

History of Science and Technology

EPM

European Pupils Magazine



**Issue 2/2021
ISSN 1722-6961**

International Editorial Board

Brasov Editorial Board Brasov, Romania

*Transilvania University of Brasov
„Dr. Ioan Meșotă” National College*

Students: Pripis Andreea-Ioana, Popa Anca - Teodora, Stîngă Alessia Maria, Dragan Maia Andreea, Baku Adrian, Cotfas Miruna-Cristina

Teachers: Elena Helerea, Monica Cotfas

Italian Editorial Board

Catania, Italy

Teacher: Angelo Rapisarda

Thessaloniki Editorial Board

Thessaloniki, Greece

Model Experimental High School

Students: Thalia Moukou, Christoforos Zirnas, Giorgos Marantidis, Apollon Kopsachilis, Eftychia Lantzou, Iliana Papadopoulou

Teachers: Nikos Georgolios

Fagaras Editorial Board

Fagaras, Romania

*Dr. Ioan Senchea Technological High School
Radu Negru National College*

Students: Plooreanu Claudiu Ionel, Paun Enrico, Acciaro Vlad, Steavu Matei Cristian, Rosu Rares Andrei, Streza Florin, Negru Denisa

Teachers: Luminita Husac, Gabriela Talaba, Emanuela Puia, Alina Manduc, Monica Grosu, Laura Elena Pop, Andreea Alashqar

Issue coordinators:
Stîngă Alessia Maria
Cotfas Miruna-Cristina
Baku Adrian

Cooperators

ES Julio Verne, Bargas, Spain

Teacher: Jesús Méndez Díaz-Ropero.

*National Trade and Banking High School,
Sofia, Bulgaria*

Teacher: Tzvetan Kostov

*I.I.S. “Gulli e Pinissi” - Acireale, Liceo Classico sede Acireale, Liceo Scientifico sede Aci Bonaccorsi
Catania, Italy*

Teachers: Tarcisio Maugeri, Susanna Tricomi, Guiseppa Tidona

*„Victor Babeș” Vational College, Bucuresti,
Romania*

Teacher: Crina Stefureac

*George Calinescu Theoretical High School,
Bucureşti*

Teacher: Marilena Marinescu

Iulia Hasdeu National College, Bucureşti

Teacher: Elisabeta Niculescu

Gh. Asachi Technical College Iasi, Romania

Teacher: Tamara Slătineanu

I.S.S.N. 1722-6961

EPM Official Website:

<http://www.epmagazine.org/>

EPM Online Magazine:

<http://www.epmagazine.org/issues/>

EPM Greek Website:

www.epmgreece.blogspot.com

Contents

Editorial

EPMagazine - foreign languages
and science

EN.....3	RO.....4
BG.....5	GR.....6
IT.....7	SP.....8

General

Educational project “Science and creativity”.....	9
--	---

14 - 16

Celestite.....	15
Graffiti.....	20

Contents

Fun Pages

The mind-body problem.....24

17 - 19

The story of a polymath.....26

University

Solar energy and its benefits....34

Editorial EN

Monica COTFAS
National College „Dr Ioan Meșotă”
Brașov, Romania



EPMagazine - foreign languages and science

EPMagazine is well suited for the education's ultimate goal nowadays, which is to help students not only to acquire knowledge, but also to build upon life skills that will enable the graduates to deal with more or less common situations and various work-related tasks, to motivate them towards life-long learning and to be aware of their own inclinations and strengths.

Intercultural experiences, such as the ones provided by EPMagazine, prove to be very beneficial in today's world as students not only write and edit scientific articles, but they also learn about foreign cultures. The articles are written in the native language of the author and translated into English, therefore encouraging the acquisition of knowledge in foreign languages, others than English. Nevertheless, English is the common language used by all participants, therefore EPMagazine becomes both a scientific and linguistic interactive learning tool.

In the context of EPMagazine, students have the opportunity to experience first-hand the usage of scientific writing, and they also get accustomed to the rigors of writing a scientific text. Therefore, EPM students have the advantage of getting used to the scientific language as a means of promoting and facilitating scientific knowledge. As features of the scientific style we support logical clarity, cohesion and coherence of ideas, objectivity by implementing impersonal style, passive constructions, using specific terminology for the domain approached, concise language by concentrating on relevant aspects.

Thus, EPM authors realise that writing a scientific text is the result of a thorough prior research, involving selection of topic, formulation of objectives, search, retrieve and select information, and only then writing the article. By respecting the required format, students need to underline the logical steps of their study: introductory remarks, sub-sections, conclusions, bibliography and webology.

The importance of speaking foreign languages in order to access various sources of information is undeniable. Nowadays everything needs to be checked, verified, compared, so as to make sure that the information that you have gathered is suitable, correct, valid. By speaking foreign languages one definitely enlarges upon his choices when it comes to selecting information sources. EPMagazine offers plenty of such scientific information, in an attractive format, accessible language and illustrative pictures that will definitely engage the reader and motivate him to further research on the topic.

Therefore, EPMagazine is a project that is only sustained by students' enthusiasm of being involved in history of science and advanced technologies by collaboration activities at local, national and international levels, activities that provide a different learning experience, less formal, more continuous, without the pressure of tight deadlines, and offering them a chance to express originality, creativity, imagination while also developing communication skills.

We should try to be not only gadgets users and scientific articles readers, but also innovators of technology and promoters of scientific research!

EPMagazine - limbi moderne și științe

EPMagazine este un proiect care se încadrează perfect tendințelor actuale din domeniul educațional, în care este priorită educarea elevilor nu numai prin dobândirea de cunoștințe, ci și prin dezvoltarea de abilități de viață, care să le permită absolvenților să facă față situațiilor mai mult sau mai puțin obișnuite și diverselor sarcini de lucru legate de viața profesională, crearea motivației pentru învățarea pe tot parcursul vieții și cunoașterea propriilor înclinații și puncte forte.

Experiențele interculturale, cum sunt cele oferite de EPMagazine, se dovedesc a fi foarte benefice în lumea de astăzi, deoarece elevii nu doar scriu și editează articole științifice, ci învață și despre alte culturi. Articolele sunt scrise în limba maternă a autorului și traduse în limba engleză, încurajându-se astfel dobândirea de cunoștințe de limbi străine, altele decât engleza. Cu toate acestea, limba engleză este limba comună folosită de toți participanții, prin urmare EPMagazine devine un instrument de învățare interactiv atât științific, cât și lingvistic.

În contextul EPMagazine, elevii și studenții au posibilitatea de a experimenta în mod direct utilizarea scrisului științific și, de asemenea, se obișnuesc cu rigorile scrierii unui astfel de text. Prin urmare, elevii EPM au avantajul de a se obișnui cu limbajul științific ca mijloc de promovare și facilitare a cunoștințelor științifice. Ca trăsături ale stilului științific promovăm claritatea logică, coeziunea și coerenta ideilor, obiectivitatea prin implementarea stilului impersonal, construcțiile pasive, utilizarea terminologiei specifice domeniului abordat, limbajul concis prin concentrarea asupra aspectelor relevante.

Astfel, autorii EPM realizează faptul că scrierea unui text științific este rezultatul unei cercetări prealabile aprofundate, care implică selecția subiectului, formularea obiectivelor, căutarea, preluarea și selectarea informațiilor și abia apoi redactarea articoului. Respectând formatul cerut, studenții trebuie să sublinieze pașii logici ai studiului lor: observații introductive, subsecțiuni, concluzii, bibliografie și webologie.

Importanța limbilor străine pentru a accesa diverse surse de informații este incontestabilă. În zilele noastre totul trebuie verificat, comparat, astfel încât să ne asigurăm că informațiile pe care le-am accesat sunt potrivite, corecte, valide. Vorbind limbi străine, se lărgește cu siguranță gama de opțiuni când vine vorba de selectarea surselor de informații. EPMagazine oferă o varietate de informații științifice, într-un format atractiv, limbaj accesibil și imagini ilustrative care cu siguranță îl vor angaja pe cititor și îl vor motiva să cerceteze în continuare subiectele abordate.

Prin urmare, EPMagazine este un proiect care este susținut de entuziasmul elevilor și studenților participanți de a fi implicați în activități diverse pe teme de istorie a științei și tehnologiei prin colaborare la nivel local, național și internațional, activități care oferă o experiență de învățare diferită, mai puțin formală, continuă, fără presiunea termenelor limită strânsă și oferindu-le șansa de a-și exprima originalitatea, creativitatea, imaginația și abilitățile de comunicare.

Ar trebui să încercăm să fim nu doar utilizatori de gadgeturi și cititori de articole științifice, ci și inovațori de tehnologie și promotori ai cercetării științifice!

Editorial BG

ЕPMagazine - Чужди езици и наука

ЕPMagazine е много подходящ за крайната цел на образованието в днешно време, която е да помогне на учениците не само да придобият знания, но и да надградят житейски умения, които ще позволяват на завършилите да се справят с повече или по-малко често срещани ситуации и различни задачи, свързани с работата, да ги мотивира към учене през целия живот и да осъзнават собствените си наклонности и силни страни.

Междукултурните преживявания, като тези, предоставени от ЕPMagazine, се оказват много полезни в днешния свят, тъй като не само пишат и редактират научни статии, но и научават за чужди култури. Статиите са написани на родния език на автора и са преведени на английски, което насырчава усвояването на знания на чужди езици, различни от английски. Въпреки това английският е общият език, използван от всички участници, поради което ЕPMagazine се превръща в научен и езиков интерактивен инструмент за обучени.

В контекста на ЕPMagazine учениците имат възможност да изпитат от първа ръка използването на научното писане и също така свикват със строгостта на писането на научен текст. Следователно учениците от ЕPM имат предимството да свикнат с научния език като средство за насырчаване и улесняване на научните знания. Като характеристики на научния стил поддържаме логическа яснота, сплотеност и съгласуваност на идеите, обективност чрез прилагане на безличен стил, пасивни конструкции, използване на специфична терминология за разглежданата област, сбит език чрез концентриране върху съответните аспекти.

Така авторите на ЕPM осъзнават, че писането на научен текст е резултат от задълбочено предварително проучване, включващо избор на тема, формулиране на целите, търсене, извлечане и подбор на информация и едва след това написване на статията. Спазвайки необходимия формат, учениците трябва да подчертаят логическите стъпки на своето обучение: уводни бележки, подраздели, заключения, библиография и уебология.

Значението на говоренето на чужди езици за достъп до различни източници на информация е неоспоримо. В днешно време всичко трябва да бъде проверено, съпоставено, за да се уверите, че информацията, която сте събрали, е подходяща, вярна, валидна. Говорейки чужди езици, човек определено разширява избора си, когато става въпрос за избор на източници на информация. ЕPMagazine предлага изобилие от такава научна информация, в атрактивен формат, достъпен език и илюстративни снимки, които определено ще ангажират читателя и ще го мотивират за по-нататъшни изследвания по темата.

Следователно ЕPMagazine е проект, който се поддържа само от ентузиазма на учениците да участват в историята на науката и напредналите технологии чрез дейности за сътрудничество на местно, национално и международно ниво, дейности, които предоставят различно изживяване на обучение, по-малко формално, по-постоянно, без натиска на кратки срокове и им предлага шанс да изразят оригиналност, креативност, въображение, като същевременно развиват комуникационни умения.

Трябва да се опитаме да бъдем не само потребители на джаджи и читатели на научни статии, но и иноватори на технологиите и популяризатори на научни изследвания!

Editorial GR

Το περιοδικό EPM (EPMagazine) - Ξένες Γλώσσες και Επιστήμη

Το EPMagazine είναι κατάλληλο για τον απώτερο στόχο της εκπαίδευσης στις μέρες μας, που είναι να βοηθήσει τους μαθητές όχι μόνο να αποκτήσουν γνώσεις, αλλά και να χτίσουν πάνω σε δεξιότητες ζωής που θα τους δώσουν τη δυνατότητα ως απόφοιτοι να αντιμετωπίσουν εύκολες ή δύσκολες καταστάσεις και διάφορες υποχρεώσεις που σχετίζονται με την εργασία, να τους παρακινήσει στη δια βίου μάθηση και να τους εξοικειώσει με τις δικές τους κλίσεις και δυνατότητες.

Οι διαπολιτισμικές εμπειρίες, όπως αυτές που παρέχει το EPMagazine, αποδεικνύονται πολύ ωφέλιμες στον σημερινό κόσμο, καθώς οι μαθητές όχι μόνο γράφουν και επεξεργάζονται επιστημονικά άρθρα, αλλά μαθαίνουν και για ξένους πολιτισμούς. Τα άρθρα είναι γραμμένα στη μητρική γλώσσα του συγγραφέα και μεταφρασμένα στα αγγλικά, ενθαρρύνοντας επομένως την απόκτηση γνώσεων σε ξένες γλώσσες, άλλες εκτός από τα αγγλικά. Ωστόσο, τα αγγλικά είναι η κοινή γλώσσα που χρησιμοποιούν όλοι οι συμμετέχοντες, επομένως το EPMagazine γίνεται ένα επιστημονικό και γλωσσικό διαδραστικό εργαλείο μάθησης.

Στο πλαίσιο του EPMagazine, οι μαθητές έχουν την ευκαιρία να βιώσουν από πρώτο χέρι τη χρήση της επιστημονικής γραφής, αλλά και να εξοικειωθούν με την αυστηρότητα της συγγραφής ενός επιστημονικού κειμένου. Ως εκ τούτου, οι μαθητές του EPM έχουν το πλεονέκτημα να συνηθίζουν στην επιστημονική γλώσσα ως μέσο προώθησης και διευκόλυνσης της επιστημονικής γνώσης. Ως χαρακτηριστικά της επιστημονικής γραφής νοούνται η σαφήνεια, η συνοχή και συνεκτικότητα των ιδεών του κειμένου, η αντικειμενικότητα με την εφαρμογή απρόσωπου στυλ, η παθητική σύνταξη, η χρήση συγκεκριμένης ορολογίας για το αντικείμενο που προσεγγίζεται και η περιεκτική γλώσσα που εστιάζει στο νόημα του κειμένου.

Έτσι, οι συγγραφείς του EPM συνειδητοποιούν ότι ένα επιστημονικό άρθρο είναι το αποτέλεσμα μιας ενδελεχούς προηγούμενης έρευνας, που περιλαμβάνει επιλογή θέματος, διατύπωση στόχων, αναζήτηση, ανάκτηση και επιλογή πληροφοριών και μόνο στη συνέχεια συγγραφή του άρθρου. Ακολουθώντας την απαιτούμενη μορφή της εργασίας, οι μαθητές πρέπει να παραθέσουν τα λογικά βήματα της μελέτης τους: εισαγωγικές παρατηρήσεις, υποενότητες, συμπεράσματα, βιβλιογραφία και διαδικτυακές αναφορές.

Η σημασία της γνώσης ξένων γλωσσών για την πρόσβαση σε διάφορες πηγές πληροφοριών είναι αναμφισβήτητη. Σήμερα όλες οι πληροφορίες οι οποίες θα χρησιμοποιηθούν πρέπει να ελεγχθούν, να επαληθευτούν, να συγκριθούν, ώστε να επιβεβαιωθεί ότι είναι κατάλληλες, σωστές και έγκυρες. Γνωρίζοντας ξένες γλώσσες κάποιος σίγουρα διευρύνει τις επιλογές του όταν πρόκειται να επιλέξει πηγή πληροφοριών. Το EPMagazine προσφέρει πολλές τέτοιες επιστημονικές πληροφορίες, σε ελκυστική μορφή, προσβάσιμη γλώσσα και ενδεικτικές εικόνες που σίγουρα θα κερδίσουν τον αναγνώστη και θα τον παρακινήσουν για περαιτέρω έρευνα για τόθεμα.

