



Good practice

Slow down education in the nature

Erasmus+ KA229 project





General information

- **School** – Primary school “Lazo Angelovski”
- **Country** – Republic of North Macedonia
- **Subject** – Mathematic and PE (open lessons for teachers in the school)
- **Topic** – Long jump and statistics
- **Teachers** – Elena Kuzmanova, Petar Aceski



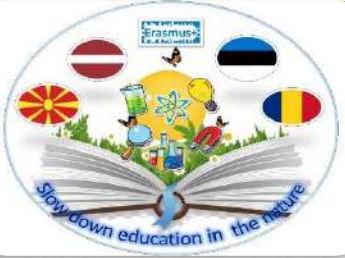
Long jump and statistics

- **Materials needed**

- mattresses,
- measuring tape,
- sportswear,
- worksheets with tables (for collecting information),
- computer (excel - for calculations and creating graphs).

- **Surroundings**

- school sports hall



Long jump and statistics

Aims

- gaining knowledge about long jump
- physical activity by using long jump
- gaining knowledge about working with data and statistics
- using Excel for calculation of average and drawing graphs



Activity 1

In the beginning of the lesson, the PE teacher demonstrates how to perform the long jump and the Maths teacher explains how to collect the necessary data.

The students have three tries to make a long jump.





Activity 2

The PE teacher gave instructions how to preform the long jump correctly and how to make a longer long jump.





Activity 3

The students enter the collected data in the Excel tables, separately for the girls and boys. They calculate the average of each try and draw graphs to present the results from the jumps, as well as a comparative graph in order to see whose results were better (they boys' or the girls' results).

STEAM – Секција
Скок во далечина и статистици

VI ОДД	Име и презиме	Обид 1	Обид 2	Обид 3	просек	најдобар скок
1	Ана Стефановски	1.98	2.22	2		
2	Марија Јаневска	1.95	2.29	2.48		
3	Марија Јаневска	1.55	2	1.69		
4	Татјана Зариновски	2.21	1.95	1.91		
5	Михаил Високи	1.35	2.77	2.40		
6						
7						
8						
9						
10						
11						
12						
13						
14						

VII ОДД	Име и презиме	Обид 1	Обид 2	Обид 3	просек	најдобар скок
1	Датчан Зманов	2.25	2.23	2.26		
2	Александар Џевиќ	2.10	2.12	1.94		
3	Петар Мандиќовски	1.97	1.50	1.80		
4	Алек Петровски	2	1.78	1.80		
5	Наташа Митревска	1.80	1.75	1.92		
6	Ева Ружичка	1.92	1.50	1		
7	Марија Јелиќ	1.60	2	2.14		
8	Марија Јаневска	1.54	1.70	0.70		
9	Ива Јелиќовска	1.79	2.20	1.60		
10	Марија Јаневска	1.98	2.13	2.10		
11	Марија Јаневска	1.68	1.79	1.40		
12						
13						
14						



Activity 3

STEAM секција Скок во далечина и статистики

машки	Име и презиме	Обид 1	Обид 2	Обид 3	просек (индивидуален)	најдобар скок
1	Стефан Ристовски	1.95	2.71	2.40	2.35	2,71
2	Павел Зафировски	2.21	1.95	1.91	2.02	2.21
3	Лука Стевановски	1.98	1.88	2.00	1.95	1.98
4	Марко Боневски	2.25	2.29	2.46	2.33	2.46
5	Александар Цветковски	2.10	2.12	1.94	2.05	2.12
6	Петар Манџуковски	1.97	1.50	1.80	1.76	1.97
7	Гаврил Азманов	2.25	2.23	2.26	2.25	2.26
8	Олег Петровски	2.00	1.78	1.90	1.89	2.00
9	Душан Димовски	1.68	1.79	1.40	1.62	1.79
10	Христијан Јакимов	2.54	3.10	3.25	2.96	3.25
11	Матеј Павловски	1.78	2.33	2.33	2.15	2.33
12	Мартин Новески	2.92	2.90	3.33	3.05	3.33
	просек од секој обид	2.14	2.22	2.25	2.20	

График - машки





Gallery





Gallery





Gallery



Споредбен график (машки-девојчиња)





Gallery



Споредбен график (машки-девојчиња)





Gallery

This was an open lesson for colleagues in school to show teaching possibilities in nature. It was visited by the other teacher-members of the STEM hobby group (Fun science) (mathematics, biology, physics, chemistry and PE teachers).





Gallery





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General information

- **School** – Primary school “Lazo Angelovski”
- **Country** – Republic of North Macedonia
- **Subject** – Mathematic
- **Topic** – Symmetry in nature
- **Teacher** – Daniela Davkovska



Symmetry in nature

- **Materials needed**
 - Worksheet with table (to fill in information),
 - A4 white paper and ink,
 - Mobile/smart phone for taking pictures,
 - Objects, plants, building in the local surroundings.
- **Surroundings**
 - The lesson took place in the school yard



Symmetry in nature

Aims

- Gaining knowledge about axial symmetry and rotational symmetry
- Identifying axial symmetrical objects in nature
- Identifying rotational symmetry in nature
- Determining the numbers of axes in symmetry and the order of rotational symmetry in different forms/objects



Activity 1

- The teacher starts the lesson by explaining the terms: axial symmetry and rotational symmetry to students using some flashcards/pictures.





Activity 2

- The students together with the teacher make some examples of axial symmetrical forms using A4 white papers and ink.







Activity 3

- The teachers gives directions to students to walk around the school yard and look at / examine different objects. After that, they have to choose some objects, take pictures of it and fill in the worksheet with the table with the appropriate information.

ООУ „ЛАЗО АНГЕЛОВСКИ“ - СКОПЈЕ

СТЕАМ-СЕКЦИЈА

Симетрија во природата

Предмет	Број на оски на симетрија	Ред на ротациона симетрија



Gallery








Gallery





ООУ „ЛАЗО АНГЕЛОВСКИ“ - СКОПЈЕ

Симетрија во природата


Предмет	Број на оски на симетрија	Ред на ротациска симетрија
Лист 1 	0	1
стол 	1	1
Форма на Школскиот Сид 	2	2

НАСТАВНИК: ДАНИЕЛА ДАВКОВСКА

ООУ „ЛАЗО АНГЕЛОВСКИ“ - СКОПЈЕ

СТЕАМ-СЕКЦИЈА

Симетрија во природата

Предмет	Број на оски на симетрија	Ред на ротациска симетрија
	3	1
	3	3
	1	1
	1	1
	1	1
	1	1
	1	1

НАСТАВНИК: ДАНИЕЛА ДАВКОВСКА



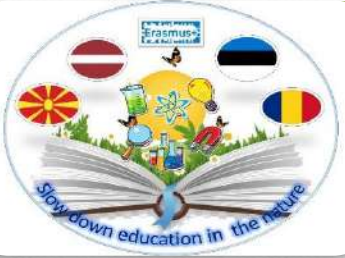


Good practice

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Erasmus KA229 project





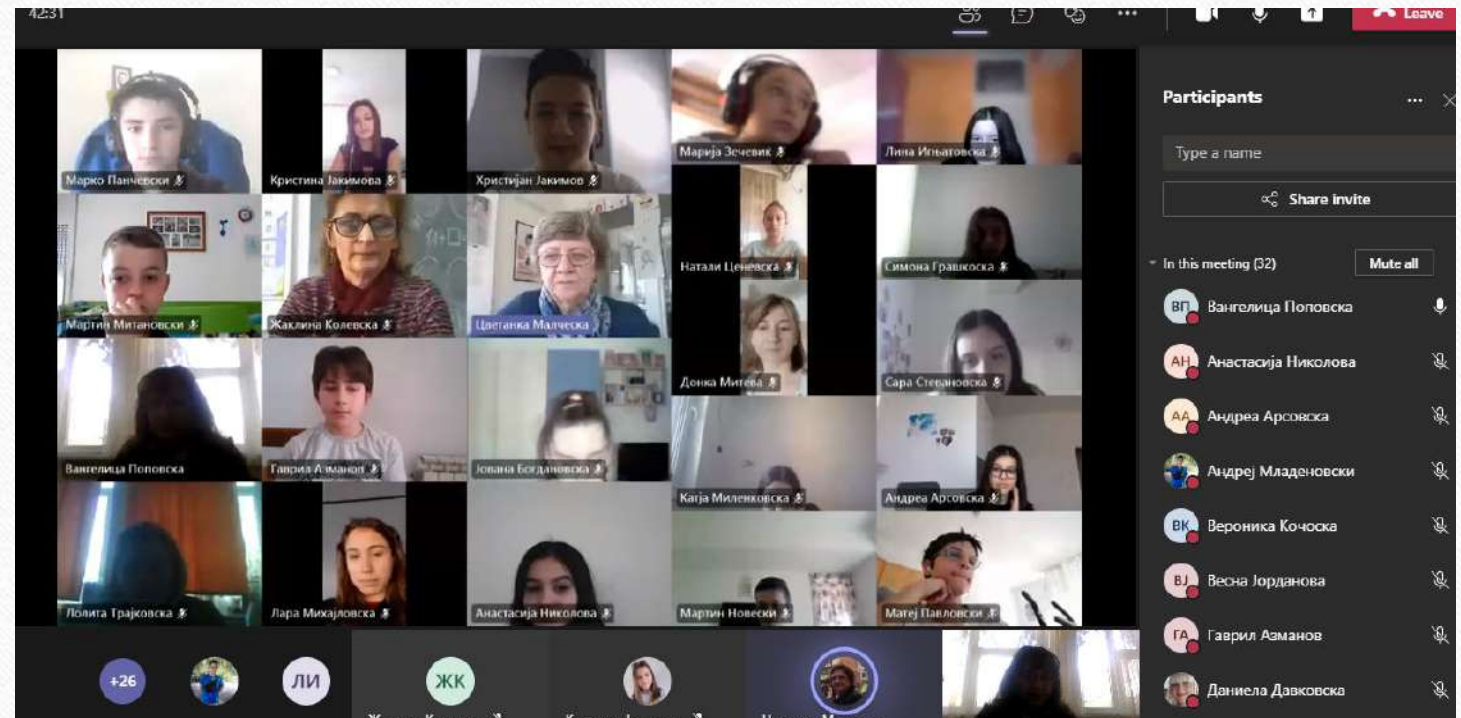
General information

- School – Primary School “Lazo Angelovski”
- Country – North Macedonia
- Subject – Biology
- Topic – Circulatory system / Blood functions
- Teacher – Cvetanka Malceska



