Promoting vocational education and training

Stredná odborná škola chemická Bratislava



Materials

- Selected materials mentioned in this presentation are available on Google Drive.
- https://drive.google.com/drive/folders/1tULs1eTnBEd5x2XBR5ZUz6JlswgH hiNj?usp=sharing



- Primary school pupils and their parents
- Secondary school graduates (higher vocational education)
- Primary school teachers (chemistry teachers and guidance counsellors)
- Employers
- School partners
- Professional community

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Promotional activities organised by SOŠCH



- Open Day
 - On-site
 - Online
 - Individual school visits and consultations
- Preparing for the Chemistry Olympiad
 - Theoretical preparation
 - Practical preparation
- Entrance exam preparation course
 - Preparation in mathematics
 - Preparation in Slovak language
- Chemical laboratory exercises
 - Flammable Chemistry
 - Fragnant chemistry
 - Alchemist Workshop
 - Forensic Chemistry (E+)
 - Colourful journey through time (E+)
 - World Water Day
 - World Soil Day
 - World Health Day
- Chemistry shows at SOŠCH
- Activities at primary schools
 - Forensic chemistry
 - Day of professions
 - Chemistry show

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Open day (onsite)

- 4 Open days, from November to January
- Tour around the school (1 hour)
- Discussion with chemistry teachers in laboratories
- Introducing Erasmus+ activities on SOŠCH



Open day (onsite)

- Until 2019/2020 Special laboratory excercises
 - Eyes catching experiments
 - Biochemistry experiments
 - Pharmaceutical analysis
- From 2022/2023 Standard laboratory excercises
 - Attractive topics



Preparation for the Chemistry Olympiad

- 10 theoretical lessons (online)
 - Topics covered: Nomenclature, Chemical calculations, Chemical reactions (general), Magnesium and calcium
 - Duration: 60 min
 - 65 participants in 2023/2024
- 5 practical lessons (on-site)
 - Topics covered: Neutralisation rections, Precipitation reactions, Redox reactions, Magnesium and calcium
 - Duration: 5 x 45 min
 - 20 participants in 2023/2024
- Topic of the current year: Magnesium and calcium



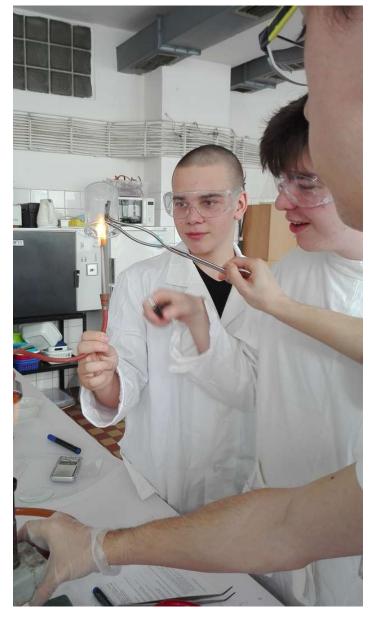
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Flammable chemistry & Fragnant chemistry

- Flammable Chemistry Methane Preparation, Ethene
 Preparation, Ethyne
 Preparation, Burning Hands
 (Butane)
- Fragrance Chemistry Esters, Identifying chemicals by smell, Isolation of oil from citrus, cloves, cinnamon (steam distillation, extraction)
- Duration: 3 x 60 min

Flammable chemistry & Fragnant chemistry

Activity	Details		
Flammable chemistry	Preparation of methane (setting up the apparatus,		
	developing methane). Combustion of methane, proof of		
	combustion products.		
	Preparation of ethene, combustion of ethene. Proof of		
	multiple bonding with potassium permanganate.		
	Preparation of ethyne , combustion of ethene. Proof of		
	multiple bonding with potassium permanganate. Comparison		
	of combustion of methane, ethene and ethyne.		
	Flammable hands - combustion of n-butane.		
Fragnant chemistry	Preparation of carboxylic acid esters. Properties of esters.		
	Recognition of chemicals by smell.		
	Isolation of oil from citrus fruits by steam distillation and		
	extraction.		















Alchemist Workshop

 Laboratory exercises focused on the implementation of attractive experiments based on neutralization, precipitation and redox reactions.