Το EPMagazine, λοιπόν, είναι μία προσπάθεια που υποστηρίζεται μόνο από τον ενθουσιασμό των μαθητών για την ιστορία της επιστήμης και των προηγμένων τεχνολογιών με δραστηριότητες συνεργασίας σε τοπικό, εθνικό και διεθνές επίπεδο. Οι δραστηριότητες αυτές παρέχουν μια διαφορετική μαθησιακή εμπειρία, λιγότερο τυπική, με μεγαλύτερη διάρκεια, χωρίς την πίεση των στενών προθεσμιών, η οποία τους προσφέρει την ευκαιρία να εκφράσουν πρωτοτυπία, δημιουργικότητα, φαντασία, αναπτύσσοντας παράλληλα δεξιότητες επικοινωνίας.

Θα πρέπει να προσπαθήσουμε να είμαστε όχι μόνο χρήστες των gadget και αναγνώστες επιστημονικών άρθρων, αλλά να πρωθούμε την επιστημονική έρευνα και την καινοτομία στην τεχνολογία!

Editorial IT

EPMagazine - Lingue Straniere e Scienza

EPMagazine, al giorno d'oggi, è un'attività efficace per raggiungere l'obiettivo che si pone l'istruzione e cioè aiutare gli studenti non solo ad acquisire conoscenze, ma anche a sviluppare competenze civiche che consentiranno ai laureati di affrontare meglio situazioni poco consuete e svolgere vari compiti legati al lavoro, per motivarli all'apprendimento lungo tutto l'arco della loro vita e per renderli consapevoli delle proprie inclinazioni e dei propri punti di forza.

Le esperienze interculturali, come quelle fornite da EPMagazine, si dimostrano molto utili nel mondo d'oggi perché gli studenti non solo scrivono ed editano articoli scientifici, ma apprendono anche culture straniere. Gli articoli sono scritti nella lingua madre dell'autore e tradotti in inglese, favorendo così l'acquisizione di conoscenze in altre lingue straniere, oltre l'Inglese. Tuttavia, l'Inglese è la lingua comune utilizzata da tutti i partecipanti, quindi EPMagazine è diventato uno strumento di apprendimento interattivo sia scientifico che linguistico.

Nel contesto di EPMagazine, gli studenti hanno l'opportunità di sperimentare in prima persona l'uso della scrittura scientifica e si abituano anche alle regole della scrittura di un testo scientifico. Come peculiarità dello stile scientifico emergono la chiarezza logica, la coesione e la coerenza delle idee, l'oggettività che è implementata dallo stile impersonale, le costruzioni passive, una terminologia specifica per il contesto affrontato - e un linguaggio sintetico concentrato sugli aspetti rilevanti.

Pertanto, gli autori di EPM sono consapevoli che la scrittura di un testo scientifico è il risultato di un'approfondita ricerca preliminare, che comprende la scelta dell'argomento, la formulazione di obiettivi, la ricerca, il recupero e la selezione delle informazioni e, solo successivamente, la scrittura dell'articolo. Gli studenti, rispettando il formato richiesto, devono sottolineare i passaggi logici del loro studio: osservazioni introduttive, sottosezioni, conclusioni, bibliografia e webolognia.

E' innegabile l'importanza di saper parlare una lingua straniera per accedere a diverse fonti di informazione; oggi tutto ha bisogno di essere controllato, verificato, confrontato, in modo da essere certi che le informazioni raccolte siano coerenti, corrette e valide. Le lingue straniere, quindi, ampliano decisamente le opportunità di scelta quando si intende selezionare le fonti di informazione.

EPMagazine è, quindi, un progetto che è sostenuto solo dall'entusiasmo degli studenti che si trovano coinvolti nella storia della scienza e delle tecnologie avanzate attraverso attività di collaborazione a livello locale, nazionale e internazionale; tali attività forniscono un'esperienza di apprendimento diversa, meno formale, più continua, senza la pressione di scadenze ravvicinate e, offrendo loro la possibilità di esprimere originalità, creatività e immaginazione, hanno la possibilità di sviluppare anche migliori capacità comunicative.

Cerchiamo di essere non solo utilizzatori di gadget e lettori di articoli scientifici, ma anche innovatori della tecnologia e promotori della ricerca scientifica!

EPM – Lenguas extranjeras y ciencia.

EPmagazine está muy en línea con el objetivo más inmediato de la educación actual, que es el de ayudar al alumnado no sólo a adquirir conocimiento sino también a construir unas habilidades de la vida diaria que les permitirá manejar situaciones más o menos comunes y resolver tareas variadas relacionadas con el trabajo; a motivarles hacia un aprendizaje a lo largo de sus vidas y a ser conscientes de sus propios intereses y puntos fuertes.

Las experiencias interculturales, como las que EPMagazine proporciona, demuestran ser muy beneficiosas en el mundo actual ya que el alumnado no sólo escribe y edita artículos científicos sino que además aprenden sobre otras culturas. Los artículos se escriben en las lenguas nativas y se traducen al inglés, por tanto, se fomenta la adquisición de conocimiento en varios idiomas además del inglés. No obstante, el inglés es el idioma común usado por todos los participantes de manera que EPMagazine se convierte en una herramienta interactiva de aprendizaje científico y también lingüístico.

En la que a EPMagazine se refiere, los estudiantes tienen la oportunidad de experimentar de primera mano el uso de la escritura científica y se acostumbran a los requisitos necesarios para redactar un texto científico. Por ello, las estudiantes de EPM tienen la ventaja de familiarizarse con el lenguaje científico como un medio de difundir y facilitar el conocimiento científico. Como características del estilo científico, insistimos en la claridad lógica, la cohesión y coherencia de las ideas, la objetividad que aporta el estilo impersonal, las construcciones en pasiva, el uso de terminología específica del tema tratado y el lenguaje conciso que se centra en aspectos relevantes.

Así, los escritores de EPM se dan cuenta de que redactar un texto científico es el resultado de una investigación previa que implica seleccionar el tema, formular objetivos, buscar, selecciones y recuperar información y sólo después de todo esto, escribir el artículo. Con respecto al formato solicitado, los estudiantes deben subrayar los pasos lógicos de su estudio: comentarios introductorios, subsecciones, conclusiones, bibliografía y webgrafía.

La importancia de hablar idiomas extranjeros para poder acceder a diferentes fuentes de información es innegable. Hoy en día todo tiene que ser comprobado, verificado, y comparado para asegurarnos de que la información recopilada es adecuada, correcta y válida. Al hablar una lengua extranjera aumentan las opciones a la hora de seleccionar fuentes de información. EPMagazine ofrece mucha información científica en un formato atractivo, con un lenguaje accesible e imágenes ilustrativas que atraerán al lector lo motivarán a seguir indagando sobre un tema.

Por tanto, EPMagazine es un proyecto que se sustenta exclusivamente del entusiasmo de los estudiantes por implicarse en la historia de la ciencia y de las tecnologías avanzadas, a través de colaboración en actividades anivel local, nacional e internacional; actividades que proporcionan una experiencia de aprendizaje diferente, menos formal, más consciente, sin la presión de plazos de entrega fijos y que les ofrece una oportunidad para expresar originalidad, creatividad e imaginación al mismo tiempo que desarrollan habilidades comunicativas.

General

Mariana Dumencu

Vocational High School of Fine Arts "Hans Mattis Teutsch" Brașov, Romania
dumencumariana@gmail.com



Educational Project "Science and Creativity"

1. Introduction

The rapid growth of science and technology sets the pace, and anchors us in the present, preparing us for the future, with a strong incentive for the development of all of our skills. These developments in science and technology have been a context for changing the mentality of societies, but also a continuous evaluation and restructuring of education systems, which are mutually influencing each other. When this reciprocity is created in a relevant way, it naturally leads to progress.

The education process in schools has inevitably been influenced by the evolution of science and technology, and its role is to apply educational strategies today that bourns result for the future.

Today's students are more active on social media, more involved in learning new technologies, and have easy access to them, the main role of the school being in managing these skills and in generating new ones. Access to new technologies has led to the transformation of educational approaches into something dynamic, responsible, and engaging for students, whereas individual study has gained new value, comparison, analysis, synthesis, generalization, thus having a more attractive interface.

STEM concept (Science, Technology, Engineering, Mathematics) is a combined educational approach that involves cohesion between these fields. Of course, the arts make a natural connection between the technical field and the creative aspect, the concept being renamed STEAM, a concept based on one single keyword: integration. The notion consolidates the arts with science and technology, stimulates curiosity and analytical thinking, and offers freedom of

Proiect educațional "Știință și creativitate"

1. Introducere

Dezvoltarea științelor și tehnologiilor ne impun ritmul, ne ancorează în prezent în fiecare secundă, pregătindu-ne pentru viitor, cu motivații puternice înspre dezvoltarea abilităților, a aptitudinilor fiecărui dintre noi. Aceste evoluții din știință și tehnologie au constituit și un context al schimbării mentalității societăților, dar și o continuă evaluare și restructurare a sistemelor de învățământ, acestea realizându-se și influențându-se reciproc. Atunci când această reciprocitate se creează într-un mod relevant, conduce în mod natural, la progres.

Educația din școală a fost, inevitabil, influențată de evoluția științelor și tehnologiilor, iar rolul acesta este de a aplica în prezent strategiile educaționale, cu rezultate pentru viitor.

Elevii de azi sunt, realmente, mai activi social-media, mai implicați în cunoașterea noilor tehnologii, cu acces facil la acestea, școala având rolul de a gestiona aceste abilități în mod eficient și orientat spre generarea de noi competențe. Accesul la noile tehnologii a dus la transformarea demersurile educaționale în ceva dinamic, responsabil, angajator din partea elevilor și nu numai, iar studiul individual a căpătat noi valențe, compararea, analiza, sinteza, generalizarea, având o interfață mai atractivă.

Conceptul de educație STEM (Science, Technology, Engineering, Mathematics) reprezintă o abordare educațională combinată ce implică o coeziune între aceste discipline. Bineînteles că artele realizează o legătură firească între domeniul tehnic și latura creativă, conceptul redenumindu-se STEAM, concept care are la bază cuvântul cheie, integrarea. Conceptul consolidează

learning through an original approach, these being just some of the landmarks of this educational strategy.

As a physics teacher in an art institution, it was a real challenge to identify solutions that would provoke intellectually but would be accepted and assimilated by students, so that learning could be associated with their own discoveries, sometimes with original or unexpected achievements. From this combination of science and art, a context promoting study was created, developing responsibility, control of one's learning, and the exchange of experiences.

2. About the project

In the present day, the projects carried out by students and presented at the semestrial science exhibitions, have naturally been incorporated into the Physics classes through granting special attention to the study topics, through the stimulation of active involvement, and through the feedback generated by failures (failure often means a different starting point). The exhibition "Science and Creativity", in which devices / experimental models made by students in order to study physical phenomena, laws, etc. are presented, aims to develop transversal skills in students.



Fig. 1. The first achievements of the exhibition - stylized manometers

Every time, the suggested theme offers a lot of flexibility to students, and while making these experimental montages, they have freedom of thought and study, becoming the architects of their vision. It is also developing an essential component in education:

artele cu științele și tehnologiile și stimulează curiozitatea și gândirea analitică, oferă libertate de control asupra învățării, printr-o abordare originală, acestea fiind doar câteva dintre reperele acestei strategii educaționale.

Ca profesor de fizică într-o instituție și cu învățământ de artă, a fost o adevărată provocare să identific soluții care să provoace intelectual, dar care să fie agreate și assimilate de către elevi, astfel încât studiul să poată fi asociat cu propriile descoperiri, uneori cu originale sau neașteptatele realizări. Din această combinație a științei cu arta, s-a creat un context propice al studiului, dezvoltându-se responsabilitatea, controlul propriei învățări, precum și schimbul de experiențe.

2. Despre proiect

În acești ani, proiectele realizate de către elevi și prezentate în expozițiile de știință semestriale, s-au încorporat firesc în etapele importante ale orelor de fizică prin atenția acordată temelor de studiu, prin stimularea unei angajări active, prin feed-back-ul generat de erori (eroarea însemnând, de multe ori, și un alt punct de plecare). Expoziția "Ştiință și creativitate", în care sunt prezentate dispozitive/montaje experimentale realizate de către elevi înspre studierea fenomenelor fizice, a legilor, etc., urmărește dezvoltarea competențelor transversale.



Fig. 2. Newton's disc and other montages

Tematica propusă este generoasă de fiecare dată, iar în realizarea acestor montaje experimentale, elevii au libertate de gândire și de studiu, devenind arhitectii proprii viziuni. Se dezvoltă, de asemenea, o componentă esențială în educație privind

environmental protection (using recyclable materials, environmental protection ideas, and the use of alternative energies is often encouraged).



Fig. 3. Incorporating nature in environment

Creativity is an important criterion in the evaluation grids of these projects, along with the practical utility that experimental models offer.

Students organize their own learning, along with their time management, which was previously negotiated with the teacher, but still having a deadline.

Each project is highlighted by its diversity in the way it's approached. The creation of functional teams applicable to large-scale projects is part of the personal development, each member having precise responsibilities, this also being a scoring criterion in group projects.



Fig. 5. Personal vision- bionic building

protecting the environment (it uses the most common recyclable materials, are advanced in projects, ideas for protecting the environment and using alternative energy sources).

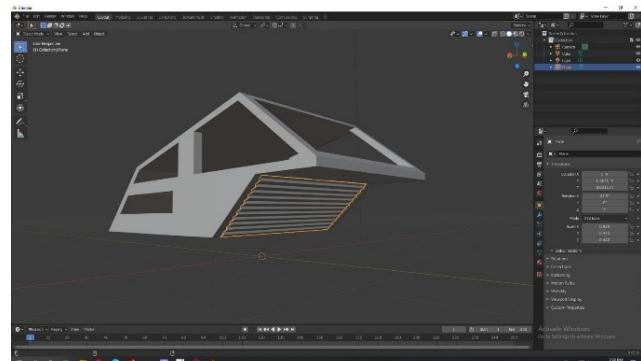


Fig. 4. Erich Dobrovolski - modern design for detached house

Creativity is an important criterion in the evaluation grids of these projects, along with the practical utility that experimental models offer.

Students organize their own learning, along with their time management, which was previously negotiated with the teacher, but still having a deadline.

Diversity of approaches is highlighted by each project and enriches the entire. Creating functional teams applicable to large-scale projects is part of personal development, each member having precise responsibilities, this also being a scoring criterion in group projects.



Fig. 6. Alexandra Mureșan și Brebeanu - 'In balance'

Since the first edition of the exhibition "Science and Creativity" in the 2016-2017 school year until now, the experiences gained have been re-evaluated, reconsidered, and transferred to the next generations, and not infrequently, some of the experimental models have been used as teaching material in Physics classes in the following years.



Fig. 7. Study of electrostatics

De la prima ediție a expoziției "Știință și creativitate" din anul școlar 2016-2017 până în prezent, experiențele acumulate au fost reevaluate, reconsiderate și transferate următoarelor generații și nu de puține ori, unele dintre montajele experimentale, au constituit material didactic la orele de fizică din anii următori.



Fig. 8. Sound and musical instruments

3. Results

The experimental models made by the students fall within the theme chosen by them or suggested by the teacher in each class, and this method is part of the summative evaluation at the end of each semester. Some of the topics agreed upon by the students are simple mechanisms, body balance, hydrostatics, electrical circuits, sound propagation, or experimental montages for the study of optical phenomena

3. Rezultate

Montajele experimentale realizate de către elevi se încadrează în tematica aleasă de ei sau propusă de profesor la clasă, iar această metodă a proiectului face parte din evaluarea sumativă de la final de semestrul. Dintre temele agreate de către elevi pot enumera: mecanisme simple, echilibrul corpurilor, hidrostatica, circuite electrice, propagarea sunetului, montaje experimentale pentru studiul fenomenelor optice.

