ПЛАН УРОКА

Предмет	Физика	
Учитель	Иманшарипова А.Ж.	BILIM
Школа, класс	г. Астана, НИШ, 10 класс	
Тема урока	Atomic structure	www.bilimland.kz

The resources <u>http://bilimland.kz/en#</u>: have been used at the lesson: Physics course+Virtual laboratory

Learning objectives(s) that this lesson is contributing to:

- update knowledge and skills, provide motivation, develop research skills.

- demonstrate understanding of how the atom model has developed.

Expected result : In the process of studying the topic, students will achieve the lesson objective with the use of the "Billim land" website resources.

Language aim: Respect, tolerance, responsibility

- develop subject-academic vocabulary through working with textual information in various formats of speech activity (reading, writing, speaking);
- verbally articulate your answers, accurately define meanings.

Forms of working : Cooperative learning. Student-centered learning.

Methods and techniques of teaching: critical thinking, ICT in teaching, CLIL methods.

The Method of differentiation: Differentiation, in accordance with the level of tasks.

Interdicsiplinary links: Chemistry, History

Approach to learning :

Communication skills: To be able to write the key points during class work.

Self-organization: To demonstrate flexibility in the selection and application of learning strategies

Social skills: To work effectively in collaboration with other students.

Research skills: To collect and analyze data on informed decision-making

Critical thinking skills: Define and solve educational problems, formulate aims and objectives.

Resources: Resources from site http://bilimland.kz/en#

Relation with the next lesson in a series of lessons: Students will be able to apply the skills learnt and language skills in their work.

This lesson presents a series of sequential lessons and includes the integration of technology, active learning methods.

The lesson was developed using the method of CLIL, because lessons are conducted in English.

Lesson plan

Торіс	Atomic Structure.				
Type of lesson	Study a new topic using the resources from <u>http://bilimland.kz/en#</u>				
Key words	Atom, atomic structure, matter, molecule, nucleus, proton, electron, neutron				
Lesson plan	Stage of the lesson:	Techniques and methods:			
	Organizational	- Activity called "Word			
	Actualization of previous knowledge	search"			
	Studying of new topic	- KWL chart activity			
	Generalization and systematization of knowledge	- Cooperative learning			
	Checking students' knowledge	- Presentation of atomic models			
	Reflection	- Virtual laboratory			
		activity			
		- Reflection: exit card			
Resources	http://bilimland.kz/en/content/structure/737-physics				
	Video: Thomson's and Rutherford's atomic model.				
	http://bilimland.kz/en/#lesson=10637				
	http://bilimland.kz/en/#lesson=10637				
	Virtual laboratory: Build an atom				
	Textbook: GCE 'O' Level Physics Matters				

Lesson Plan Planned activities

- Warm-up:

Aim: Create conditions to solve a learning problem Form of work : individual-paired-group Organizing class for the lesson. Students are introduced with the lesson objectives.

• Actualization of knowledge



- Warm-up. Vocabulary "Word search" activity, where students guess the key words of the Topic

Procedure:

Identify the words as given in diagonal, horisontal or in vertical lines

Answers (Key Words of the Lesson): MATTER, ATOM, MASS, NUCLEUS, PROTON, ELECTRON

MOLECULE,

ELEMENT,

NEUTRON

- As a whole class discuss in class the previous knowledge on chemistry about atomic structure using KWL chart.



Procedure:

In the first column, learners write what they have already learnt about the topic. In the second column, learners write questions about what they want to learn in the topic studied. When the topic is complete, learners can fill in the third column to specify what they have already learned.



- The Stage of the New Topic:

Objective: to develop research and collaboration skills Form of work : work in small group - Co-operative learning:

Task for group work:

In 2 small groups students will try to model the atomic structure and create their own model of atomic structure as independent scientists. Then they will draw a labeled diagram and describe the structure of different atomic models using the information from <u>http://bilimland.kz/en/content/structure/737-physics</u>.

Each group works on one of the worksheets, which includes some background information from <u>http://bilimland.kz/en/content/structure/737-physics</u> about the scientists, what they have discovered. They draw an atomic model according to the information given.

<u>Task for Group 1: J.J.Thomsons</u> Thomson's Model of Atomic Structure – 1899

1. Atoms composed of rings of negative electrons and embedded in a sphere of positive charge (the plum pudding model).

- 2. The positive and negative charges balance to make the atom neutral.
- 3. The atom mass was determined with the nucleus.
- 4. The electron mass was 1/1840 of the hydrogen mass, the lightest atom.
- 5. There were 1840 electrons in a hydrogen atom.

What to DO:

- 1. Make a model or draw a diagram of JJ Thomson's model of the atom.
- 2. What is the main difference in this model?
- 3. What advances in technology made it possible for Thomson to successfully complete his investigations?

Task for Group 2: E. Rutherford

Rutherford's Model of Atomic Theory

- 1. The atom consists mainly of space.
- 2. The atom mass is concentrated in the nucleus, which is a small core at the atom centre.
- 3. The nucleus has positive charges.
- 4. Electrons move around the nucleus like planets orbiting the sun.
- 5. The atom is neutral as it has the same number of positive charges and negatively charged electrons.

What to DO:

- 1. Make a model or draw a diagram of Rutherford's atom.
- 2. What was the main difference between Rutherford's atom model and Thomson's atom model?
- 3. Why did Rutherford carry out his experiments in the dark?
- 4. What evidence do you think lead Rutherford to conclude that the atom had a positively charged nucleus?



-Presentation of the students' Model:

Teacher organises the whole group discussion.

Students present their understanding of the model, of how they have worked as a group and of what they have learnt. Presentation of various scientific models of atomic structures (Rutherford, Thomson). After their presentation students post their diagrams of atom models on the wall.

At the end, students synthesize all models of atomic structure and compare their models.



Students' Posters From the Lesson

- After the presentation students will watch a video about atomic structure from http://bilimland.kz/en/#lesson=10637



- Practical Part: Virtual laboratory "Build an Atom"

Task: Students do the virtual laboratory work, applying their knowledge about the atomic structure



- Stage "Reflection"

Aim : analyze success in their aim achievement

Form of work: individual.

- Check the gained knowledge with the use of the Activity "True or False" and "Matching".

Activity 1

Indicate which statements are true and which are false.

	True	False
The electron is thought to have been discovered by J. J.		
Thomson.		
An electron is not a component of an atom.	•	0
The radius of an electron $\text{R}{\approx}10^{-10}\text{m}.$		•
The diameter of an atom is 0,1 mm.		0
An atom as a whole is electrically neutral.		

- Students' Reflection:

Students reflect on the questions and fill in exit cards:

Activity 1



- One thing you have learnt today;

- One question for today;

- One fact from today

Students write their notes on the exit cards.

This approach helps teachers reflect on the lesson progress and prepare for the next lesson because the students identify questions they still have. It allows a teacher to organise his/her work to search for answers to questions.

One thing you have learnt today	One thing you have learnt today
People had different perception of atonic	Afom module have been changing
structure throughout the history. For inter	Human history but its
thist an was counted as solid piece of matter	One question about today we i with
One question about today of different color	Aoes pealer of atom match fo
Were there any other models or	those, which putherford storted
ideas?	One fact from today
One fact from today	Authenford and Thempson worked
Now we use quantum theory model.	forgether of the Convariant lab in

Student Reflection Form