**Teacher:** Sultanova Yelena ( Султанова Елена Анатольевна)

**Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Class:** 8 «А» grade

**Learning**

**Objectives:** 8.4.2.6 - explain the wide distribution, the unique properties of water and its importance for life

**Anticipated Problems:**

**All**: Know and describe the features of water, its anomalies, know what systems water forms as a solvent, its properties and applications.

**Most**: Apply the acquired knowledge to explain the problem of drinking water, what role the State plays in the problem of water protection.

**Some**: Analyze the features of systems in which water is a solvent.

|  |  |  |  |
| --- | --- | --- | --- |
| **STAGE AND ITS OBJECTIVES** | **PROCEDURE** | **INTERACTION** | **TIME** |
| **1.Organizational moment and a positive attitude.**  **Purpose: to organize and configure the class** | **Good morning, everybody.**  Welcome, everybody!  Is everybody ready to start?  I hope you are all ready for our chemistry lesson.  I think we can begin our lesson.  Write down your homework. – textbook «Chemistry – 8 grade»? Module 10, page 110, Q. page 114.  The essay – an appeal to the person on behalf of water "People! I am Life. Don't allow me to die!" and the site Bilimland.kz other useful sites on the topic of our lesson. The list of websites is on the tables. Some of them we are going to use during the lesson**.**  **Resources: presentation, video** | **work with the class** | **1-2** **minutes** |
| **2. Checking homework and introduction to the topic of the lesson.**  **Purpose: The video is shown, through the consolidation of their attention; the objectives of the lesson are shared with the students; The “nearest development zone” is defined.** | Look at the board.  What is the topic of our lesson?  Yes, Water. I think the best name for our lesson « The Great Mystery of Water! ».  As Audrey Herburn said «Water is life, and clean water means health ».  What is the aim of our lesson?  8.4.2.6- to explain wide spreading, the unique properties of water and its value for life.  We will study new material in groups. You went into the classroom and took the color cards that you mean to the group and the role in it.  Before studying the new topic, let’s repeat material of the previous lesson.   1. **Individual tasks**: 3 people work on tests in different testing programs, 2 people solve tasks at the board (tasks are taken from WOUD) 2. **1**. What volume of Hydrogen will be allocated during the interaction of 13 grams of zinc with Sulfuric acid? (WOUD) 3. **2**. The thermochemical equation of Magnesium burring 2Mg+ O2→2MgO+1127 кДж. 4. How much heat will be allocated during combustion of 2,4 grams of Magnesium (WOUD) 5. **Multi-level tasks** 6. **«A».** Give definition to a concept “oxide”. Choose oxides from the list of substances and call them 7. CuO, NaOH, Na2S, HCl, H2SO4, SO2, KClO3, Na2O, Cr2O3, Cr(OH)3, P2O5. 8. **«B».** During combustion of 1 kg of fuel in the car carburetor about 800 grams of carbon oxide are thrown out into air. Calculate the weight and volume of the carbon oxide which is formed at combustion of 100 kg. fuel.   **«C».** Solve the transformation chain  Ca →CaO→Ca(OH)2→Ca3(PO4)2  1 people works on multi-level tasks, there is a pair of “a teacher - a student” for homework, other students work frontally with the teacher.   1. **Frontal work** 2. **Exercise № 1.**  **Correct the substances’ names** 3. К2SO4 - Copper Сarbonate 4. NaOH- Sodium Oxide **translate into Kazakh** 5. NaNO3 - Potassium Sulfate 6. BaCl2 - Sodium Nitrate 7. HCl - Сarbonic acid 8. AlPO4 - Barium Chloride 9. H2CO3- Sulfuric acid 10. CuCO3-Aluminium Phosphate 11. CuO- Potassium Hydroxide 12. **Exercise № 2.**  **Odd one out.** 13. 1. Sodium hydroxide Potassium hydroxide Iron chloride Copper hydroxide 14. 2. Sulfuric acid Nitric acid Sodium chloride Hydrochloric acid 15. 3. Copper oxide Zink oxide Sodium hydroxide Carbon oxide 16. 4. Sodium Sulfate Copper Nitrate Сarbonic acid Iron Phosphate 17. 