

CLASSIFYING

1. Scientific Disciplines

Make a list of disciplines that can be studied at Masaryk University.

How would you classify them?

Compare your criteria in groups - are they similar or different?

Which of the categories does your own area of study fit into?

Chemistry can be divided into several branches. Match a branch and its description.

- | | |
|-------------------------|----------------------------|
| 1. General Chemistry | 5. Environmental Chemistry |
| 2. Inorganic Chemistry | 6. Chemical Engineering |
| 3. Organic Chemistry | 7. Biochemistry |
| 4. Analytical Chemistry | 8. Physical Chemistry |

a. focuses on chemical and biochemical phenomena that occur in natural places. It should not be confused with green chemistry, which seeks to reduce pollution. It can be defined as the study of the sources, reactions, transport, and effects of chemical species in the hydrosphere, atmosphere and lithosphere.

b. describes the nature of matter, solutions and gases; introduces concepts such as stoichiometry, prediction of reaction products, thermodynamics, nuclear chemistry, and chemical kinetics.

c. chemistry of materials from non-biological origins; typically, this refers to materials not containing carbon-hydrogen bonds.

d. practical application to solve problems, usually in industry; design, construction and operation of machines and plants that perform chemical reactions to solve practical problems or make useful products;

e. branch that applies physical principles and measurements to understand the properties of matter, this includes the applications of thermodynamics and quantum mechanics to chemistry.

f. the study of the chemistry of matter and the development of tools for measuring properties of matter, it includes the identification of compounds & mixtures (qualitative analysis) and the determination of the proportions of the constituents (quantitative analysis)

g. studies compounds containing carbon (originally defined as the chemistry of substances produced by living organisms but now extended to substances synthesized artificially)

h. is concerned with the structure and chemical processes of proteins, carbohydrates, lipids, nucleic acids and other molecules found in or produced by organisms

2. Vocabulary

The following are examples of short sentences from specialist chemical texts. Scan the sentences and underline words indicating classification.

An atom consists of three basic components: electrons, protons, and neutrons.

The periodic table consists of two major divisions: the metals and the non-metals.

A suspension consists of large particles mixed or suspended in a solution.

Heterogeneous solutions are composed of two phases.

Each element is composed of a unique number of protons.

The atom is composed of a nucleus and an electron cloud around the nucleus.

A water molecule is made up of two hydrogen atoms and one oxygen atom.

Protein is made up of amino-acids.

The elements in a vertical column of the Periodic Table constitute a group or family.

Large macromolecules constitute the microscopic basis of life.

Metals comprise more than 78% of all known elements.

The f-block comprises the lanthanides and actinides

Typical metals include the elements Copper, Tin, and Lead.

Common examples of strong bases include hydroxides of alkali metals.

Silicon is classified as semi-metal.

Acids and bases can be classified as organic or inorganic.

The elements can be divided into metals and non-metals.

Mixtures can be divided into homogeneous and heterogeneous.

Source: corpus prepared for JAC01, <http://ske.fi.muni.cz>

Now answer these questions:

1. Which verb collocates with *examples*?
2. Which synonym can replace the verb in *solutions consist of*?
3. What prepositions are used with *classify* and *divide*?
4. What is the difference between *made of* and *made up of*?
5. The words *constitute* and *represent* have different meanings. Is it true?

3. Reading

A) You are going to read a text about matter. First, read only the title and the first sentence of each paragraph.

What is the purpose of the whole text? Select from the answers below.

1. to give technical details about everything around us
2. to list the benefits of matter for us in general
3. to describe how matter can be categorized
4. to explain what solids and its forms are

The Nature of Matter

1	Everything around us consists of matter: this paper, your body, the air you breathe, and the water you drink. Matter is anything that has weight or mass and takes up space.
2	All matter may be classified as either solid, liquid, or gas. Solids are firm and have a definite form. Rubber, wood, glass, iron, cotton, and sand are all classified as solids. A considerable force would be needed to change the shape or volume of an iron bar, for example, because the atoms or molecules of a solid are densely packed and have very little freedom of movement.
3	Solids may be further divided into two classes: crystalline and amorphous. Rocks, wood, paper, and cotton are crystalline solids. Crystalline solids are made up of atoms arranged in a definite pattern. When these solids are heated, they change to a liquid, known as melting, is sharp and clear. Amorphous substances include rubber, glass, and sulphur. In these substances, the pattern of atoms is not orderly, and when heated, they gradually soften.
4	Liquids, on the other hand, are not rigid. If water, milk, or oil is poured on a table, it will flow all over the surface. The atoms or molecules of liquids attract each other and thereby enable liquids to flow. But these atoms are loosely structured and do not keep their shape. Therefore a liquid will take the shape of any container in which it is poured. However, liquids have a definite volume: a quart of milk cannot fit in a pint container.
5	Gases, such as air, oxygen, and carbon dioxide, have no fixed shape or volume of their own. They diffuse or spread out to fill any container. The atoms or molecules of gases are widely spaced and move very rapidly. They either compress or expand to adapt to any area.
6	Everything we know is made of matter in solid, liquid or gaseous form.

