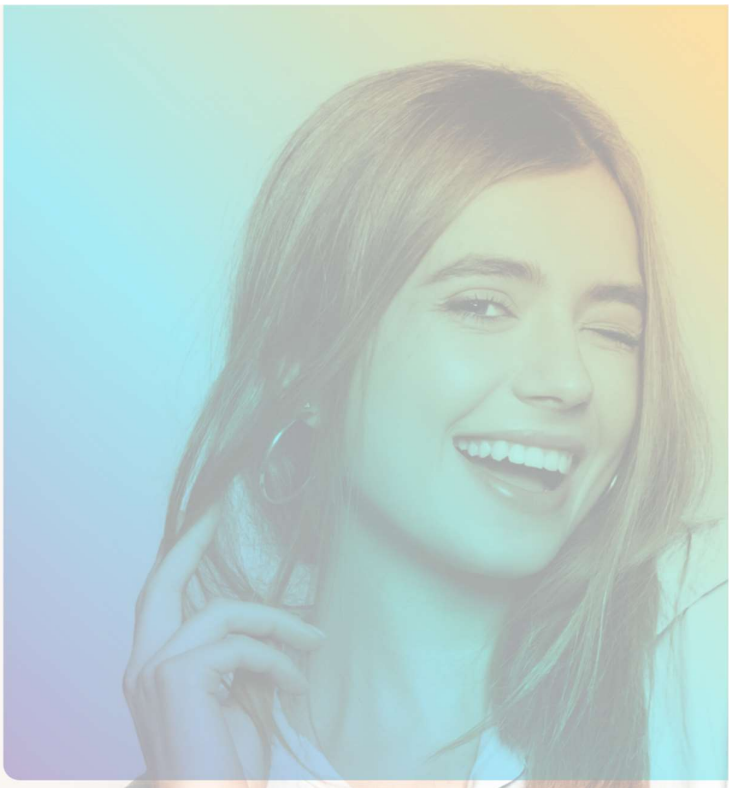
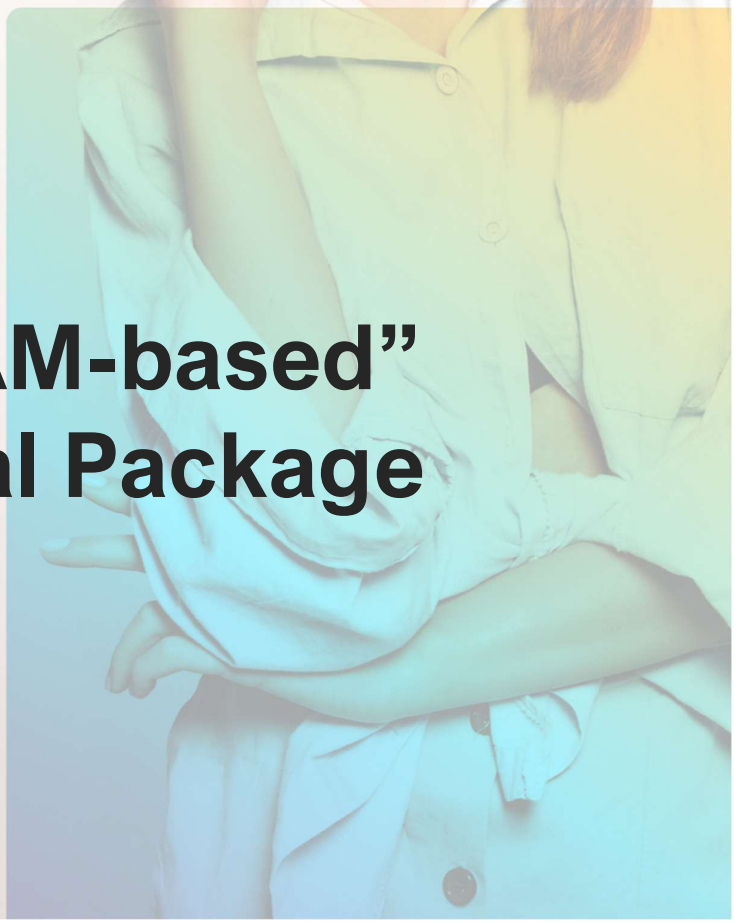
SHOES YOUR LIFE
SYL





SYL “STEAM-based” Educational Package

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Contents

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Introduction

Generation Z, growing up with pervasive technology, has a strong entrepreneurial spirit, with many aspiring to start their own businesses. This generation comprises students between the 7th and 9th grades, typically aged 12-15. Generation Z (born roughly between 1997 and 2012) is the first generation to have widespread access to the Internet at an early age, high potential of dealing with new technologies and therefore more exigent and motivated to go for the mentioned careers.

The European footwear industry, with a focus on quality, flexibility, and technology, seeks to attract young talent to rejuvenate its workforce, as many in the older generation are nearing retirement. This industry, like others in Europe, is embracing Industry 4.0 (i4.0) and offering STEAM-based opportunities for young people.

The "SHOES (CHOOSE) YOUR LIFE - SYL" project targets Generation Z, aiming to inspire them to consider industry-based careers in the digital and smart sector. The project focuses on involving teachers and students in early education stages, transforming teachers into ambassadors of i4.0 in schools, and promoting new approaches to teaching/education.

The first project results - R1 (result 1) – with the same name of this documents – **SYL "STEAM-based" Educational Package** - consists in a STEAM (**S**cience, **T**echnology, **E**ngineering, **A**rts, **M**aths) based educational package with a modular structure, toward

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generation Z students constituted by an **educational approach** to engage Generation Z in a new educational challenge towards the discovery of the new industry, an **educational kit** and an **immersive app** in virtual reality that offers immersive experiences.