5. NaNO3 CuSO4 K2CO3 KOH 18. These are all substances 19. Answer the questions: 20. 1. What is substance? 21. 2. How substances are classified? 22. 3. What products are formed by oxygen 23. with substances? 24. 4 What is the translation "hydrogen"?   **Resources:**  [**http://monobit.ru/konstruktor-testov-easyquizzy.html**](http://monobit.ru/konstruktor-testov-easyquizzy.html)  [**http://soft.mydiv.net/win/download-UniTest-System.html**](http://soft.mydiv.net/win/download-UniTest-System.html)  [**http://soft.mydiv.net/win/download-TestMaker.html**](http://soft.mydiv.net/win/download-TestMaker.html) | **individual work, work in pairs, work on multi-level tasks, frontal work** | **10 minutes** |
| **3.Self-assessment**  **“Thumb”**  **Purpose:** **Work out the ability to evaluate yourself.** | Assess yourself Картинки по запросу большой палец вниз смайлик  I worked excellent  Картинки по запросу большой палец вниз смайлик  I worked well,  Картинки по запросу большой палец вниз смайликI could work better.  This site will help you to improve your results.  What kind of secrets does water open to us? We will learn at the lesson. | **independent work** | **2 minutes** |
| **4.** **The main part of the lesson. The introduction of new material.**  **Purpose: 8.4.2.6- to explain wide spreading, the unique properties of water and its value for life.** | Look at the board.  Why was Balkhash shown in the video?  Where is water in nature?  What did I want to tell you using this video?  Yes, we need to save water. There is not enough drinkable water on the planet. And you need to start from your native Lake Balkhash.  Before working in groups we will have a relax  You will study new material in groups. You need to turn to the classmates to make a group.  Using additional material, internet - resources  group 1 – М- water molecule, its structure  The task for group - Using additional material, Internet - resources, describe the structure of the water molecule. You will present your answer as a model of a water molecule  group 2 - Ph.- physical properties  Task for the group- Using additional material, Internet - resources, describe the physical properties of water.  you will be presenting your answer in the poster  group 3 – А- anomalies  Task for the group -Using additional material, Internet - resources; explain the water anomalies and their role.  you will be presented your answer in the form of a poster-flower  group 4 - S- water - solvent, types of systems  Task for the group - Using additional material, online resources describe which systems provides water as a solvent. Conduct the experiment.  You will give your answer in the form of a chart.  You have 5 minutes to do this work. You can start.  Time. We finish the job. Look at me.  Please the first group  Are there any questions?  Speakers rate the group.  What do you know about water?  **Resources: Video 3,**  [**https://bilimland.kz/en/content/structure/738\_chemistry#lesson=9956**](https://bilimland.kz/en/content/structure/738_chemistry#lesson=9956)**, application** | **group work** | **15 minutes** |
| **5. Fastening the material through testing on computers in groups.**  **Purpose: Identify the level of learning topics.** | **Fastening: true оr false (My Test)**  1. Water can exist in three different states: as a solid, a liquid or a gas.  2. Hydrogen bonds are formed between two hydrogen atoms belonging to two different water molecules.  3.Water freezes at 100°C.  4. Water has a high surface tension.  5. Water boils at a lower temperature in the lake Balkhash than at the beach.  6. Pure water is tasteless.  7. Ice sinks in water.  **Resources:** **testing program** | **group work** | **6 minutes** |
| **6. Reflection.**  **Purpose: Summing up and evaluation of their work at the lesson.** | Let's reflex. Choose a letter and give the answer  Reflection «Acrostal»  W - What are your emotions?  A- A substance of our lesson is…  T-Today I have studied…  E-Exercises were ...  R-Really I can…  Thanks for the lesson. Good bye. See you next lesson. | **independent work** | **5 minutes** |