4. Conclusions

The experiences gained and the achievements of the students have always been valued and shared publicly, from staff meetings within the micro-circles of Physics

4. Concluzii

Experiențele obținute și realizările elevilor au fost, de fiecare dată, puse în valoare. De la întâlnirile profesionale din cadrul microcercurilor profesorilor de fizică, până la

teachers ,to participating in competitions, or presenting them to the general public (though high school Facebook page). I am grateful for the participation, joy, and also for the effort of the children and all of those who have contributed to their education so far. The openness of the students to this form of study gives further incentive to continue the effort. The opportunity to incorporate, the student's passion for the visual arts, as well as to value their effort and progress in the study of this discipline, was harmoniously aligned with their motivation for learning and the excitement of innovation.

Years ago, the famous mathematician Solomon Marcus urged us, the teachers who attended that meeting the followings: "Dear colleagues, do not lose your enthusiasm in front of your students". It is an ingredient that has not been missing from the personal approach and which, passed on to the students correctly, offers



Fig. 9. Buildings



Fig. 10. Yasmine Sezer -"The Kiss of Brâncuși"

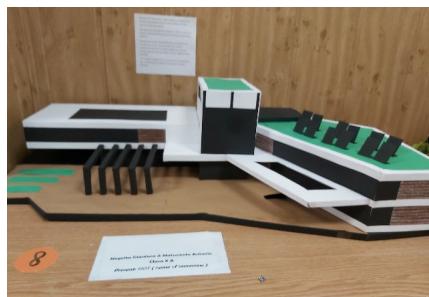


Fig. 11. Negoită Gianluca and Matsumoto Antonio -Energy independent house with minimalist design



Fig. 12 Night Lamp

participarea la concursuri, sau prezentarea printr-un mijloc facil de comunicare pentru publicul larg (pagina de facebook a liceului), toate aceste demersuri au fost făcute cunoscute, împărtășindu-le. Sunt recunoșcătoare pentru participarea, bucuria, precum și efortul copiilor și al tuturor celor care au contribuit la formarea lor de până acum, iar deschiderea elevilor către această formă de studiu dă imbold pe mai departe. Oportunitatea de a incorpora, pe de o parte, pasiunea elevilor pentru artele vizuale și, pe de altă parte, de a le valoriza efortul și progresul în studiul acestei discipline, s-a aliniat, armonios, cu motivația pentru învățare și emoția inovării.

Cu ani în urmă, la una dintre întâlniri cu renumitul matematician Solomon Marcus, unul dintre îndemnuri către noi, profesorii, a fost: " Dragi colegi, să nu vă pierdeți entuziasmul în față

positive emotional support, prompting towards study and further development.

elevilor d-voastră". Este un ingredient care nu a lipsit din abordarea personală și care, transmis corect elevilor, oferă un suport emoțional pozitiv, declanșator înspre studiu și dezvoltare.

Webology

- [1] https://inaco.ro/wp-content/uploads/2021/09/21-septembrie>Editia-IVa_Ghidul-Meseriilor-Viitorului_INACO_2021.pdf
- [2] https://eacea.ec.europa.eu/national-policies/eurydice/content/national-reforms-school-education-56_en
- [3] <https://creeracord.com/2020/01/15/4-mituri-despre-educatia-viitorului/>
- [4] http://www.anc.edu.ro/wp-content/uploads/2019/11/Tabel_competente_transversale.pdf

Iconography

Fig. 1-12 - from the author's collection.



Celestite

1. About Crystals

The world we live in is made up of three realms:

animal, vegetable, and mineral.

Minerals - natural combinations of chemical elements; represents the substrate on which plants and animals appeared and evolved.

Like the cell in living organisms, the minerals can be seen as a basic unit in rocks, in the earth's crust, or in the solid shells of celestial bodies.

In ancient times the use of minerals was most often mixed with superstition. No wonder people believed in magic and had a poor understanding of the chemical composition of the world and said so many strange things about minerals and rocks.

2. Celestite Meaning

Celestite, also known as Celestine, is a mineral that forms blue crystals. Celestite is often associated with divine power and is thought to increase understanding, higher consciousness, as well as mindfulness when used in meditation and prayer.

Celestite is a mineral composed of strontium sulfate (SrSO_4). Its name is derived from Latin word *Caelestis*, meaning "celestial", which was inspired by the crystals' well-known shades of sky blue. This mineral can occur in geodes as crystals. Celestite can also occur as fibers in sedimentary rock: river, streams, and ocean beds. The crystals are also often found growing alongside Gypsum ($\text{CaSO}_4 \cdot 2 \text{H}_2\text{O}$), Anhydrite/Calcium Sulfate (CaSO_4) and Halite/Salt (NaCl).



Fig. 1 Angelite in nature



Fig. 2 Celestite in nature

Celestina

1. Despre cristale

Lumea în care trăim este alcătuită din trei regnuri: animal, vegetal și mineral.

Mineralele - combinații naturale de elemente chimice - reprezintă substratul pe care au apărut și evoluat plantele și animalele. Aidoma celulei din organismele vii, mineralele pot fi privite ca o unitate de bază în roci, în scoarța terestră sau în învelișurile solide ale corpilor cerești.

In timpurile străvechi utilizarea mineralelor s-a combinat cel mai adesea cu superstiția. Nu e de mirare că oamenii crezând în magie și având o slabă înțelegere a alcătuirii chimice a lumii și-au spus atâta de lucruri stranii despre minerale și roci.

2. Introducere în lumea celestinei

În acest articol vom pătrunde în lumea fascinantă a celestinei Celestitul, cunoscut și sub numele de Celestina, este un mineral care formează cristale albastre. Celestina este adesea asociată cu puterea divină și se crede că dezvoltă înțelegerea, conștiința superioară, precum și atenția atunci când este folosită în meditație și rugăciune.

Celestina este un mineral compus din sulfat de strонțiu (SrSO_4). Numele său este derivat din cuvântul latin *Caelestis*, care înseamnă „celest” și care a fost inspirat de binecunoscutele nuanțe de albastru precum cerul al cristalelor. Acest mineral poate apărea în geode sub formă de cristale. Celestina poate apărea și sub formă de fibre în rocile sedimentare: râuri, pâraie și albiile oceanice. Cristalele se găsesc adesea crescând alături de gips ($\text{CaSO}_4 \cdot 2 \text{H}_2\text{O}$), anhidrit/sulfat de calciu (CaSO_4) și halit/sare gemă (NaCl).

Celestite is found worldwide in small quantities. The pale blue specimens that the name is derived from are found in Madagascar and Sicily, Italy. It can also occur as colorless, white, pink, pale green, pale brown, and black. Orange specimens have been found in Ontario, Canada. Other interesting names for the mineral include Coelestine and Sicilianite.

3. Properties of celestine

- **Chemical formula:** SrSO₄
- **Shape:** prismatic / rhombic, sometimes tubular.
- **Color:** blue, yellow, dark brown, white and colorless
- **Gloss:** glassy
- **Transparency:** transparent
- **Density:** 3.70 g / cm³
- **Molar mass:** 183.68 grams / mol
- **Hardness:** 3-3.5 on the Mohs scale



Fig.3 Celestite in nature

4. Celestine fluorescence

Fluorescent minerals are those minerals that emit light when activated by ultraviolet radiation or other energy sources.

The name fluorescence comes from fluorine, because the phenomenon was first observed in this mineral. Fluorescence is a phenomenon that is observed in the dark, occurs and lasts as long as it causes the cause that caused it and disappears with this cause.

The explanation for this phenomenon is as follows: certain electrons of the mineral

Celestina se găsește în toată lumea în cantități mici. Exemplarele albastru pal din care provine numele se găsesc în Madagascar și Sicilia (Italia). De asemenea, poate apărea ca incolor, alb, roz, verde pal, maro pal și negru. Exemplare portocalii au fost găsite în Ontario (Canada). Alte nume interesante pentru mineral includ Coelestine și Sicilianite.

3. Proprietățile celestinei

- **Formula chimică:** SrSO₄
- **Forma:** prismatică/rombică, câteodată tubulară.
- **Culoarea:** albastru, galben, brun-închis, alb și incolor
- **Luciu:** sticlos
- **Transparență:** transparent
- **Densitatea:** 3,70 g/cm³
- **Masa molară:** 183,68 grame/mol
- Duritatea:** 3-3,5 pe scara Mohs



Fig.4 Celestite under UV radiation

4. Fluorescența celestinei

Mineralele fluorescente sunt acele minerale care emite lumină atunci când sunt activate de radiații ultraviolete sau alte surse de energie.

Denumirea de fluorescență vina de la fluorina, pentru că fenomenul s-a observat prima dată la acest mineral. Fluorescența este fenomenul care se observă în întuneric, apare și durează atâtă timp cât ține cauza care l-a provocat și dispără cu această cauză.

Explicația acestui fenomen este următoare: anumiți electroni ai substanței minerale absorb energia de la sursă trecând pe nivele

substance absorb energy from the source by switching to lower energy levels and emitting light in different colors, depending on the chemical composition of the mineral.

Celes is sometimes fluorescent ultraviolet lamp and even thermoluminescent, the fact that in an open flame, a sample of celestine .

5. History & Modern Uses

In addition to its divine connotations, Celestite is important in the scientific community due to one of the elements it contains in its composition: strontium. Protozoa creatures called Acantharia composed their rudimentary skeletons of Celestite obtained by biomineralizing or creating the mineral using strontium. They were the only creatures to do this.

Interestingly, because of their crystal-fibrous skeletons, this gave their single cell bodies a star-like appearance. As an effect, these creatures did not fossilize but crystalize into Celestite cultures.

The mineral itself started being called ‘Celestite’ in 1798. This was sometime after the formal description of the element strontium in 1792. Celestine is also the main natural source for the element strontium, which is mixed into a metal salt and used to create red-colored fireworks. While one would expect strontium to possibly create blue fireworks, it does not burn as blue.

Due to the fragility of Celestite, they are hard to cut and facet. While they can be cut, stones of Celestite rarely exceed 10 carats. It is more common to find them in small jewelry pieces or as raw, uncut, geode crystal displays of various sizes.



Fig. 5 Bracelet made of celestite



Fig.6 Celestite crystal

mai joase de energie și emițând o lumină în culori diferite, în funcție de compoziția chimică a mineralului.

Celestite este uneori fluorescentă la lampa cu ultraviolete și chiar termoluminescentă, datorită faptului că într-o flacără deschisă, un eșantion de celestină colorează flacără respectivă în roșu-carmin.

5. Istoria și utilizările moderne

Pe lângă conotațiile sale divine, Celestina este importantă în comunitatea științifică datorită unuia dintre elementele pe care le conține în compoziția sa: stronțiul. Creaturile protozoare numite *Acantharia* au compus scheletele rudimentare din Celestina obținută prin biominerizarea sau crearea mineralului folosind stronțiul. Au

fost singurele creaturi care au făcut asta. Din cauza scheletului lor cristalin, acest lucru a dat corpurilor lor unicocelulare un aspect asemănător cu o stea. Ca efect, aceste creaturi nu s-au fosilizat, ci s-au cristalizat în grupări de Celestina.

Mineralul în sine a început să fie numit „Celestina” în 1798. Acest lucru a fost cândva după descrierea oficială a elementului stronțiul în 1792. Celestina este, de asemenea, principala sursă naturală pentru elementul stronțiul, care este amestecat într-o sare de metal și folosit pentru a crea artificii de culoare roșie. Deși ne-am așteptă ca stronțiul să creeze artificii albastre, acest lucru nu este posibil.

Datorită fragilității Celestinei, acestea sunt greu de tăiat și fațetă. Deși pot fi tăiate, pietrele de Celestina rareori depășesc 10 carate. Este mai obișnuit să le găsești în piese mici de bijuterii sau ca expoziții de cristale geode brute, netăiate, de diferite dimensiuni.

6. Celestite Metaphysical Properties

Associated with celestial beings, Celestite is strongly connected to divine energy and cosmic supernatural forces. As the result, this gem is best used for pursuing spiritual strength. Celestite also promotes discernment or higher spiritual awareness. This makes the stone useful for gaining understanding and promoting inner peace.



Fig.7 Celestite geode

7. Geodes

Celestine crystals are found in some geodes. The world's largest known geode, a celestine geode 11 m in diameter at its widest point, is located near the village of Put-in-Ba, Ohio, on South Bass Island in Lake Erie. The geode has been converted into a viewing cave, Crystal Cave, with the crystals which once composed the base of the geode removed. The geode has celestine crystals as wide as 46 cm across, estimated to weigh up to 140 kg each.

Celestine geodes are understood to form by replacement of alabaster nodules consisting of the calcium sulfates gypsum or anhydrite. Calcium sulfate is sparingly soluble, but strontium sulfate is mostly insoluble. Strontium-bearing solutions that come into contact with calcium sulfate nodules dissolve the calcium away, leaving a cavity. The strontium is immediately precipitated as celestine, with the crystals growing into the newly-formed cavity.

Conclusion

Among the specialists in crystals, the celestite is also categorized as Cosmic swing song.

In industry, jewelry is used to obtain strontium, which is part of the formation. It is used for the manufacture of pyrotechnics, to give hardness to aluminum and copper, as an anti-corrosion coating for zinc and aviation alloys.

6. Proprietățile metafizice ale celestinei

Asociat cu ființe cerești, Celestina este puternic conectată la energia divină și forțele supranaturale cosmice. Ca rezultat, această bijuterie este cel mai bine folosită pentru a găsi puterea spirituală. Celestina promovează, de asemenea, discernământul sau conștientizarea spirituală superioară. Acest lucru face ca piatra să fie folositoare pentru înțelegerea și obținerea păcii interioare.

7. Geode

Cristalele de celestină se găsesc în unele geode. Cea mai mare geodă cunoscută din lume, o geodă celestină cu diametrul de 11 m în punctul său cel mai lat, este situată în apropiere de satul Put-in-Ba, Ohio, pe insula South Bass din Lacul Erie. Geoda a fost transformată într-o peșteră de cristal, cu cristale care au compus odată baza geodei. Geoda are cristale de celestină cu o lățime de 46 cm, care cântăresc până la 140 kg fiecare.

Geodele celestine se formează prin înlocuirea nodulilor de alabastru, constând din gips de sulfăți de calciu sau anhidrit. Sulfatul de calciu este puțin solubil, dar sulfatul de strontiu este în mare parte insolubil. Soluțiile purtătoare de strontiu care vin în contact cu nodulii de sulfat de calciu dizolvă calciul, lăsând o cavitate. Strontiul este precipitat imediat ca celestină, cristalele crescând în cavitatea nou formată⁸.

Concluzii

În rândul specialiștilor în cristale, celestul mai este catalogat sub denumirea de *Cântec de leagăn cosmic*.

În industrie, bijuteria este utilizată pentru obținerea strontiului, care face parte din formațiune. Este utilizat pentru fabricarea pirotehnicii, pentru a conferi duritate aluminiului și cuprului, ca strat anticoroziv pentru zinc și aliaje de aviație.

Celestine has also found applications in the sugar, glass, ceramics and pharmaceutical industries. It is very difficult to work with stone. Therefore, only piece products are made from it.

Celestine a găsit și aplicații în industria zahărului, sticlei, ceramicii și farmaceutice. Este foarte greu să lucrezi cu piatră. Prin urmare, din aceasta se fabrică numai produse bucăți.

Coordinator: Niculescu Elisabeta

Web - biography

- [1] <https://capecodcrystals.com/>
- [2] [https://en.wikipedia.org/wiki/Celestine_\(mineral\)](https://en.wikipedia.org/wiki/Celestine_(mineral))
- [3] <https://ro.cultureoeuvre.com/>

Bibliography:

- [1] Gogu Pârvu, Minerale și roci, Științifică și enciclopedie, 1983
- [2] The National Geology Museum

Iconography:

- Img. 1 : <https://www.kristale.ro/>
- Img. 2: <https://www.alibaba.com/>
- Img. 3: <https://newmoonbeginnings.com/>
- Img. 4: <https://www.catawiki.com/>
- Img. 5: <https://www.tiemeup.ro/>
- Img. 6: <https://www.minerals-kingdom.com/>



Graffiti

1. Definition

Graffiti is a text message or a drawing spray painted in public places, usually on a wall. Graffiti expresses feelings, protest or sends a message to the community.