This R1 includes the following elements:

1- **A STEAM-based educational approach,** common to the 3 countries involved, highlighting the experimentation, teambuilding, learning by doing, exchange of ideas and practices, validated it near the observation panel;

2- A **pack of 8 different hands-on contents and materials** (the **educational kit**) interconnected to be used in Fab Labs or in schools, aiming at supporting practical activities, dedicated to i4.0 and other surrounding subjects, and developing important competences for employability and entrepreneurship, namely communication, problem solving, teamwork, negotiation and persuasion, leadership, organisation, perseverance and motivation, ability to work under pressure, confidence, IT skills, entrepreneurial skills, analytical skills, resilience and capability of learn to learn.

3- A **Virtual Reality app (immersive App)** using 360º videos built from the scratch, to provide a smart industrial environment where the students feel like they are into a i4.0 smart company, to be used simultaneously with the pack of contents or eventually alone. The VR includes challenges where the students can interact with machines and cooperate, put themselves to the proof, discover their own knowledge and develop news knowledge and skills.

In this regard, we promote the development of more engaging content using Virtual Reality as a mean to attract the youth. The project partners discussed the topics to incorporate and decided, in accordance with different schools and industries, to develop 8 subjects: **chemistry**, **science lab**, **mechanics**, **3d printing**, **sustainability**, **ITC computing**, **marketing** and **history and heritage**.

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This Educational Package comprised of **eight kits** that form our modular program, providing a variety of experiences that serve to the diverse interests and needs of different students. These guides will serve as support for the Virtual Reality application that is an integral part of the "**STEAM-based Educational Package**".

This manual of contents provides an overview of the key sections within this index. It is designed to give a clear roadmap of the topics covered, starting with the general framework and target audience, leading to the main aims of the program, and finally delving into the specific activities, resources, timeline, conclusions, and references. Each section is tailored to guide users through the contents and objectives of this comprehensive program.

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Target group

The success of any educational initiative relies on the engagement and collaboration of various key stakeholders. In the context of this project, the target groups play pivotal roles in shaping the future of education and the integration of In-dustry 4.0 principles. The main target audiences to reach are:"

Generation Z Students: This group comprises students in schools (regular education) aged between 12 and 15, though the program's impact may extend to older age groups. As digital natives, they are uniquely positioned to embrace the transformative potential of Industry 4.0 technologies, making them a central focus of our efforts. The project envisages the following impact on this group, as described:

- They will have access to STEAM-based education, comprehending i4.0, innovative employability and entrepreneurial skill, firstly related to footwear sector but actually transferable to many other sectors.
- They will have a new perspective on the footwear sector and other traditional sectors and can envisage a career in i4.0 smart footwear company, supported by high-quality learning opportunities.
- They will benefit from the piloting opportunities and get to know more about the i4.0, innovative employability and entrepreneurial skill and also footwear manufacturing.
- They will have a wide vision for selecting a modern and motivating STEAM career namely in footwear sector but also in many others.

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Teachers: Educators serve as the essential mediators and facilitators of the learning process. In this context, they not only impart knowledge but also act as ambassadors of Industry 4.0 within school environments. By empowering teachers, we ensure the sustainable integration of these technologies into the educational landscape.

Industry: The business sector, represented here, has a crucial role in rejuvenating human capital. Collaborating with education, industry stakeholders can provide real-world context and expertise, enriching the learning experiences of students and helping them develop relevant skills for the future.

The footwear industry was the selected sector of activity of this project, a sector eager to attract young people to rejuvenate the companies and to be the talented recipients of the transference of skills from the actual generation over 50+ in average, that will be soon retired. Footwear industry is totally embracing the challenges of i4.0 and is offering a wide range of STEAM based occupations and opportunities for youngsters, allying talent, creativity and critical attitude to a new generation of high-end manufacturing industry with high standards of employability and opportunities of self-employment for the most ambitious and entrepreneur youngsters.

This diverse range of **stakeholders**, united in their commitment to enhancing education and preparing students for the challenges of Industry 4.0, forms the core of our project's vision. Together, they work towards a shared goal of a more innovative and adaptive education system for the benefit of the upcoming generation and the workforce of tomorrow.

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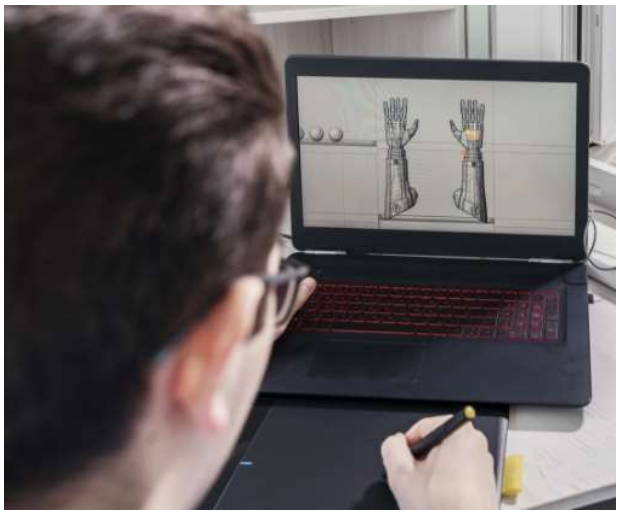
Project main aims

The expected contributions of the project, in line with its objectives, are as follows:



- To reduce the school dropout by orienting the generation Z students to potential opportunities in STEAM-based jobs, in sectors embracing i4.0.
- To develop innovative skills for employability and entrepreneurship in this generation Z according to their potential and ambitions.
- To develop the motivation for the embracing of STEAM-based jobs in parallel with the rejuvenation of the traditional industries, stimulating the youngsters through immersive experiences in the i4.0, and activate the attraction for the industry in Europe.
- To provide international interchange between teachers and students, acceleration a joint growth with Europe in backstage.
- To update teachers in the new digital education methodologies that can attract even more students to STEAM based qualifications, and afterwards to jobs in i4.0 industry.
- To disseminate different ways of teaching, based on hands-on activities combined with digital tool/practices such as virtual reality, promoting unforgettable immersive learning experiences for life.