Circulatory system/ Blood functions

- Materials needed –
Power Point presentation
- Surrounding – using
Microsoft Teams platform





Circulatory system/ Blood functions

Aims-

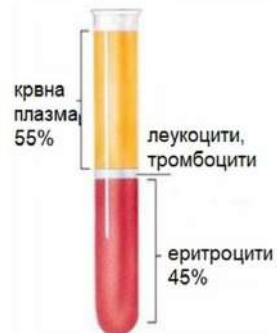
- Gaining knowledge about blood functions and blood role
- Gaining knowledge about blood parts, their referent values and role
- How to read blood report
- Find out how to detect lacks and disturbance in the human body
- Gaining healthy eating and living habbits



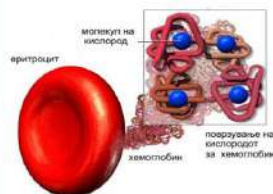
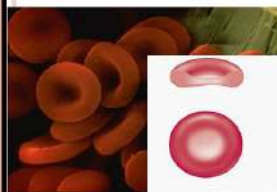
Activity 1

-
- Class starts with presentation from the teacher. Here students will gain basic knowledge about:
 - meaning and the role of the blood in the human body;
 - consisting parts, blood elements and their role;
 - referent values of the blood elements;
 - meaning of high or low referent values of the blood elements;

СОСТАВНИ ДЕЛОВИ



КРВНА ПЛАЗМА И ФОРМАТИВНИ ЕЛЕМЕНТИ (ТЕЛЦА)
 КРВНА ПЛАЗМА – содржи околу 90% вода во која се растворени хранливи материји и во која пливаат формативните елементи (црвени крвни клетки – еритроцити, бели крвни клетки – леукоцити и крвни плочки – тромбоцити).



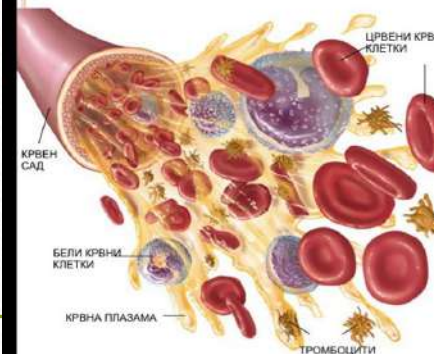
ЦРВЕНИТЕ КРВНИ КЛЕТКИ – ЕРИТРОЦИТИ

- единствени клетки во човечкото тело кои немаат јадро
 - имаат дисковидна форма во чија средина има вдлабнатина
 - Содржат посебен вид на белковина – хемоглобин која ја дава црвената боја на еритроцитите и која гради лабави врски со кислородот и јаглороддиоксидот.
 Еритроцитите многу брзо се трошат. Нивниот век на живеење е до 90 дена. Брзината на таложување на остарените еритроцити позната е како **СЕДИМЕНТАЦИЈА**



Ц. Малческа

Ц. Малческа



ФУНКЦИИ:

1. ПРЕНЕСУВАЊЕ

- А) пренесува кислород и јаглороддиоксид
- Б) пренесува хранливи материји и штетни материји
- В) пренесува хормони
- Г) пренесува топлина

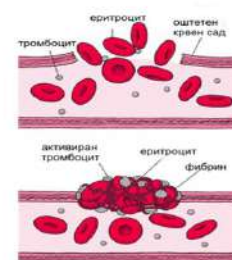
2. РЕГУЛИРАЊЕ

- А) помага во одржување на Рн вредностите
- Б) количеството на течности во организмот

3. ЗАШТИТА

- А) го штити организмот од различни заболувања
- Б) го штити организмот од губење на крв

Ц. Малческа

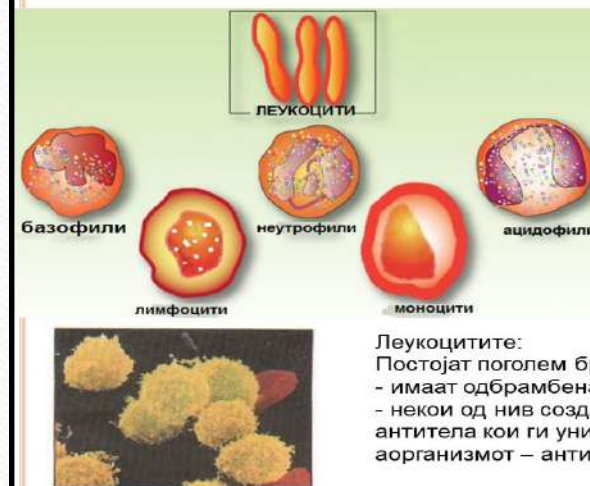


ТРОМБОЦИТИ – КРВНИ ПЛОЧКИ

Неопходни се за коагулација – засирување на крвта
 Ако настане оштетување на некој крвен сад и крвта излезе надвор од него:
 - се активираат тромбоцитите кои создаваат ензим – тромбин.
 - овој ензим предизвикува создавање на нишковидни конци - фибрин
 - создавање на крвен колач, засирок или тромб

-Наследно заболување – хемофилија

Ц. Малческа



БЕЛИ КРВНИ КЛЕТКИ – ЛЕУКОЦИТИ

-имаат јадро
 - се движат амевидно

Леукоцитите:

Постојат поголем број на леукоцити кои:
 - имаат одбрамбена улога
 - некои од нив создаваат посебни молекули – антитела кои ги уништуваат напаѓачите на аорганизмот – антигени

Ц. Малческа



Activity 2

- Students were given a picture with abbreviations of the blood elements and their role

На сликата ви се дадени составните делови на крвта и што значат ознаките

RBC **ЕРИТРОЦИТИ**
Црвени крвни клетки чија основна задача е пренос на кислородот до сите ткива и органи

WBC **ЛЕУКОЦИТИ**
Бели крвни клетки кои претставуваат клеточен дел од имунолошката одбрана на организмот. Бројот на леукоцити зависи од возраста, физичката активност, бременост, стрес...

HGB **ХЕМОГЛОБИН**
Протеин кој се наоѓа во составот на еритроцитите, содржи железо и овозможува транспорт на кислород во ткивата

PLT **ТРОМБОЦИТИ**
Тромбоцитите или крвните плочки имаат значајна улога при коагулацијата и формирање на крвен тромб

MCH **СРЕДЕН КОРПУСКУЛАРЕН ХЕМОГЛОБИН**

MCHC **КОНЦЕНТРАЦИЈА НА СРЕДЕН КОРПУСКУЛАРЕН ХЕМОГЛОБИН**

MCV **СРЕДЕН КОРПУСКУЛАРЕН ВОЛУМЕН НА ЕРИТРОЦИТИ**
Зависи од вкупниот број на еритроцити и концентрацијата на хемоглобинот

RDW **ЕРИТРОЦИТНА ДИСТРИБУЦИЈА**
Варијабилност на еритроцитите во однос на големината и волуменот

MPV **СРЕДЕН ВОЛУМЕН НА ТРОМБОЦИТИ**

PDW **ПРОСЕЧНА ГОЛЕМИНА НА ТРОМБОЦИТИТЕ ВО ВОЛУМЕНОТ НА КРВ**

Ц. Малческа



Activity 3

- Students were given a task to analyze 4 blood reports. The aim of the task is to find out the disturbances and lacks when the referent blood values are low or high. Also, students should gain skills to practice healthy eating and living habits.

Задана: Во дадената табела се наорисованите составни делови на крвта и нивните референтни вредности. Крвните слики 1,2,3 и 4 се резултати од 4 различни пациенти. Ваша задача е: преку анализа на референтните и добиените вредности на дадените крвни подметрувања се резултат на овие 4 пациенти. Доколку си лекар или генетрагон би бил да дај на пациентите за здравна исхрана.

Крвни подметрувања	Референтна вредност	1	2	3	4
RBC	$5.5 \times 10^{12}/L$	3.3	6.6	4.5	6.5
HE	2-15mm/h	10	30	55	30
HGB	100-160g/L	78	120	100	140
WBC	$5.0 - 10 \times 10^9/L$	4.4	15	9	13
PLT	$140 - 450 \times 10^9/L$	550	380	520	800
Т-клетки		380	550	300	1800

Ц. Митрковска



Activity 4

- Students presented their analysis and conclusions in front of the other students.

Имена на пациентите	Референтна вредност	1	2	3	4
RBC	5,8-1012/L	3,3	6,6	4,8	6,5
SE	2-12mm/h	10	30	25	20
HGB	100-180g/L	78	120	100	140
WBC	3,9-10x10 ⁹ /L	4,4	15	9	12
PLT	140-450x10 ⁹ /L	550	380	320	800
D-димери	До 500	380	550	300	1800

Крвна слика/вредности	Референтна вредност	1	2	3	4
RBC	3,8-5,8x10 ¹² /L	3,3	6,6	4,8	6,5
SE	2-12mm/h	10	30	25	20
HGB	100-180g/L	78	120	100	140
WBC	3,9-10x10 ⁹ /L	4,4	15	9	12
PLT	140-450x10 ⁹ /L	550	380	320	800
D-димери	До 500	380	550	300	1800

Пациент бр.1 - Намалена вредност на еритроцити и хемоглобин. Докторот сигурно би му дал лекови против анемија. Но јас исто тана би му дал лимон или сок од лимон и пилешка супа.

Пациент бр.2 - Зголемен број на леукоцити, ова најверојатно значи дека има бактеријска инфекција. Пациентот мора да ги внесе следниве работи - овошје, печурки, риба. Оваа храна содржи витамини и ензими. Витамините и Ензимите ги намалуваат бројот на леукоцитите.

Пациент бр.3 - Покачена седиментација. Незнам точно кои лекови докторот би ги препишал. Ако пациентот е женско може да биде знак на бременост или менструација, но не сум сигурен.

Пациент бр.4 - Сите крвни врзца се покачени освен хемоглобинот. Ова може да доведе до тромбоза. Освен тоа што не треба пациентот да прима лекарства јас мислам дека не биде добра идеја да ја јаде следнава храна - див и домашен лук, кромид, магнонос и лимон.