2. Graffiti history

The first painted representations were drawn thousands of years ago. They were found in caves in France, India, Spain, South Africa, China, Australia, etc.

The paintings were mere observations of the natives' world. A typical example is a drawing of animal designs with hunting scenes in Lascaux caves in France about 20000 years ago. Another example of that period is the fascinating "Cave of Hands" (Cueva de las Manos) in Santa Cruz, Argentina.

Archaeologists have found that, in the following years, the ancient Greeks and Egyptians also drew paintings with various themes. Ancient Greeks often drew scenes from sports such as Olympic Games and battles! The ancient Egyptians used hieroglyphs (i.e. an image-based alphabet) to celebrate and worship the Pharaohs and various ancient gods.

During the first centuries AD, the archaeologists found depictions in many other places. A typical example is the graffiti carved in marble found in an urban area in Asia Minor. The Aphrodisian graffiti shows prayers, religious symbols, drawings of faces, animals,



Fig. 2 SantaCruz
"Cave of hands"

Γκράφιτι

1. Ορισμός

Το γκράφιτι είναι ένα μήνυμα κειμένου ή ένα σχέδιο που ζωγραφίζεται με σπρέι σε δημόσιους χώρους συνήθως σε τοίχο. Το γκράφιτι εκφράζει τα συναισθήματα, διαμαρτυρίες ή στέλνει ένα μήνυμα στην κοινωνία.

2. Ιστορία του γκράφιτι

Οι πρώτες ζωγραφισμένες παραστάσεις σχεδιάστηκαν πριν από χιλιάδες χρόνια. Βρέθηκαν σε σπήλαια στη Γαλλία, την Ινδία, την Ισπανία, τη Νότια Αφρική, την Κίνα, την Αυστραλία κ.λπ.

Οι πίνακες ήταν απλές παρατηρήσεις του κόσμου των ιθαγενών. Χαρακτηριστικό παράδειγμα είναι ένα σχέδιο ζωικών σχεδίων με σκηνές κυνηγιού στις σπηλιές Lascaux στη Γαλλία πριν από περίπου 20000 χρόνια. Ένα άλλο παράδειγμα εκείνης της περιόδου είναι το συναρπαστικό «Σπήλαιο των Χεριών» (Cueva de las Manos) στη Σάντα Κρουζ της Αργεντινής.

Οι αρχαιολόγοι διαπίστωσαν ότι τα επόμενα χρόνια οι αρχαίοι Έλληνες και οι Αιγύπτιοι σχεδίασαν επίσης παραστάσεις με διάφορα θέματα. Οι αρχαίοι Έλληνες ζωγράφιζαν συχνά σκηνές από αθλήματα όπως οι Ολυμπιακοί Αγώνες και από μάχες! Οι αρχαίοι Αιγύπτιοι χρησιμοποιούσαν ιερογλυφικά (δηλαδή ένα αλφάριθμο με βάση την εικόνα) για να γιορτάσουν και να λατρέψουν τους Φαραώ και άλλους διάφορους αρχαίους θεούς.

Κατά τους πρώτους αιώνες μ.Χ., οι αρχαιολόγοι βρήκαν απεικονίσεις σε πολλά άλλα μέρη. Χαρακτηριστικό παράδειγμα είναι ένα γκράφιτι σκαλισμένο σε μάρμαρο που βρίσκεται σε αστική περιοχή, στην Αφροδισιάδα της Μικράς Ασίας. Τα αφροδισιακά γκράφιτι

objects, and even obscene texts and images.

Even nowadays can we find many depictions in various places, where people send a message or express their feelings.



Fig. 3. Aphrodisian graffiti:
Obscene texts and images

For example, ancient Romans or the barbarians used to carve texts in monuments and walls, such as a message carved by a Viking in Aghia Sophia church in Constantinople during the 9th century. Even during the Second World War, soldiers used to write on walls to strengthen and encourage their team.

Modern graffiti first appeared in Philadelphia, USA during the early 1960s, when youngsters would write their names on the wall just to get attention. This new type of expression was spread to New York and, in a few years, across Europe and many other places worldwide. The term graffiti was first introduced by the newspaper "The New York Times" and the novelist Norman Mailer. In the 70s this art was so popular that it was found on many public or private walls, on trains or buses, even on billboards or street posters. At the same time, public authorities began chasing people practicing this kind of art, considering it rather vandalism.

Nevertheless, this dispute has both good and bad examples. An example of Graffiti for a good case comes from a city in Mexico. What comes to your mind when you think of a big city? Gray buildings, litter and air pollution, or perhaps crime?

A neighborhood in Mexico City tried to change this image by painting a colorful mural across 200 buildings. If you view this mural from a distance, the once rundown neighborhood now looks like a huge rainbow!



Fig. 4 Rainbow Graffiti

αναπαριστούν προσευχές, θρησκευτικά σύμβολα, σχέδια προσώπων, ζώων, αντικειμένων, ακόμη και άσεμνων κειμένων και εικόνων. Μπορούμε να βρούμε πολλές απεικονίσεις σε διάφορα μέρη, όπου οι άνθρωποι στέλνουν ένα μήνυμα ή εκφράζουν τα συναισθήματά τους, μέχρι σήμερα.

Για παράδειγμα, οι αρχαίοι Ρωμαίοι ή οι βάρβαροι, συνήθιζαν να χαράζουν κείμενα σε μνημεία και τείχη, όπως ένα μήνυμα χαραγμένο από έναν Βίκινγκ στην εκκλησία της Αγίας Σοφίας στην Κωνσταντινούπολη τον 9ο αιώνα. Ακόμα και κατά τη διάρκεια του Β' Παγκοσμίου Πολέμου, οι στρατιώτες έγραφαν στους τοίχους μηνύματα για να ενισχύσουν και να ενθαρρύνουν την ομάδα τους.

Το σύγχρονο γκράφιτι εμφανίζεται για πρώτη φορά στη Φιλαδέλφεια των ΗΠΑ στις αρχές της δεκαετίας του 1960, όταν οι νέοι έγραφαν τα ονόματά τους στον τοίχο για να τραβήξουν την προσοχή. Αυτός ο νέος τρόπος έκφρασης διαδόθηκε στη Νέα Υόρκη και σε λίγα χρόνια σε ολόκληρη την Ευρώπη και σε πολλά άλλα μέρη παγκοσμίως. Ο όρος γκράφιτι παρουσιάστηκε για πρώτη φορά από την εφημερίδα «The New York Times» από τον μυθιστοριογράφο Norman Mailer. Στη δεκαετία του '70 αυτή η τέχνη ήταν τόσο δημοφιλής που βρισκόταν σε πολλούς τοίχους, δημόσιους ή ιδιωτικούς, τρένα ή λεωφορεία, ακόμη και σε καμβάδες που κρέμονταν στους δρόμους. Ταυτόχρονα όμως, οι δημόσιες αρχές άρχισαν να κυνηγούν ανθρώπους που ασκούν τέτοιου είδους τέχνη θεωρώντας την μάλλον βανδαλισμό.

Παρ' όλα αυτά, αυτή η δράση έχει καλά και κακά παραδείγματα. Ένα καλό παράδειγμα με γκράφιτι προέρχεται από μια πόλη στο Μεξικό. Τι έρχεται στο μυαλό σας όταν σκέφτεστε μια μεγάλη πόλη; Γκρι κτίρια, σκουπίδια και ατμοσφαιρική ρύπανση ή ίσως και εγκλήματα;

Μια γειτονιά στην Πόλη του Μεξικού προσπάθησε να αλλάξει αυτήν την εικόνα ζωγραφίζοντας μια πολύχρωμη τοιχογραφία σε 200 κτίρια. Εάν δείτε αυτήν την τοιχογραφία από απόσταση, η κάποτε

A team of graffiti artists worked with local residents for 10 weeks to complete the mural. Some of the buildings were almost inaccessible because of the rubbish in the streets, so the artists had to clear it. Then they restored the damaged walls and painted the mural with bright colors.

Several curious passengers watched the progress of the mural. Many of them were in doubt about the success of the project. How could art help a troubled neighborhood? However, rival gangs collaborated on the project with the encouragement of the artists. This project helped them to get to know one another. This cooperation was significant since the crime rates were reduced. Now, residents can go out safely and spend more time in their community. The project was very successful and many municipalities plan to create murals not only in cities but also in the suburban areas of Mexico.

How would one decide if graffiti is art or vandalism?

The problem with graffiti is that city centers are covered everywhere with it. Graffiti is a common sight in city centers all over the world (Figure 6 and 7). However, many business owners and local residents do not consider graffiti a form of art. Some of them disagree with the paintings and even consider it annoying.

This problem cannot be easily solved. It is not very easy to agree about anything! If graffiti is not accepted by the majority of the community, volunteer groups, or even the people who painted the graffiti perhaps should erase it. Perhaps, graffiti may not be seen as art, but it is a modern way of communicating, when some groups may



Fig. 5 Simple G, "Giant graffiti of woman in Athens draws all eyes"



Fig. 6 Vandalism

υποβαθμισμένη γειτονιά μοιάζει τώρα με ένα τεράστιο ουράνιο τόξο!

Μια ομάδα καλλιτεχνών γκράφιτι συνεργάστηκε με ντόπιους κατοίκους για 10 εβδομάδες για να ολοκληρώσει την τοιχογραφία. Μερικά από τα κτίρια ήταν σχεδόν απρόσιτα λόγω των σκουπιδιών στους δρόμους, οπότε οι καλλιτέχνες έπρεπε να το καθαρίσουν. Στη συνέχεια αποκατέστησαν τους κατεστραμμένους τοίχους και ζωγράφισαν την τοιχογραφία με έντονα χρώματα.

Αρκετοί περίεργοι περαστικοί παρακολούθησαν την πρόοδο της τοιχογραφίας. Πολλοί από αυτούς αμφέβαλαν για την επιτυχία του έργου. Πώς θα μπορούσε η τέχνη να βοηθήσει μια ταραγμένη γειτονιά; Ωστόσο, αντίπαλες συμμορίες συνεργάστηκαν στο έργο με την ενθάρρυνση των καλλιτεχνών. Αυτό το έργο τους βοήθησε να γνωριστούν καλύτερα. Έτσι η συνεργασία αυτή αποδείχθηκε σημαντική, αφού μειώθηκαν τα ποσοστά εγκληματικότητας. Τώρα, οι κάτοικοι μπορούν να βγουν με ασφάλεια και να περάσουν περισσότερο χρόνο στην κοινότητά τους. Το έργο ήταν πολύ επιτυχημένο και πολλοί δήμοι σχεδιάζουν να δημιουργήσουν τοιχογραφίες όχι μόνο στις πόλεις αλλά και στις προαστιακές περιοχές του Μεξικού.

Πώς θα μπορούσε να αποφασίσει κανείς, αν το γκράφιτι είναι τέχνη ή βανδαλισμός;

Το πρόβλημα με τα γκράφιτι είναι ότι το κέντρο των πόλεων κατακλύζεται από αυτά. Έτσι το γκράφιτι είναι ένα κοινό θέαμα σε κέντρα πόλεων σε όλο τον κόσμο. Ωστόσο, πολλοί ιδιοκτήτες επιχειρήσεων και κάτοικοι της περιοχής δεν θεωρούν τα γκράφιτι μορφή τέχνης. Μερικοί από αυτούς διαφωνούν με αυτό και μάλιστα το θεωρούν ενοχλητικό.

Αντό το πρόβλημα δεν μπορεί να λυθεί εύκολα. Δεν είναι πολύ εύκολο να συμφωνήσεις για οτιδήποτε! Εάν τα γκράφιτι δεν γίνονται αποδεκτά από την πλειοψηφία της κοινότητας, εθελοντικές ομάδες ή ακόμα και τα άτομα που ζωγράφισαν τα γκράφιτι ίσως πρέπει να τα

want to send some political or social messages because they do not have another more appropriate way.

It is true, however, that some of these murals present exceptional artistic elements that could not unjustly be described as works of art. Besides, there are galleries in New York that buy such works.

Nowadays, many graffiti artists are creating their work in various places, walls, public buildings, transportation. Some of them are Banksy, Daze, David Choe, Lee, Cornbread, Shepard Fairey.

In conclusion, young people and old ones as well, can be creative and paint exciting graffiti or even murals. In order for their graffiti to be well accepted, it would be better if they could cooperate with the local community and municipality. In turn, the local community must provide some available facilities for people to be creative and paint exciting graffiti.

Coordinator: Nikolaos Georgolios

Web - biography

- [1] https://cdn.sofokleousin.gr/sites/default/files/styles/node_full/public/2019-07/street-art.jpg?itok=m1y0eyBm
- [2] <https://www.cna.gr/wp-content/uploads/2019/06/graffiti2.jpg>
- [3] <https://i.pinimg.com/736x/56/61/e9/5661e9a68fa47213520352255e9b6023--wallpaper-for-iphone-wallpaper.jpg>
- [4] https://miro.medium.com/max/3544/1*WM10tRqBWxqMsULtXL5JZQ.jpeg
- [5] https://www.archαιολογία.gr/wp-content/uploads/2012/06/chauvet_new.jpg
- [6] <http://en.protothema.gr/giant-graffiti-of-woman-in-athens-draws-all-eyes-photo/>
- [7] <https://youthincmag.com/how-to-make-a-legal-career-as-a-graffiti-artist>
- [8] <https://www.ias.edu/ideas/2015/chaniotis%E2%80%93graffitti>
- [9] <https://www.gratefulgypsies.com/street-art-in-mexico/>
- [10] <https://www.ias.edu/ideas/2015/chaniotis%E2%80%93graffitti>
- [11] <https://www.timeout.com/newyork/art/top-famous-street-artists>
- [12] <https://www.thecollector.com/graffiti-wall-art/>
- [13] <https://radar.gr/wp-content/uploads/2021/02/banksy.jpg>

Iconography:

- [1] <https://upload.wikimedia.org/wikipedia/commons/thumb/0/07/Lascaux2.jpg/220px-Lascaux2.jpg>
- [2] <https://upload.wikimedia.org/wikipedia/commons/f/f4/SantaCruz-CuevaManos-P2210651b.jpg>
- [3] https://www.ias.edu/sites/default/files/styles/wysiwyg_full/public/media-assets/Screen-Shot-2016-02-18-at-12.23.35-PM_2.png?itok=hyUrbS9x (includes 2 additional pictures, which may be used)
- [4] <http://www.brooklynstreetart.com/theblog/wp-content/uploads/2015/08/Brooklyn-Street-Art-740-Mexico-German-Crew-Screen-Shot-2015-08-13-at-9.21.37-PM.jpg>
- [5] <https://en.protothema.gr/wp-content/uploads/2019/12/wom55.jpg>
- [6] <https://content.api.news/v3/images/bin/bcb8e0a5457d990f27c141600ca43d3d>
- [7] <https://radar.gr/wp-content/uploads/2021/02/banksy.jpg>

σβήσουν. Ίσως, τα γκράφιτι να μην θεωρούνται τέχνη, αλλά είναι ένας σύγχρονος τρόπος επικοινωνίας, όπου ορισμένες ομάδες μπορεί να θέλουν να στείλουν κάποια πολιτικά ή κοινωνικά μηνύματα επειδή δεν έχουν έναν άλλο πιο κατάλληλο τρόπο.



Fig. 7 Banksy, "the girl with the balloon"

Είναι αλήθεια, ωστόσο, ότι μερικές από αυτές τις τοιχογραφίες παρουσιάζουν εξαιρετικά καλλιτεχνικά στοιχεία που δεν θα μπορούσαν να περιγραφούν άδικα ως έργα τέχνης. Εκτός αυτού, υπάρχουν γκαλερί στη Νέα Υόρκη που αγοράζουν τέτοια έργα.