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- To accelerate the transference of tacit knowledge and skills in European industries from older workers to talented youngsters, perpetuating their heritage now supported by disruptive innovation.

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STEAM-based educational approach

An educational approach refers to a specific philosophy, method, or strategy used to facilitate learning and teaching. Different educational approaches are designed to cater to various learning styles, goals, and environments, and they encompass a broad range of theories and practices.

Educational approaches are diverse and multifaceted, each with its own set of principles, strategies, and goals. Choosing the right approach depends on various factors, including the educational context, the needs and preferences of students, and the objectives of the educational program. Understanding these different approaches helps educators create effective and engaging learning environments.

What Portugal, Italy and Romania has in common in education for young generations?

Education for the younger generation in Portugal, Italy, and Romania shares several common characteristics, typical of European Union approach and harmonization having educational systems influenced by similar historical, cultural, and policy-driven factors.

While there are many similarities in the educational systems of Portugal, Italy, and Romania, each country also retains unique features influenced by its own historical, cultural, and socio-economic context. However, a common line is relevant which reflects shared goals of providing comprehensive, inclusive, and modern education to prepare the younger generation for the future.

In all the 3 countries we have the following framework:

- **Compulsory** Education structured into primary, lower secondary, and upper secondary education. In all three countries, compulsory education typically spans

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from around age 6 to 16. This ensures that children receive a basic education that includes primary and lower secondary education.

- **Curriculum Standards** where each country has a national curriculum set by their respective Ministries of Education outlining the subjects and learning objectives for each grade level, with common subjects which include mathematics, science, language and literature (including native languages like Portuguese, Italian, and Romanian), foreign languages (often English which is commonly taught as a second language starting in primary school but it can vary from French, Spanish, and German particularly in secondary education), history, geography, physical education, and arts, Information and Communication Technology (ICT) teaching students essential digital skills. This also includes the participation in EU programs like Erasmus+ which encourages language learning and cultural exchange and well as a set of different basic competences around autonomy.

- **Educational Reforms** and EU influence aligned with EU Policies and frameworks, such as the Bologna Process and the European Qualifications Framework (EQF).

- **Focus on Modernization** within an ongoing effort to modernize educational infrastructure and teaching methodologies to meet EU standards and improve educational outcomes.

- **Support for Special Needs** according to policies in place to support inclusive education, ensuring that students with special educational needs receive appropriate support, reducing educational disparities and promote equal access to education for all students.

- Emphasis in the **Digital Literacy** and the integration of technology in the classroom including the use of digital tools and resources to enhance learning and teacher qualifications and training and continuous professional development to

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ensure high standards of teaching emphasising pedagogical training to equip teachers with modern teaching strategies and classroom management skills.

- **Standardized Assessment and Evaluation** procedures using standardized testing at various stages of education to assess student performance and educational outcomes, with the focus on continuous assessment which combines classroom-based evaluations and final exams to determine student progression and certification.

- **Cultural and Civic Education** focused on the importance of civic education, teaching students about their rights, responsibilities, and the functioning of democratic institutions.

- **Cultural Heritag**e, incorporating national and regional history and culture in the curriculum to foster a sense of identity and heritage.

What is important to take into consideration when drafting an educational approach for the Generation Z?

When drafting an educational approach for Generation Z, it is crucial to consider their unique characteristics, preferences, and the environment they are growing up in. It's essential to create a dynamic, inclusive, and flexible learning environment that leverages technology, promotes active and experiential learning, addresses mental health and well-being, and prepares students for the demands of the 21st century. By considering these factors, educators can create a more effective and engaging educational experience that meets the needs and expectations of this generation.

The draft of this approach took into consideration several important factors to know:

- **Technological Integration** considering that Generation Z are digital natives and have grown up with technology. Education should incorporate digital tools, online

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resources, and technology-driven instruction to match their familiarity and comfort with digital environments, utilizing online learning platforms and blended learning models to provide flexibility and personalized learning experiences.

- **Active and Experiential Collaborative Learning**, adopting Hands-On activities which emphasize experiential learning through projects, and real-world problem-solving to make learning more engaging and relevant, encouraging group work and collaborative projects to develop teamwork and communication skills.

- **Personalization and flexibility** structuring individual learning paths, adapting teaching methods to cater to individual learning styles and paces, using adaptive learning technologies to personalize educational content.

- **Choice and Autonomy** offering students choices in their learning activities and projects to foster a sense of ownership and motivation.

- **Focus on 21st Century Skills Competencies**, prioritizing the development of critical thinking, creativity, communication, collaboration, and problem-solving skills, Digital Literacy, ensuring students are proficient in using digital tools and understanding digital citizenship, including **online safety** and **ethics**.

- **Relevance and Real-World Application** integrating contextual learning features and connect academic content to real-world scenarios to make learning relevant and meaningful, integrating career education and life skills training to prepare students for the workforce and adult life, managing stress, balancing school and personal life, and building resilience.