Activity 4

ПРОЕКТНА АКТИВНОСТ ПО БИОЛОГИЈА

RBC -red blood cells. Тоа се црвени крвни клетки-еритроцити.

Референтни вредности се од $3,8-5,8 \times 10^{12}/L$.

Намалени вредности се знак на анемија-слабокрвност.

Зголемени вредности е полицитемија-густа крв која е ризик за срцев удар.

SE - sedimentation. Седиментација на крвта.

Референтни вредности се од $2-12 \text{ mm/h}$.

Намалени вредности се знак на анемија или алергија.

Зголемени вредности е знак за инфекција, труење, бременост, инфаркт.

Кај првиот пациент имаме нормални вредности на седиментацијата, тромбоцитите, леукоцитите и Д димерите, додека има намалена вредност на еритроцитите и хемоглобинот. Тоа значи дека пациентот е слабокрвен. Во овој случај докторот ќе препише лекаства против анемија. Тие од друга страна се штетни за црниот дроб. Јас би им препорачал сок од цвекло, јаболко, морков и лимон. Лимонот е неопходен бидејќи се витаминот ц од него се врзува со железото од цвеклото. Ако го нема витаминот ц железото ќе биде неискористено и исфрлено од организмот. Исто така и сокот од вишна и боровинка. Проверено.

Кај вториот пациент имаме нормални вредности на хемоглобинот и тромбоцитите, д- димерите се благо покачени, додека еритроцитите, седиментацијата и леукоцитите имаат покачена вредност. Зголемениот број на леукоцити значи појава на најверојатно бактериска инфекција која треба да се докаже со земање на брис од грло или нос. Ако нема лечењето се заменува со најдобриот природен лек-лукот и кромидот. Покрај овие две работи во исхраната се збогатува и со риба (богата со омега 3 масни

Намалени вредности се знак на анемија.

Зголемени вредности е знак за хемокоцентрации и полицитемија.

WBC -white blood cells. Тоа се бели крвни клетки-леукоцити.

Референтни вредности се од $3,5-10 \text{ g} \times 100/L$.

Намалени вредности се знак на намален имунитет, стрес, долготрајна примена на лекаства.

Зголемени вредности е знак за инфекција или екстремно зголемени е знак за леукемија.

PLT -platelet count test. Крвни плочки- тромбоцити.

Референтни вредности се од $140-450 \text{ g} \times 100/L$.

Намалени вредности се знак на склоност кон крварење. Причини хемотерапија, хепатитис ц.

Кај третиот пациент сите вредности се во нормала, освен седиментацијата која е малку покачена. Докторот ќе препише нормално лекови, но јас кога би бил доктор оваа седиментација не би ја земал за нешто сериозно. Бидејќи сите други показатели се добри и ако пациентот нема никакви други проблеми не треба никакво земање на лекаства. Ако пациентот е женско покачена седиментација може да значи и бременост или менструација. Исто така покачена седиментација се јавува и кај повозрасни пациенти. Овој пациент да продолжи да се храни здраво.

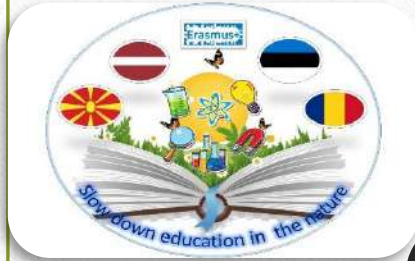
Кај четвртиот пациент освен хемоглобинот сите други вредности се покачени. Кај овој пациент има зголемена опасност од згрутчување на крвта и појава на тромб. Бидејќи д- димерите имаат висока вредност. За да се избегне појавата на тромбоза треба да се јадат неколку природни разредувачи на крвта: див лук, домашен лук, кромид, ѓумбир, омега 3 масни киселини, магдонос и лимон. Сите овие состојки да се јадат во свежа состојба и да бидат од органско производство.



Gallery

The screenshot shows a Zoom meeting gallery view with 32 participants. The participants are arranged in a grid of 4 rows and 8 columns. The names of the participants are visible below their video thumbnails. On the right side, there is a 'Participants' panel with a search bar, a 'Share invite' button, and a list of participants with their names and icons. The list includes: Вангелица Поповска, Анастасија Николова, Андреа Арсовска, Андреј Младеновски, Вероника Кочоска, Весна Јорданова, Гаврил Азманов, and Даниела Давковска. The bottom of the screen shows a toolbar with icons for chat, mute, and other meeting controls.

Participant Name
Марко Панчевски
Кристина Јакимова
Христијан Јакимов
Марија Зечевиќ
Лина Игњатовска
Марлин Митановски
Жаќина Колевска
Цветанка Малческа
Натали Цевеска
Симона Грашковска
Донка Митева
Сара Стевановска
Вангелица Поповска
Гаврил Азманов
Јована Богдановска
Каја Миленковска
Андреа Арсовска
Лолита Трајковска
Лара Михајловска
Анастасија Николова
Мартин Новески
Матеј Павловски



Good practice

Slow down education in the nature

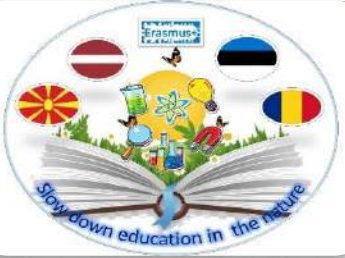
Erasmus+ KA229 project





General information

- School –Stalgene Secondary School
- Country –Latvia
- Subject – Math
- Topic - Measuring growing trees
- Teacher – Ilze Ērstiķe



Measuring growing treesu

- Materials needed – worksheet, pencil, tape-measure
- Surrounding - Courtyard, garden, close to an area with trees





Measuring growing trees

- Aims- build an understanding of how you can study trees in a park using mathematical skills.



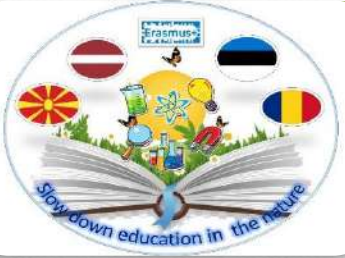
Activity 1

-
- 1. Pick out 2 trees with a friend, which you will study.
 - 2. Without measuring (by eye measurement) complete the first column of the table.
 - 3. Choose the necessary measuring tools and do the required measurements.



Complete the table!

Chosen tree	Tree circumference		Tree height		Tree age	
	By eye measurement	Accurate measurement	By eye measurement	Accurate measurement	By eye measurement	Accurate measurement
If you recognize the tree, write its name						
1.						
2.						



Measurement

- **Tree circumference.** Remember to measure it 1,30m from the ground!
- **Tree height.** To determine the height, you need a straight piece of wood (pencil, stick). How to do it? Your partner stands under the tree. Stand so you can see him/her and the tree in full view. Hold the piece of wood in a stretched out hand. Hold your arm so the feet of your partner are lined up with the tree trunk. Note their height on the piece of wood. Try to see how many times your friend's height fits into the height of the tree. Multiply the result with your partner's actual height.
- **Tree age.** The circumference of the tree is divided by 2,5. The resulting figure shows how many years the tree.



Evaluate the results! Discuss!

-
- a) Were you able to determine the approximate measurement of the tree without measuring it?
 - b) Do you know a different method how to determine the circumference, height and age of a tree?
 - c) What did you learn new today?



Gallery

- Other photos of the activities





Good practice

Slow down education in the nature

Erasmus+ KA229 project





General information

- School –Stalgene Secondary School
- Country –Lavia
- Subject – Physics
- Topic - Simple Mechanics
- Teacher –Dalija Brige



Simple Mechanics

-
- Materials needed – A camera or smartphone, a log, a board
 - Surrounding - Courtyard, garden, close area



Materials needed

For photos or videos



- For making a prototype of a lever



Surroundings

- A park, a backyard e.c.





Digital wal Padlet

A screenshot of a Padlet board. The board has a light green background. At the top left, it says "padlet". In the top right corner, there are navigation icons: a magnifying glass, a share icon, "DALĪTIES", a user icon, and a profile icon labeled "D". Below the "padlet" text, there is a small icon of a person with a wheelbarrow and a scale, followed by the text "D D Brige • 1m". The main title of the board is "Vienkāršie mehānismi" in bold black text. Below the title, it says "Āra nodarbība 9.klasei". In the bottom right corner of the board, there is a pink circular button with the Greek letter pi (π) inside.

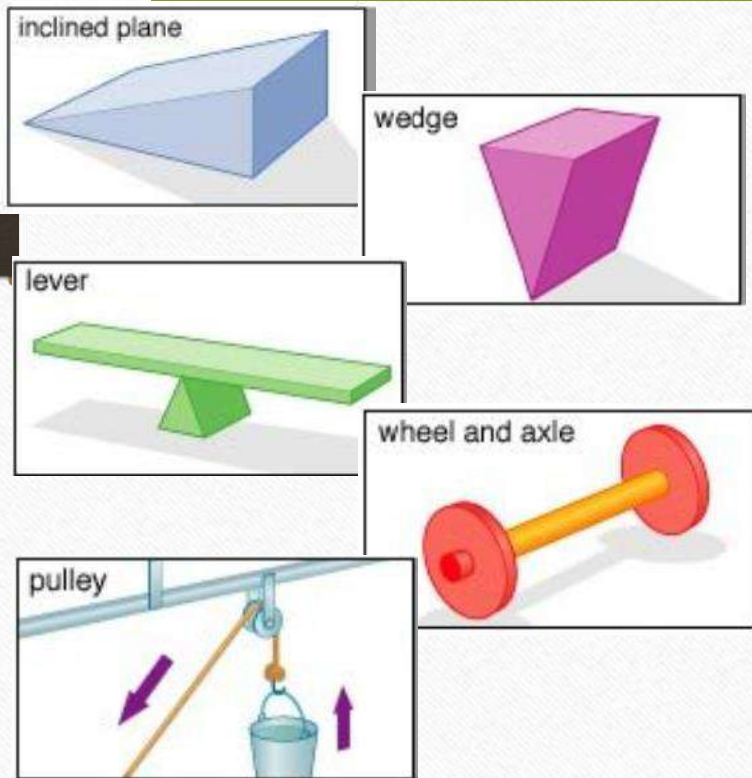


Simple Mechanics

- Aims- Recognise simple mechanisms, observe application of them in everyday life.