Σήμερα, πολλοί καλλιτέχνες γκράφιτι δημιουργούν το έργο τους σε διάφορα μέρη, τοίχους, δημόσια κτίρια, μεταφορές. Μερικοί από αυτούς είναι οι Banksy, Daze, David Choe, Lee, Cornbread, Shepard Fairey.

Έτσι καταλήγουμε στο συμπέρασμα, ότι οι νέοι μπορούν να είναι δημιουργικοί και να ζωγραφίζουν συναρπαστικά γκράφιτι ή ακόμα και τοιχογραφίες. Για να γίνουν αποδεκτά τα γκράφιτι τους, θα ήταν καλύτερα αν μπορούσαν να συνεργαστούν με την τοπική κοινωνία και τον δήμο. Με τη σειρά του, οι τοπικές αρχές πρέπει να παρέχουν κάποιες διαθέσιμες εγκαταστάσεις, ώστε οι άνθρωποι να είναι δημιουργικοί και να δημιουργούν συναρπαστικά γκράφιτι.



The mind-body problem “What’s it like to be a bat?”



The mind–body problem is essentially a debate that looks into the relationship between thought and consciousness in the human mind and the brain as part of the physical body.

A glimpse into the mind of Thomas Nagel:

We know that there's many features that are exclusive to mankind - but is consciousness one of them? Thomas Nagel argues that "*conscious experience is a widespread phenomenon*" and is, in fact, characteristic to most living forms!

Why bats?

Let's start with what we know about bats: they are mammals (thus are assumed to have conscious experience), but most importantly, they function based on a highly evolved biological apparatus - they use echolocation as their own built-in GPS.

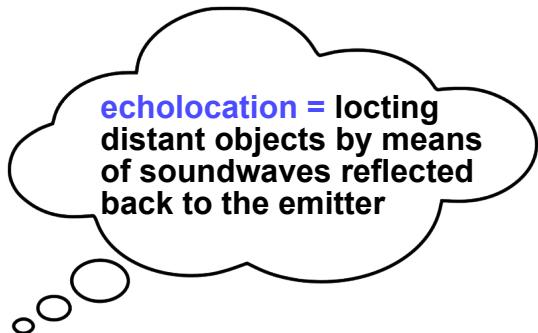
Therefore, echolocation can be understood as a form of human vision using both auditory and visual stimuli.

So, now we understand a tiny fraction of how bats function. It's the moment for Nagel to come into play and ask us the question that revolutionised his work:

If we understand how bats move around, their habits and nutrition - can we understand what it's like to be a bat?

Nagel's use of metaphor aims to explain that physical events or states can never be perfectly explained because experience is **subjective** to the person living it.

Even if we became bats, would only understand the behaviour, not the mindset.



"I mean, I've got the costume, I've got the gadgets... but I just can't shake the feeling that I'll never know what it's like to be a bat."



If this topic sparked your interest, you can read more about it here!

Bibliography:

- [1] What's it like to be a bat? - Thomas Nagel, ~1970s
[humananimalstudies/lectures/32/nagel_bat.pdf](https://humananimalstudies.lectures/32/nagel_bat.pdf)

Webology:

https://en.wikipedia.org/wiki/What_Is_It_Like_to_Be_a_Bat%3F

Iconography:

<https://i.stack.imgur.com/9s1KH.jpg>

<https://i.gr-assets.com/images/S/compressed.photo.goodreads.com/hostedimages/1548609090i/26977313.png>



The story of a polymath

We know the name Benjamin Franklin mainly from American movies as a USA's patriot and one of their founding fathers.

But in truth, Benjamin Franklin is one of the most amazing humans not only from American history but also for humankind itself.

Ben Franklin was a polymath, writer, printer, political philosopher, politician, Freemason, postmaster, scientist, inventor, humorist, civic activist, statesman, and diplomat. He was a major figure in the history of physics and nowadays we still use his inventions and theories.

When we dive deep into Franklin's achievements it seems impossible for a human being to achieve so many things in one lifetime. But he was an exception. His inventions were:

The lightning road. (no need for introduction, it's everywhere)

(Fig. 1); **Bifocals** - eyeglass lenses contain two lens powers to help you see objects at all distances after you lose the ability to naturally change the focus of your eyes. (Fig. 2); **Swim Fins** (Fig. 3); **Franklin's stove** - metal-lined fireplace designed to provide more heat with less fuel. (Fig. 4); **Armonica** - a musical instrument composed of spinning glass bowls on a shaft.

Both Ludwig van Beethoven and Wolfgang Amadeus Mozart



Fig. 1 The Kite Experiment of Benjamin Franklin



Fig. 2 Bifocals



Fig. 3 Swim Fins



Fig. 4 Franklin's Stove

Днес знаем за Бенджамин Франклин главно от американски филми, които го описват като американски патриот и един от бащите основатели.

в действителност Бенджамин Франклин е един от най-удивителните хора, не само в американската история, но и в световната.

Бенджамин Франклин е бил полимат, писател, печатар, политически философ, политик, Масон, пощенски началник, учен, изобретател, хуморист, гражданска активист, държавник и дипломат. Бил е главна фигура в развитието на физиката и днес ние все още използваме неговите изобретения и теории.

Когато се вгледаме в постиженията на Франклин е нормално да ни изглежда невъзможно човешко същество да постигне толкова много през живота си. Но той е бил изключение. Неговите изобретения са:

Гръмоотвода (Няма нужда от представяне, той е навсякъде);

Бифокални очила – това са очила позволяващи ти да виждаш на близко и далечно разстояние, използвани след като човек започне да губи зрението си.

Плавници; Отоплителната машина „Франклин“ – метално подплатено огнище, произвеждащо повече топлина с по-малко гориво; **Армоника** –

composed music for the strange instrument. (Fig. 5); **Rocking chair** (Fig. 6)

Flexible catheter - thin tube made from medical grade materials serving a broad range of functions. (Fig. 7); **Franklin's electrostatic machine** - electromechanical generator that produces static electricity. (Fig. 8)

He discovered:

1. Ways to keep streets cleaner and deal with waste management
2. That electricity existed in storm clouds, in the form of lightning

He observed:

That storms can move in an opposite direction from the direction of the wind and proposed one of the first correct explanations for storm movement in the northern hemisphere. That prolonged exposure to lead would cause sickness

He surmised:

That the common cold was passed from person to person through indoor air

He was first to:

Use the words "positive" and "negative" to describe electricity
Create a political cartoon in America

Chart the Gulf Stream's temperatures and currents on transatlantic trips, to and from London

Serve as Ambassador of the United States

Introduce colonists to Scotch kale, Swiss barley, Chinese rhubarb and kohlrabi

He improved:

Street lamps so they gave more light and would not be easily vandalized

He suggested:

Colonies join together in a confederation, The Albany Plan of 1734, but it wasn't adopted

The concept of Daylight Savings Time



Fig. 5 Armonica



Fig. 6 Rocking chair

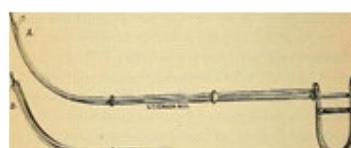


Fig. 7 Flexible catheter



Fig. 8 Franklin's electrostatic machine

музикален инструмент, издаващ звук, чрез въртящи се на дървена пръчка купи. Лудвиг ван Бетовен и Волфганг Амадеус Моцарт са композирали на страния инструмент.; **Люлеещия се стол; Гъвкас катетър** – тънка тръба от медицински материали, притежаваща множество функции.; **Електрическата машина „Франклайн“** – електромеханичен генератор, произвеждащ статично електричество.

Открил е:

Начин да запази улиците чисти и да контролира градските отпадъците. Наличието на електричество в буреносните области.

Наблюдавал е:

Движението на бури в посока противоположна на вятъра, давайки ни едно от първите верни обяснения за движението на бурите в северното полукълбо. Продължителния контакт с оловни метали и връзката им с разболяването на хората.

Предположил:

Че обикновената настинка се разпространява в затворени помещения.

ой е бил първият:

Използвал думите „позитивен“ и „отрицателен“ за да опише електричество.

Създад полиптически комикс в Америка.

Начертал графика на температурите в Персийския залив при трансатлантически пътувания към Лондон и обратно.

Подобрил:

Уличните лампи, така че да произвеждат повече светлина и да бъдат по трудни за вандализиране.

Предложил:

Обединението на колониите в конфедерация, Олбанският план, 1734, но не било осъществено.

Концепцията за лятно часово време

He founded and co-founded:

America's first circulating library,
The Library Company of Philadelphia

America's first volunteer fire department, Union Fire Co.

America's first learning society (with John Bartram), American Philosophical Society

America's first liberal arts academy, Pennsylvania Academy & College, now the University of Pennsylvania

America's first public hospital, Pennsylvania Hospital

America's first mutual insurance company, "The Philadelphia Contributionship"]¹

Only one of these successes could make a man die peacefully, knowing that he had achieved something meaningful in his life, but Ben Franklin didn't want to rest on his fame. His inventions weren't even patented. This man has invented some of the most successful and popular creations of the modern world, he and his family could benefit enormously from them. But Benjamin Franklin believed that inventions should be shared freely.

"That as we enjoy great advantages from the inventions of others, we should be glad of an opportunity to serve others by any invention of ours, and this we should do freely and generously." — Benjamin Franklin

Now, after we remind ourselves how much a human can achieve in his lifetime and that it's not impossible, because it already happened, let's see a short summary of Benjamin Franklin's life.



Fig.9 Franklin's Portrait



Fig. 10 Benjamin Franklin as a child in the Massachusetts Bay Colony



Fig. 11 London 18th Century

Основал и съосновал:

Първата тиражна библиотека в Америка, Филаделфската библиотекарна компания.

Първата доброволческа пожарна служба в Америка, Унион Файър Ко.

Първото общество на ученолюбиви хора в Америка (с Джон Бертрам), Американското философско общество. Първата академия за свободни изкуства в Америка, Пенсилванската академия и колеж, в днешно време Пенсиленванския университет. Първата държавна болница в Америка, Пенсиленванска болница. Първата компания за взаимно застраховане в Америка, Филаделфската контрибуторска компания.

Само едно от тези успехи биха позволили на човек да умре спокоен, знаейки че е направил нещо от значение през живота си, но Бенджамин Франклин не е искал да почива на славата си. Той дори не е патентовал своите изобретения. Това са били едни от най-успешните изобретения на модерния свят и семейството му е могло да се възползва от тях изключително много. Но Бенджамин Франклин е вярвал, че изобретенията трябва да се използват свободно от всекиго.

"Както насладата от нас изпитана, чрез чуждо изобретения, трябва да сме благодарни заради възможността да служим на другите хора чрез всяко наше изобретение, свободно и щедро." — Бенджамин Франклин.

След като си припомнихме какво може да се постигне за един човешки живот, което не е невъзможно, понеже вече се е случвало, нека разгледаме кратко обобщение на живота на Бенджамин Франклин.

Early life

In 1706 Benjamin Franklin was born, when the USA was still a British colony, in Massachusetts Bay Colony, today known as Boston. His father was Josiah Franklin, a soap and candle maker, who had 17 children, from which Franklin was the youngest son.

From the age of 8 to the age of 10 young Benjamin attended school, but he stopped his formal schooling in order to work full-time in his cash-strapped father's candle and soap shop. Dipping wax didn't fire the young boy's imagination, however.

After two more years, his father sent him to work as a prentice in his older half brother James print shop, without a wage.

Tired of his brother's "harsh and tyrannical" behaviour, Benjamin ran away to New York before settling in Philadelphia, at age of 17. This city became his home for the rest of his life.

Life in England and Philadelphia

Benjamin was young and incredibly smart. Very important combination in that time. He continued to teach himself throughout his life by reading dozens and dozens of books.

After his arrival to Philadelphia, he became friend with Pennsylvania's Governor Sir William Keith. He convinced him to sail to London to buy equipment, so he could open his print shop. Which the governor would pay for.

Young Benjamin was convinced and sailed to London only to find out that Sir William had flaked on him. He couldn't do a thing so he started searching for work in a print shop, then he started to fall in love with the city. Franklin took full advantage of the city's pleasures—joining theatre performances, mingling with the locals in coffee houses and continuing his passion for reading.

After two years he went back to Philadelphia. There he rose rapidly in the printing industry. He published his most successful literary venture, the annual Poor Richard's Almanac (1733-1758). It won popularity in the colonies second only to the Bible, and its fame eventually spread to Europe.



Fig. 12 The British

Детство Бенджамин

Франклин се е родил, когато САЩ още са били британска колония, в Колонията в масачузетския залив, днешен Бостон. Син на Джосайа Франклин, занимаващ се с производството на сапуни и свещи, имащ 17 деца, от които Франклин бил най-малкият син.

От 8 до 10 годишна възраст младият Бенджамин посещавал училище, но спрял своето образование за да работи пълно работно време в магазина за сапун и свещи на баща си, без да получава възнаграждение. Обаче, топящият се въськ не бил от интерес за младият мечтател.

След две години работа, баща му го праща в печатницата на своят по-голям, полубрат, Джеймс, отново без заплата.

Не можещ вече да издържа „суворостта и тираничността“ на по-големият си брат, Бенджамин бяга и се запътва

към Ню Йорк, преди да се премести във Филаделфия, когато е на 17 години. Филаделфия остава да бъде негов дом до края на живота му.

Живот в Англия и Филаделфия

Бенджамин е бил млад и изключително интелигентен. Изключително полезна комбинация по негово време. Той продължава да се самообразова, чрез четене много, много книги.

След пристигането му във Филаделфия той става приятел с пенсилванския губернатор Сър Уилиям Каид, които убеждава Бенджамин да отплата до Лондон, за да закупи съоръжения, с които да отвори своя печатница за сметка на губернатора.

Младият Бенджамин отпътувал за Лондон само за да осъзнае, че Сър Уилиам го е измамил. Не можещ да направи нищо Бенджамин започнал да си търси работа като печатар и постепенно започнал да се влюбва в града. Франклин се възползвал максимално от удоволствията на големия град. Посещавал театрални постановки,

Benjamin Franklin was a student of the Enlightenment and thought and belief. He was continuously thinking of ways to improve the city like a library, inventions, police and fire department. He needed to become influential. Two things helped him.

First was his wealth. His newspaper chain was the best not only in America. It was the best newspaper chain in the entire world. He was so wealthy in fact he was one of the richest men in the whole colony.

The wealth gave him the leverage and time to make what will make him world-famous later on. The second thing, his experiments and writings. He invented a lot of things we use today. But his electricity experiments and writings are what gave him international fame.

However influential people didn't always look up to him. They thought of him as a "glorified printer boy".

Colony's Agent in England

In 1757 Franklin was appointed by the Pennsylvania Assembly to serve as the colony's agent in England. Franklin sailed to London to negotiate a long-standing dispute with the proprietors of the colony.

In 1760 the tension between America and England was rising. Franklin wanted to prevent the revolution, which was slowly going to happen. He loved his home country, but he considers himself more of an Englishman than American man.

No matter how hard he tried to explain English's position in America and no matter how hard he tried to explain America's position to England, the revolution inevitably was going to happen.

Eventually, Franklin was removed from his position, after a scandal for illegally sending Massachusetts Governor Thomas Hutchinson's private letter to America. This letter was suggesting the right restriction of the colonists. Franklin was heartbroken. That meant that he no more had the privileges in the English society that he had before. His son was also crushed after hearing about the treason of his father



Fig. 14 US 100
Dollar bill

смесвал се с местните в кафенета и продължавал да бъде страстен читател. След две години се завръща във Филаделфия, където става заможен човек, чрез печатната индустрия. По това време той публикува най-успешното си литературно начинание, „Алеята на бедния Ричард“ (1733-1758). Единствената книга, която го задминавала по популярност, в цялата колония, била Библията. По-късно се разпространява из Европа.