Duration: 3 x 60 min



Alchemist Workshop

Alchemist workshop

č.	Activity	Details	Time (min)
1.	Welcome. Safety instructions		10
2.	Alchemist workshop	Flammable experiments. Magic drinks	70
		<i>Group work.</i> Pupils divided into 6 groups will prepare and carry out 1 out of 6 experiments in a group of 2-4 pupils.	30
		Peer learning. Then, under the guidance of an assistant, they demonstrate the experiment to the whole class, or, with a higher number of pupils, to half the class. The estimated duration of the demonstration is 5-8 minutes.	40
3.	Dry ice experiments	Pupils carry out experiments in groups of 2-4 pupils. All groups carry out the same series of experiments.	30
4.	Evaluation of activity		10
	Total		120



Ν°	TASK	DESCRIPTION			
	Part 1 Flammable experiments				
	Method of implementation	Group work			
1	Make "silver" and "gold" coins from the copper ones.	Electrochemical series of metals. Preparation of brass.			
2	Prepare gunpowder.	Preparation of ammunition and its combustion.			
3 a	Prepare oxygen by decomposing hydrogen peroxide in a gas generator. Use the collected oxygen in the following task to prepare a " phosphorous lamp".	Preparation of oxygen by catalytic decomposition of hydrogen peroxide.			
3b	Prepare the "phosphorous lamp".	Combustion of phosphorus in oxygen.			
	Method of implementation	Demonstration experiment. It will be carried out if there is time in reserve.			
	Prepare pyrophoric iron.	Preparation of ferric oxalate. Thermal decomposition of ferric oxalate.			
	Prepare carob flies in the bank.	Catalytic decomposition of ammonia.			
	Part 2 Magic drinks				
	Method of implementation	Group work			
4	Prepare colorful drinks.	The discoloration that accompanies neutralization and redox reactions.			
5	Turn red wine into other beverages.	The discoloration that accompanies neutralization, precipitation and redox reactions.			
6	Copper chameleon	Redox reactions			
	Method of implementation	Demonstration experiment. It will be carried out if there is time in reserve.			
	Prepare a coloured traffic light.	Redox reactions			





- A colour journey through time via pigments from prehistoric man to Van Gogh
- Synthesis of pigments (yellow ochre, Prussian blue), their use in the creation of artwork
- STEAM
- Duration: 4 x 60 min



Task 1 Find information about pigments, their occurrence and properties.

Task 2 Prepare the pigments.



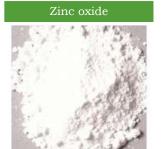


Task 3 Use pigments to create a piece of artwork.

Task 4 Find information about light. Complete the quiz on analysing the composition of pigments using optical methods.



- Multidisciplinary approach chemistry, physics, history, civics, foreign languages.
- Chemical calculations
- Using information sources







Iron(III) hydroxide-oxide



Indigo



Iron(III) oxide



ultramarine



Malachite



Prussian blue



Verdigris











Starry night, Van Gogh, Museum of Modern Art, New York (1889)



Colourful journey

• From the Stone Age to the present day

Colourful journey

1704
Paint
manufacturer
Diesbach,
Germany
Pigment
discovery



John
Woodward
published a
manual for
synthesis
Pigment is
available for
artists



1847
Mauritius
Postage
stamp, 2
pence
British
Library
Philatelic
Collections,
London



2019
How is pigment being used today?















1709
Pieter van der
Werff, "The
Burial of
Christ"
Sanssouci
Picture
Gallery,
Potsdam



1842 Sir John Herschel Discovered blueprint

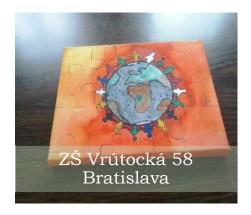


1889
Van Gogh,
Starry Night,
Museum of
Modern Art,
New York













- Laboratory exercises focused on solving a criminal case using simple experiments
- Based on real story
- 2 criminal cases
- Duration: 3 x 60 min

Dívka (†17) zemřela v nemocnici: Vražda draslíkem?





Pacientku na Bulovce zabil draslík v infuzi

Praha /AKTUALIZOVÁNO/-Z nedbalosti je obviněna zdravotní sestra, která pacientku ošetřovala. V infuzi bylo velké množství draslíku.