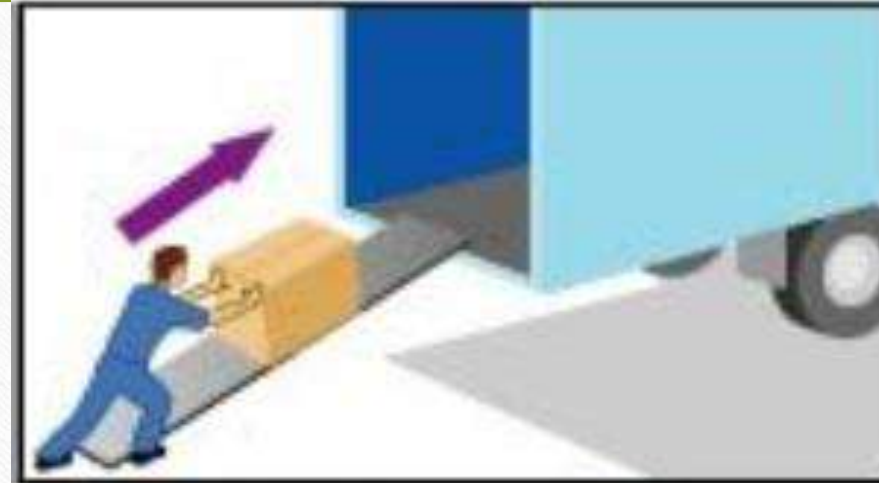
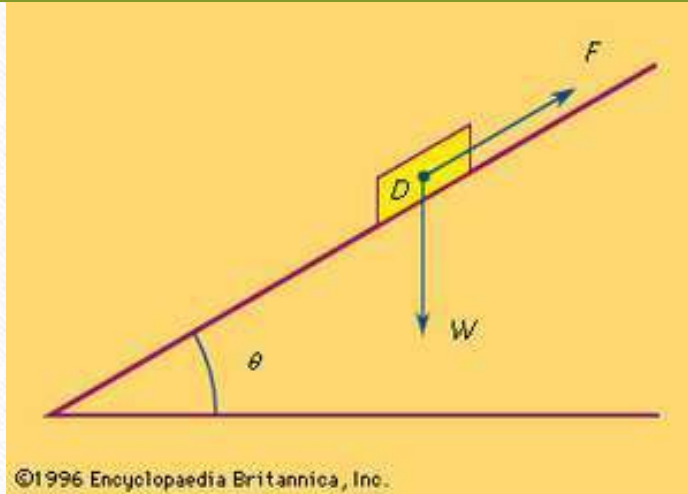
What is what?



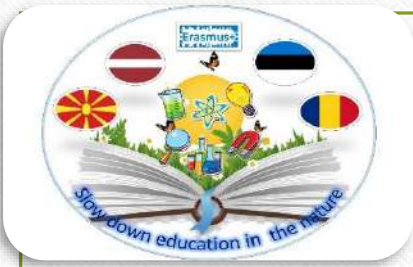
- Simple machine, any of several devices with few or no moving parts that are used to modify motion and the magnitude of a force in order to perform work.
- <https://www.britannica.com/technology/simple-machine>



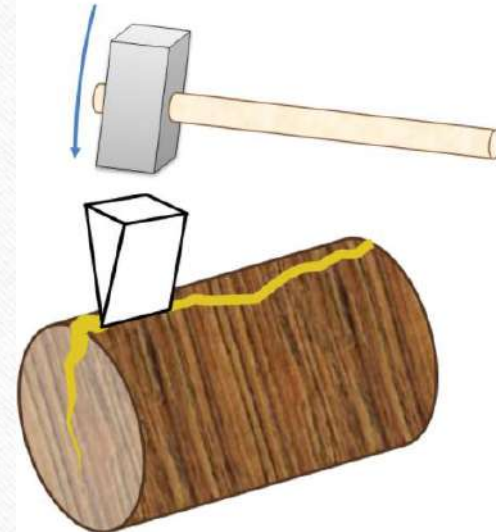
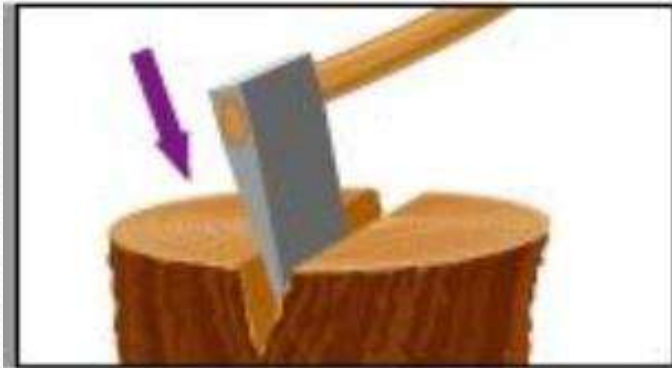
Inclined plane



In this representation of an inclined plane, D represents a block to be moved up the plane, F represents the force required to move the block, and W represents the weight of the block.



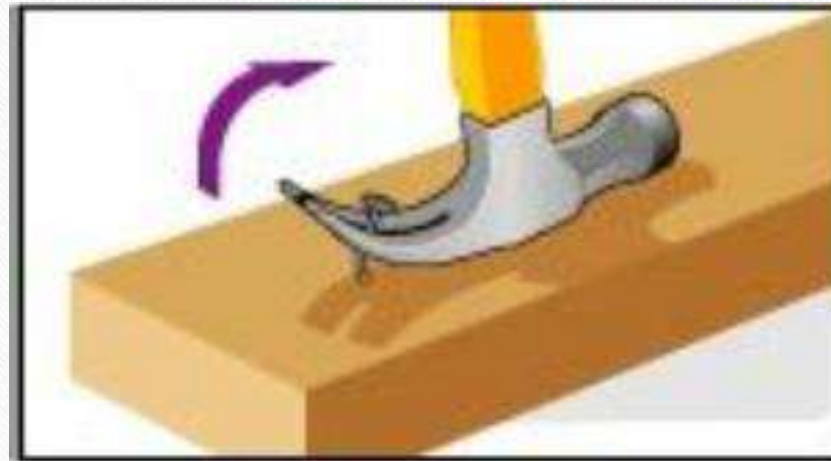
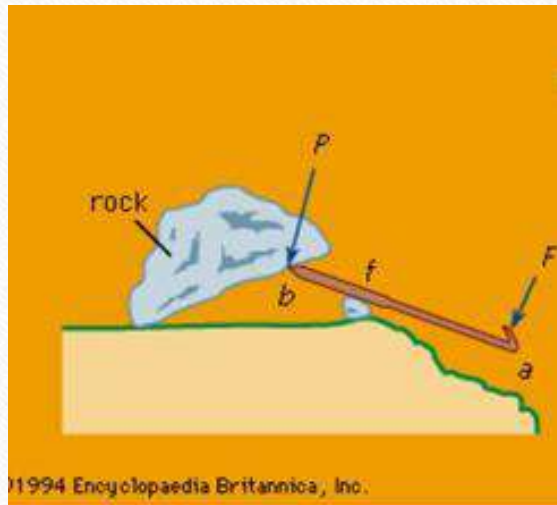
Wedge



A wedge as a tool is used to push two things apart such as the blade of a sword and knife does when it cuts woods.



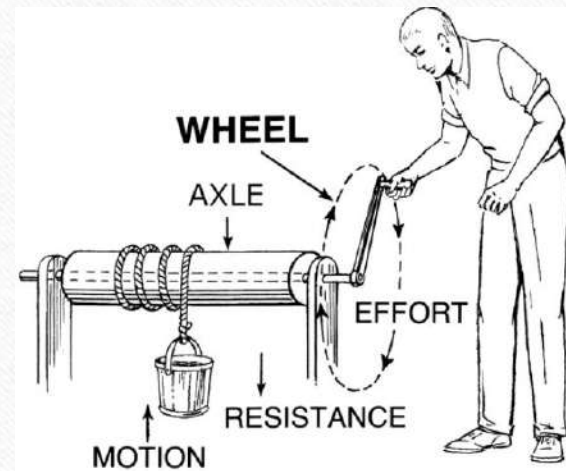
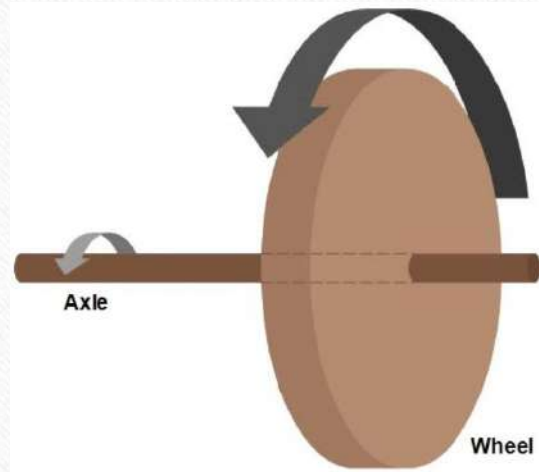
Lever



A crowbar, supported and turning freely on a fulcrum f , multiplies a downward force F applied at point a such that it can overcome the load P exerted by the mass of the rock at point b .



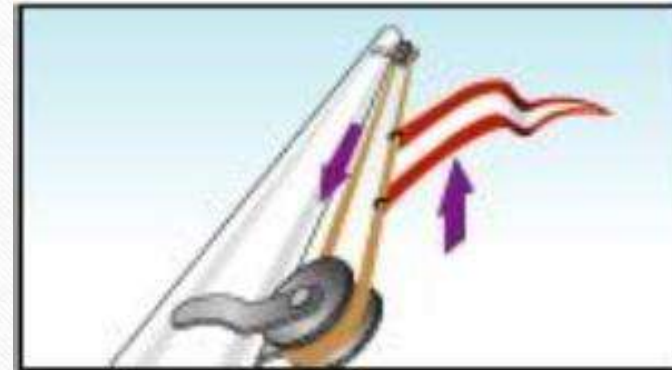
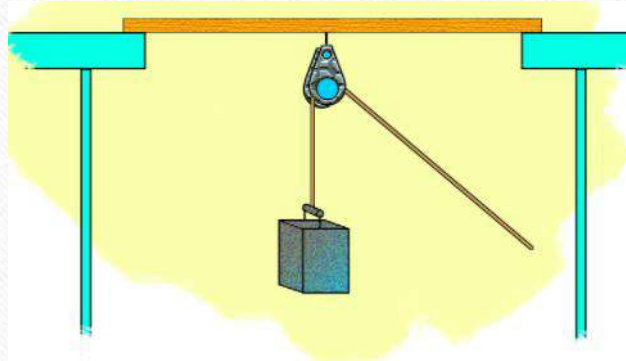
Wheel and axle



A wheel and axle is made up of a circular frame (the wheel) that revolves on a shaft or rod (the axle). In its earliest form it was probably used for raising weights or water buckets from wells.