Бенджамин Франклин е бил поддръжник на ренесансовото мислене и вярвания, което го карало постоянно да мисли за начини да подобри градският живот, като библиотеки, изобретения, полицейско и пожарникарско управление. Но за това е трябвало да стане влиятелна личност. Две неща му помогнали за целта. Първото било неговата заможност. Вестникарската му верига не била най-добрата само в Америка, била най-добрата в света. Той станал толкова богат, че се наредил сред най-богатите хора в цялата колония. Парите му осигурили възможността и времето, което е щяло да го направи световно известен по-нататък. Което е второто, неговите експерименти и проучвания. Бенджамин Франклин направил множество изобретения, които използваме и днес. Но неговите експерименти и проучвания за електричеството му дали световна слава. Но все пак влиятелните хора често се отнасяли с пренебрежение към него.

Приемайки го като „прославено вестникарче“.

Представител на колонията в Англия

През 1758 Франклин е бил избран от Пенсилванското събрание за представител на колонията в Англия. Франклин отплата до Лондон за дългогодишен спор с притежателите на колонията.

През 1760 напрежението между Америка и Англия започнало да нараства. Франклин безнадеждно се опитвал да предотврати революцията, която неизбежно щяла да настъпи. Той обичал родната си държава, но се определял

against the Crown in favor of its colony. Their relationship never recovered and now they were on two opposing sides of the revolution.

The American's Nation

When Benjamin Franklin stepped out of his ship he started to act strongly for America's independence.

In May 1775 he signed the declaration of independence.

In 1776 he was chosen as the first American ambassador to France. So he can get financial support for the revolution. Revolutions aren't free. When you start a revolution you have to be very careful who we'll be the ambassador. If the revolution gets out of money, the war is over. That's why Franklin was more important than Thomas Jefferson for the revolution's success

because when America went out of cash, Franklin was there to bring more.

The reason Franklin managed to get the support of France was that he already was incredibly famous there for his scientific contributions. People were having his statues and paintings of him in their homes, at the moment he arrived his clothes became the new fashion in the country. The king was sick of seeing so many portraits of Franklin. The second reason was because of the great diplomatic skills that he held in England.

Finally, his whole work and build reputation in closed communities, including the court of King Louis XVI, led to the Treaty of Paris in 1783, which won the Revolutionary War. After a decade in France in 1785, he returned to America. In 1787 he was elected as Pennsylvania's representative at the Constitutional Convention to draft and ratify the first U.S Constitution.

Death

On April 17, 1790, in the house of Sarah Bache, his daughter, Benjamin Franklin died



Fig. 13 Declaration of Independence

повече като англичанин отколкото американец.

Колкото и да се е опитвал да обясни английската гледна точка на Америка и американската гледна точка на Англия революцията оставала неизбежна.

Вследствие Франклин бил свален от своят пост, след като нелегално изпратил личното писмо на Масачузетския губернатор Томас Хътчинсън до Америка. Писмото предлагало намаляването на правата на колониалните жители.

Това било съсипващо за Франклин. Всичките му привилегии в английското общество вече не били зачитани. Синът му също бил покорусен от престъплението на баща си към Английската империята. Отношенията им така и не се възстановяват и в момента били на един срещу друг по време на революцията.

Американската нация

С пристигането на кораба си, Бенджамин Франклин започва да действа с всички сили за независимостта на Америка.

През май 1775 подписал декларацията за независимост.

През 1776 бил избран за първия американски посланик във Франция, за да осигури финансова подкрепа за революцията.

Революциите не са безплатни. Когато започваш революция трябва да си доста внимателен кой ще бъде твой посланик, защото щом революцията остане без финансови средства, войната свършва. Затова Франклин е играл по-важна роля дори и от Томас Джеферсън за успеха на революцията, понеже когато Америка оставала без пари, Франклин винаги е бил зад гърба й, осигурявайки още.

Успехът на Франклин да набави нужните средства се дължал, първо, на огромната популярност, която имал във Франция заради научните си открития. В домовете си хората притежавали негови портрети и статуи. Когато пристигнал, дрехите му моментално станали новата мода в страната. Дори на краля накрая му

from a lung burst. However, his war contributions wouldn't be recognized until after his death. He bequeathed his fortune funding scholarships, schools and museums. His autobiography became very famous among young people with his "Early to bed and early to rise make a man healthy, wealthy, and wise" and it had similar effects as the self-improvement community today. Benjamin Franklin continues to do good after his death.

Concluding the article

Benjamin Franklin's extraordinary achievements can be discouraging for us. But they can also be motivating for us. How many times did we tell ourselves that our goals are unrealistic? We have to rapidly remind ourselves that this man really existed. He had put lots of energy into achieving his goals and he showed us that it is possible.

Interesting fact: In his autobiography, he didn't once mention that he was a genius.

Acknowledgements

I would like to thank Tzvetan Kostov, Mariana Guneva and Todorka Kanchelova, teachers at National Trade and Banking High School, for their methodological support and cooperation.

Coordinator: Tzvetan Kostov



Fig. 15 Franklin on his death bed

писнalo постоянно да вижда портрети на Франклин. И второ, на невероятните му дипломатически умения усвоени в Англия. Най-накрая цялата му работа и изградена репутация в затворени общности, включващи дори корта на крал Луи XVI, довела до Парижкия договор през 1783, който довел до победа в революцията. След цяло десетилетие във Франция, през 1785 се завръща в Америка. През 1787 е избран за представител на Пенсилвания от Конституционната конвенция за разработване и ратифициране на първата конституция на САЩ.

Смърт

На 17 април 1790 в къщата на Сара Бейч, дъщеря му, Бенджамин Франклин умира от белодробно спукване. Но приносите му по време на войната ще бъдат признати след смъртта му. Завещава богатствата си за основаването на стипендии, училища и музеи. Автобиографията му става изключително известна сред младите с неговото „Ранното лягане и ранното ставане води до заздравяване, помъдряване и забогатяване“ и има ефект подобен на движението за себепомощ в днешно време. Бенджамин Франклин продължава да върши добрини дори след смъртта си.

Завършване на статията

Необикновените постижения на Бенджамин Франклин могат доста да ни обезсърчат. Но те също могат и да ни мотивират. Колко пъти сме си казвали, че целите ни са нереалистични? Трябва постоянно да си припомняме, че този човек наистина е съществувал. Работел е неуморно за своите цели и ни е показал какво е възможно.

Интересен факт: В своята автобиография той нито веднъж не споменава, че е гений.

Bibliography

Mémoires de la vie privée de Benjamin Franklin, Paris, 1791

Webography

1. <https://www.mcall.com/entertainment/mc-xpm-2013-08-31-mc-ben-franklin-accomplishments-0901-20130831-story.html> [1]
2. <https://www.fi.edu/benjamin-franklin/inventions>
3. <http://www.let.rug.nl/usa/biographies/benjamin-franklin/>
4. <https://www.biography.com/scholar/benjamin-franklin>
5. <https://pubmed.ncbi.nlm.nih.gov/2274850/>
6. <http://www.benjamin-franklin-history.org/early-life>
7. <https://www.famousscientists.org/benjamin-franklin/>
8. <https://www.ushistory.org/franklin/>

Iconography

1. <https://images.fineartamerica.com/images-medium-large-5/1750s-benjamin-franklin-touching-key-vintage-images.jpg>
2. https://sites.google.com/site/benjaminfranklin15/_/rsrc/1468742647977/inventions/steampunkspex.jpg?height=260&width=400
3. <https://benjaminfranklinhouse.org/wp-content/uploads/2020/04/Week-5-750x321.jpeg>
4. https://upload.wikimedia.org/wikipedia/commons/b/b3/Franklin_stove.jpg
5. https://www.glasspaint.com/wp-content/uploads/2016/12/2067474659_b1188532b5_z.jpg
6. https://upload.wikimedia.org/wikipedia/commons/thumb/a/a6/Ackerman_farmer.jpg/250px-Ackerman_farmer.jpg
7. https://upload.wikimedia.org/wikipedia/commons/thumb/f/fc/Benjamin_Franklin%27s_electrostatic_generator%2C_maker_unknown%2C_c._1745_-_DSC06559.JPG/220px-Benjamin_Franklin%27s_electrostatic_generator%2C_maker_unknown%2C_c._1745_-_DSC06559.JPG
9. <https://cdn.quizclub.com/trivia/2019-07/which-one-of-the-diplomats-named-invented-the-flexible-urinary-catheter.jpg>
10. <https://www.fi.edu/sites/default/files/images/scientists/b43e54d52d84fc1fdde20b50ef6d31--benjamin-franklin-foundings-fathers.jpg>
11. <https://www.literaryhistory.com/18thC/franklin2.jpg>
12. <https://lh3.googleusercontent.com/proxy/B3uztpFN0OfSJSERgdhffPPYAq0Z1BaNPok9O7iL7uE65n51KvhhuIsJaiZjVK6DRVTw8GAGdWu55piCaXjsAZ5W-0eiqoCx5a6tgaOEBevEVJHhqBeyV1DX4>
13. <https://marriageinprideandprejudice.files.wordpress.com/2016/06/hogarth3.jpg?w=560&h=425>
14. <https://www.tate.org.uk/sites/default/files/styles/width-600/public/images/william%20hogarth%20%20marriage%20ala%20mode%20the%20marriage%20settlement.jpg>
15. https://imgc.allpostersimages.com/img/print/posters/illustration-of-benjamin-franklin-on-his-death-bed_a-G-12667723-8880731.jpg?w=894&h=671
16. <https://www.intellectualtakeout.org/assets/3/28/100.jpg>

Приноси

Искам да благодаря на Цветан Костов, Марияна Гунева и Тодорка Канчелова, учители в Национална търговско-банкова гимназия, за методологическата помощ и подкрепа.



Solar Energy and its benefits

1. Introduction

Solar energy is considered one of the most important sources of energy on Earth, if not the most important source, because there can be no life on Earth without solar energy (Fig. 1).

Solar energy is the main element in the photosynthesis process that takes place in plants, through which carbon dioxide is transformed into oxygen. Without the light received from the Sun, we will never receive oxygen, and that means the end of life.

Fortunately, the amount of solar radiation reaching the Earth actually corresponds to the energy needed to sustain life. So, when we talk about solar energy, we should talk about the many basic aspects that need to be understood first, such as the concept of energy, its forms, its importance and possible sources, as well as its benefits in the case of solar energy. Let's begin.



Fig. 1. Panels with photovoltaic cells

Energia solară beneficii

1. Introducere

Energia solară este considerată una dintre cele mai importante surse de energie de pe Pământ, dacă nu chiar cea mai importantă sursă, întrucât nu poate exista viață pe Pământ fără energie solară (fig. 1).

Energia solară este elementul principal în procesul de fotosinteză care are loc în plante, prin care dioxidul de carbon este transformat în oxigen. Fără lumina primită de la Soare, nu vom primi niciodată oxigen, iar asta înseamnă sfârșitul vieții.

Din fericire, cantitatea de radiație solară care ajunge pe Pământ corespunde de fapt cu energia necesară sustinerii vieții. Deci, atunci când vorbim despre energie solară, ar trebui să vorbim despre multele aspecte de bază care trebuie înțelese mai întâi, cum ar fi conceptul de energie, formele, importanța și posibilele surse de obținere, precum și beneficiile în cazul energiei solare. Să începem.

2. About energy

The word "energy" is somewhat equivalent to the word "power" meaning the ability to perform any type of mechanical or to perform any type of movement.

Energy is not of one kind, there are several types of energy depending on the field of study addressed, and for each field of study, and the meaning of the term energy is different.

In engineering, for example, energy describes the dynamic state of a system, while in mechanics, for example, energy expresses the given combination of the motion (kinetic energy) and the ability to produce motion (potential energy).

2.1. The concept of energy

The word "energy" derives from the ancient Greek: ἐνέργεια (energeia), with the meaning of "activity, operation" [1, 2]. The term appears for the first time in the work of Aristotle in the 4th century BC.

Unlike the modern definition, energy was a qualitative philosophical concept, broad enough to include ideas such as happiness and pleasure.

The first to use the term energy in its modern sense was Thomas Young (1773–1929) in 1807, replacing the meaning proposed by Gottfried Leibniz (1646–1716) in the 17th century [1].

As I said earlier, the concept of energy can be confused with the concept of power, but the well-known example of object acceleration can help us understand the difference between these two concepts.

Suppose that a certain amount of energy is required to accelerate two identical objects from their rest position (velocity $v=0$) to the state of motion with a certain speed (velocity $v=\text{constant}$).

If object X, having a power P_x , can reach this speed v in 20 seconds, and object Y wants to achieve the same speed v in half the time required for object X (ie 10 seconds), we will say that the power required for object Y is $P_y = 2P_x$. The power required by object Y is double, although in

2. Despre energie

Cuvântul „energie” este oarecum echivalent cu cuvântul „putere”, cu semnificația de capacitate de a efectua orice tip de lucru mecanic sau de a realiza orice fel de mișcare.

Energia nu este de un singur fel, există mai multe tipuri de energie în funcție de domeniul de studiu abordat, și în fiecare domeniu de studiu, semnificația termenului de energie este diferită.

În tehnică, de exemplu, energia descrie starea dinamică a unui sistem, în timp ce în mecanică, de exemplu, energia exprimă combinația dată de mișcare (energia cinetică) și capacitatea de producere a mișcării (energia potențială).

2.1. Conceptul de energie

Cuvântul „energie” derivă din greaca veche: ἐνέργεια (energeia), cu sensul de „activitate, operare” [1, 2]. Termenul apare pentru prima dată în opera lui Aristotel în secolul al IV-lea î.Hr.

Spre deosebire de definiția modernă, energiea a fost un concept filozofic calitativ, suficient de larg pentru a include idei precum fericirea și placerea.

Primul care a folosit termenul de energie în sensul său modern a fost Thomas Young (1773–1929) în 1807, înlocuind semnificația propusă de către Gottfried Leibniz (1646–1716) în secolul al XVII-lea [1].

După cum am spus mai înainte, conceptul de energie poate fi confundat cu conceptul de putere, dar exemplul cunoscut al accelerării unui corp ne poate face să înțelegem diferența dintre aceste două concepte.

Să presupunem că este necesară o anumită cantitate de energie pentru a accelera două obiecte identice din poziția lor de repaus (viteza $v=0$) la starea de mișcare cu o anumită vitează (viteza $v=\text{constant}$).

Dacă obiectul X, având o putere P_x , poate atinge această vitează v în 20 de secunde, iar obiectul Y dorește să obțină aceeași viteza v în jumătate din timpul necesar pentru obiectul X (adică 10 secunde), vom spune că puterea necesară pentru obiectul Y este $P_y = 2P_x$.

both cases, for movement, the two objects spend the same amount of energy. Power means the capacity to perform an action, in this case, to perform a movement.

Then, the dependence between the physical quantities energy and power is given by the relationship:

$$\text{Power} = \text{Energy} / \text{Time},$$

or

$$\text{Energy} = \text{Power} \times \text{Time}.$$

The units of measurement for these two physical quantities in International System of measurement (IS) are:

$[\text{Power}]_{\text{IS}} = 1 \text{ Watt} = 1 \text{ Joule} / 1 \text{ second}$, written as:
 $1 \text{ W} = 1 \text{ J} / 1 \text{ s}$,

$[\text{Energy}]_{\text{IS}} = 1 \text{ Joule} = 1 \text{ Watt} \times 1 \text{ second}$, written as:
 $1 \text{ J} = 1 \text{ W} \times 1 \text{ s}$.

2.2. Energy use and benefits

In our world, we need energy at every moment. Our life would be difficult in the absence of energy sources. Today, we benefit from different sources of energy. We can use energy everywhere: in factories, on the streets, at school, at home.

Everywhere in our world today everything needs some kind of energy, so the uses of energy are countless: for heating homes (by burning wood or coal, by using electricity, by using geothermal energy, etc.), for land, water and air transportation (by burning fossil fuels, by using electricity), for technological processes in industry (with energy sources based on fossil fuels, more recently, renewable energy sources) and many other uses.

