

SCIENCE MODULE

Subject: Chemistry

TOPIC of the module: The story of the periodical system

Age of students: 13

Number of students: 24

Required prior knowledge: - scientific terminology and conventions about the chemical phenomena studied;
- the classification of the composites, solutions, elements, molecules and chemical reactions;
- the structural characteristics of different atoms.

Objectives: At the end of the module the students will be able to

- Define the atom, chemical element and symbol
- State Mendeleev's periodicity law
- Recognise the structure of the periodical system
- Define the groups and periods
- Classify the elements based on the position in the system

Opportunities: - Students will be able to use art while learning about the periodical system.
- Students will be able to create their own story about the periodical system.
- Students will be able to use their imagination to create their own images of the chemical elements.

Resources: colours, water colours, colored paper, colored chalk, caps and t-shirts

Time frame: 5 lessons (50 minutes/lesson)

Arts involved: drawing, drama, poetry

Methods of work: group work,

Procedure / steps:

Lesson 1 – classifying the elements

Through a wordsearch worksheet about the chemical elements the students find out the name of the chemist who gave us the modern classification of the elements, **Dimitri Mendeleev**. Then the students learn about the criteria used to classify the elements.

Lesson 2 – the periodical system

The teacher presents the periodical system by Mendeleev and through a game they discover by themselves how the chemist arranged the elements in the system. Each student chooses a different element (out of the first 20) and has to write its electronic configuration.

They have to make a table with those 20 elements and under each element they have to write the number of electrons from the last row of each atom. Then they have to compare the number of the electrons from the last row of the other elements and finally they have to narrow down the horizontal line, arranging the symbols of the elements with the same number of electrons on the last row, one under the other. And so they get the periodical system.

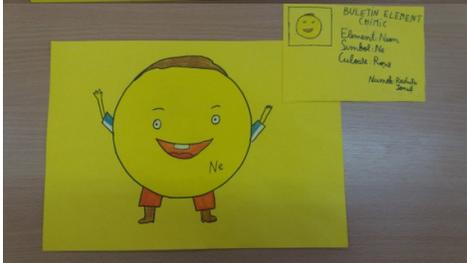
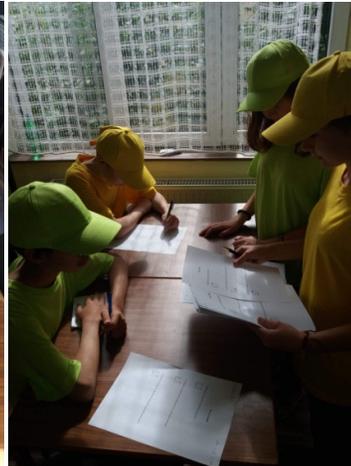


Lesson 3 – the structure of the periodical system

The students learn about the horizontal lines and vertical columns and what they are: periods and groups. They learn about main and secondary groups and about the metals and nonmetals, and of course about their characteristics.

Lessons 4&5 – the story of the periodical system

Having acquired all the information about the periodical system the students are faced with a challenge. They have to work together and create their own story of the periodical system. The teacher gives the students the setting, the town where the elements reside, and each student has to take the role of a different element. The students have to create a description of their element in verse but also to draw it and to make an “ID” card for it. After the students finish creating their verses and drawings they film everything like a short drama entitled “The Story of the periodical system”.





This is their story

Our lesson today is about ... and please guess:

He's at the base of matter

In a world being a host

All the people consider it indivisible

And Democrit named it ATOM

Two atoms considered

That they are true brothers

Always walk together

And they form our MOLECULE

Lots of scientists searched them

And they named them

Not to be tangled

And with symbols they were called

So anybody could know them

Even you seventh year students

CHEMICAL ELEMENTS

We do not know anything about the atom,

Just ... how much is learned by man.

The atom is the infinite little,

Little is small but endless,

Everybody's got a little piece,

And together they all have nothing.

It's the question that hurts us,

If the atom is a flower,

What brings a greater evil,

Or horror ... destructive?

He is the little gentle,

That is not seen in motion,

But he has so much to say,

That never will it be broken.

THE CAPITAL OF CHEMISTRY is THE PERIODICAL SYSTEM where the CHEMICAL ELEMENTS live. The capital has an amazing architecture: the tall buildings are GROUPS, and the straight streets are PERIODS and THE HOUSES OF THE CHEMICAL ELEMENTS are luxury suits.

In the capital lives the king of CHEMISTRY KINGDOM – GOLD, in a huge and shiny castle.