Pulley



A pulley is a mechanical device that can be used to lift heavily objects more easily. Pulleys consist of a wheel that rotates on an **axle**—which is a rod through the center of the wheel—and a rope, cable, or chain.



Activity 1

- Find simple mechanisms used in close proximity. Take pictures or short videos and post them on the digital wall.





Activity 2

- Create a lever prototype - a balance board from easily available materials





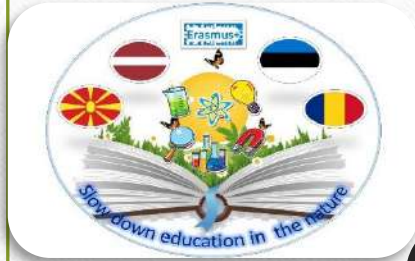
Gallery





Conclusions

-
- Students liked this lesson, because it was interesting to see in real life what you learn about.
 - You can't do this task alone. To take photos or film you need to collaborate with someone.



Good practice

Slow down education in the nature

Erasmus+ KA229 project





General information

School – Stalgene Secondary School

Country – Latvia

Subject – Engineering

Topic - Deformed body energy

Teacher – Dalija Brige



Deformed body energy

Materials needed – 4 plastic bottle cups or wooden discs, 2 craft sticks, rubber bands, drinking straw, wooden skewer, used battery to make it heavier, awl , scissors, hot-glue gun.

Surrounding - Flat, hard surface for testing car.



Deformed body energy

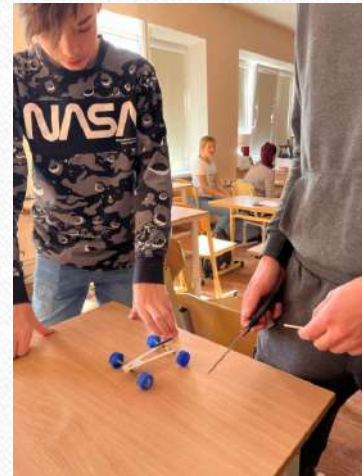
Aims- Create a system for the use of deformed body energy.

When you stretch a rubber band it stores potential energy. You can attach your rubber band to a simple machine—a wheel and axle—to build a simple rubber band–powered car.



Activity 1

Create a simple car driven by twisted rubber.

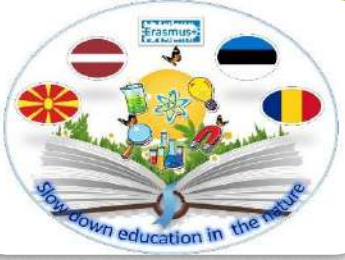




Activity 2

Test a simple car driven by twisted rubber.





Gallery

Other photos of the activities





Good practice

Slow down education in the nature

Erasmus+ KA229 project





General information

School – Stalgene Secondary School

Country – Latvia

Subject – Math

Topic – Pythagorean theorem

Teacher – Ilze Ērstiķe



Pythagorean theorem

Materials needed – worksheet for notes, tape measure, internet connection

Surrounding – environmental objects in nature in which to see triangles



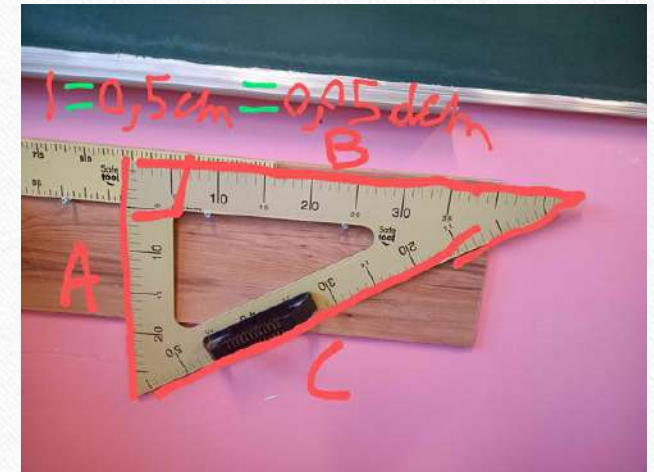
Pythagorean theorem

Aims- practically apply the knowledge gained in mathematics lessons about the Pythagorean theorem. To be able to see a triangle in nature. To develop the ability to perform measurements on natural objects.

During the work, the students discovered that in nature, longer distances can be measured using Internet programs - only the relevant measurements were performed and the obtained data were compared.



See the triangles in nature and take the necessary measurements





Notes

15.05.2022

$a^2 + b^2 = c^2$
 $3^2 + 4^2 = 5^2$
 $9 + 16 = 25$
 $25 = 25$
 $a = 3$
 $b = 4$
 $c = 5$

Tamás, dőve egy sz

36

$x^2 = 144 : 2$
 $x^2 = 72$
 $x = \sqrt{72} = 6\sqrt{2}$

$a^2 + b^2 = c^2$
 $33^2 + 42^2 = c^2$
 $1089 + 1764 = c^2$
 $c = \sqrt{2853} = 53,4$

$a^2 + b^2 = c^2$
 $56^2 + 119^2 = c^2$
 $3136 + 14161 = c^2$
 $c = \sqrt{17297} = 131,57$

$a^2 + b^2 = c^2$
 $44^2 + 44^2 = c^2$
 $1936 + 1936 = c^2$
 $\sqrt{3872} = 62,22$
 $c^2 = 44 = \sqrt{1936}$

(Ujvárosi Tamás)
 $a^2 + b^2 = c^2$
 $50^2 + 30^2 = 55^2$
 $2500 + 900 = 3400$
 $3400 = 3025$
 Most társaság Δ



Gallery

Other photos of the activity





Good practice

Slow down education in the nature

Erasmus+ KA229 project





General information

School – Stalgene Secondary School

Country – Latvia

Subject – Physic

Topic – Gas Pressure

Teacher – Dalija Brige



Gas Pressure

Materials needed – Plastic bottle (volume about 2 litres), some water, wooden plank as a stand, cork, a bike pump with a hose, a string and connecting pipes for safety.

Surrounding – Safe outdoor space to test a water rocket.



Gas Pressure

Aims- Shoot a water bottle in the air by the pressure in it.

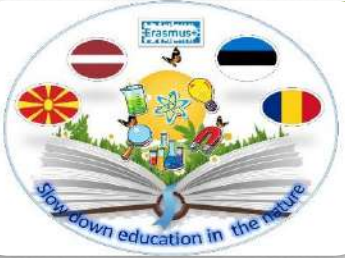
As you pump air into the bottle pressure builds up inside. If you keep pumping, the force of the air pushing on the water eventually becomes strong enough to force the cork out of the bottle allowing water to rush out in one direction while the the bottle pushes back in the other direction. This forces the rocket upwards.



Activity 1

Description and photos of the activity 1
Creating a water rocket using air pressure in the bottle.





Activity 2

Description and photos of the activity 2
Testing a water rocket.

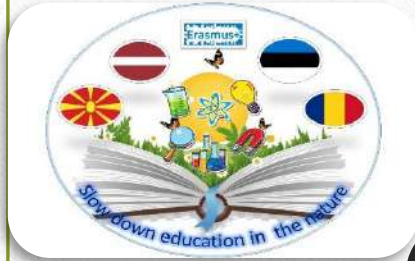




Gallery

Other photos of the activities





Good practice

Slow down education in the nature

Erasmus+ KA229 project





General information

- School – Stalgene Secondary School
- Country – Latvia
- Subject – interdisciplinary lesson: Math + Sport
- Topic – Movement speed
- Teacher – Ilze Ērtiķe (Math); Edīte Čakša (Sport)



Movement speed

-
- Materials needed – tape measure for distance measurement, stopwatch, worksheet, pencil
 - Surrounding – place for students to move - gym, yard



Movement speed

- Aims:
 - To develop the ability to cooperate in pairs, to work accurately.
 - In sports - to overcome the distance in different ways.
 - In mathematics - to improve students' understanding of speed calculation and conversion of units of measurement.



Sport activities

- Students measure the appropriate distance (30m)
- Working in pairs: one moves; second - takes time (then changes)
- The distance is done in different ways: walking, crawling, jumping, running.
- Fills in the first two columns of the table - distance, speed

Pārvietošanās veids	Distance	Laiks	Ātrums	Ātrums km/h
Soļošana "Skudriņa"				
Rāpošana "Vēzītis"				
Lekšana uz abām kājām				
Atspoles skrējieni				

Vidējais ātrums _____



Matemātikas aktivitātes

- Aizpilda tabulas trešo kolonnu, aprēķinot ātrumu
- Pārveido mērvienības no m/s uz km/h
- Aprēķina vidējo ātrumu
- Analizē paveikto

Pārvietošanās veids	Distance	Laiks	Ātrums	Ātrums km/h
Soļošana "Skudriņa"				
Rāpošana "Vēzītis"				
Lekšana uz abām kājām				
Atspoles skrējieni				

Vidējais ātrums _____



Worksheet

Ātruma aprēķināšana

Starpdisciplināra stunda - matemātika un sports

Mērķis: pilnveidot skolēnu izpratni par ātruma aprēķināšanu.

ATTĪSTĪT prasmi sadarboties pāri, strādāt precīzi.

Darba gaita:

Sports

- Skolēni izmēra attiecīgu distanci (30m)
- Strādā pāri: viens pārvietojas, otrs - uzņem laiku (pēc tam mainās)
- Distanci veic 3 dažādos veidos: soļojot, rāpojot, skrienot
- Aizpilda tabulu.

Matemātikas stundā

- Aizpilda tabulu, aprēķinot ātrumu.
- Pārveido mērvienības
- Analizē paveikto

Nepieciešamie materiāli: telpa, mērinstrumenti, hronometrs, darba lapa, zīmulis

Darba lapa- ātrums dažādos veidos, tā aprēķināšana Sports un matemātika

Sports stunda

Mērķis: Veikt distanci dažādos veidos. ATTĪSTĪT prasmi sadarboties pāri, strādāt precīzi.

