

TEACHING WITH THE SUPPORT OF INTERACTIVE METHODS AS AN EXAMPLE OF INTRUSIVE AND EFFUSIVE ROCKS

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Abstract: This article highlights the possibilities of using interactive methods in practice on the example of intrusive and effusive rock formations.

Key words: Interactive method, theoretical understanding, practical skills, logical, critical, analytical, creative thinking, educational system, pedagogical technology, technological approach, igneous rocks, venn diagram, sinkvein, cubic strategy

Theoretical and practical works of great importance are being carried out in our republic in order to raise spirituality, improve the national education system, strengthen its national ground, bring it to the level of world standards based on the harmonization with the requirements of the times. , great attention is paid to the training of competent, independent thinking, willing, selfless and initiative personnel.

Developmental education is an educational theory that ensures the educational, educational, spiritual, mental and physical development of students at a certain time, as well as their adaptation to society and life in a rapidly changing world. Every country thinking about its future should be able to purposefully direct all the social influences affecting the individual in the life of the society for the development of the person, for him to realize and express his identity. When developing educational technologies are used, the interest of students increases, knowledge turns into skills, and the quality of knowledge increases.

Educational technologies and methods that enhance teaching can be applied to almost all disciplines, including Engineering Geology. In this article, on the example of the phrase "intrusive and effusive" from the science of engineering geology, educational models are created, the specified goals are developed based

on «Bloom's taxonomy», and the interactive methods «Venn diagram», «Cubic strategy» and «Sinkwein» are used on the example of the phrase «Intrusive and effusive rocks» on the subject. the content and essence of the topic is revealed during the teaching process. In addition, the use of the method of working in small groups was shown in the teaching of this subject.

1. **With the help of «Venn diagram»**, the signs or characteristics of 2 concepts that are unique and common to both are determined. Below is a Venn diagram for the concepts of Intrusive Rocks and Effusive Rocks:

Intrusive rocks	Commonalities and differences	Effusive rocks
<p>Reasons for its formation: 1. ("intrusion" means that magma cools and solidifies in the lithosphere layer without reaching the surface of the earth).</p> <p>2. Granite, granodiorite</p> <p>3. Forms of intrusive rock formations Batholith, stock, laccolith, lopolite, dyke, sill</p> <p>4. Structure and texture of intrusive rocks - the student fills in</p>	<p>1. It is formed by solidification of various gaseous substances and water vapors at very high pressure and temperature.</p> <p>2. Sour rocks SiO₂ 75-65% 75-65%. Feldspar, quartz, mica, fake ice</p> <p>3. Occupies large areas.</p> <p>4. The student finds common and different aspects of these rocks.</p>	<p>Reasons for its formation 1. (from the Greek "effusio" - poured out, overflowed), that is, it is formed from the solidification of magma that has erupted on the surface of the earth.</p> <p>2. Liporite, quartz porphyry</p> <p>3. Formations of effusive rocks Cover, dome</p> <p>4. Structure and texture of effusive rocks - the student fills in</p>

Completing the Venn diagram can be used as a basis for teacher assessment of how much knowledge a student has about a new topic and how well he has mastered the topic.

Apply the cube strategy.

A) **«Define».** **Intrusive** («intruzio»-cracking in place) means magma is formed by cooling and solidifying in the lithosphere layer without reaching the earth's surface. When magma cools and crystallizes in the deep part of the Earth's crust, under high pressure and temperature, the atoms and molecules that make up it are completely crystallized and fully crystalline rocks are formed, and they are called intrusive igneous rocks.

Effusive (from the Greek «effusio» - poured out, overflowed), that is, it is formed by the solidification of magma that has erupted on the surface of the earth. Effusive rocks are formed when magma erupts on the surface of the earth or solidifies at the bottom of seas and oceans. Volatile components in magma quickly disappear, low pressure and temperature cause it to solidify quickly. As a result, the rocks do not have time to fully crystallize. Because of this, some of the volcanic lava solidifies as crystalline, and some as amorphous. The part that has come to the surface is completely amorphous and hardens into a glassy color.

B) **«Compare».** The structure of intrusive rocks is fully crystallized (granular) because the magma solidifies very slowly in the deep layers of the earth's crust. Rocks are divided according to the size of the mineral particles. Coarse-grained (>5mm), medium-grained (1-5mm) and fine-grained (<1mm). Fine-grained rocks have a high degree of strength.

The structure of effusive rocks is very different from the structure of intrusive rocks. Porphyry structure. This type of structure is characteristic of interveinal and effusive rocks, examples of which are porphyry and porphyrite. Basalt enters the medium crystalline structure, and the crystalline particles of the rock can be observed only through a microscope. Glassy and porous structure. As a result of the cooling of the magma, the mineral particles take a glassy flat amorphous form without having time to crystallize. An example of this group is volcanic glass, obsidian.

In most cases, **the texture of intrusive rocks** is massive (uniform, dense). Many cracks appear from the solidification of magma. As a result, the massifs of

intrusive rocks are separated into separate pieces in various forms along the cracks. For example, basalt-pillar, granite-palaxa, diabase-ball form. Intrusive rocks have tectonic cracks and faults, weathering cracks, and other types of cracks, in addition to individual cracks.

The texture of effusive rocks is characterized by massive, porous, slag and almond appearance. Effusive igneous rocks are prone to cracks like intrusive rocks. Due to the solidification of the lava, it has vertical and horizontal cracks, its mass is divided into separate pieces in various forms along the cracks. Discrete fractures reduce the strength of rock masses and increase water permeability

V) «**Association**». Typical representatives of superbasic rocks are dunite, peridotite and pyroxenite. The basic rocks are composed of gabbro, labradorite, basalt and diabase. Typical representatives of medium rocks include syenite, diorite, trachyte, andesite, porphyry with feldspar, porphyrite, and granite, rhyolite, and quartz porphyry. Metamorphic rocks consist only of pegmatites. Rock-forming minerals, which make up about 99% of the total composition of igneous rocks, include quartz, potassium feldspars, plagioclase, leucite, nepheline, pyroxenes, amphiboles, micas, and olivine.

G) «**Analysis**» The formation of intrusive and effusive rocks has its own characteristics and differs from each other in terms of structure and texture.

3. Syncway - the interactive method helps to develop students' thinking ability based on a different approach to the problem in the process of disseminating and summarizing information.

1. ___ noun (who, what);
2. ___ ___ quality (how, what);
3. ___ ___ ___ verb (task, function);
4. ___ ___ ___ association (imagination, what came to mind)
5. Synonym (similarity) of the noun ___.

For example: let's make a sinquevein for the phrase "Granite":

1. "Intrusive rock"
2. Mainly composed of quartz and feldspar;
3. Basic raw materials in construction;

4. Fully crystallized;

5. Granodiorite

In conclusion, it can be said that the use of Venn diagram, "Cubic strategy" and "Sinquain" interactive methods from educational technologies that develop students in the process of teaching serves as the main factor for students to master the subject well.

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