



Chemistry: All About You

Suggestions for lesson plans

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PART 1: SUGGESTIONS FOR LESSON PLANS

This section provides examples on how teachers can plan a lesson about chemistry and its societal aspects using the video “*Chemistry: All About You*”.

The structure of the lesson plans includes the objectives of the activities, the materials needed for implementation, the process of the activities and the timing of each single activity. The lesson plans proposed have been designed to be flexible and adaptable to the various European national contexts. The components of each lesson plan are detailed in the modules proposed in this guide.

LESSON 1

Getting started, giving basic knowledge on chemistry and its applications: the teacher should show the video “*Chemistry: All About You*” to the students and then discuss briefly what they have learned.

To follow up, working on chemistry and its societal aspects: the teacher invites the students to create an awareness-raising campaign to increase the interest of students, especially girls, in the opportunities for young people in chemistry research and the chemical industry. The teacher should refer to **Module 4: Equality: Awareness-raising activities on Chemistry**.

To conclude, working on hands-on chemistry activity: Students take part in a lab activity chosen from **Module 5. Hands-on activities: Material and Properties**.

OBJECTIVES:	<p>To search for ideas and actions that can increase the interest of young people in chemistry both at school and later on in their choice of studies and careers.</p> <p>To motivate young students to study the topic, showing them the concrete applications in their daily lives and running awareness-raising activities, with particular attention to the role of women in the field.</p> <p>To change students’ attitudes to studying science, especially chemistry.</p>
MATERIALS:	<p>papers, crayons, pencils</p> <p>video or photo camera</p> <p>computer with MS programs and appropriate software</p>
THE PROCESS:	<p>Getting started</p> <p>The teacher shows the video “<i>Chemistry: All About You</i>” to the students and briefly discusses what they learned from it.</p> <p>1) Collecting ideas</p>

<p>THE PROCESS:</p>	<p>Getting started</p> <p>The teacher shows the video “<i>Chemistry: All About You</i>” to the students and briefly discusses what they learned from it.</p> <p>1) Collecting ideas</p> <p>The teacher divides the students into small groups and collects ideas to start the campaign to raise young people’s awareness of chemistry, focussing on the role of women in the sector.</p> <p>2) Creating a campaign</p> <p>The students work in groups to collect and sort information, to decide on the format of the dissemination tools and prepare a communication plan.</p> <p>3) Exchanging information</p> <p>The teams show their work to their fellow students, explaining their ideas, objectives, initiatives and conclusions about the topic. The works are made visible to the students, teachers, parents and local community.</p> <p>TIPS: the teacher can stop the activity after step 4) or continue with a hands-on activity and show the concrete applications of chemistry to students in their daily lives.</p> <p>4) Hands on experiment</p> <p>The teacher runs a lab activity with the students: the combustion of natural and artificial fibres from Module 5. Hands-on activities: Material and Properties</p>
<p>TIME NEEDED:</p>	<p>4.5 hours (2 hours to search and debate the ideas, 2 hours for editing the dissemination tool, 30 minutes for the experiment)</p>

LESSON 2

Getting started, raising students' awareness of the opportunities existing in chemistry research and the chemical industry: students should build up a portrait of a woman from their country who has a career in chemistry or petrochemistry, using the instructions from **Module 4. Equality: Awareness-raising activities on Chemistry**

To follow up: The teacher shows the video "*Chemistry: All About You*" to the students to give them basic knowledge on the multiple applications of chemistry. The video is presented as an example of how to increase the interest of secondary school students in the chemistry sector by designing video that is inspiring for new talent, focussing on girls.

To conclude: the teacher organises a debate on the chemistry industry and its societal aspects: the teacher provide background information on a specific domain of the chemical industry (e.g. fuel) looking into **Module 1. Background information** on chemistry in our daily lives, **Module 2. Chemistry: All About You – the video** and **Module 3. Links to online resources on chemistry and its various applications**. The teacher then invites the students to debate the risks and opportunities related to this sector of activity.

OBJECTIVES:	To help students realise the importance of chemistry in our daily lives and increase their interest in the topic To learn how to work with inquiry-based methods and conduct an interview To use ICT tools for editing a video/PP presentation.
MATERIALS:	video or photo camera computer with MS programs and appropriate software
THE PROCESS:	<p>1) Getting started: The teacher reviews in detail using the instructions from Module 4. Equality: Awareness-raising activities on Chemistry and makes sure students have understood them.</p> <p>2) Collecting ideas The teacher divides the students into small groups (of 3 or 4) and collects ideas to starting designing the portrait of a woman chemist from the research field or from the industry. The teacher can mention examples of women who had exemplary careers in that field, such as Marie Curie.</p> <p>3) Collecting and sorting information Collecting and sorting information on the role of the chemistry in our daily lives (showing the video "<i>Chemistry: All About You</i>") and especially on the role of women in chemistry research and the chemical industry.</p>