**TEACHER’S COMMENTS AFTER THE lESSON:** Урок разработан для 8 класса, по всем принципам обновлённого содержания образования, содержит различные формы и методы работы, среди которых, индивидуальная, парная, групповая работа, предлагаются задания различного уровня сложности, через весь урок прослеживается формативное оценивание, самооценивание, оценивание в паре, группе. При работе в группе предлагаются различные интернет сайты, которые способствуют формированию у учащихся умения анализировать информацию и выделять главное. Задания подобраны таким образом, чтобы на ряду с химическими знаниями у учащихся развивались и языковые навыки.

**Application**

group 1 – M- water molecule, its structure.

Task for group - Using additional material, internet - resources, describe the structure of the water molecule. Imagine a spherical-rod model of a water molecule.

**Additional material:** Water is made from one oxygen atom and two hydrogens. The oxygen has 6 electrons in its outer shell, but it really wants to have 8 to have a full shell. The hydrogens have one outer shell electron, but want to have two. The atoms share their electrons, forming covalent bonds. So all three atoms have full outer shells, and create a water molecule. Water has two covalent bonds.

In water, the bonding electrons spend most of their time nearer the oxygen atom, because it is more ELECTRONEGATIVE. This means that it is electron withdrawing.

As the negatively charged electrons are nearer the oxygen atom, the oxygen atom becomes a little bit negative itself, while the hydrogens become a little positive. This is called delta positive and delta negative. Water doesn’t just have any old covalent bonds; it has what we call POLAR COVALENT bonds and is a POLAR molecule. This is really important as it affects how water behaves and reacts with other elements.

**Internet – resource:** [**https://bilimland.kz/en#lesson=9956**](https://bilimland.kz/en#lesson=9956)

[**http://www.chem1.com/acad/sci/aboutwater.html**](http://www.chem1.com/acad/sci/aboutwater.html)

**Itinerary of the group's work**

**Маршрутный лист работы группы № 1**

|  |  |
| --- | --- |
| **Раздел**  **Тема** | 8.С Water  The Great Mystery of Water! Water is in the nature. Structure, properties and use of water. Water is the universal natural solvent. |
| **Цель обучения** | 8.4.2.6- to explain wide spreading, the unique properties of water and its value for life. |
| **Уровни мыслительных навыков** | Knowledge, understanding, analysis, assessment |
| **Evaluation criteria**  **Критерии оценивания** | Describe the structure of the water molecule. |
| **Task for group:** Using additional material, internet - resources, describe the structure of the water molecule. **You will present your answer as a 3D model of a water molecule**  **Internet – resource:** [**https://bilimland.kz/en#lesson=9956**](https://bilimland.kz/en#lesson=9956)  [**http://www.chem1.com/acad/sci/aboutwater.html**](http://www.chem1.com/acad/sci/aboutwater.html) | |
| **Evaluation criteria**  **Критерии оценивания** | **Descriptor**  **Дескриптор** |
| Describe the structure of the water molecule. | * Приводит примеры ЦОР, с помощью которых изучали структуру молекулы воды; * Указывает состав молекулы воды; * Указывает типы связи в молекуле воды; * Указывает тип связи между молекулами воды. |

group 2 - Ph. - physical properties.

Task for group- Using additional material, internet - resources, describe the physical properties of water.

**Additional material:** With 70% of our earth being ocean water and 65% of our bodies being water, it is hard to not be aware of how important it is in our lives. There are 3 different forms of water, or H2O: solid (ice), liquid (water), and gas (steam). And we all know that the boiling point of water is 100°C. So despite its small molecular weight, water has an incredibly big boiling point.

Water is a tasteless, odorless liquid at ambient temperature and pressure, and appears colorless in small quantities, although it has its own intrinsic very light blue hue. Ice also appears colorless, and water vapor is essentially invisible as a gas.

**Internet – resource:** [**https://bilimland.kz/en#lesson=9956**](https://bilimland.kz/en#lesson=9956)

[**https://ruclip.com/video/h0py6BFlFZw/properties-of-water-chemistry-for-all-the-fuse-school.html**](https://ruclip.com/video/h0py6BFlFZw/properties-of-water-chemistry-for-all-the-fuse-school.html)

**Itinerary of the group's work**

**Маршрутный лист работы группы № 2**

|  |  |
| --- | --- |
| **Раздел**  **Тема** | 8.С Water  The Great Mystery of Water! Water is in the nature. Structure, properties and use of water. Water is the universal natural solvent. |
| **Цель обучения** | 8.4.2.6- to explain wide spreading, the unique properties of water and its value for life. |
| **Уровни мыслительных навыков** | Knowledge, understanding, analysis, assessment |
| **Evaluation criteria**  **Критерии оценивания** | Describe the physical properties of water. |
| **Task for group:** Using additional material, internet - resources, describe the physical properties of water. **Your answer you will be presenting in the poster**  **Internet – resource:** [**https://bilimland.kz/en#lesson=9956**](https://bilimland.kz/en#lesson=9956)  [**https://ruclip.com/video/h0py6BFlFZw/properties-of-water-chemistry-for-all-the-fuse-school.html**](https://ruclip.com/video/h0py6BFlFZw/properties-of-water-chemistry-for-all-the-fuse-school.html) | |
| **Evaluation criteria**  **Критерии оценивания** | **Descriptor**  **Дескриптор** |
| Describe the physical properties of water. | * Приводит примеры ЦОР, с помощью которых, изучали физические свойства воды; * Указывает три состояния воды; * Указывает цвет, запах и вкус воды; * Указывает температуры кипения и замерзания воды. |

**Group 3 – А- anomalies**

Task for group -Using additional material, internet - resources; explain the water anomalies and their role.