Uzdevumi:

- 1) Klase kopīgi vienoties par veicamo attālumu (distanci) un izmēriet to.
- 2) Sadalieties pāri. Iepazīstieties ar darba lapa, sadaliet pienākumus.
- 3) Viens no pāra - pārvietojas, otrs- uzņem laiku ar hronometru un aizpilda tabulu
- 4) Katrs veic divus pārvietošanās veidus.

Pārvietošanās veids	Distance	Laiks	Ātrums	Ātrums km/h
Soļošana "Skudriņa"				
Rāpošana "Vēzītis"				
Lekšana uz abām kājām				
Atspoles skrējiena				

Vidējais ātrums _____

Matemātika

Mērķis: pilnveidot skolēnu izpratni par ātruma aprēķināšanu un mērvienību pārveidošanu.

Uzdevumi strādājot pāri:

- 1) Noskaidrojiet/atkārtojiet ātruma aprēķināšanas formulu
- 2) Veiciet papilddarbības un aprēķiniet katru pārvietošanās veida ātrumu.
- 3) Nosakiet kāds bija vidējais ātrums veicot visus vingrinājumus.
- 4) Pārveidojiet esošās mērvienības par km/h.

Google doc dokumentā novērtējiet savu darbu:

Kā jūs jutāties šajās mācību stundās?

Vai bija viegli sadarboties grupā?

Vai jūs ieguvāt jaunas zināšanas?

Kas jums vislabāk patika?

Vai jūs gribētu šādu stundu atkārtot?

Vai bija kas tāds, ko jūs vēlētos mainīt? Kas?

Students feedback

- I really enjoyed working practically - measuring distance, measuring time
- It's cool to be able to combine two subjects into one topic
- Accuracy in measuring is very important for proper calculations
- Such lessons could be more common, also in other subjects
- It will be easier to remember how to calculate the speed - I tried it myself.
- It was easy for me to work with a classmate
- I had disagreements with a classmate while we were moving, but later we managed.



Gallery



Gallery





Good practice

Slow down education in the nature

Erasmus+ KA229 project





General information

- **School** – Palade Põhikool
- **Country** – Estonia
- **Subject** – Chemistry, Physics, Geography- density and its dependence on pressure and temperature. Natural phenomena due to air density. Ice and water densities.
- **Teachers** – Karin Poola, Anne Luukas



Chemistry is cool, part 2

- **Materials needed for each group:**

- Clear container- preferably a tall transparent bottle. As alternative you may use drinking glass
- 4-5 measuring cups
- Dark (corn) syrup
- Liquid dish washing soap
- Water
- Cooking oil
- Rubbing alcohol (80%)
- Food colouring- 2 difernt

- **Surroundings**

- school LAB
- Classroom
- Home





Stack Liquids

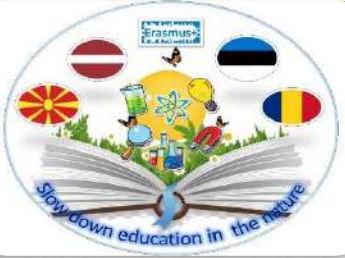
Aims

- increasing students science skills
- gaining knowledge about mixtures and separations
- gaining knowledge about density of substance
- handle all equipment and water carefully and responsibly
- work cooperatively with partners/group members
- make Chemistry more attractive subject
- Offer practical hands-on learning methods



Activity 1

- Introduction by the teacher in the beginning of the lesson, safety instructions. Whole class discussion.
- Density is a physical quantity that indicates the mass of a substance per unit volume. The density symbol is ρ and SI is the unit in kg / m^3 or g / cm^3 . This is the International System of Units (Système International d'Unités)
- **The density of a substance generally depends on pressure and temperature. In the case of gaseous substances this dependence is very strong, in the case of solids rather weak (imperceptible to the eye), but in the case of liquids it is completely observable.**



Activity 2

- Make small groups with 4-5 persons
- Prepare for every group all equipments described above
- Group members cooperate to stack different liquids – each group member should have a turn at adding one of the ingredients to glass or bottle





Activity 3

1. At first make clear how much liquid your bottle or drinking glass can carry: you have 5 different liquids, so you need to divide the container by 5 to determine how many milliliters of each liquid you will need.
2. Using measuring cups and measure out each liquid, if you don't have so many measuring cups then you may use also plastic cups as a containers for different liquids. It is important that the container where you will stack the liquids is transparent
3. Add food colouring to water and alcohol



Activity 3

4. Now you start to pour liquids into the container- do it very slowly and carefully, one at the time: try to pour liquids along the glass wall
5. Start with syrup
6. Liquid dish washing soap
7. Dyed water
8. Cooking oil
9. Dyed alcohol

By adding water and alcohol the container must be tilted





Activity 4

Observations and discussion:

- Each group make observations- they will predict:
 1. what will happen at each step
 2. will the oil and water mix?
 3. how will a drop of food colour behave in oil?
- A whole class have discussion about the theory of operation

ATTENTION! Dispose of used substances in accordance with local requirements!



Activity 4

Observations and discussion:

- Each group make observations- they will predict: what will happen at each step
- If you do have a cap for the container then put the cap on tightly and **slowly, slowly turn the bottle upside down**. The arrangement should hold and the liquids will stack again in the same order.
- A whole class have discussion about the theory of operation

ATTENTION! Dispose of used substances in accordance with local requirements!



Gallery



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2020-2022



Gallery



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2020-2022



Good practice

Slow down education in the nature

Erasmus+ KA229 project





General information

- **School** – Palade Põhikool
- **Country** – Estonia
- **Subject** – science, practical experiment
- **Teacher** – Anne Luukas- STEM teacher



Cabbage Chameleon



Materials needed

- Red cabbage
- Grater
- Sieve
- Worksheet with pencil
- Water (1L)
- Different bowls for cabbage juice- 2
- Different acid, alkaline and neutral solutions

Materials needed

- **Suitable for acidic solutions:** acidic toilet cleaner(H_2SO_4), citric acid solution, vinegar(CH_3COOH)- choose one of them
- **Suitable for alkaline solutions:** pipe cleaner (strong $NaOH$ solution), baking soda solution($NaHCO_3$), washing powder solution(Na_2CO_3)
- Water as a neutral solution



Surroundings



- School LAB
- Classroom
- Home





Description

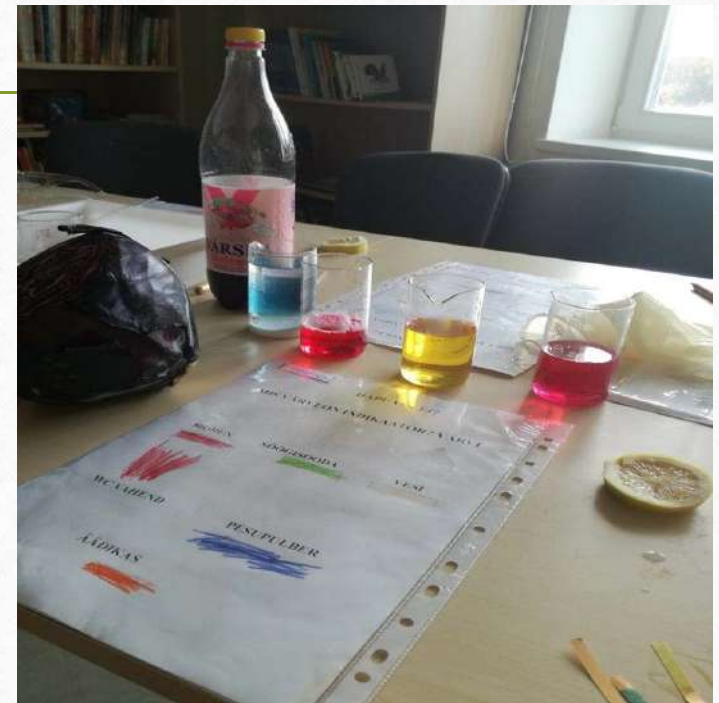
Introduction

- We all know the chameleon- an animal who changes its colour as the environment changes around it.
- We are going to use this feature in a different setting. We use red cabbage to show how its fluid changes its colour in different solutions. Is the solution acid, neutral or alkaline? Like the chameleon, red cabbage fluid changes its colour in different kinds of solutions.



Aim

- Through the practical experiment find out how red cabbage fluid changes its colour in different solutions





How it works?

1. Grate the cabbage through biggest holes of grater;
2. Put mass of cabbages in a bowl and pour out water on top of it.
3. Stir and wait 2- 3 minutes
4. Drain the cabbage juice with a sieve



Mass of red cabbage in sieve after soaking it in water- we use just cabbage fluid



How it works?

4. Drain the cabbage juice with a sieve;
5. You will gain some blue fluid in the bowl.
6. Put your solutions ready, if needed, write notes on it. (NaOH , H_2SO_4 etc)
7. Pour some cabbage fluid in every solution.





How it works?

8. Describe which colours will appear.
9. **NB! you must be quick to notice that some solutions change its colour several times.**
10. Write your observations in the table .

Picture description: different solutions and colours.
Acids, alkaline and water. Dark blue is cabbage fluid





Table sheet

Solution	Colour of solution



Conclusions:

Alkaline(name)..... cabbage fluid wascolour.

Acid(name).....cabbage fluid was..... colour.

In water cabbage fluid wascolour.

Red cabbage is a natural indicator like blueberry. It changes its color dependence on PH. In Laboratory we use indicators like litmus, universal test paper and phenolphthalein.

GOOD LUCK!