- **Inclusivity** and **Diversification** creating an inclusive learning environment that respects and celebrates diversity ensuring that all students, regardless of background, have equal access to educational opportunities, incorporate multicultural

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education to enhance students' understanding and appreciation of different cultures and perspectives.

- **Integrate Interactive** and **Engaging Methods** such as Gamification through game-based learning and gamification techniques to increase engagement and motivation, interactive media such as videos, simulations, and virtual reality, to make learning more dynamic and immersive.

- **Assessment** and **Feedback** combining formative assessment (continuous assessment to provide timely and constructive feedback, helping students improve and understand their learning progress), with other alternative methods such as portfolios, presentations, and peer assessments, to evaluate a range of skills and competencies.

- **Sustainability** and **Global Awareness**, which includes environmental education (sustainability and environmental education to foster awareness and responsibility towards global challenges), global Citizenship encouraging global awareness and understanding of international issues, promoting a sense of global citizenship.

The new education approach is now set up!

From the Traditional Education approach which privileged the Lecture-Based Learning, where the teacher is the central figure of the educational strategy, who imparts knowledge through lectures, students being passive recipients of information, and the learning process very emphasized on memorization and standardized testing, we'll need to evolve to a student centred-based educational strategy, where the student is the central figure of the educational process and all the methodologies should be different and adapted to the new framework

So the **Teacher-Centred Approach**…

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- Teacher directs the learning process and controls the classroom activities;
- Focus on curriculum and instruction, often with a rigid structure;
- Learning process very emphasized on memorization and standardized testing

…it's required to evolve to a **Student-Centred Approach**:

- Emphasizes the student's active role in the learning process.
- Encourages collaboration, critical thinking, and problem-solving.
- Examples include project-based learning and inquiry-based learning.
- Adopt Experiential Learning, through constructive methods, where the students learning through experience and reflection, engage in hands-on activities and real-world problem-solving.

Based on the idea that students construct their own understanding and knowledge, learning is seen as an active, contextualized process of constructing knowledge rather than acquiring it, focusing on self-directed activity, hands-on learning, and collaborative role-plays, where classrooms are designed to facilitate independence and exploration.

However, and taking into account the Generation Z students' level of adoption of the available technology, as we have presented in past sections, education needs to integrate also technology learning method in a more "EdTech Integration" approach, incorporating technology into education to enhance learning experiences.

However again, education approach also needs to take into consideration the inclusivity and diversity factors, ensuring all students, regardless of their abilities or disabilities and easy or difficult access to technology are able to learn together in the same environment and it is tailored to every student never and doesn't leave anyone behind. Therefore, teachers should adjust their teaching strategies based on the readiness, interests, and learning profiles of students.

Definitely the best way of implementing the change is always adopting blended solutions, such as the Blended Learning, which combines traditional face-to-face instruction

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with online and more technology learning, allowing for flexibility and personalized learning experiences.

The teachers' roles in the new Generation Z educational approach

The educational approach tailored to Generation Z, requires a significant shift in the roles and responsibilities of teachers who need to be multifaceted and dynamic, focusing on developing a broad range of skills that prepare students for the complexities of the modern world. The new educational approach for Generation Z emphasizes not just traditional academic knowledge but also a range of skills necessary for the 21st century. This involves being not just educators but also mentors, innovators, and role models, guiding students through an ever-changing educational landscape.

The Virtual Reality as the new black of the educational methods for youngsters

Virtual Reality (VR) is a powerful technology that creates immersive, interactive digital environments, offering numerous applications across various fields. Its ability to simulate real-world experiences and provide unique interactive opportunities makes it a valuable tool for entertainment, education, training, and beyond. It uses computer technology to generate realistic images, sounds, and other sensations that simulate a user's physical presence in a virtual or imaginary environment.

Virtual Reality is indeed becoming a pivotal component of modern educational methods, offering immersive, engaging, and personalized learning experiences. By overcoming traditional barriers and providing innovative ways to visualize and interact with content, VR holds the potential to revolutionize education for youngsters, preparing them for the complexities of the 21st century. However, careful consideration of challenges such as cost, content development, and teacher training is essential for its successful implementation. SYL project reflected and developed support for all these considerations and worries.

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General Modular Programme Structure

The foundation of any comprehensive educational program lies in its structure and the content it offers. In the context of our educational initiative, we have carefully designed a General Programme Structure comprising eight distinct hands-on Kits of Contents, each focusing on a specific area of knowledge and skill development. These kits have been crafted with the intention of providing a well-rounded and engaging learning experience for our target audience.
In addition these education al proposals that are presented in the next pages were also integrated into Virtual Reality modules, within a modular curricula to support the learning process of the subjects proposed.

The eight activities included in this structure are as follows:

ACTIVITY 1 - **CHEMISTRY:** Delving into the world of chemical reactions and discoveries, this kit ignites curiosity and exploration.

ACTIVITY 2 - **SCIENCE LAB**: A laboratory-based experience that fosters a deep understanding of scientific principles and experimentation.

ACTIVITY 3 - **MECHANICS:** Offering hands-on insights into the world of mechanics and physical processes, promoting problem-solving and engineering thinking.

ACTIVITY 4 - **3D PRINTING**: Exploring the cutting-edge technology of 3D printing, empowering students to create and innovate.

ACTIVITY 5 - **SUSTAINABILITY:** A critical focus on environmental consciousness and sustainable practices, preparing students for a greener future.

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ACTIVITY 6 - **ITC COMPUTING**: Navigating the world of information technology and computing, enhancing digital literacy and problem-solving skills.