**Additional material:** Because water seems so ubiquitous, many people are unaware of the unusual and unique properties of water, including:

Boiling Point and Freezing Point (If you look at the periodic table and locate tellurium, you find that the boiling points of hydrides decrease as molecule size decreases. So the hydride for tellurium: H2Te (hydrogen telluride) has a boiling point of -4°C. Moving up, the next hydride would be H2Se (hydrogen selenide) with a boiling point of -42°C. One more up and you find that H2S (hydrogen sulfide) has a boiling point at -62°C. The next hydride would be H2O (WATER!).

Surface Tension, Heat of Vaporization, and Vapor Pressure (Besides mercury, water has the highest surface tension for all liquids. Water's high surface tension is due to the hydrogen bonding in water molecules)

Viscosity and Cohesion

**Internet – resource:** [**https://www.youtube.com/watch?v=UL3jYLE2aaw**](https://www.youtube.com/watch?v=UL3jYLE2aaw)

[**https://www.youtube.com/watch?v=dQR7IcJOBJE**](https://www.youtube.com/watch?v=dQR7IcJOBJE)

[**http://water157.narod.ru/anom/root\_e.htm**](http://water157.narod.ru/anom/root_e.htm)

**Itinerary of the group's work**

**Маршрутный лист работы группы № 3**

|  |  |
| --- | --- |
| **Раздел**  **Тема** | 8.С Water  The Great Mystery of Water! Water is in the nature. Structure, properties and use of water. Water is the universal natural solvent. |
| **Цель обучения** | 8.4.2.6- to explain wide spreading, the unique properties of water and its value for life. |
| **Уровни мыслительных навыков** | Knowledge, understanding, analysis, assessment |
| **Evaluation criteria**  **Критерии оценивания** | Explain the water anomalies and their role. |
| **Task for group:** Using additional material, internet - resources explain the water anomalies and their role.  **Your answer you will be presented in the form of a poster-flower.**  **Internet – resource: Internet – resource:** [**https://www.youtube.com/watch?v=UL3jYLE2aaw**](https://www.youtube.com/watch?v=UL3jYLE2aaw)  [**https://www.youtube.com/watch?v=dQR7IcJOBJE**](https://www.youtube.com/watch?v=dQR7IcJOBJE)  [**http://water157.narod.ru/anom/root\_e.htm**](http://water157.narod.ru/anom/root_e.htm) | |
| **Evaluation criteria**  **Критерии оценивания** | **Descriptor**  **Дескриптор** |
| Explain the water anomalies and their role. | * Приводит примеры ЦОР, при помощи которых изучали аномалии воды; * Указывает 5 аномалий воды; * Объясняет их роль для жизни человека. |

**Group 4 - S- water - solvent, types of systems**

Task for group - Using additional material, online resources describe which systems provides water as a solvent. Conduct the experiment. Carry out the experiment: Dissolve salt, oil and sand in water and determine the type of system.

**Additional material:** Water is capable of dissolving a variety of different substances, which is why it is such a good solvent. And, water is called the "universal solvent" because it dissolves more substances than any other liquid. This is important to every living thing on earth. It means that wherever water goes, either through the ground or through our bodies, it takes along valuable chemicals, minerals, and nutrients. Water forms a number of systems, as a solvent: these are solutions, colloids. To the colloids are suspensions and emulsions. A solution is a homogeneous mixture involving a solute and a solvent. The solute is the substance that gets dissolved and the solvent is the liquid in which the solute dissolves. The solute (may be liquid or solid) is broken down completely into individual ions or molecules in a way that can no longer be seen as a separate entity. A material is said to be soluble if it dissolves completely in a solvent. For example: If you dissolve salt (solute) in water (solvent), the salt is broken down into Sodium and Chlorine ions within the solvent. This mixture will look and taste the same everywhere in the cup, and would have salt and water in the same proportions. In this example, salt is a soluble material. An emulsion is a heterogeneous mixture of two or more liquids, in which one ends up as very tiny droplets inside the other. Very often, the liquids involved are not mutually soluble — like adding some water to a bottle of cooking oil. You will notice that, even after some shaking and agitation, it does not dissolve in each other, but appear as bits and pools in the main liquid. Emulsions behave this way. Emulsions are colloidal systems too. What is the difference between a colloid and an emulsion?

