. ........ I didn't really enjoy the course, but ………………… I really started to enjoy it.

 *In the beginning At the beginning At the end In the end*

2. ........ of the film the main character arrives in town looking for somewhere to stay.

 *In the beginning At the beginning*

3. We waited ages for a bus. ........ we decided to walk home. *Eventually At last*

4.The audience waited patiently for the delayed performance to start. ........ the curtain rose.

 *Lastly At last*

5. I waited for you ........ 10.00. I finally decided you weren't coming. *before until*

6. I managed to get the house tidy ........ my parents got home. *before until*

7. ........ had I gone to bed than I heard the phone ring. *Hardly As soon as*

8.I played a lot of tennis ........ I was on holiday. *during while*

**8. HW - In the article, fill each gap with one of the following forms of the verbs in brackets:**

infinitive with or without to*(to separate, separate),* gerund – verbal noun (*separating),* present participle – active verbal adjective (*separating),* past participle – passive verbal adjective *(separated)*

|  |
| --- |
| Physicists in the US have shown that two nano-scale magnets can be made ………..(oscillate) in phase when they are positioned close to one another. The phenomenon, which is similar to the way two pendulum clocks ……..(hang) on the same wall become ……………(synchronize) by weak …………….(couple) of acoustic signals, produces a stable microwave output. It could therefore …….(replace) bulky and expensive components in devices such as portable phones and radar systems. The magnets may also serve as tiny receivers that would enable microchips ……………….(communicate) with each other without……………….(be) in contact, and thus dramatically………………….(increase) the …………………..(process) power of computers.The scientists of the National Institute of Standards and Technology (NIST) built their nanomagnets from two magnetic films of different thicknesses………………(separate) by a non-magnetic layer. Standard semiconductor processing technology was used for ………………….(pattern) the layers, allowing the team ……………..(produce) magnets less than 100-nm across. When a DC current is applied to such a device, the magnetic nature of the layers makes the angular momentum or spin of electrons in the current ………………..(point) in the same direction. The spin of the electrons in the current is transferred from the first film to the second and thus causing its magnetization ………………..(oscillate). The oscillations generate microwaves that can be tuned from a few gigahertz to several tens of gigahertz by simply …………..(vary) the current or by…………………..(apply) an external magnetic field. Moreover, when two nanomagnets are placed close together (200-500 nm) and certain combinations are applied, they are observed ……………(oscillate) in harmony. This phase-locked system produces a microwave signal twice as intense as that …………………….(generate) by a single magnet.  |

**Paraphrasing** (adapted from <http://study.com/academy/lesson/what-is-paraphrasing-definition-examples-quiz.html>)

**Paraphrasing** = using your own words to express someone else's message or ideas. In a paraphrase, the ideas and meaning of the original source must be maintained; the main ideas need to come through, but the wording has to be your own.

Why is it important to use your own words?

How is paraphrasing different form summarizing?

**Examples**

Paraphrasing can be done with individual sentences or entire paragraphs.

Original sentence:
*Her life spanned years of incredible change for women.*

Paraphrased sentence:
*She lived through an era of liberating reform for women.*

Original sentence:
*Giraffes like Acacia leaves and hay, and they can consume 75 pounds of food a day.*

Paraphrased sentence:
*A giraffe can eat up to 75 pounds of Acacia leaves and hay every day.*

Original sentence:

*Any trip to Italy should include a trip to Tuscany to sample its exquisite wines.*

Paraphrased sentence:

*Be sure to include a Tuscan wine-tasting experience when visiting Italy.*

*Rewriting a text for the purpose of including it in your own writing can be done by:*

1. changing the vocabulary (synonyms)

She examined the difficulties that resulted in the collapse of the system.

*She investigated the problems that led to the breakup of the system.*

1. changing the verb form (e.g. from active to passive: this can change the focus or emphasis)

Johns analysed the student´s difficulties…

*The student´s difficulties were analysed by Johns …*

1. changing the word class (e.g. from verb to noun phrase)

The reports were completed in April, which ensured that students had time for revision before their examinations.

*The completion of the reports in April ensured that the students were able to revise before their examinations.*

**1. Now try to paraphrase the following statements using some or all of these three ways.**

a) Fortunately, no harm was done to the nuclear reactor.

……………………………………………………………………………………………….

b) A fine was imposed on all three companies found guilty of polluting the river.

……………………………………………………………………………………………….

c) This was an interesting attempt to explore the effects of long-term isolation.

………………………………………………………………………………….

d) Companies need to distribute their products in the most cost-effective way.

………………………………………………………………………………….

e) Competition for quality jobs at postgraduate level is fierce at the moment.

………………………………………………………………………………….

f) A thorough investigation of the different ways to collect taxes is essential.

…………………………………………………………………………………

g) Statisticians analysed the latest data on unemployment.

……………………………………………………………………………………

h) Hi-tech companies have created 10,000 new jobs in the UK electronics industry since 2008.

……………………………………………………………………………………

**2. Choose the best paraphrase of the original passage.** *(adapted from Oshima, A. Hogue, Ann. Writing Academic English. Pearson Education, 2006)*

Source: Page 16 of a three-page article in the October 15, 2003 issue of *Space Science* magazine. The tile of the article is “Manned Mars Flight: Impossible Dream?” The author is Patrick Clinton, a NASA physician.

Original statement: *Living aboard a space station in orbit around Earth for months at a time poses problems for astronauts’ bodies as well as for their minds.*

1. An article in *Space Science* magazine reports that lengthy space station duty may lead to physical and mental problems for astronauts (Clinton 16).
2. An article in *Space Science* magazine reports that astronauts who live aboard space stations for long periods of time may experience physical as well as mental problems.
3. An article in *Space Science* reports that astronauts will become physically sick and have mental problems if they visit a space station (Clinton 16).
4. An article in *Space Science* reports that living in a space station orbiting Earth for a long time can cause difficulties for astronauts’ bodies and minds (Clinton16).