THE PROCESS:	<p>1) Getting started:</p> <p>The teacher reviews in detail using the instructions from Module 4. Equality: Awareness-raising activities on Chemistry and makes sure students have understood them.</p> <p>2) Collecting ideas</p> <p>The teacher divides the students into small groups (of 3 or 4) and collects ideas to starting designing the portrait of a woman chemist from the research field or from the industry. The teacher can mention examples of women who had exemplary careers in that field, such as Marie Curie.</p> <p>3) Collecting and sorting information</p> <p>Collecting and sorting information on the role of the chemistry in our daily lives (showing the video “<i>Chemistry: All About You</i>”) and especially on the role of women in chemistry research and the chemical industry.</p> <p>4) Exchanging information:</p> <p>The teams show their work (film or PowerPoint presentation) to their fellow students, explaining their ideas, objectives, initiatives and conclusions about the topic. The works are made visible to the students, teachers, parents and the local community (on the school website, for example).</p> <p>5) Organising a debate activities:</p> <p>The teacher organises a debate on the chemistry industry and its societal aspects: the teacher provide background information on a specific domain of the chemical industry (e.g. fuel) looking into Module 1. Background information on chemistry in our daily lives, Module 2. Chemistry: All About You – the video and Module 3. Links to online resources on chemistry and its various applications.</p> <p>The teacher then invites the students to debate the risks and opportunities related to this sector of activity.</p>
TIME NEEDED:	6 hours (2 hours for the interview, 2 hours editing the video or making the PowerPoint presentation, 2 hours for the debate activities)

LESSON 3

Getting started, raising awareness on the role of chemistry research in the process of cleaning water, using the instructions from **Module 6. Hands-on activities: Water experiments**.

To follow up: The teacher shows the video “*Chemistry: All About You*” to the students to provide basic knowledge on the multiple industrial methods for cleaning water.

To conclude: The teacher provides background information on a specific domain of the chemistry industry (e.g. food, water) and then invites the students to debate the risks and opportunities related to this sector of activity.

OBJECTIVES:	To help students to realise the importance of chemistry in our daily lives and increase their interest in the topic To build a solar still To clean water using non-conventional tools
MATERIALS:	Large metal or plastic bowl Small, shallow glass or cup (clean) Measuring jug or cylinder Cling film (wider than the bowl) A pebble, Hot water and Food dye and salt
THE PROCESS:	<p>1) Getting started: The teacher should divide the students into small teams and discuss the importance of the water for the health.</p> <p>2) Collecting and sorting information Collecting and sorting information about water (sources, role in the health of human beings, quality) and methods used in industry for purifying it, looking into Module 1. Background information on chemistry in our daily lives, Module 2. Chemistry: All About You – the video and Module 3. Links to online resources on chemistry and its various applications.</p> <p>3) Hands on experiment: Module 6. Hands-on activities: Water experiments</p> <p>4) Exchanging information: The teams discuss the conclusions on the topic. The works (experimental sheets) are made visible to the students, teachers, parents and the local community.</p>
TIME NEEDED:	4 hours (2 hours to search, collect and sort information, 1 hour for the experiments, 1 hour to exchange the information)



LESSON 4

Getting started, raising awareness on the role of chemistry research in the materials industry: students should formulate the importance of resistance of different artificial and natural materials to combustion, using the instructions

To follow up: The teacher shows the video “*Chemistry: All About You*” to the students to provide basic knowledge on the multiple applications of chemistry in the clothes and fashion industry.

To continue, the teacher runs the experiment on Combustion of natural and artificial fibres from **Module 5. Hands-on activities: Material and Properties**

To conclude, the teacher provides background information on a specific domain of the chemical industry (e.g. synthetic materials) looking into **Module 1. Background information** on chemistry in our daily lives, **Module 2. Chemistry: All About You – the video** and **Module 3. Links to online resources on chemistry and its various applications**. The teacher then invites the students to debate the risks and opportunities related to this sector of activity.

OBJECTIVES:	To help students to realise the importance of chemistry in our daily lives and increase their interest in the topic <ul style="list-style-type: none"> To test the resistance of natural and artificial fibres to combustion
MATERIALS:	Natural fibres: cotton, wool, silk, linen (2 cm strips) Synthetic: nylon, orlon, rayon, cellulose acetate (2 cm strips) Bunsen burner
THE PROCESS:	<p>1) Getting started</p> <p>The teacher should divide the students into small teams and discuss the importance of resistance of different artificial and natural materials to combustion.</p> <p>2) Collecting and sorting information</p> <p>Students should look for information on materials (natural, synthetic, nano-materials) and methods used in industry for testing their resistance.</p> <p>3) The video</p> <p>The teacher shows the video “<i>Chemistry: All About You</i>” to the students to provide basic knowledge on the multiple applications of chemistry in the clothes and fashion industry.</p> <p>4) Hands on experiment:</p> <p>Module 5. Hands-on activities: Material and Properties, activity 2. Combustion of</p>

<p>THE PROCESS:</p>	<p>1) Getting started</p> <p>The teacher should divide the students into small teams and discuss the importance of resistance of different artificial and natural materials to combustion.</p> <p>2) Collecting and sorting information</p> <p>Students should look for information on materials (natural, synthetic, nano-materials) and methods used in industry for testing their resistance.</p> <p>3) The video</p> <p>The teacher shows the video “<i>Chemistry: All About You</i>” to the students to provide basic knowledge on the multiple applications of chemistry in the clothes and fashion industry.</p> <p>4) Hands on experiment:</p> <p>Module 5. Hands-on activities: Material and Properties, activity 2. Combustion of natural and artificial fibres</p> <p>5) Exchanging information</p> <p>The teams discuss the conclusions on the topic. The works (experimental sheets) are made visible to the students, teachers, parents and the local community.</p>
<p>TIME NEEDED:</p>	<p>4 hours (2 hours to search, collect and sort information and watch the video, 1 hour for the experiments, 1 hour to exchange the information)</p>