ACTIVITY 7 - **MARKETING**: Encouraging entrepreneurial thinking and marketing skills development.

ACTIVITY 8 - **HISTORY AND HERITAGE**: Connecting the past to the present, promoting a sense of cultural awareness and heritage preservation.

These eight kits form the cornerstone of our modular program, providing a diverse range of experiences that cater to the varied interests and needs of our students. Together, they create a holistic and engaging educational journey that fosters well-rounded and prepared individuals for the challenges and opportunities of the future.

These contents will be embedded in an augmented reality application, where students can access them using their own VR glasses. It will provide a unique experience that will allow them to learn in a more engaging way.

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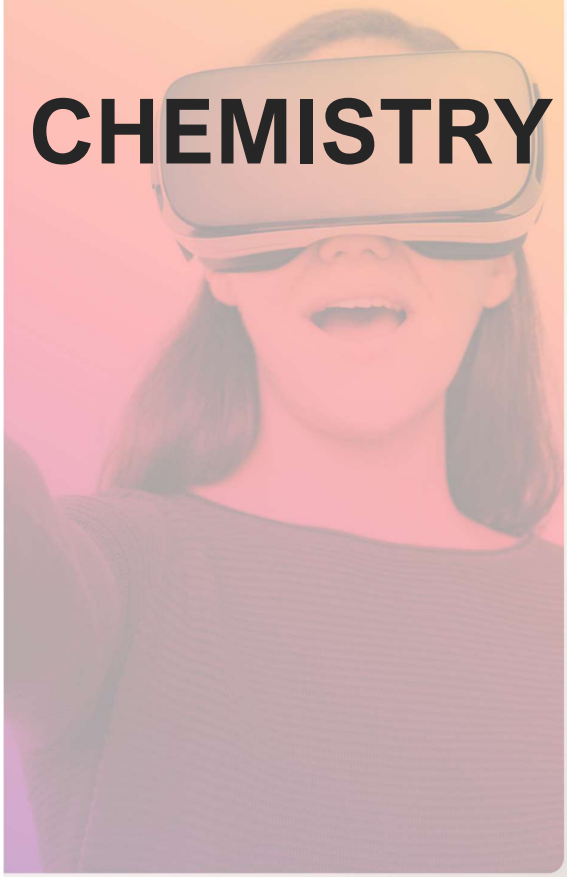
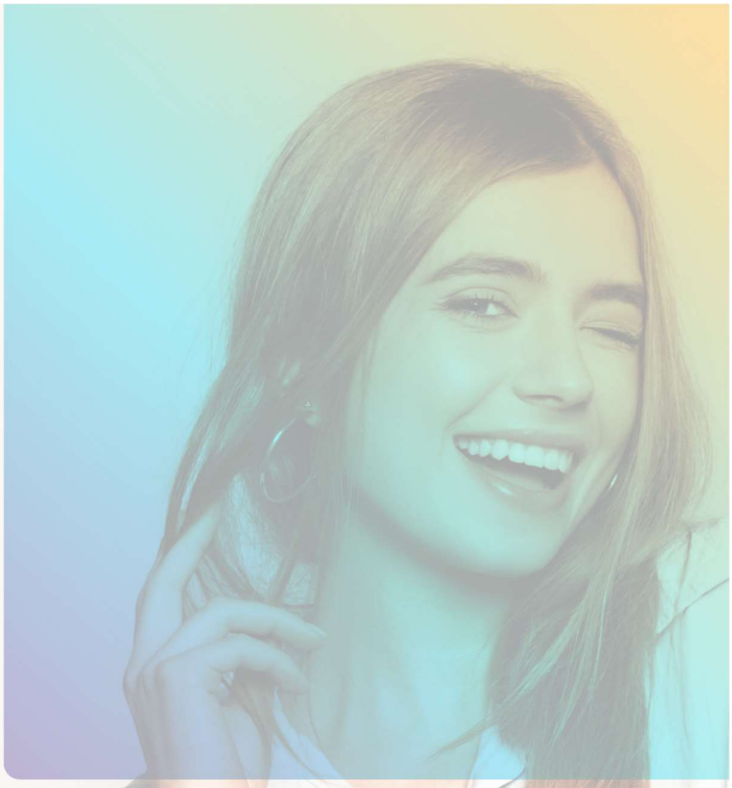
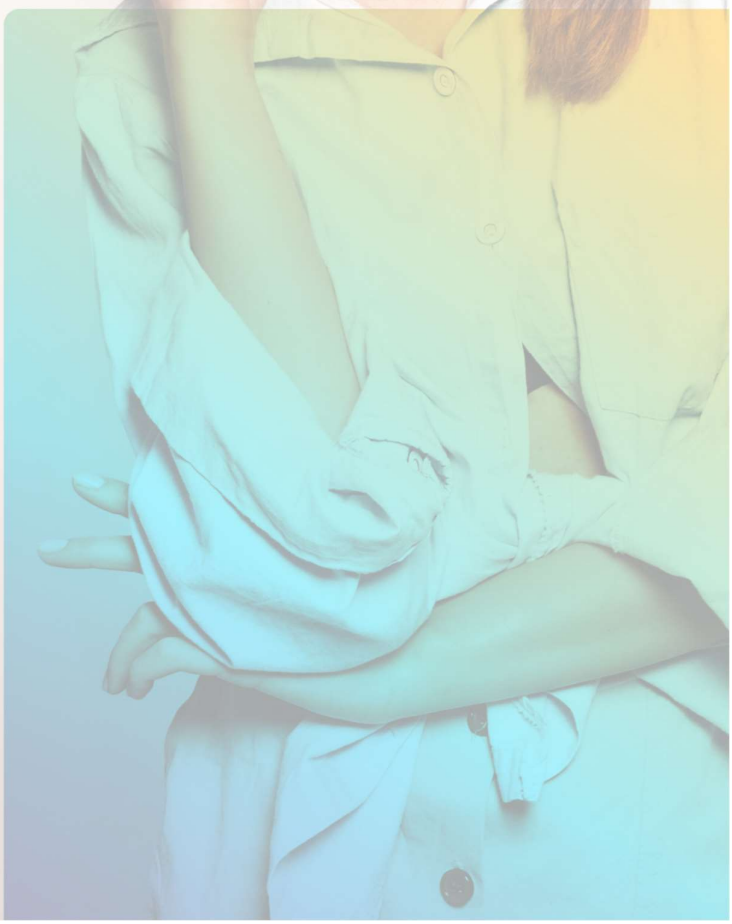
CHEMISTRY