White powder in the envelope

Lethal infusion

Industrial espionage in a pharmaceutical laboratory

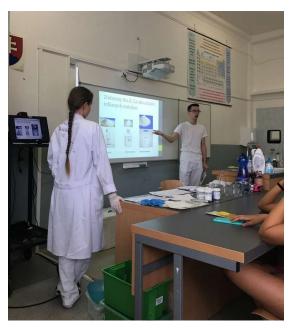


Damaged ear

Dangerous barrels

Imprint - a trace left behind

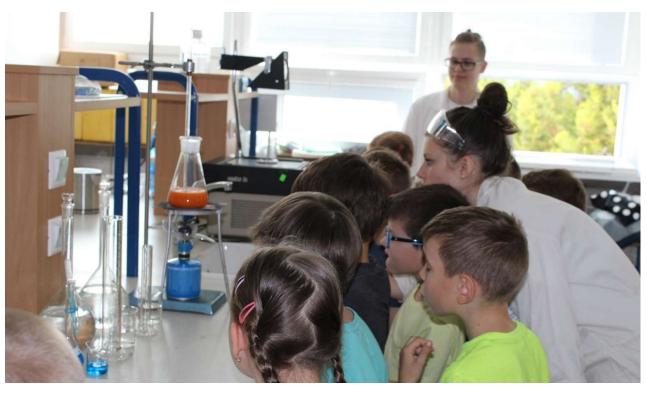






- Workshop day in elementary school (Základná škola Fándlyho 11 Pezinok)
- Forensic chemistry
 - Presentation of a criminal case
 - Quiz
- Chemistry show
 - Flammable experiments (Fingerprints)
 - Colourful experiments (Secret message)
 - Dry ice experiments
- 3 x 60 min cycles





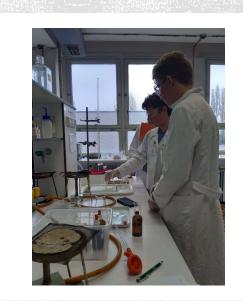
Science day in elementary school (ZŠ Rajčianska 3, Bratislava)

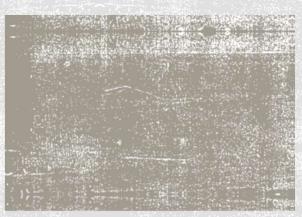
N°	ACTIVITY	TIME (MIN)
1	Introduction	2
2	Lethal injection case	10
	Presentation The Lethal Infusion Case. Quiz	3
	Flame show with ethanol solutions of group 1 and 2 metals.	4
	Homemade sparklers (pre-prepared)	3
3	Alchemist's Workshop. Fire experiments	10
	Production of "silver" and "gold" coins from the copper	3
	Flammable mixtures	4
	Gunpowder	3
4	The case of industrial espionage	8
	Presentation The case of industrial espionage. Quiz	3
	Invisible inks - neutralization reactions, complexing reactions.	5



Ν°	Activity	Time (min)
5	Sherlock Holmes in the chemistry lab. The experiments are carried out by primary school	3
	pupils under the guidance of assistants	
	Presentation The Prints Case - the trace left behind. Quiz	Reserve
	The chemical development of fingerprints	Reserve
	Odour as a trace.	3
6	Dry ice experiments	15
	Sublimation of dry ice	
	Colour changes of indicators (Indicator rainbow)	
	Combustion of magnesium in carbon dioxide	
	Generator of bubbles	
	Dry ice makes sounds	
	Fire extinguishing with carbon dioxide	Reserve
	Home pharmacy. Biotechnology is changing the world.	10
	Cream preparation	5
	Sample cultures of microorganisms (inoculated in advance)	5
	Summary	2
	Total	60







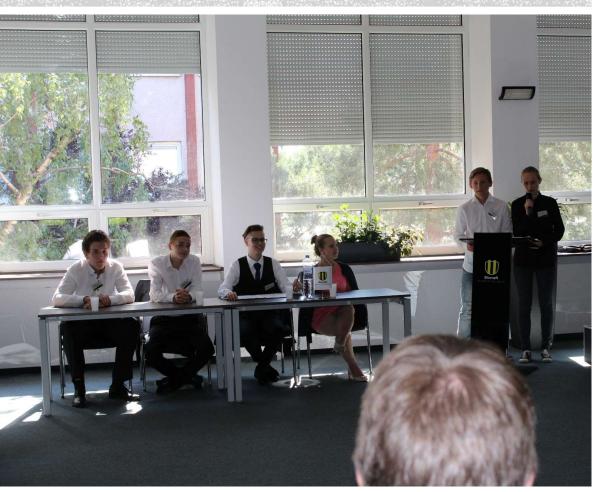




- Parts of the project:
 - Introduction of the criminal case
 - Forensic analysis
 - Court hearing
- 3 days in total
- Forensic analysis:
 - Test for cations
 - Test for functional group
 - Volumetric analysis
 - Spectrophotometry, colorimetry
- Supported by petrochemical company SLOVNAFT



