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| Topic of the Lesson | Мodern genetic technologies in agriculture. | |
| Teachers: | Кim V.О. | |
| Date: |  | |
| Class: 9 | Number present: | Absent : |
| Learning objectives that this lesson is contributing to | 9.2.4.11-study the use of modern agricultural technologies to increase crop yields based on the local region | |
| Lesson objectives | *All students:*  - reveal the essence of new terms;  - highlight the main idea of the text.  *Most students:*  - discuss the occurrence of heterosis, determine its features;  - distinguish between guide and artificial mutagenesis, identify the scope of their application;  - describe the method of polyploidy, get acquainted with the works of scientists working in this direction;  - prepare a report on the achievements of genetic engineering.  *Some students:*   * evaluate the importance of using modern agricultural technologies to increase crop yields. | |

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| Planned timings | Teachers | Student | Аssessment | Resources and equipment |
| |  |  | | --- | --- | |  |  |   Introduction  7 min | Good morning, everyone.  Sit down, please. I'm glad to see you.  How are you?  Who is absent?  What was your home task?  Please, repeat your homework:   * terms of genetic methods and their definitions.   Let's complete the task. You need to connect the names of genetics methods and their definitions.  *The task*  You need to connect the names of genetics methods and their definitions.   |  |  |  | | --- | --- | --- | | 1. Genealogical |  | 1. *Detects genetic changes.* | | 1. Twin | 1. *Detects damaged protein-enzymes.* | | 1. Cytogenetic | 1. *Based on the appearance of signs in identical twins. Identifies the influence of the environment on the traits in the phenotype.* | | 1. [Immunological](https://www.britannica.com/science/immunology) | 1. *Used in blood group determinations in blood transfusions, in organ transplants.* | | 1. Biochemical | 1. *Allows you to predict the number of genetic diseases that will occur in the next generations.* | | 1. Population and statistics | 1. *Based on pedigree analysis. Detects the inheritance of a dominant or recessive trait in an organism* | | Students complete tasks | 3 points | flashcards |
| |  | | --- | | Middle |   17 min | You see envelopes, plants are hidden in them. I will tell you information about them, and you guess the name of the plants.  Sunflower  Wheat  Pumpkin  *New words*  heterosis [hetəˈrəʊsɪs] - гетерозис  polyploidy [pɒlɪˈplɔɪdɪ ] -полиплоидия  mutagenesis [mjuːtəˈʤenɪsɪs] -мутагенез  site-directed mutagenesis [saɪt-dɪˈrektɪd mjuːtəˈʤenɪsɪs ] -направленный мутагенез  artificial mutagenesis [ɑːtɪˈfɪʃəl mjuːtəˈʤenɪsɪs ] -искусственный мутагенез  genetic engineering [ʤɪˈnetɪk enʤɪˈnɪərɪŋ ] -генная инженерия    **New terms**  **1. Site-directed mutagenesis** is the process of deliberately increasing mutations  **2.** **Heterosis** is an increase in the productivity, fecundity, and adaptability of hybrids  **3.** **Polyploidy** - organism which contain more than two sets of chromosomes.  **4. Genetic engineering** - constructing new DNA from DNA of different species  **Генная инженерия** - конструирование новой ДНК из ДНК разных видов.  Как вы думаете с чем связаны эти растения, правильно, с с/х?  Как вы думаете их искусственно вырастили, или они и были в таком виде всегда?  А теперь открываем тетради и записываем тему урока.  Современные генетические технологии в сельском хозяйстве.  Мodern genetic technologies in agriculture.  Teacher's explanation of the topic pages §12.7 | Students first get acquainted with the glossary, then the tasks in the group | 2 points | Cards, drawings |
| **End** of the **lesson**  12 min | Let's repeat the new words.  I suggest you be a scientist.  We will now complete the task. I will give you pictures with plants, and you will need to complete the task.  Class is divided into 6 groups.  Teacher gives one plant or an organ of plant to each group: pumpkin, orange, sunflower seeds, banana, wheat, chrysanthemum.  Groups observe the plant and answer to these questions:  1. Is this plant was modified by human?  2. What characteristics people improved in this plant?  3. What characteristics you would improve in this plant? | Completing tasks | 5 points | Sheets with tasks, and pictures with plants |
| |  | | --- | | Reflection |   3 min | |  |  | | --- | --- | | * I worked… * The class worked… * The lesson was… | * very well * actively * excellent * hard * not hard * interesting * badly * bad * good |  |  |  |  | | --- | --- | --- | | **plus +** | **minus -** | **Interesting** | |  |  |  | | Generalization of knowledge |  | Sheets with reflection |
| Homework  1 min | §12.7 read. |  |  |  |