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ACTIVITY 4.1 – CHEMISTRY

Introduction

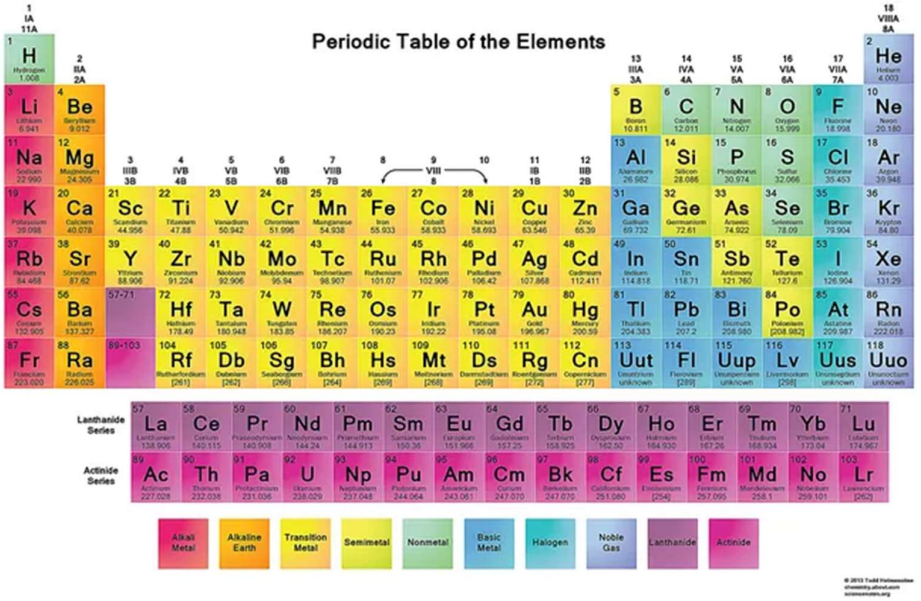
Welcome to the first activity of our program, "ACTIVITY 1 - CHEMISTRY - Exploring the Industrial Applications of Atoms and the Periodic Table" In this engaging and interactive session, students will delve into the fascinating world of chemistry and its practical applications in various industries, particularly in the context of shoemaking.

Objective

The primary goal of this activity is to foster an understanding of how atoms and the periodic table are essential tools in the industrial landscape. Through hands-on exploration and problem-solving, students will gain valuable insights into the role of chemistry in real-world settings.

Subject development

As you enter the room, you'll notice a board adorned with the periodic table. However, only a selection of 10 elements will be activated at a given time.



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Understanding the periodic table and its properties is crucial for the footwear industry due to its relevance in material selection, manufacturing processes, and product safety. Elements featured in the periodic table play a significant role in various aspects of shoe production, from determining the composition of materials to ensuring compliance with health and safety regulations.

One key aspect where the periodic table knowledge is indispensable is in material selection. Elements such as chromium (Cr) and cadmium (Cd) are commonly used in leather tanning processes to enhance durability and color retention. However, both chromium and cadmium are known carcinogens, posing serious health risks to workers involved in leather processing and potentially to consumers through prolonged exposure. Therefore, understanding the properties and potential hazards of these elements enables the industry to make informed decisions regarding material sourcing and manufacturing practices.

Moreover, elements like lead (Pb) and mercury (Hg), although not as prevalent in modern shoe manufacturing, have historically been used in certain components like pigments and adhesives. Both lead and mercury are highly toxic substances that can cause severe health issues, particularly neurological damage and developmental disorders. By being aware of the presence and risks associated with these elements, shoe manufacturers can adopt alternative materials and processes to mitigate health and environmental concerns.

Additionally, knowledge of the periodic table facilitates compliance with regulatory standards and product safety requirements. Regulatory bodies such as the Environmental Protection Agency (EPA) and the European Chemicals Agency (ECHA) impose strict limits on the use of hazardous substances in consumer products, including footwear. Understanding which elements are restricted or regulated allows manufacturers to ensure their products meet legal obligations and maintain consumer trust.

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The periodic table serves as a fundamental tool for the footwear industry, guiding material selection, manufacturing processes, and regulatory compliance. By recognizing the properties and hazards of elements like chromium, cadmium, lead, and mercury, manufacturers can prioritize safety, sustainability, and quality in shoe production, ultimately benefiting both workers and consumers alike.

Exercise:

1 - Study the periodic table carefully. You can select certain elements to know more about them.

They have time limit.