With colloids, the mixture has components that tend not to settle out when left undisturbed. In addition to that, a colloid involves the uniform dispersion of fine solid particles in a liquid medium. An emulsion is a uniform mix of two immiscible liquids (immiscible liquids are those that do not dissolve well into each other). A suspension is a heterogeneous mixture of a liquid and a solid. The solid usually does not dissolve, and can be very visible to the eye. Sometimes the solids are heavy, and large enough for sedimentation (particles settling down in layers) in the container holding it. Unlike colloids, regular agitation is needed to keep mixture fairly mixed. An example of a suspension is a mixture of sand and water. Suspensions often involve 2 phases of matter, because after the solids are mixed with the solvent (liquid) stay the same. Some good characteristics of suspensions are:

1. It is cloudy (not as clear as a solution).

2. It can be filtered.

3. The larger particles settle at the bottom.

4. It is a mixture of two phases.

Note that suspensions can also involve tiny liquid particles in a gas, or tiny solid particle

in a gas. Examples include particulate matter in the atmosphere. Pollutants such as dust

particles, soot, salt or cloud droplets in the atmosphere are all suspensions.

**Internet – resource:** [**https://bilimland.kz/en/content/structure/738\_chemistry#lesson=9957**](https://bilimland.kz/en/content/structure/738_chemistry#lesson=9957)[**https://www.youtube.com/watch?v=bC\_czAL24zY**](https://www.youtube.com/watch?v=bC_czAL24zY)

**Itinerary of the group's work**

**Маршрутный лист работы группы № 4**

|  |  |
| --- | --- |
| **Раздел**  **Тема** | 8.С Water  The Great Mystery of Water! Water is in the nature. Structure, properties and use of water. Water is the universal natural solvent. |
| **Цель обучения** | 8.4.2.6- to explain wide spreading, the unique properties of water and its value for life. |
| **Уровни мыслительных навыков** | Knowledge, understanding, analysis, assessment |
| **Evaluation criteria**  **Критерии оценивания** | Describe which systems provides water as a solvent. |
| **Task for group:** Using additional material, online resources describe which systems provides water as a solvent. Conduct the experiment. Carry out the experiment: Dissolve oil in water and determine the type of system.  **You will give your answer in the form of a chart.**  **Internet – resource:** [**https://bilimland.kz/en/content/structure/738\_chemistry#lesson=9957**](https://bilimland.kz/en/content/structure/738_chemistry#lesson=9957)  [**https://www.youtube.com/watch?v=bC\_czAL24zY**](https://www.youtube.com/watch?v=bC_czAL24zY) | |
| **Evaluation criteria**  **Критерии оценивания** | **Descriptor**  **Дескриптор** |
| Describe which systems provides water as a solvent. | * Приводит примеры ЦОР, при помощи которых изучали виды систем, в которых вода – растворитель; * Указывает особенности раствора; * Называет неоднородные системы: эмульсию и суспензию; * Объясняет химический эксперимент по растворению различных веществ в воде. |

**Self-assessment sheet**

**Лист самооценки**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Criteria**  **Критерии** | | **Indicators**  **Показатели** | | **Evaluation of the success**  **Оценка успешности** | |
| **«I»**  **«Я»** | себя чувствовал в процессе учения | было ли мне комфортно | с каким настроением я работал | доволен ли собой | 5  4  3  2  1 |
| **«We» «Мы»** | насколько мне было комфортно работать в составе малой группы | какие у меня были затруднения в общении с группой. | смог ли я помочь товарищам | смогли ли они мне помочь | 5  4  3  2  1 |
| **«Job»**  **«Дело»** | я достиг цели учения | учебный материал нужен для дальнейшей учебы, для практики, он просто интересен | в чем я затруднялся, почему | как мне преодолеть свои проблемы | 5  4  3  2  1 |