

11 NOBEL PRIZE II, Use of Visuals

1. Discussion of the groundbreaking works of the past 10 years.

- Which topics are you familiar with? Which works are the most significant in your opinion?
- What would you say the trends are in the areas of research that have been awarded with a Nobel Prize? Which topics tend to occur?

2. 2018 Nobel Prize in Chemistry. <https://www.youtube.com/watch?v=ZKfRWqGtBDY>

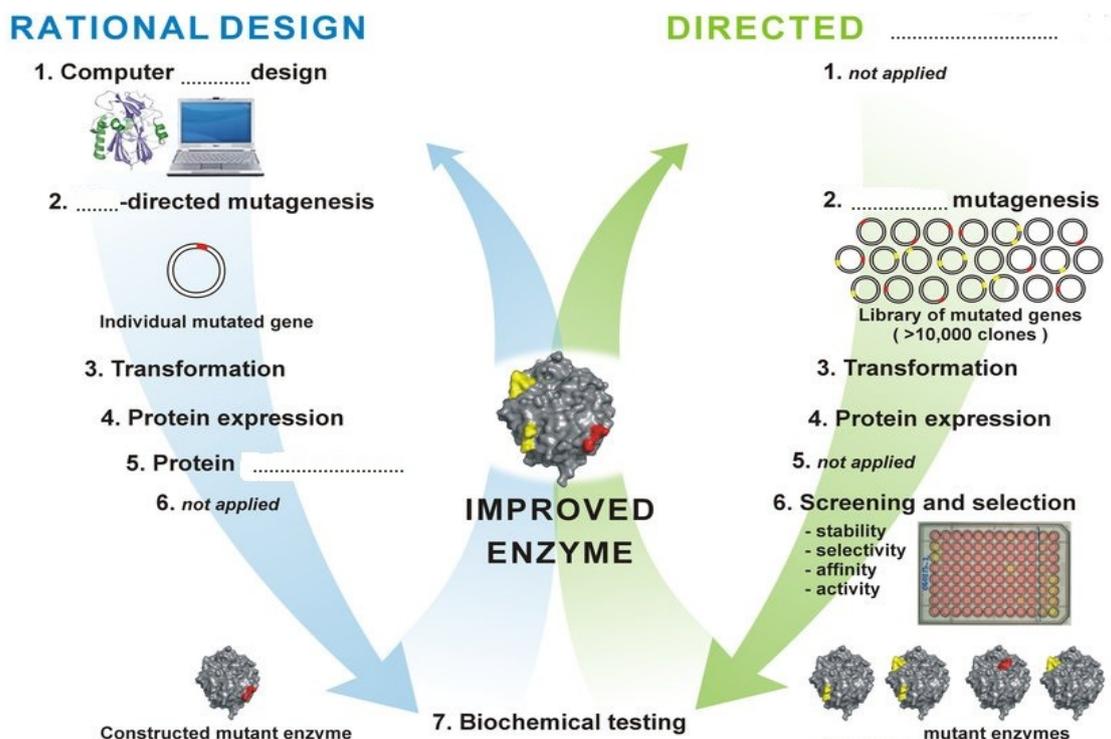
First listen and answer the questions (last week's handout). **Then complete the text with the phrases A - G below** (it's one of the types of exam tasks).

Phages are viruses that essentially hijack bacteria. They just unload their genetic payload 1___ and those genes trick the bacteria 2 ____. Total virus move. In the mid-80s, George Smith 3 ___ and proteins of interest. First step: stick a gene of interest into a phage. That phage builds the corresponding peptide or protein and plants it on its surface. Smith then 4 ___ out of a pool of other phages. And once he's caught the phage, he's now got the protein and the genetic information 5 ____. So Smith introduced this new tool, called phage display, to explore biochemistry.

Gregory Winter's work brings this year's prize full circle. Building on Smith's phage display, Winter got phages to plant human antibodies on their surfaces. Using directed evolution he then 6 ____. And he looked for the ones that would bind best to target proteins – proteins that are, say, involved in human diseases. ... Winter's work led to drug based on a human antibody 7 ____. The drug was approved in 2002 to fight rheumatoid arthritis.

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| <p>A that helps create it</p> <p>B into making more phages</p> <p>C into bacterial cells</p> <p>D created multitudes of mutated antibodies</p> | <p>E that can halt inflammation in the body</p> <p>F used an antibody lure to pluck that particular phage</p> <p>G harnessed phages to sort of mass produce and screen peptides</p> |
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3. Explaining concepts with the help of visuals. What purpose does this diagram have?



Two methods of changing the protein structure with the aim to improve selected characteristics.

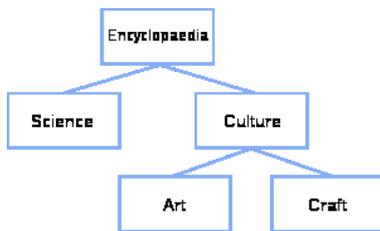
- **Vocabulary: complete the missing words in the image above:**
site purification selected aided random evolution

- **Compare the two processes in the picture; refer to their similarities and differences.**

4. Have a look at the three types of diagrams below and discuss the questions.

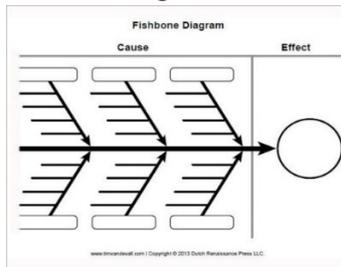
- Does the image in task 3 belong under any of these types? If so, in what way?
- What specific language functions can be depicted by these types of images?
- When would it be helpful for you to use such a diagram instead of giving the information in a form of a text?

