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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 |
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Introduction7 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.

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| 1. Genealogical
 |  | 1. *Detects genetic changes.*

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| 1. Twin
 | 1. *Detects damaged protein-enzymes.*
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| 1. Cytogenetic
 | 1. *Based on the appearance of signs in identical twins. Identifies the influence of the environment on the traits in the phenotype.*
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| 1. [Immunological](https://www.britannica.com/science/immunology)
 | 1. *Used in blood group determinations in blood transfusions, in organ transplants.*
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| 1. Biochemical
 | 1. *Allows you to predict the number of genetic diseases that will occur in the next generations.*
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| 1. Population and statistics
 | 1. *Based on pedigree analysis. Detects the inheritance of a dominant or recessive trait in an organism*
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 | Students complete tasks | 3 points | flashcards |
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| 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.SunflowerWheatPumpkin*New words*heterosis [hetəˈrəʊsɪs] - гетерозисpolyploidy [pɒlɪˈplɔɪdɪ ] -полиплоидияmutagenesis [mjuːtəˈʤenɪsɪs] -мутагенезsite-directed mutagenesis [saɪt-dɪˈrektɪd mjuːtəˈʤenɪsɪs ] -направленный мутагенезartificial mutagenesis [ɑːtɪˈfɪʃəl mjuːtəˈʤenɪsɪs ] -искусственный мутагенезgenetic 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 |
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| Reflection |

3 min |

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| * I worked…
* The class worked…
* The lesson was…
 | * very well
* actively
* excellent
* hard
* not hard
* interesting
* badly
* bad
* good
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| **plus +** | **minus -** | **Interesting** |
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 | Generalization of knowledge |  | Sheets with reflection |
| Homework1 min | §12.7 read.  |  |  |  |