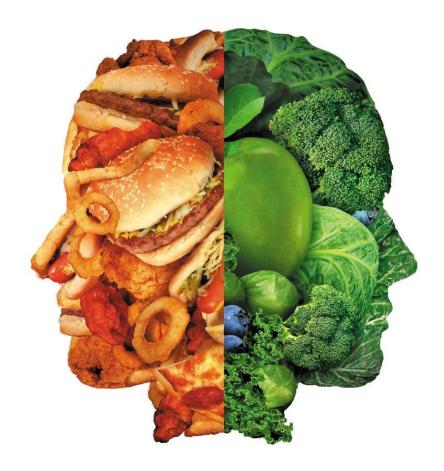






Word Water Day

- Analysis of water in own samples - pH, conductivity, chlorides, ammonium ions, chemical oxygen demand, water hardness, water neutralization capacity
- Information on the occurrence of the constituent to be determined in natural waters, its significance, indication of pollution and its negative impact on the human body
- Information adapted to the specific year's theme
- Duration: 3 x 60 min



Word Health Day

- The motto "We are what we eat!,"
- Evidence of protein, carbohydrates and fats in food
- Determination of protein in food.
- Determination of carbohydrates in energy drinks.
- Determination of cholesterol in lard
- Myths and the truth about food
- Duration: 3 x 60 min



Entrance exam preparation course

- Online
- Preparation in mathematics
 - Duration: 4 x 45 min
- Preparation in Slovak language
 - Duration: 3 x 45 min



Kids' Lab Hókus-Pókus

- Developed by chemical company BASF
- The laboratory is located in the building of SOŠCH.
- 90-minute workshop
- The workshop is aimed at young researchers aged 7-12 years old and aims to answer the research question of how water plays an indispensable role in our lives.
- Through independent experimentation, children will see how chemistry enables responsible handling of water, a precious resource.
- This year's "Water Loves Chemistry" program includes two lab experiments - water retention and water research.



- Workshop for chemistry teachers and guidance counsellors in primary schools
- Preparation for the Chemistry Olympiad
- Job-shadowing on chemistry laboratory exercises at SOŠCH
- Workshop Chemistry of everyday life in leisure activities
- Workshop Environmental experiments
- Exchange of experiences

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Workshop for chemistry teachers and guidance counsellors in primary schools

- 2005 2019 on-site, 2020 2023 online
- SOŠCH
 - Study programmes
 - Extracurricular activities
 - Projects
 - Promotional activities
- Slovak Board of Chemistry Olympiad
 - Tasks in the current school year
 - Evaluation of previous year
- BASF
 - Activities for primary schools
- Duration: 2 hours

Science fairs and other activities



- Presentation exhibitions of secondary schools
 - County Schools Day (Bratislava region)
 - Where to go to Secondary School (Other regions)
 - Young creator
 - JUVYR (terminated)
- Science fairs
 - Night of researchers
 - Science Fair
- Christmas Market Bratislava Self-Governing Region
- Cvernovka (Creative Centre in the former SOŠCH building)



- Chemistry Show
 - Colourful experiments
 - Forensic chemistry experiments
 - Dry ice experiments
 - Liquid nitrogen experiments
- Exposition
 - Pharmacology
 - Microbiology
 - Biochemistry
 - Cosmetics
 - Forensic chemistry
- Quizzes
- Discussion
- Erasmus+