Tree diagram



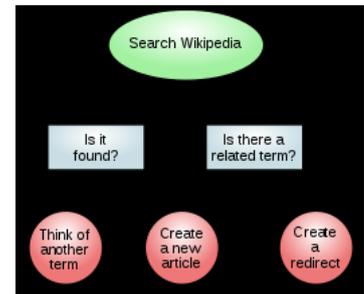
https://en.wikipedia.org/wiki/File:Binary_tree_structure.svg

Fishbone diagram



<https://www.template.net/business/work-templates/fishbone-diagram-template/>

Flow chart



https://en.wikipedia.org/wiki/File:Wikipedia_article-creation-2.svg

5. Different ways of presenting data in research.

For which purposes are these visuals suitable?

bar chart diagram histogram line graph map pie chart scatter plot stacked bar chart table

- **Discuss and check here** <https://www.youtube.com/watch?v=9BkbYeTC6Mo> 3.00 – 5.41

- **Complete the sentences below using the words in the box.**

It is best to use a

- _____ or _____ to show a comparison between items.
- _____ to show a correlation.
- _____ to describe a location.
- _____ or a _____ to show proportions of a whole.
- _____ to describe a structure.
- _____ or a _____ to show trends.

6. How to write a paper in scientific journal style: tables and figures. Answer the questions in pairs.

<http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtablefigs.html#legends>

- Are the words 'chart' and 'figure' used to mean the same or different types of visuals?
- What is a 'photograph'?
- When referring to figures and tables in the text, are the words abbreviated?
- Do you number tables and figures independently (Table 1, Figure1) or continuously (Table 1, Figure 2) in the sequence?
- Any table or figure must be described by its legend (i.e. caption). Where are the legends placed?

7. Writing captions for visuals: remove four words from each sentence to make noun phrases:

A) *The figure shows the copper concentration in the soft and exoskeleton tissues of four shrimp species.*

B) *The table presents a comparison of the physical and chemical characteristics of the hydrothermal fluids at Menez Gwen, Lucky Strike and Rainbow (adapted from Douville et al., 2002).*

8. Describing visual representations.

Select a process / a system / a cause and effect relationship / ... from your area of study or one that you know well. Prepare a simple visual representation of this concept, including a caption. Explain this concept to your classmate with help of your visual.

Grammar - Plurals of words taken over from Greek and Latin.

Study the chart and put the nouns below into the appropriate columns.

larva	medium	synthesis	axis	phenomenon	alga	bacillus	thesis
fungus	crisis	vertebra	species	index	spectrum	alumna	
alumnus	radius	hypothesis	matrix	forum	syllabus	coccus	

analysis [ɪs] analyses [i:z]	nucleus [ɛs] nuclei [ai]	formula [ə] formulae [i:]	datum [əɪ] data [ə]

series [i:z] series [i:z]	criterion [n] criteria [ə]	appendix [iks] appendices [isi:z]	genus [s] corpus genera [rə] corpora

Change the following sentences from plural to singular. Make all the necessary changes in grammar.

1. What criteria did the scientists use?
2. The formulae represent the molecular structures of the substances.
3. The investigated phenomena are not frequent.
4. The analyses of the results did not prove his hypotheses.
5. Atoms emit or absorb quanta of equal energy.
6. Chemical equilibria may be classified into two groups.
7. There were two occasions when we invited alumni to visit the school.
8. Electrolyses are used for purifying certain metals.

Write the plural form of the words in italics.

1. A scientist is supposed to generate (*hypothesis*) and test them against empirical observations.
2. Nuclear energy is produced using the heat generated by splitting the (*nucleus*) of atoms of certain elements.
3. There has been relatively little research in this area, most of it resulting in unpublished MA (*thesis*) or doctoral dissertations.
4. (*Bacterium*) are capable of bringing about chemical reactions of amazing variety.
5. University of Texas at Austin (*alumnus*) are most commonly known as Texas Exes. The university's (*alumnus*) association, the Ex-Students' Association, prefers to be known as the Texas Exes.
6. The (*index*) of refraction for violet light ($\lambda = 400 \text{ nm}$) and red light ($\lambda = 700 \text{ nm}$) in diamond are 2.46 and 2.41, respectively.
7. The measurements of analytical chemists are used to help physicians specify (*diagnosis*) of their patients.
8. The (*formula*) represent the molecular structure of the substance.
9. New university (*curriculum*) are being developed to meet the 21st century expectations.
10. Food plants have to compete with weeds, pests, (*virus*) and (*fungus*).
11. The University Library operates on each of the four (*campus*), providing stock and services related to the needs of users.

Adapted from: Oreská, Alžbeta, *Activity book English for chemists*. Bratislava: Slovenská technická univerzita, 2005, Marie Sabolová, Milada Pavlovová and Andrea Rozkošná.