2.3. The forms of energy

Thanks to scientific advancement and technological developments, many forms of energy are available to us here on Earth today. And the energy has a lot of forms such as:

- Work, for example, it is when you do a movement;
- Heat, for example, when you boil water;
- Radiation energy, for example, when we receive light from the sun;
- Gravitational energy, noticed when the

Puterea necesară obiectului Y este dublă, deși în cele două cazuri, pentru deplasare, cele două obiecte au cheltuit aceeași cantitate de energie. Puterea semnifică capacitatea de efectuare a unei acțiuni, în acest caz, efectuarea unei mișcări. Atunci, dependența dintre mărimile fizice Energie și Putere este dată de relația:

$$\text{Puterea} = \text{Energia} / \text{Timp},$$

sau

$$\text{Energia} = \text{Putere} \times \text{Timp}.$$

Unitățile de măsură pentru aceste două mărimi fizice în Sistemul Internațional de Unități de Măsură (IS) sunt:

$[\text{Puterea}]_{\text{IS}} = 1 \text{ Watt} = 1 \text{ Joule} / 1 \text{ secundă}$, cu notația: $1 \text{ W} = 1 \text{ J} / 1 \text{ s}$,

$[\text{Energia}]_{\text{IS}} = 1 \text{ Joule} = 1 \text{ Watt} \times 1 \text{ second}$, written as: $1 \text{ J} = 1 \text{ W} \times 1 \text{ s}$.

2.2. Utilizarea și beneficiile energiei

În lumea noastră, avem nevoie de energie în fiecare moment. Viața noastră ar fi dificilă în absența surselor de energie. Astăzi, beneficiem de diferite surse de energie. Putem folosi energia peste tot: în fabrici, pe străzi, la școală, acasă.

Peste tot în lumea noastră totul are nevoie de un anumit fel de energie, astfel încât utilizările energiei sunt nenumărate: pentru încălzirea locuințelor (prin arderea lemnului sau carbunelui, prin utilizare energie electrică, prin utilizarea energiei geotermale, etc.), pentru transport terestru, pe apă sau aerian (prin arderea combustibilor fosili, prin utilizarea energiei electrice), pentru procesele tehnologice din industrie și multe alte utilizări.

2.3. Formele energiei

Datorită avansului științific și al dezvoltărilor tehnologice, multe din formele de energie ne sunt astăzi disponibile, aici pe Pământ. Și energia are o mulțime de forme, cum sunt:

- Lucru mecanic, de exemplu, atunci când faci o deplasare;
- Căldura, de exemplu, atunci când fierbeți apa;
- Energiea de radiație, de exemplu, atunci când primim lumina de la soare;
- Energia gravitațională, sesizată la cădere.

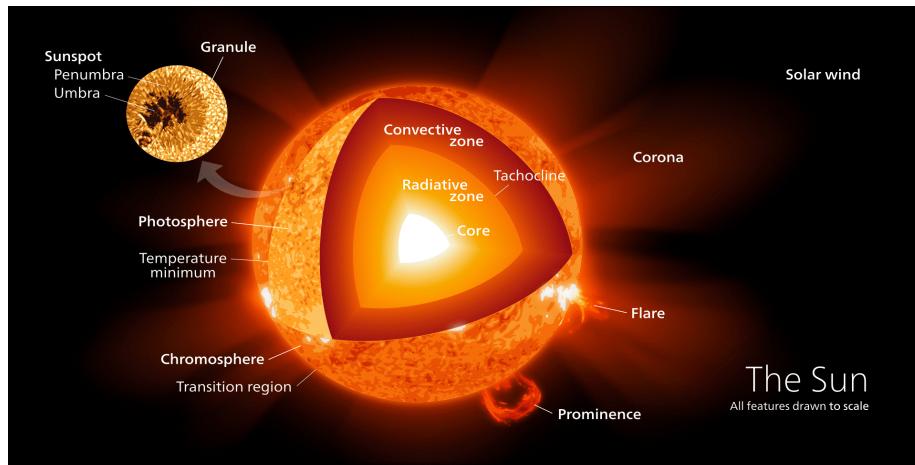


Fig. 2. The sun structure

bodies fall, being a form of potential energy generated by the universal attraction of bodies;

- Nuclear energy, in which atomic energy is involved;
- Chemical energy, as a form of potential energy generated by various associations of atoms in molecules and various other types of aggregation of matter;
- Electrical energy, which is sensed when a light bulb lights up or when the mobile phone is switched on, being a form of energy due to the interactions between bodies charged with electrical charges.

And there are many other forms of energy that have not yet been exploited by mankind!

3. The Sun as a resource of energy

3.1. The Sun as a planet and its components

While billions of stars are scattered throughout the universe, the one at the center of our solar system plays a special role for us here on the Earth our Sun which is formed about billion years ago in the Milky Way galaxy's Orion's fur.

It was born when a cloud of dust and gas known as a solar nebula collapsed and in the middle of this formation matter condensed into a burning ball of gas that became our sun.

The Sun's fiery nature along with a tremendous gravitational pull and an extensive magnetic field helped it to become the heart of our solar system.

The structure of Sun can be divided into six layers or regions (Fig. 2):

corpurilor, fiind o formă de energie potențială generată de atracția universală a corpurilor;

- Energia nucleară, în care este implicată energia atomilor;
- Energia chimică, ca formă de energie potențială generată de diferite asocieri ale atomilor în molecule și a diferitelor alte feluri de agregare ale materiei;
- Energie electrică, pe care o sesizăm atunci când un bec electric luminează sau când telefonul mobil este pornit, fiind o formă de energie datorată interacțiunilor dintre corpuși încărcate cu sarcini electrice.

Și există multe alte forme de energie care încă nu au fost exploataate de omenire!

3. Soarele ca resursă de energie

3.1. Soarele ca planetă și componente sale

În timp ce miliarde de stele sunt împăraștiate în tot universul, cea din centrul sistemului nostru solar joacă un rol special pentru noi aici, pe Pământ, Soarele nostru, care s-a format în urmă cu aproximativ miliarde de ani în zona Orion a galaxiei Calea Lactee.

S-a născut când un nor de praf și gaze, cunoscut sub numele de nebuloasă solară, s-a prăbușit și în mijlocul acestei formațiuni materiei s-a condensat într-o mină de gaz arzând care a devenit soarele nostru. Natura de foc a soarelui, împreună cu atracția gravitațională uriașă și un câmp magnetic intens, l-au ajutat să devină inima sistemului nostru solar. Structura Soarelui poate fi împărțită în șase straturi sau regiuni (Fig. 2):

- Corona,
- Chromosphere,
- Photosphere,
- Convective zone,
- Radiative zone,
- Core.

The composition of Sun includes:

- 90% Hydrogen,
- 8.9% Helium,
- 0.1% Heavier Elements.

And all of these element stay in state gas called plasma.

3.2. Sun's reactions and energy

The sun was always a bit of a mystery no one could figure out what was powering it, in the 19th century some scientists thought it could all be explained by gravity the sun began as a giant of dust and gas. And this cloud collapsed under the force of gravity releasing lots of heat.

In the core, temperatures reaching the values of millions degrees Celsius, combined with the Sun's powerful gravity, determine the fusion of the hydrogen molecules to form helium, through the thermonuclear fusion reaction. This releases an enormous amount of energy in the different forms, as:

- Radiation energy,
- Electromagnetic energy.,
- Solar wind.

The sun nuclear reactions are similar to the chemical reactions in many ways. But nuclear reactions are different from chemical reactions: they are harder to produce, much more powerful, and involve neutrons. Chemical reactions are part of our everyday life, while nuclear reactions are not.

In Sun, when two protons collide one of them undergoes beta decay and turns into a neutron and this gives us hydrogen nucleus and releases tons of GW (10^{12} W) of energy. Hydrogen nucleus continues moving around and when it bumps into a proton it turns into helium and this also releases tons of kW (10^3 W) of energy. As this process continues the sun produces more and more

- Coroana,
- Cromosferă,
- Fotosferă,
- Zona convectivă,
- Zona radiativă,
- Miezul.

In compoziția Soarelui intră:

- 90% hidrogen,
- 8.9% heliu,
- 0.1% elemente grele.

Și toate aceste elemente rămân în stare de gaz numită plasmă.

3.2. Reacțiile din Soare și energia solară

Soarele a fost întotdeauna un mister, nimeni nu a putut să-și dea seama ce îl alimentează. În secolul al XIX-lea unii oameni de știință credeau că totul poate fi explicat prin gravitație: soarele a început ca un gigant de praf și gaz, apoi acest nor s-a prăbușit sub forța gravitației, eliberând multă căldură. La temperaturile din miez care ating valori de peste 27 de milioane de grade Celsius, combinate cu gravitația puternică, moleculele de hidrogen fuzionează pentru a crea heliu prin reacția de fuziune termonucleară. În această reacție se eliberează o cantitate enormă de energie sub diferite forme, cum sunt:

- Energie de radiație,
- Energie electromagnetică,
- Vântul solar.

Reacțiile nucleare din Soare sunt similare în multe privințe cu reacțiile chimice. Dar reacțiile nucleare sunt diferite față de reacțiile chimice: sunt mai greu de produs, sunt mult mai puternice și implică neutroni. Reacțiile chimice fac parte din viața noastră de zi cu zi, pe când, reacțiile nucleare nu.

În Soare, când doi protoni se ciocnesc, unul dintre ei suferă o dezintegrare beta și se transformă într-un neutron, iar acesta ne dă nucleul de hidrogen și eliberează tone de GW (10^{12} W) de energie. Nucleul de hidrogen continuă să se miște și atunci când se lovește de un proton se transformă în heliu. Si în această reacție se eliberează, de asemenea, tone de kW (10^3 W) de energie. Pe

helium and every time it releases billions of tons of energy.

The quantity of energy is huge, the relationship between energy, mass m , and light speed being expressed as:

$$\text{Energy} = \text{Mass} \times (\text{Light speed})^2$$

Thus, as long as the solar reactions will take place in the Sun, on Earth we will have the energy necessary for life.

4. Solar energy

Solar energy which reaches our planet is a form of radiation energy.

The Sun itself is a giant nuclear reactor in which fusion reactions take place and huge quantities of radiation are emitted in all directions. Part of this energy reaches the Earth planet. It travels in waves that possess a characteristic wavelength (Fig. 3).

măsură ce acest proces continuă, soarele produce din ce în ce mai mult heliu și de fiecare dată eliberează miliarde de tone de energie. Cantitatea de energie este uriașă, relația dintre energia, masă și viteza luminii fiind exprimată astfel:

$$\text{Energia} = \text{Masa} \times (\text{Viteza luminii})^2$$

Astfel, atâtă timp cât reacțiile solare vor avea loc în Soare, pe Pământ vom avea energia necesară vieții.

4. Energia solară

Energia solară care ajunge pe planeta noastră este o formă de energie de radiație.

Soarele însuși este un reactor nuclear gigant în care au loc reacții de fuziune și cantități uriașe de radiații sunt emise în toate direcțiile. O parte din această energie ajunge pe planeta Pământ. Se deplasează în valuri care posedă o lungime de undă caracteristică (Fig. 3).

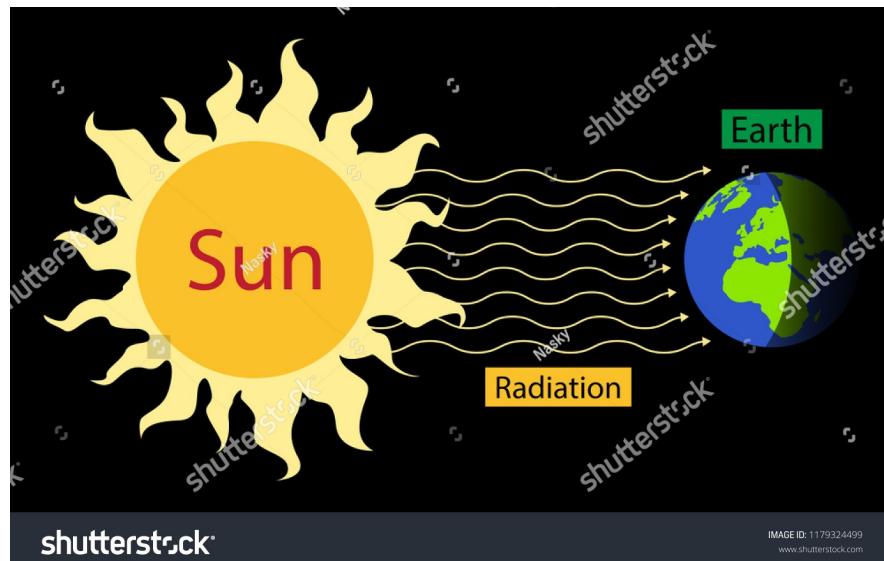


Fig. 3. Through radiation, solar energy reaches the Earth

Characteristic for the radiation energy is the number of peaks of the waves that pass through a certain point in space in one second, a quantity that is called the frequency of the wave, denoted f . The shorter the wavelength of the radiation, the its frequency f is higher (Fig. 4) and the radiation will be more intense [1], [3].

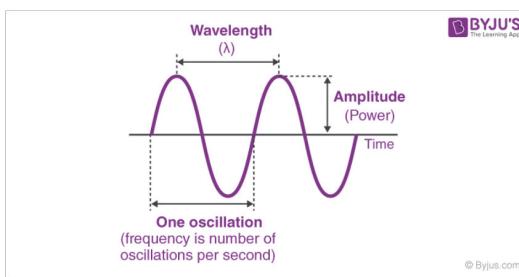


Fig. 4. Wave form of radiation energy

The electromagnetic spectrum of energy radiation represents the graph of radiation energy in function of the frequency or to the wavelength (Fig. 5).

The transition regions from one form of radiation to another, indicated in Fig. 4, are only approximate. It turns out that only a small part of this so-called electromagnetic spectrum corresponds to "sunlight" or visible radiation.

The following fundamental relationship between frequency and wavelength of electromagnetic waves defines the speed of light:

$$\text{Speed of light} = \text{Wavelength} \times \text{Frequency}.$$

Radiation of higher intensity – for example, ultraviolet rays, x-rays and gamma-rays – can be harmful. At the opposite end, low-intensity radio waves (standard AM broadcast, TV signals, FM waves and microwaves) are relatively harmless; in fact, they are purposely produced in the myriad electronic devices that characterize modern society.

Caracteristic pentru energia de radiație este numărul de varfuri ale undelor care trec printr-un anumit punct din spațiu într-o secundă, marime care se numește se numește frecvență undei. Cu cât lungimea de undă a radiației este mai mică, cu atât frecvența f a acesteia este mai mare (Fig. 4) și radiația va fi mai intensă [1], [3].

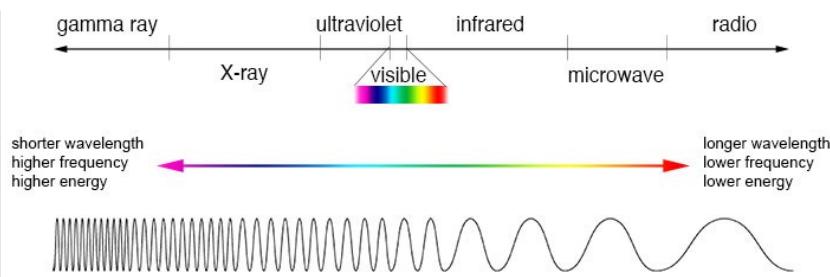


Fig. 5. Electromagnetic spectrum of solar radiation energy

Spectrul electromagnetic al energiei de radiație reprezintă graficul energiei de radiație în funcție de frecvență sau de lungimea de undă (Fig. 5).