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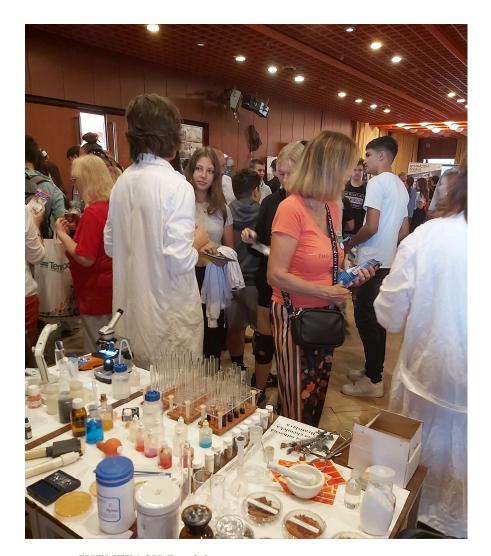
County schools day

- County schools day in Bratislava
- Exhibitors: More than 50 secondary schools from Bratislava self-governing region
- Activities: Demonstration of experiments
- Brochure: https://bratislavskykraj.sk/wp-content/uploads/2023/09/broza5-2023-web.pdf
- Website: <u>https://bratislavskykraj.sk/stredna-pre-mna/</u>



Secondary School Presentation Exhibitions

- Target group: For pupils in the eighth and ninth years of primary school
- Exhibitors: Secondary schools, representatives of companies and firms cooperating with secondary schools in the framework of dual education
- Activities:
 - Demonstrations of students' activities
 - For undecided eighth and ninth graders there is an evaluation of their study disposition by the staff of the Centre for Educational and Psychological Counselling and Prevention



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Secondary School Presentation Exhibitions

- Trnava region: Where to go to secondary school
- Venue: Trnava, Dunajská Streda, Senica
- Exhibitors: secondary schools from Trnava self-governing region (some schools form other regions are invited)
- Activities:
 - Demonstration of experiments
 - Pupils carry out some easy experiments



Science fair

- The aim is to introduce science in a playful way, especially to primary and secondary school pupils, but also to curious adults.
- Venue: Bratislava
- Exhibitors: Universities and secondary vocational schools, industrial schools, scientific institutes, interest organisations and commercial entities participating in the fair will demonstrate in their stands that science is all around us in everyday life.
- Activities:
 - Universities and secondary vocational schools will present skillful students and showcase their inventions, which have often won various awards at home and abroad.
 - Young visitors will be able to try out some of the experiments themselves or test their skills and knowledge in competitive quizzes.
 - Children will be able to verify many facts and phenomena for themselves through interactive experiments.
- Website: http://www.vedeckyveltrh.sk/



Night of researchers

- The festival of science European Researchers' Night is an annually organized event throughout Europe.
- Venue: Bratislava
- The main aim of this festival is, above all, to familiarise the general public with science and research.
- Activities:
 - The program activities bring research out of the laboratory and into the city centres, shopping malls, cafés, clubs or museums.
 - The public can try out the latest technologies and instruments under the guidance of scientists, participate in experiments, competitions and quizzes, watch demonstrations and simulations and exchange ideas and parties with the researchers.
- Web site: https://www.nocvyskumnikov.sk

Online promotional activities



- Social networks*
- School website
- Newsletter
- Videos*
- Podcast* (new)
- Promotional materials*

 * Students participate in the preparation of content.



Web and social networks

• Website: https://www.sosch.sk/

Facebook: https://www.facebook.com/soschba

Instagram: https://www.instagram.com/soschba/

(48) Arranging activities



- Project Manager
 - Plan, prepares and coordinates the activities
 - Takes part on activities
 - Gives feedback
- Student project team
 - 30 members
 - At least one member from each study program and year
- Team of teachers
 - Teachers from different departments
 - Take part on specific activities according their specialisation



- Professional reputation and status in the school
- Exceptional evaluation in a related professional subject
- Portfolio building for Erasmus+ selection procedure, for calls for projects outside the school
- Professional skills development
- Soft skills development

Activity	Number of participants
2016/2017	3729
2017/2018	4428
2018/2019	3068
2019/2020	1934
COVID affected years	
2023/2024	1480

Promotional activities in numbers

- 2022/2023
 - 30 group activities
 - 20 individual consultations (pupils, elementary school teachers)
 - 1480 participants



Promoting chemistry careers and qualifications to students

Promoting chemistry careers

- Activities for secondary school students
- University fairs
- Open days of universities
- Job fairs



University fair Gaudeamus – Akadémia

- Gaudeamus Academy
- · Veue: Brno, Prague, Nitra and Bratislava
- Lectures with up-to-date information on admissions and study conditions, as well as behind-the-scenes information directly from students and graduates
- Testing Centre and Advice Service for undecided students - complex information, advice and support in choosing a university
- College stands
- Stands of counselling institutions for higher education study abroad
- Educational Centre lectures, seminars and consultations aimed specifically at guidance counsellors and secondary school teachers
- Web: https://sk.gaudeamus.cz/



University Fair - "Where to go to college"?