Good practice

Slow down education in the nature

Erasmus+ KA229 project





General information

-
- **School** – Palade Põhikool
 - **Country** – Estonia
 - **Subject** – Math, Geometry integrated with Craft and Technology
 - **Teachers** – Anne Luukas, Karin Poola



Geometrical shapes

- **Materials needed**
 - Foam rubber
 - ruler
 - scissors
 - worksheet with pattern
 - double sided tape
- **Surroundings**
 - Classroom, home



Ogdagon

Aims How to integrate VI students into inclusive classes using Nature Sciences as a S.T.E.M. tool

- To develop students' cognitive functions and social and emotional skills based on interdisciplinary learning methods
- To increase students interest in STEM subjects with the help of cultural heritage/national identity
- To develop students' observation and defination of geometric shape types
- To develop students' patial thinking and logical thinking
- To learn association theoretical knowledge with practice
- To learn how to controll variables and design an experiment
- Teamwork experience in mixed type of gruop

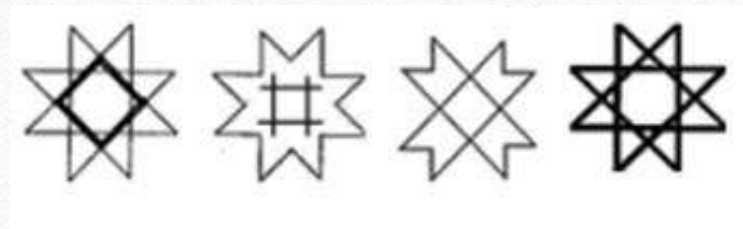


Scenario



- Estonians like to use their national patterns in everyday life to save their national identity.
- Some of the patterns are created before the Christians time- like the ocdagon

- Ocdagon is Estonians' most important symbol- protects our soul and home from making mistakes
- Ocdagon is called also as a star of heaven or as a star of happiness

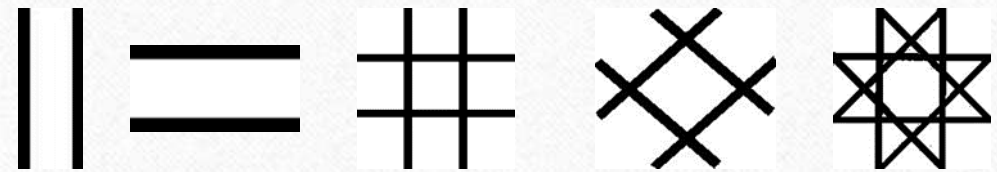




Scenario

- Estonians used ocdagon in every kind of life field:
- Architecture
- Handicrafts
- Blessing of death or birth
- Weddings and funerals

- Different shapes of ocdagon have several meanings and influence on our home and family
- Ocdagon is like a double cross- most powerful symbol of protection





Scenario

- Several Estonians' counties and towns using ocdagon as a symbol of cultural heritage on their flags and coat of arms

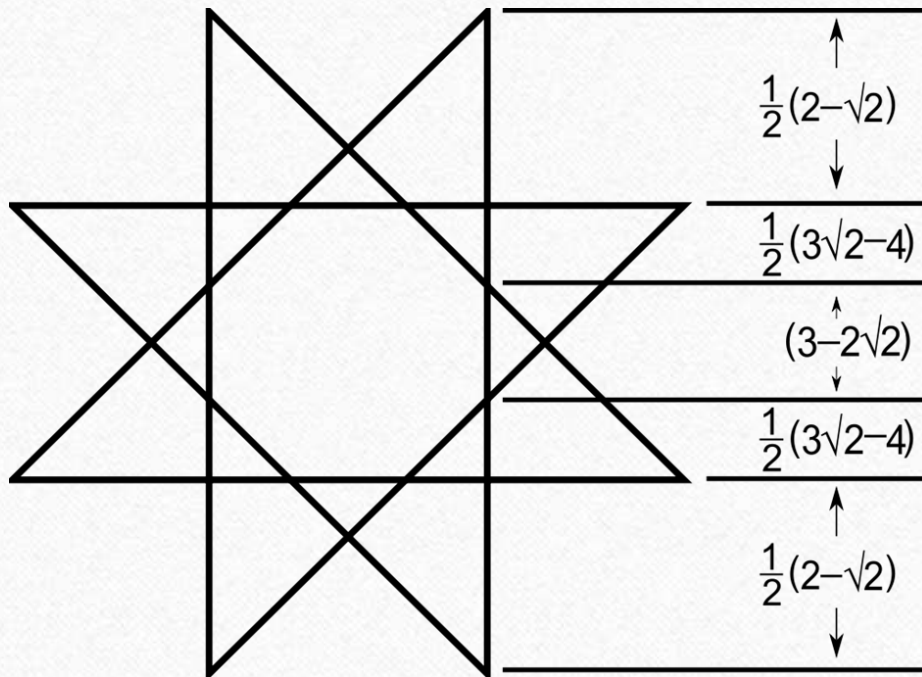


- Using ocdagon by our fraternal nations like Mordovia, Udmurt etc.





Using ogdagon in Math lessons



- Geometrically, an octagon, or regular octagon, is a star-shaped polygon with eight sides and eight vertices, with sides of equal length and interior angles of equal size



Hectagon from cultural heritage as a geometrical shape

WORKSHEET



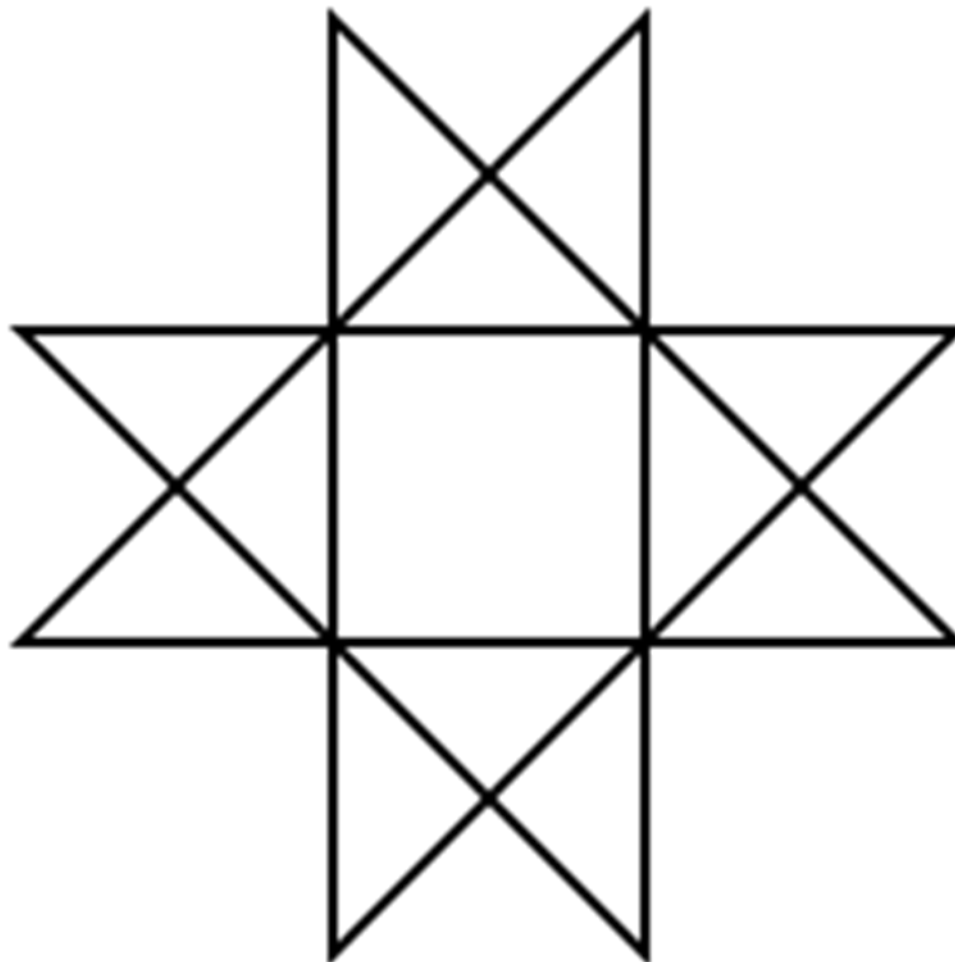
Part 1

1. Work in a group of 2 persons
2. Look at the work sheet and try to identify so many geometrical shapes as possible (triangles, squares)
3. How many did you find?

Part 2

1. Use your template and draw an octagon on your worksheet
2. Make from your template so many templates as you think is needed for cutting out all different geometrical shapes you identified
3. Using your templates draw all pieces on the foam rubber sheets and cut out
4. Look at the symbol on your worksheet and try to make a copy in 3D on your work place using all pieces you cut out
5. You can make your choice where to start
6. You must use all your shapes
7. Level up- try to figure out what you need to do to create from your 3D octagon 2 crossed rectangles
8. For visually impaired students- use your template of the octagon on the worksheet and draw with hot glue gun an octagon on the laminating film- after cooling up use the template for creating 3D octagon on the worksheet

Have fun!





Good practice

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General information

- **School** – Palade Põhikool
- **Country** – Estonia
- **Subject** – Biology- freshwater biota
- **Teachers** – Karin Poola



Outside learning-natural sciences

- **Materials needed**

- Fish nets with handles (for invertebrates and different living beings in finding in water)- whether large or small, called "aquarium fish nests" or sieves
- thermometer
- plastic trays (light colour) and a jar as an observation aquarium
- spoons or brushes for sorting
- loupe
- pen and writing pad
- paper for making notes.
- Microscope if possible

- **Surroundings**

- Freshwater bodies like river, lake, pond
- **Duration: 1-2 hours**



Outside learning-natural sciences

- **Materials needed**

1. Fish nets with handlas (big and small)
2. Thermometer
3. Plastic trays (ligh colour), jar
4. Spoons or brushes for sorting
5. Loupe
6. Pen and writing bad
7. Paper for making notes.
8. Microscope if possible





Observation of fresh water biota

Aims

- Gaining knowledge about different biota in freshwater
- Increasing practical fieldwork at the water bodies
- Developing 8 science skills in students (**Observing, Classifying, Quantifying, Predicting, Controlling variables, Interpreting, Communicating, Forming conclusions**)
- Gaining knowledge about aquatic invertebrates and amphibians
- Collecting and saving data for future study



Activity 1

Introduction:

- This lesson is intended for practical fieldwork at freshwater bodies to observe and learn about aquatic invertebrates, amphibians living in freshwater and to develop nature observation skills.
- In the beginning of the lesson the Biology teacher describe the working process and safety rules. Also make an introduction to the topic.
- The students make practical fieldwork at the water reservoir (lake, river, pond), make observation, collecting information, make, notes and compare their results with ohter students.
- Freshwater life in lakes, rivers, ponds and streams is very diverse: from small protozoa, plankton and invertebrates to plants and vertebrate mammals.