Regiunile de trecere de la o formă de radiație la alta, indicate în Fig. 4, sunt doar aproximative. Se observă că doar o mică parte din acest aşa-numit spectru electromagnetic corespunde „luminii solare” sau radiației vizibile. Următoarea relație fundamentală între frecvență și lungimea de undă a undelor electomagnetice definește viteza luminii:

$$\text{Viteza luminii} = \text{Lungimea de undă} \times \text{Frecvență}$$

Radiațiile de intensitate mai mare – de exemplu, razele ultraviolete, razele X și razele Gamma – pot fi dăunătoare. Undele de joasă intensitate (undele de medie frecvență standard), semnalele TV, undele FM și microundele sunt relativ inofensive. Sunt produse intenționat în nenumăratele dispozitive electronice care caracterizează societatea modernă.

5. Energy resources and use of solar energy

There are two major types of energy sources: non-renewable sources and renewable energy sources.

Non-renewable sources of energy production rely on energy stored in fossil fuels. The big disadvantage of these categories of resources is that they intensely pollute the atmosphere, leading to the intensification of climate change.

Renewable energy sources use for the production of energy (especially electricity) natural resources that regenerate and are found in abundance on Earth: wind, ocean waves, light received from the Sun. The great advantage is that these sources develop a much lower degree of pollution. Therefore the current trend is to replace non-renewable energy sources with renewable ones.

Everywhere in our world today everything needs some kind of energy, so the uses of energy are countless: for heating homes (by burning wood or coal, by using electricity, by using geothermal energy, etc.), for land, water and air transportation (by burning fossil fuels, by using electricity), for technological processes in industry (with energy sources based on fossil fuels, more recently, renewable energy sources) and many other uses.

5. Resursele de energie și utilizarea energiei solare

Există două mari tipuri de surse de energie: surse neregenerabile și surse regenerabile de energie.

Sursele neregenerabile de producere a energiei se bazează pe energia stocată în combustibilii fosili. Dezavantajul acestei categorii de resurse este că poluează atmosfera, ducând la intensificarea schimbărilor climatice.

Sursele regenerabile de energie utilizează pentru producerea de energie (în special electricitate) resurse naturale care se regenerează și care se găsesc în abundență pe Pământ: vântul, valurile, lumina primită de la soare. Avantajul este că aceste surse au un grad mai mic de poluare. De aceea tendința actuală este de înlocuire a surselor neregenerabile cu cele regenerabile.

Peste tot în lumea noastră de astăzi totul are nevoie de un fel de energie, astfel încât utilizările energiei sunt nenumărate: pentru încălzirea locuințelor (prin arderea lemnului sau a cărbunelui, prin folosirea energiei electrice, prin utilizarea energiei geotermale etc.), pentru transportul terestru, pe apă și cel aerian, pentru procesele tehnologice din industrie și pentru multe alte utilizări.



Fig. 6. Electrical and non-electrical applications of solar energy

Fig. 6 shows some active applications of solar energy, as source for electricity generation (PV panels with PV cells, solar collectors, etc.) and as source of heating or cooling (solar water heater, solar air heater, solar cooker, solar cooler, etc.).

A detail regarding the electrical applications of solar energy is given in Fig. 7.

Fig. 6 prezintă unele aplicații ale energiei solare, ca sursă de generare a energiei electrice (panouri fotovoltaice cu celule fotovoltaice, colectoare solare etc.) și ca sursă de încălzire sau răcire (încălzitor solar de apă, aerotermă solară, aragaz solar, răcitor solar, etc.).

O detaliere a aplicațiilor electrice ale energiei solare este dată în Fig. 7.

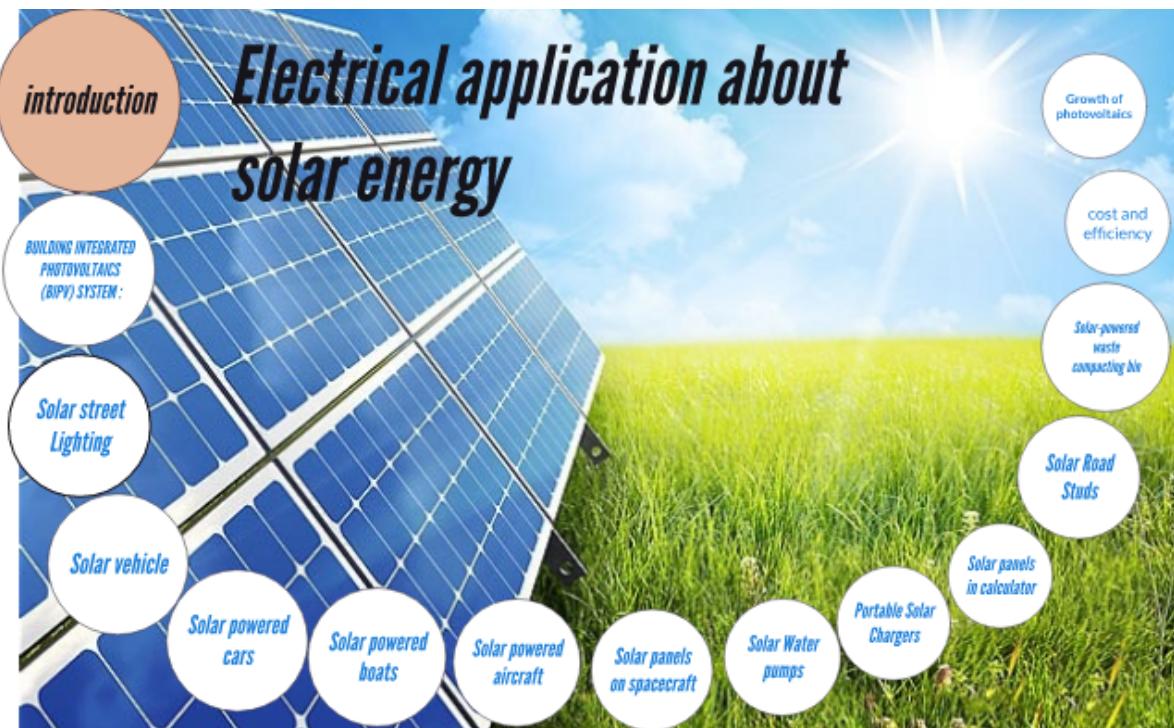


Fig. 7. Electrical applications of solar energy

Details about the Sun as an energy reactor, about photovoltaic energy sources and about their multiple applications can also be found in the series of articles published in European Pupil Magazine in the period 2007 – 2020 [4-11].

6. Conclusions

Solar energy is the most abundant renewable energy resource available on Earth.

But renewable solar sources also have some disadvantages. A disadvantage is related to their intermittent operation: they cannot generate

Detalii despre Soare ca reactor de energie, despre sursele fotovoltaice de energie și despre multiplele lor aplicații pot fi găsite și în seria de articole publicate în European Pupil Magazine în perioada 2007 – 2020 [4-11].

6. Concluzii

Energia solară este cea mai abundentă resursă de energie regenerabilă disponibilă pe Pământ.

Dar sursele solare regenerabile au și unele dezavantaje. Un dezavantaj este legat de funcționarea lor intermitentă: nu pot genera

electricity during the night. Another inconvenience is the fact that they occupy large areas of land to capture a large amount of solar radiation, which leads to the occupation of land that could be used for agriculture.

To ensure continuous operation, energy storage systems are attached, such as electric batteries. This makes the overall price higher.

Solar energy can be used in many ways. In order to increase the number of applications based on solar energy, new knowledge and new technologies are needed to efficiently exploit the advantages of this form of energy.

electricitate pe timpul nopții. Alt inconvenient este și de faptul că ocupă suprafețe mari de teren pentru a capta o cantitate mare de radiație solară, ceea ce duce la ocuparea de terenuri care ar putea fi utilizate pentru agricultură.

Pentru a asigura o funcționare continuă, sunt atașate sisteme de stocare a energiei, cum ar fi bateriile electrice. Acest lucru face ca prețul general să fie mai mare. Energia solară poate fi utilizată în mai multe moduri. Pentru a crește numărul de aplicații bazate pe energia solară, sunt necesare noi cunoștințe și noi tehnologii care să exploateze eficient avantajele acestei forme de energie.

Bibliography

- [1] Mort Walker, Concept of energy, Centre Daily Times, 8/11/96.
- [2] Energy Information Administration, Annual Energy Review 2007, June 2008. The National Energy Education Development Project, Intermediate Energy Infobook, 2007. https://ei.lehigh.edu/learners/energy/readings/energy_basics.pdf.
- [3] Luigi Prestinenza, *The solar system*, EPM issue 3, 2007.
- [4] António Manuel da Mota Almeida, Carlos Duarte Afonso Pereira, Daniel Araújo Barros, Flavia Vieira Barbosa, Gabriel Filipe Cracel Dantas, *Solar Tracker Project*, EPM issue 1, 2010.
- [5] Mihai-Adrian Soprony, *Solar Spectrum Challenges: Photovoltaics*, EPM Issue 3, 2010.
- [6] Andra Tudor, *Relation between Sun and Earth*, EPM issue 2, 2011.
- [7] Benjamin Paulin, *How can we transform solar energy into electricity*, EPM Issue 2, 2013.
- [8] Simone Giusti, *Space and Solar System Evolution*, EPM Issue 3, 2015.
- [9] Teodor Moșoiu, *Using solar energy for illumination*, EPM Issue 2, 2017.
- [10] Mihail Milotoiu, Horia Ciobanu, *Electrical cars - Using solar energy*, EPM Issue 2, 2017.
- [11] Ionel Bălan, *Solar fruit dryer and vegetables dehydrator*, EPM Issue 2, 2020.

Webology

- [12] Wikipedia, <https://en.wikipedia.org/wiki/Energy>.

Iconography

Fig.1:

https://www.google.com/search?q=photovoltaic&rlz=1C1BNSD_enRO965RO965&sxsrf=AOaemvKmm2Gtfv15yPGCKdMDQmw0Rh_yQ:1637273001484&source=lnms&tbs=isch&sa=X&ved=2ahUKEwj4Jyd9aL0AhXRTMAKhc6HDhYQ_AUoAXoECAEQAw&biw=1366&bih=625&dpr=1#imgrc=aSFa-dIFFwP33M

Fig.2:

https://www.google.com/search?q=sun+components+pics&tbs=isch&ved=2ahUKEwic05DirZ32AhXelP0HHQyIAzIQ2-cCegQIABAA&oq=sun+components+pics&gs_lcp=CgNpbWcQAzoHCCMQ7wMQJzoECAAQQzoFCAAQgAQ6BggAEAUQHjoGCAAQCBAeOgQIABAYOgQIABAeUABYrnFgonNoAXAAeACAAckBiAGpEJIBBjE2LjMuMZgBAKABAaoBC2d3cy13aXotaW1nwAEB&sclient=img&ei=YBsAYpjOt6p9u8PiMqOkAM&biw=568&bih=1349&rlz=1C1BNSD_enRO965RO965&hl=en-GB#imgrc=8EZBzx90Uyf82M

Fig.3:

https://www.google.com/search?q=radiation+energy.&rlz=1C1BNSD_enRO965RO965&sxsrf=AOaemvJGO3znBqROYJQOlkucPhBkOA2m1Q:1640273139228&source=lnms&tbs=isch&sa=X&ved=2ahUKEwix67DOnfr0AhWggv0HHTzbDiEQ_AUoAXoECAIQAw&biw=1366&bih=625&dpr=1#imgrc=oHN2IAM347A31M

Fig.4:

https://www.google.com/search?q=Wave+form+of+energy+radiation&tbs=isch&ved=2ahUKEwjE3475np32AhWK_KQKHWI8ChkQ2-cCegQIABAA&oq=Wave+form+of+energy+radiation&gs_lcp=CgNpbWcQA1DwEFjwEGC_GWgAcAB4AIABWogBswGSAQEymAEAoAEBqgELZ3dzLXdpei1pbWfAAQE&sclient=img&ei=1gsaYsScJor5kwXp-KHIBw&biw=568&bih=1366&rlz=1C1BNSD_enRO965RO965#imgrc=g_kdW2Y2tStMvM

Fig.5:

https://www.google.com/search?q=The+electromagnetic+spectrum+of+energy+radiation&rlz=1C1BNSD_enRO965RO965&sxsrf=AOaemvJ_i_y_R_s_u_Q_-ATk8Uf3OOGnAq8RxXSwa:1640273626027&source=lnms&tbs=isch&sa=X&ved=2ahUKEwjZu8C2nr0AhVz7rsIHud0AGUQ_AUoAXoECAIQAw&biw=1366&bih=568&dpr=1#imgrc=zwm48m-mGrYD6M

Fig.6:

https://www.google.com/search?q=energy+application&tbs=isch&ved=2ahUKEwiuv5ukm532AhVU0eAKHf4KA-cQ2-cCegQIABAA&oq=energy+app&gs_lcp=CgNpbWcQARgCMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgQIABAeMgYIABAFEB4yBggAEAUQHjIECAAQGFDD1jdE2C3GGgAcAB4AIABW4gBsAGSAQEymAEAoAEBqgELZ3dzLXdpei1pbWfAAQE&sclient=img&ei=whsaYvK6DY30Uofhkbge&biw=568&bih=625&rlz=1C1BNSD_enRO965RO965#imgrc=ZD9n_DarBL8w1M

Fig.7:

https://www.google.com/search?q=application+of+solar+energy+&tbs=isch&ved=2ahUKEwjyz_XerZ32AhUNuhQKHYdwBEcQ2-cCegQIABAA&oq=application+of+solar+energy+&gs_lcp=CgNpbWcQAzoHCCMQ7wMQJzIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgQIABAeMgYIABAFEB4yBggAEAUQHjIECAAQGFDD1jdE2C3GGgAcAB4AIABW4gBsAGSAQEymAEAoAEBqgELZ3dzLXdpei1pbWfAAQE&sclient=img&ei=WhsaYvK6DY30Uofhkbge&biw=568&bih=625&rlz=1C1BNSD_enRO965RO965&hl=en-GB#imgrc=5YYTDVv8wXdtAM6&bih=568&dpr=1#imgrc=zwm48m-mGrYD6M

EUROPEAN PUPILS MAGAZINE

History of Science and Technology

Guidelines for Contributors

Authors of original manuscripts who would like their work to be considered for publication in the **European Pupils Magazine** are invited to submit their papers to be concerned with the **History of Science and Technology** as follows:

Papers may be the result of either personal research or classroom practice in the covered topics. Submitted articles shouldnot have been published or being currently under consideration for publication elsewhere. Submitting an article with exactly or almost exactly the same content as found in publications of another journal or conference proceedings may result in the refusal of its publication. Submitted articles have to be sent to issuingepm@epmagazine.org together with thesubmission form, includes a list of 10 keywords in each language.

Include in your mail:

- a. Article both in English and in your mother tongue (*.doc or *.rtf format);
- b. Submission form filled and signed (do not forget 10 keywords in both languages).

Before adding the files as attachments, please make sure the tables and/or pictures are inserted in the proper place andthe files can be opened without any problems.

Please, classify your manuscript into one of the following sections:

General (Experts'/Teachers' contribution)

News

Fun Pages

14 to 16 years old (Secondary school)

17 to 19 years old (Secondary school)

19 to 24 years old (University)

You have to be in the possession of the copy-right for submitted pictures and in order to avoid any problems with unauthorized reproduction wesuggest exclusive use of your own pictures. Each image source has to be cited in the Iconography at the end of the submitted paper. The images must be numerated in the caption i.e. (Fig. 1) and in the iconography as well. The EPM Editorial Board reserves the right not to publish all orsome of the included pictures for copyright and/or layout reasons. The last page of the submitted paper has to include mandatorily: **Bibliography – Webology – Iconography**.

EPMagazine is an International Educational Scientific Periodical published by apool of European Universities and Secondary Schools. Contributions are welcome from every level of educational institutions, students and teachers.

Note:

The views expressed in the articles do not necessarily comply with the *EPM* editorial board's ones.

History of Science and Technology

EPM