- Roadshow
- Post-secondary Education Showcase
- Information about Slovak and Czech universities, study programmes and conditions for studying abroad
- Study options, accommodation, financing, future job opportunities
- Venue: Trnava, Trenčín, Žilina, Banská Bystrica, Poprad, Prešov, Košice, Bratislava
- Website: https://kamnavysoku.sk/



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Mini fair ALMA MATER

- Mini fair in every regional city in Slovakia.
- Help with choosing a university.
- Contribute to reducing the brain drain from Slovakia.
- Increase awareness of Slovak universities.
- Introduce the Study at home, Slovakia will reward you scholarship scheme.
- Next year's freshmen will be able to receive €9,000 (in some cases up to €16,500).



#studying without borders

- Study Abroad Fair
- In person in Bratislava or online
- Personal meeting with representatives of foreign schools
- Presentations of schools at a set time
- Opportunities to study at universities and secondary schools in different countries.
- Information about study benefits, admission conditions and further employment.
- Website: https://studiumbezhranic.sk/



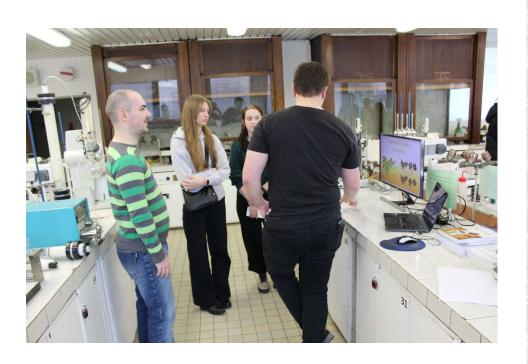
Online university fair

- Video presentations of universities
- Chat with university representatives
- Web: https://veltrh.vysokeskoly.sk/



Open days

- Open days at chemically and technically oriented faculties
- Faculty of Chemical and Food Technology STU in Bratislava
- Faculty of Natural Sciences of Comenius University in Bratislava
- Faculty of Natural Sciences of Cyril and Method University in Trnava



CHEMWEEK

- Faculty of Chemical and Food Technology STU in Bratislava (FCHPT STU Bratislava)
- Chemical experiments live distillation, extraction, filtration, titration or chromatographic techniques.
- Shows that without the combination of chemistry with other science disciplines and technical approaches, many things would not exist or work today



Job fair JobSpoTT

Job fair

Venue: Trnava, Trenčín

Web: https://jobspott.sk/



ChemDay

- Job fair for companies of chemical, food and pharmaceutical industries at FCHPT STU in Bratislava
- Ideal place for better and faster job search in the studied field for graduating students and graduates of FCHPT STU
- The members of the Association participated in the fair: Axxence Slovakia, Duslo, Lanxess Central Eastern Europe, Saneca Pharmaceuticals and VUCHT.

63 Activity



- Solve the following tasks in groups.
- You can find useful materials on Google drive: https://drive.google.com/drive/folders/1yXJtFh2LgoPkTF23OhWnN8oVYVXuO6_z?usp=sharing
- Select one group member to summarize the results for your group.



- What promotional activities do your school carry out?
- Who is involved in promotional activities?
- Are employers and graduates involved in promotional activities?



- Choose the promotional activity you will organise.
 - One group chooses an activity to be carried out on the school site and the other group chooses an activity to be carried out off the school site.
- Please indicate:
 - The objective of the activity
 - The target group of participants
 - Estimated number of participants spatial conditions (dimensions, equipment of the space)number of presenting pupils and teachers
 - Choose activities for example experiment, play, competition.
 - Choose the criteria according to which you will select the experiments.
 - For example: difficulty of preparation, amount of material used, simplicity of execution, green experiments ...
 - Select 5 experiments to demonstrate at the promotional activity.
 - A student of the SOŠCH will be part of your team. He/she can help you evaluate the attractiveness of the experiments.