The elements available on the Periodic Table are:

n. 1 Hydrogen

n. 8 Oxygen

n. 20 Calcium

n. 7 Nitrogen

n. 12 Magnesium

n. 24 Chromium

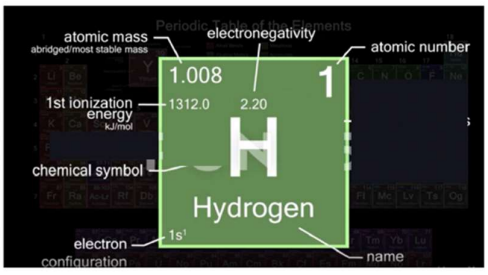
n. 16 Sulphur

n. 11 Sodium

n. 17 Chlorine

n. 13 Aluminium

Example:



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2 - Now answer the questions based on what you have learnt.
They have time limit.

The questions will appear on the board and the answers will be on the periodic table.
They will have to point and select the correct answer.

A - Choose the elements found in a water molecule.
Correct answe: Oxygen (8) and Hydrogen (1)

B - Choose an element with two valence electrons.
Correct answer: Calcium (20) or magnesium (12)

C - Which element gains two electrons in order to form a stable ion?
Correct answer: Oxygen (8)

D - According to their characteristics, choose the elements that classify as "metals".
Correct Answer: n. 20 Calcium, n. 12 Magnesium, n. 13 Aluminium, n. 24 Chromium, n. 11 Sodium

E - According to their characteristics, choose the elements that classify as "non-metals".
Correct Answer: n. 8 Oxygen, n. 7 Nitrogen, n. 16 Sulphur, n. 17 Chlorine

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SCIENCE LAB

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ACTIVITY 4.2: SCIENCE LAB

Introduction

Welcome to the second activity of our program, "ACTIVITY 2 – SCIENCE LAB". In this engaging and interactive session, students will delve into the fascinating world of chemistry and its practical applications in various industries, particularly in the context of shoemaking.

Objective

The primary goal of this activity is to foster an understanding of how atoms and the periodic table are essential tools in the industrial landscape. Through hands-on exploration and problem-solving, students will gain valuable insights into the role of chemistry in real-world settings, **u**nderstand about the importance of quality control in the industry.

Subject development

Students will enter in a SYL science Lab with a table full of objects.

List of common laboratory equipment and tools:

- Beakers: Used for holding and mixing liquids. Available in various sizes.
- Test Tubes: Small, narrow containers for holding small amounts of liquids or substances.
- Flasks: Like beakers, but often with a narrower neck and used for specific purposes, such as titration.
- Graduated Cylinders: Used to measure the volume of liquids accurately.
- Burettes: Precise instruments for dispensing and measuring specific volumes of liquid.
- Pipettes: Used to transfer small amounts of liquids accurately.
- Microscopes: Instruments for magnifying and viewing small objects or specimens.
- Centrifuges: Devices that spin samples at high speeds to separate components.
- Incubators: Used to provide a controlled environment for growing and maintaining cultures.

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- Autoclaves: Sterilization equipment used to kill bacteria, viruses, and other microorganisms.
- Ovens: Used for drying or heating samples and materials.
- Hot Plates: Electric heating devices with a flat surface for heating containers.
- Balances: Instruments for measuring the mass of objects or substances.
- pH Meters: Used to measure the acidity or alkalinity of a solution.
- Spectrophotometers: Instruments for measuring the absorption and transmission of light by a substance.
- Hoods and Cabinets: Used for working with hazardous materials, such as biological safety cabinets.
- Stirrers and Stirring Rods: Used to mix solutions or substances in containers.
- Tongs and Forceps: Tools for holding, gripping, or picking up objects.

- Safety Goggles and Lab Coats: Personal protective equipment for safety in the lab.
- Microtome: A specialized instrument for cutting thin sections of samples for microscopic examination.
- Petri Dishes: Flat, round, shallow dishes used for growing and observing cultures.
- Volumetric Flasks: Precision glassware for measuring a specific volume of liquid.
- Spatulas and Scoops: Used for transferring or dispensing small amounts of solids.
- Thermometers: Instruments for measuring temperature.
- Electrochemical Cells: Used for conducting electrochemical experiments.
- Bunsen Burners: Gas burners used for heating and sterilizing in the lab.

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- Funnels: Used for guiding liquids into containers with small openings.
- Microplate Readers: Instruments for reading the results of assays in microplates.
- Glass Slides and Coverslips: Used for preparing and viewing microscope slides.
- Desiccators: Containers used to maintain a dry environment for moisture-sensitive materials.
- Nitrile glove: Nitrile gloves are essential safety gear in laboratories, providing protection against chemicals, biological hazards, and contaminants while offering comfort and dexterity.

These are just some of the common laboratory equipment and tools used in scientific research and experimentation. The specific equipment used may vary depending on the type of laboratory and the experiments being conducted. Not all of these are presente in the SYL Science Lab.

And then they will have to answer a true or false quizz.

Exercise:

1 - Analyse the chemicals available in the lab.
They have time limit.

POTASSIUM DICHROMATE (K2Cr2O7)

Potassium dichromate is used in the tanning process for leather used in footwear.

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POTASSIUM PERMANGANATE (KMnO4)

Potassium permanganate is an inorganic compound, the salt of permanganic acid with potassium, with the formula KMnO4, being an extremely strong oxidizing agent, often used in the laboratory. In solution, permanganate ions give an intense pink-violet coloration, and in the solid state, permanganate has the appearance of purple-black crystals.

SODIUM BICARBONATE (NaHCO3)

The acid carbonate radical (HCO3-) and the sodium ion (Na+) make up sodium bicarbonate. It neutralizes acids and releases carbon dioxide. It does not pollute the environment, it has countless uses.