Zimmerrman, Fran. *English for Science*. New Jersey 1989

matter (n) – hmota

solid (n/adj) - pevná látka, pevný

liquid (n/adj) - kapalina, kapalný

gas (n), gaseous /adj.) – plyn, plynný

weight / mass (n) - hmotnost, váha

shape and volume (n) – tvar a objem

movement / motion (n) - pohyb

firm / rigid (adj) – pevný, neohebný, tuhý

definite form (adj+n) – určitá (přesně daná) forma

considerable force (adj+n) – značná síla

gradually (adv) – postupně

therefore / thereby (adv) – a tak, a proto, a tudíž

heat the substance (n) – zahřát látku

orderly (adj) - uspořádaný

oxygen (n) – kyslík

iron (n)- železo

sulphur (n) – síra

carbon dioxide (adj+n) - oxid uhličitý

densely packed atoms - hustě natěsnané atomy

loosely structured - ve volné struktuře

arranged in a definite pattern – uspořádané do určitého vzorce

to pour (v) – lít

flow all over the surface - rozlévat se po povrchu

attract each other – přitahovat se navzájem

container (n) – nádoba

diffuse / spread out (v) – rozpínat se

compress or expand (v) – stlačit se nebo se roztahovat

quart - 2 pints, 1.14 of a Br.litre/ 0.94 of a US litre

B) Use the information from the text to make notes in the form of a diagram. In pairs describe the information from your diagram. Use some of the phrases for classifying.

4. Listening.

Watch the video and fill in the gaps.

States of Matter

The states of are gas, liquid and solid. Gasses assume the shape and of their container. Particles of a gas are separated from each other, move in straight lines, and in a completely random manner. They change direction only when they collide with each other or the

Liquids have a volume, and assume the shape of their containers. The particles of a liquid are closely spaced, and so their motion is still random, but much more The particles slip past, and collide with, near-neighbors.

Solids have a definite and volume. Particles of solids are in positions, and collide only with near-neighbors.

Available at http://highered.mcgraw-hill.com/sites/0072396814/student_view0/animations_center.html#
or <http://www.youtube.com/watch?v=s-KvoVzukHo> accessed 15.9.2013

to assume the shape - přebírat tvar

particles collide with each other (n) – částice se srážejí

separated (adj) oddělený

in a completely random manner - zcela náhodně

slip past (v) – mijet

5. Presentations

Evaluating guidelines

Look at guidelines 1- 12 for giving a good presentation. Decide which of them are about preparation and which about delivery (giving the presentation). Mark them P or D.

5. Know your audience – who are they and why are they there?
6. Know your subject and what you are aiming to achieve.
7. Make sure your talk has a structure: introduction, main points, conclusion.
8. Make sure there is logical connection between the points, and that you include examples / evidence to support them.
9. Emphasize key information by repeating it.
10. Speak from notes, do not read a script.
11. Try to speak naturally and clearly.
12. Use signalling language to help your audience follow what you are saying.
13. Time yourself so that you know how long giving your presentation takes.
14. At the end, summarize your message.
15. Maintain eye contact with your audience / talk to them, not to the slide.
16. Practice giving the presentation – use your slides to guide you.

Are there any items you would add?

Which guidelines do you think are the most important in each category (P, D) ?

from E. de Chazal, S. McCarter, Oxford EAP, OUP, 2012

Work in small groups.

Each group will get a text describing something from the area of chemistry. Read it and underline all the things that are classified. Then draw a slide with a diagram.

Present your diagram to the others, use the vocabulary that you have learnt today.
(e.g. *may be divided into four parts, can be classified as...*)

Remember to have all the important stages in your presentation:

1. **welcoming the audience**
2. **introduction of the speakers and the topic of the presentation**
3. **presenting the topic with the use of visuals**
4. **conclusion**

Useful phrases:

1. Good morning/ afternoon/ Hello, everyone.
2. My name is ... and this is...I would like to talk about.../ We would like to show you.../
We will take a look at...
3. First of all...
As you can see on the chart/ graph/ poster...
Finally...
4. That's all. My/our presentation is over. Thank you for your attention.
Thank you for your time and attention.

Don't forget to let your partner speak!

And now Martin will tell you more. / ...will continue

Homework:

Do some vocabulary research and fill in the table with the right words for describing changing states of matter.

Changing state of matter	Verb	Noun
1. <i>liquid to gas</i>	<i>to evaporate</i>	<i>evaporation</i>
2. gas to liquid		
3.		melting / liquefaction
4.		solidification
5.	to sublimate	
6. gas to solid		

Alžběta Oreská et al. *English for Chemistry*. Bratislava: STU, 2006.

GRAMMAR - passive voice

I. Look at the sentences from the lesson:

1. Matter can be classified as solid, liquid & gas.
2. A considerable force would be needed to change the shape of an iron bar.
3. Crystalline solids are arranged in a definite pattern.
4. When they are heated, they melt.
5. If water is poured on the table...

Revise the tenses: present, past, present perfect

- Simple and continuous forms
- Questions, negatives
- Passives in simple forms