Gold is a noble metal and its symbol is ...

THE PRIM-MINISTER is MR. OXYGEN, which ensures breathing to all living creatures. Its symbol is

THE MINISTER OF HEALTH is MR. CHLORINE. Its symbol is ..., it destroys bacteria, ensuring a healthy environment.

THE MINISTER OF EDUCATION is MR.PHOSPHORUS. Being the element of life and ration, he is absolutely necessary to the human brain. Its symbol is ... and you can find it in fish, bread etc.

THE MINISTER OF NATIONAL SECURITY is MR. LEAD; its symbol is It is used in the production of bullets and it is a heavy metal.

THE MINISTER OF CONSTRUCTION is MR.SILICON, in 26% of the Earth's bark. Its symbol is and you can find it in clay, sand, but also in hair, in liver, in skin and also in blood. And in olives, reddish and in blueberries.

The manager of the Central Hospital in the CHEMISTRY KINDOM is IODINE. It has the chemical symbol and he fortifies the organism's immunity, contributing to the process of growing and ensures the health of nails and teeth.

BROMINE is the head of the "Neurology" department in the Central Hospital. BROMINE gets in the blood, liver and especially the brain. In case of nervous system disorders, the doctors recommend to prepare bromine.

The orthopedics department is driven by Mr. Calcium. He is symbolized and ensures the resistance of bones.

From this journey results the history of the City of the Periodical System.

The City of the Periodical System of chemical elements has the following history:

The history of the City of the periodical system is presented in the lost manuscript.

In 2015 Mendeleev's City of the periodical system has a population of 118 – chemical elements including 90 in natural state – grandparents and parents, and kids, 28 artificial elements.

Someday in the near future a new resident – alkal metal - will enter the city of the periodical system known as "MENDELEEV'S TABLE". We're talking about the resident with the atomic number 119, the creation of the German chemist Chistoph Dullmann. The chemical element with the number 119 will mark the beginning of a new row in Mendeleev's table - a new inhabitant in the city of the periodical system.

Gold is valuable

And it's very precious

It finds himself in the ground

And it's also very expensive

Learn from gold not to be cheap

To make precious things which last through time.

Iron, wide-spread metal

It is everywhere found

At objects used

If you don't take care it rusts

Learn from iron to be rough

And in personality pure.

Nobody sees me alone, I'm discreet, but everywhere

In acids, in water, bases, wherever I have a place

It's easy to force gas to rise up to the sky

And the balloon and the rocket wearing tons of steel

I pass through everything that surrounds me

I'm base in the living world with carbon's good brother
The smallest of all atoms, but my older brothers
I'm in the bomb that destroys, and in the light of the hard ones.

I find myself everywhere: in the air, and in the field used as a fertilizer.
And in liquid state I'm real freezer, odorless and colorless.
Being in plants, animals base their lives on the earth, making proteins.
If you want to have everything, live well with the nitrogen!

I am a perfect actor
When I want I am a diamond
Fullerene or graphite
Or heating coal.
And if you're intoxicated
Drink activated charcoal.
Alloy with iron I do
I am diverse, liked by all.

Silver is my name
Bright and expensive always I am
I'm the most beautiful and the most valuable
Solid, powerful and great.

Calcium, important element
There's no diamond
It is very common
In teeth it is found
From milk it does come
My name is Plutonium,
I'm friend with Uranium.
I am a metal But not a regular one,
But unlike the others I can make „boom“.

I am famous ROBY
Because I am dangerous
But I am explosive
Only when I am used abusively
No I am not plutonium
I am uranium.

When the blue sky becomes dark,
To see the light of the city,
A trail of red ruby and white diamond, lights the city.
The light comes and leaves every night.
She always lights up like me, neon,
But who knows how long can it survive?

Magnesium is necessary in our organism
It helps our metabolism
If magnesium is not there
Our organism sickens
I advise you all
Magnesium to consume
It's a good antioxidant
And for the heart it's fuel

I am aluminum
I have 13 protons
My symbol is Al
I have 14 neutrons
I am very familiar
My color is silver
I am a builder.
You can make with me a plane
To fly on an air lane.
I am aluminum.

Evaluation summary and comments about how the module went: engagement of the students, difficulty, effectiveness, and improvement suggestions)

All the students were actively involved in the module, each of them having a specific task to perform. They really enjoyed the role play, and although it all seemed like a game, they took the assignment very seriously and thus, at the end, they realized that they had acquired new knowledge without a lot of effort but only by playing and using their imagination and creativity.