Wyższa Szkoła Informatyki i Umiejętności

CHEMISTRY IS ALL AROUND NETWORK

EDUCATIONAL METHODS AND TEACHING MATERIALS USED IN CHEMISTRY TEACHING IN POLISH SCHOOLS

Dr Monika Smaga
Wyższa Szkoła Informatyki i Umiejętności
Łódź, Poland
monikaturek@op.pl

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Situation in Poland

- Educational reforms – new curricula and syllabuses for scientific subjects
- New approaches towards teaching and learning Chemistry
- Flexibility of the teacher in the choice of methods in each level of education
- Polish school – promoting students' interest in chemistry
- Obstacles (?)

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Chemistry education in Poland

- Lower Secondary school (gimnazjum) - 3 years
- Upper Secondary school (liceum) – 1 year (basic chemical education)
- Upper Secondary school (liceum) - 3 years (extended curricula) – 4 hours of Chemistry a week
- Different approaches applied at each level of education

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Lower Secondary School – *Gimnazjum*

- 3 years of Chemistry education
- extensive curriculum – inorganic and organic chemistry
- physical and chemical properties of elements and compounds
- key stage in awakening students' interest in chemistry
- education based on *'chemistry is around us'* basis

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Upper Secondary School – *Liceum* – 1 year

- basic level of chemical education - aimed at students with low interest in chemistry as their prospective career choice
- '*chemistry is around us'* approach
- interesting facts from science and chemistry
- applications of chemistry in pharmacy, medicine, sports, cosmetics, food, energy and genetics.

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Upper Secondary School – *Liceum* - 3 years

- advanced curricula – majority of students take matura exam in chemistry
- gaining knowledge of the subject necessary to study the chemistry related sciences in the future, such as medicine, pharmacy, biotechnology, dietetics etc.
- chemistry clubs and special interest groups
- olympiads and chemical competitions

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Role of the chemistry teacher

- 3 different approaches to teaching chemistry
- flexibility in the choice of methods to meet the objectives of each level of education
- ability to select the right materials and tools for the classroom use in a poorly equipped chemical classroom (choice of visual aids) or experimenting with basic labolatory glassware and substances to be found '*around us*'

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Methods applied for all stages

- visualisation through experiment or visual aids (posters)
- multimedia videos and presentations
- educational games – models of molecules assembled together to visualise chemical bonds
- multimedia educational games – licenced software
- educational videos – how muscles work; the role of protein supplements and isotonic drinks etc.
- chats, debates, interviews, discussion
- educational trips, e.g. to sewage treatment plants, rafineries

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Methods applied for advanced chemistry

- experimenting and observations in the labs
- special interest groups for most apt students
- cooperation with universities – lectures and experimenting
- teaching students physic-chemical properties of elements and compounds, and to recognize formulas for chemical calculations
- teaching the ability to prepare chemical solutions, conduct experiments and determine observations.
- teaching the ability to compare the chemicals or their groups, to design experiments and write equations of chemical processes and to solve calculation tasks

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Conclusions

- despite differences in educational objectives all stages have the same goals – to develop students' awarness of chemical world and properties
- experimenting and observation is promoted at each stage
- use of multimedia visual tools and materials are of great help for all stages of education

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Thank you for your attention

for further questions please refer to dr Monika Smaga

monikaturek@op.pl

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