Activity 2

- Making groups from 4-5 students
- Prepare your containers with the same water where you catching the living beings from the water
- Using fishing nest catch from the water invertebrates and amphibians from different habitats (between plants, muddy and sandy bottoms, open water). When catching, it is important to take into account that the water body is a habitat for many animals and plants, so care should be taken.

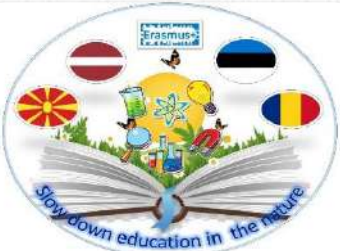




Activity 3

- Place the contents of the nest in your container and sort with a spoon or brushes all your catch into containers or into observation aquarium by species (like insects, invertebrates and amphibians or order by common characteristics etc). For the observation aquarium is suitable also a transparent plastic aquarium or a jar. Use a magnifying glass to observe small creatures and insects.





Activity 3

Fulfill the worksheet:

WORKSHEET

1. Which freshwater invertebrates or amphibians did you find in the water?

.....
.....
.....

2. Draw and describe the 3 freshwater aquatic animals found

Drawing			
Animal designation			
Modus of movement			
Bodyshape, size			
Head, eyes			
Body colour			
Wings			
Legs			
Body extensions			

3. What other observations did you make by the pond? Did you see other animals and birds?

Describe 1-2 of the most interesting observations.

.....
.....
.....
.....

4. Water properties and aquatic plants

Water properties and aquatic plants (as oxygen producers) are also important in the aquatic ecosystem. Draw a line to the appropriate answer, if necessary add the required answer.

1. Is the observed water body rich in vegetation? Are there plants: abundant, average, few?
.....
2. Is the surface of the water body covered with a green layer: algae or duckweed (abundant, medium, few).....
3. Can you see the floating plants: **pond-lily** (*Nuphar*), **water-lily** (*Nymphaea alba*), **potamogeton/ "river neighbor"** (*Potamogeton*),.....
4. Are there plants grow on the pond side: reed, bulrush, water horsetail or swamp horsetail?.....
5. Can you see the plants growing inside the water? (abundant, average, few):
.....

Measure or estimate the length of the smallest and largest or longest plant.

The smallest plant:.....
The longest plant:

5. Water temperature and color

What is the water temperature?.....
What is the color of the water?.....

6. Sort the animals in order of size

Indicate size (mm or cm) and name of animal (if known)

Which 2 are the largest?.....
Which 2 are the smallest?.....
What is the most peculiar shape?.....
Which has the brightest colour?.....

It is a good idea to use a multi-compartment tray (such as a candy box-type plastic tray) or small trays to accomplish this task.

7. Evaluate the purity of the water

Do you think that the water body you researched is clean or polluted (rubbish, water blooms, oil slicks, dead animals, etc.)? Justify/explain. Why is it necessary to protect water bodies?

.....
.....
.....
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.....
.....
.....
.....



Good practice

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General information

- School – LICEUL TEHNOLOGIC TOPOLOVENI
- Country –ROMANIA
- Subject – Science
- Topic – The pencil that bends in water
- Teacher – TABARAC VIRGINIA, BOTIRCA OANA
- Date: October 2021



The pen that bends in water

- Materials needed
- Water (300-500 ml)
- Transparent glasses
- Pens or drinking straws



The pen that bends in water

- Aims- The children will be able to understand the difference in density between air and water.





Activity description

The students put water in a transparent glass, it doesn't have to be full. Then they inserted a pencil or a drinking straw. They had to observe the experiment from the moment they put the pencil/drinking straw in the water. They noticed how the respective pen/drinking straw seemed to break.

Scientific explanation: The light that passes through the water gives the feeling that it bends the pencil. It first travels through the air, then through the water. Because water is denser than air, light rays "bend" into the water. Thus, the pencil/drinking straw seems to bend, and the process is called refraction.



Gallery



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Gallery





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General information

- School – LICEUL TEHNOLOGIC TOPOLOVENI
- Country –ROMANIA
- Subject – Chemistry
- Topic - Vitamin C
- Teacher - BOTIRCA OANA
- Date: 12th April 2021



Detecting Vitamin C in Fruit and Vegetables

- Materials needed – Water (300-500 ml)
- Iodine (we used betadine, from the Chemist's)
- Transparent glasses
- Medicine dropper/syringe
- The food we want to test. We used lemon slices, apple slices, potatoes. You can also try other food or drinks. We can also try two alternatives: raw and cooked/ boiled food to demonstrate that vitamin C is distributed before boiling (it is better to eat raw vegetables and fruit!)
- Surrounding - outside in the nature



Detecting Vitamin C in Fruit and Vegetables

- Aims- The children will be able to demonstrate and to test the presence of Vitamin C in vegetables, fruit and drinks.





Activity description

Mix approx. a cup of water with two or three tablespoons of iodine, so as to make a solution. The color of the water will change to intense reddish-brown.

Put the food you want to test in the transparent glasses. Over solid food, add a little water and stir.

Take the iodine solution and pour 20 drops (or add a tablespoon of the solution) into each glass. You will see that in the glasses with soluble vitamin C, with lemon and apple, the liquid does not color, but remains in its original state. In the glass in which I put the potato (i.e. where there is no vitamin C or it is in small quantities) the water turns reddish-brown or purple. The purple color indicates the presence of starch (potato)



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General information

- School – LICEUL TEHNOLOGIC TOPOLOVENI
- Country –ROMANIA
- Subject – Science/Biology
- Topic – Germinatig plants
- Teacher - BOTIRCA OANA
- Date: November 2021



Germinating wheat

- Materials needed
- a bowl/mug/flower pot
- Wheat 250-350 g
- Flower soil
- Wadding (from cotton)

Aim- The children will be able to understand the process of germinating wheat and to observe how big the wheat grows when it has light and heat and compare it with wheat left in the dark.



Activity description

The students put some cotton wool in the flower pots or bowls, then they placed the wheat grains. After that they sprinkled some flower soil on them and then watered them. They left some flower pots/bowls at the window, where it has light, air and heat, and left the other ones in a dark place.

After 5 days the wheat in the pot left at the light has sprouted nicely and has small green leaves. Wheat left at darker sprouted harder and is yellowish because the lack of light made it difficult for photosynthesis, the transformation of raw sap (water from the vessel + the substances in the water) in elaborate sap.

The experiment continued, the students continuing to leave the containers with wheat, some in the light, the others in the dark, to see how big was the differences between the sprouted grains in the two containers.

The students had to fill in worksheets writing observations about the germinating wheat.



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Galery





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General information

STEM CONTEST

- School – LICEUL TEHNOLOGIC TOPOLOVENI
- Country –ROMANIA
- Subjects: Science, Maths, Sports
- Topic –STEM beyond boundaries
- Place: The students are placed outside the limits of their regular classroom activities
- Teachers – VISAN NICULINA, MATEI LIVIU, BOTIRCA OANA
- Date: March 2021



STEM CONTEST

Key skills:

- Working with others (collaborative learning – quicker progress)
- - Creative thinking (think outside the box)
- Setting goals (taking on challenges, dividing the project into smaller steps, being resilient)
- - Developing communication skills



Activity description

Students are given a set of tasks to solve during a time limit (total duration 2 hours)

Location:

Classroom

Sports hall (it was raining heavily outside)

Tasks:

Science and Maths worksheet – analysing tasks

Practical Activity –

- establishing the route and drawing it using coloured chalk for the sports event – triangular, rectangular and circle shapes (using a measuring tool)
- the sports test: which consists in covering the routes in the shortest possible time (dwarf's walk) - timing;
- recording and processing data necessary to determine the travel speed for each team;

Activity description

Challenges:

- Drawing the routes (triangular, rectangular and circle shapes)



Activity description

- Children had to use a string to draw the perimeter of the triangle, rectangle and circle (30 m).



Activity description

- After drawing the shapes, a representative of the team had to cover the perimeter (30 m) using “dwarf’s walk”.
- The sports teacher timed and at the end the teams had to calculate the speed of each representative.



Activity description

- Final Remarks
- Evaluation
- Self-evaluation





Good practice

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General information

- School – LICEUL TEHNOLOGIC TOPOLOVENI
- Country –ROMANIA
- Subject – Science
- Topic – Taste Buds
- Teacher – Tabarac Virginia
- Date: September 2021



Detecting the four taste buds

- Aims- The children will be able to understand where the taste buds for each taste are located.
- Materials needed :
 - - bottles with sugar solutions, table salt, acetic acid (vinegar), wormwood tea
 - - small cotton swabs
 - - Four tweezers
 - - Four glasses
- Surrounding - outside in the nature



Activity description

The students worked in teams, did experiments that highlighted the location of the four tastes on the surface of the tongue.

Procedure:

Soak the small cotton swab in the sugar solution and apply it on the middle of the tongue, then on the edges of the tongue, towards the top. The student always indicates the Taste sensation felt. The experiment is repeated for all the other solutions.

Fill in the blanks:

The sweet taste is localized to the tongue.

The salty taste is localized to the tongue.

The sour taste is localized to the tongue.

The bitter taste is localized to the tongue.



Activity description

They had to fill in a worksheet with the location of the four taste buds:

“The sweet taste is localized to the tongue _____
The salty taste is localized to the tongue _____
The sour taste is localized to the tongue _____
The bitter taste is localized to the tongue _____”



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General information

- School – LICEUL TEHNOLOGIC TOPOLOVENI
- Country –ROMANIA
- Subject – Science
- Topic - The importance of planting trees to save the environment
- Teacher – Tabarac Virginia
- Date: May 2021



The importance of planting trees to save the environment

- Aim: Children will learn about trees and will understand the importance of preserving the quality of the environment and that they can raise public awareness and decision-making institutions regarding the protection of forests and nature.
- Materials needed :
 - balloons, plates, coloured pencils, gardening tools, seedlings.
- Surrounding - outside in the nature



Activity description

The students participated in a project-based learning activity which took place in two parts:

1. In the classroom - students learned about the forest and its importance, using Biology and Chemistry knowledge
2. In the school yard- students worked in teams, filled in worksheets, drew, used coloured pencils, identified abiotic factors and biotic factors from the forest. They created messages for the protection of the forest and the environment and made a campaign for planting trees.

At the end of the activity they planted a tree.



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