

**DEVELOPMENT OF STUDENTS' INDEPENDENT WORK SKILLS THROUGH
CROCODILE CHEMISTRY COMPUTER PROGRAM**

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Today, the rapid development of science and technology leads to many changes in human life. The only way to eliminate and prevent problems that exist now and are likely to arise in the near future is to direct the accumulated knowledge, formed skills and qualifications, acquired experience and conclusions to a single goal, to effectively combine the educational process with the development of technology. This, in turn, places new tasks directly before educational institutions in the world, in particular, in our country.

According to the decision of the President of the Republic of Uzbekistan No. PQ-4805 of August 12, 2020, Annex 5, Clause 19, part two, "virtual laboratories" are included in the educational process in higher and professional educational institutions starting from the 2021-2022 academic year. phased implementation tasks are defined [1].

We know that chemistry is an experimental science, and it is difficult to master the subject without laboratory experiments in teaching this science. Most secondary schools do not have enough chemical equipment and reagents for independent experiments, and even if there are enough, it takes a long time to complete the experiments. That time is the main obstacle to the fact that students do not have enough time to perform experiments, make experimental conclusions, strengthen the subject, and do not form the necessary knowledge and skills [2].

Usually, during chemical reactions, it is not possible to observe the process of transformation of the reacting molecules into other molecules (at the molecular level). Using a computer program, it will be possible to observe the dynamics of molecules during the reaction of a chemical substance with other substances. It is possible to model chemical processes, carry out various reactions and, most importantly, conduct experiments safely.

In fact, the Crocodile chemistry virtual laboratory program allows practical performance of experiments, formation of analytical and systematic thinking. For example, the change in the color of solution indicators when studying the interaction of water with oxides. The color change of the indicators in the solution formed by the interaction of calcium oxide with water can be monitored using a computer program. Pour 50 ml of water into a glass and add 10 grams of quicklime. Watch what happened. Cool the resulting white solution. Take 2-3 milliliters from the white part of the penis into three test tubes, add litmus solution to the 1st test tube, phenolphthalein to the 2nd test tube, and methyl yellow



solution to the 3rd test tube. Pay attention to the change in the color of the solution to which the indicators are added, and you can compare it with the table of indicators.

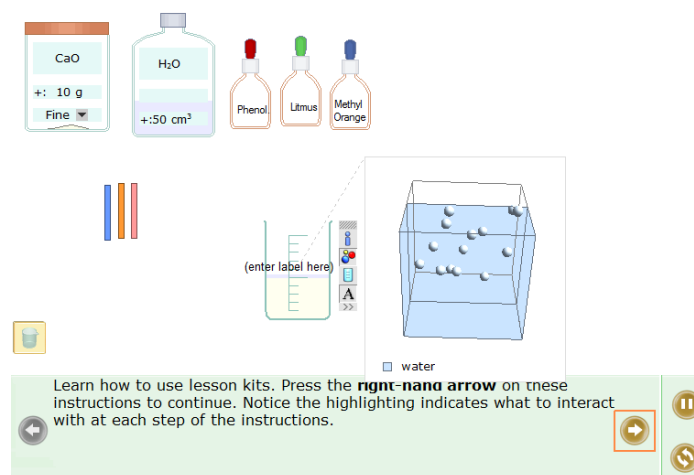


Figure 1. The interaction of calcium oxide with water in the Crocodile chemistry computer program

Crocodile chemistry program can be widely used by high school students and teachers, students and professors of academic and higher education institutions as an additional pedagogical software tool.

This program teaches the user to be inquisitive, think creatively, and analyze the results of work, regardless of his profession. The possibilities of the program are very wide, and it can be widely used in practical and experimental training (i.e. in solving problems), especially in performing virtual experimental work.

In conclusion, the changes related to the new realities of socio-economic and political life currently taking place in the educational system of our country force the pedagogues of educational institutions to go beyond the scope of traditional training and introduce a new approach to the educational process. makes you think about ways to find approaches. These fundamental changes that are taking place require the development of methodological support of the educational process in each educational institution. It is natural that modern information and communication technologies will become the main source of pedagogical innovations in the coming years and serve to develop students' independent work skills.

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