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SULFUR TETRAFLUORIDE (SF4)

Sulfur tetrafluoride, SF4 is a colorless, highly toxic, corrosive, non-flammable, highly reactive gas. Pure sulfur tetrafluoride is used in the fluorination of other chemicals

CHROMIUM OXIDE (Cr2O3)

Hexavalent chromium in its mineral form was used as a pigment for dyeing leather materials.The name chrome comes from the Greek language and means color. Chromium oxide is one of the main oxides of chromium and is used as a pigment.

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CHLORINE - HCL

In contact with the skin, the acid causes burns, its vapors are also caustic. In case of contact with the acid, it is recommended to wash the skin with plenty of water when the doctor arrives. Also, some soaps containing too much caustic soda can damage the skin even worse

In organic chemistry, the oxidizing properties of chlorine are used to substitute hydrogen atoms in the composition of molecules, giving them different superior properties (for example in copolymers in synthetic rubbers).

ACETONE (C3H6O)

Acetone (also known as propanone or dimethylketone) is the simplest ketone. It is a colorless liquid with a characteristic odor, being used as an organic solvent and as a reactant in a number of thermolysis processes and synthesis reactions in organic chemistry. It is part of the ketone group, characteristic of the acetone structure is the carbonyl group to which two methyl groups are attached.

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METHYL ALCOHOL (CH3OH)

Methanol has a high calorific value (about 22300 kj/kg) and can be used as fuel.

Its use as fuel is limited due to its toxicity and high price. Methyl alcohol is used as a solvent for fats, varnishes, paints, to obtain synthetic materials, dyes.

2 - Now read the statements carefully and determine if they are true or false.

They have time limited.

1.Potassium permanganate on heating forms atomic oxygen.

2.Potassium dichromate is used in the tanning process for leather used in footwear.

3.Sodium bicarbonate is an inorganic chemical compound that belongs to the category of oxides.

4.Chromium oxide is one of the main oxides of chromium and is used as a pigment.

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5.Molecular chlorine is obtained at an industrial level through the process of electrolysis of brine.

6.The usual way to obtain acetone consists in combining benzene with propane to obtain isopropylbenzene, and through oxidation cumene hyperperoxide is formed which in an acidic environment decomposes into phenol and acetone.

7.Potassium dichromate is a green crystalline solid very open.

Results

1,2,4,5- true

3, 6, 7 -false

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MECHANICS

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ACTIVITY 4.3: MECHANICS

Introduction

We are now on activity 3 of our program, "ACTIVITY 3 – MECHANICS”. In this engaging and interactive session, students will play with a 3D engine and will learn how to assembling and disassembling the engine, learning by themselves all its features and fuctionalities

Objective

The primary goal of this activity is to foster an understanding of how engines work and how they can be used in industrial environments.

Subject development

Students will be confronted with the material and instruction and will explore by themselves with the accompaniment of the teachers how to assembling and disassembling the engine developing a set of competences from technical to soft skills.

Exercise

1 - Pay attention to how the engine works and then reassemble it. they can select the pieces to know more about them.

They have time limit.

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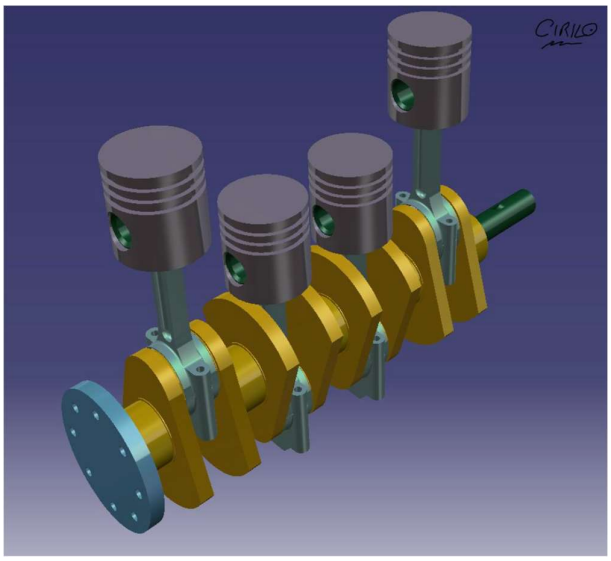
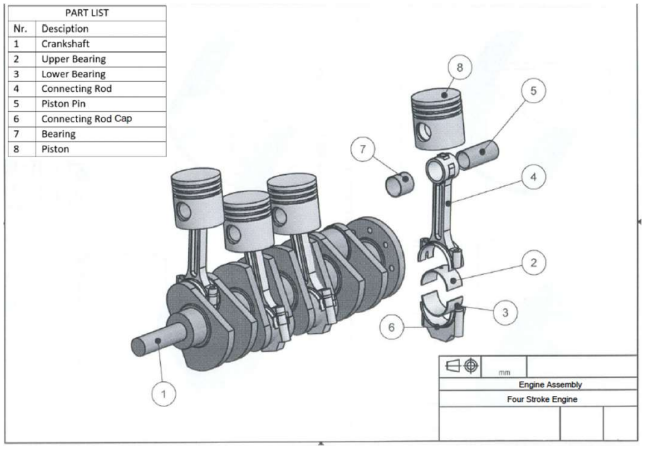


First students will analyse a 3D object and it’s parts. Students will be asked to observe closely, move around and understand its’ function.

This is the 3D object they have in front of them and how they should look at it, so they will be able to assembler it back together in the end.



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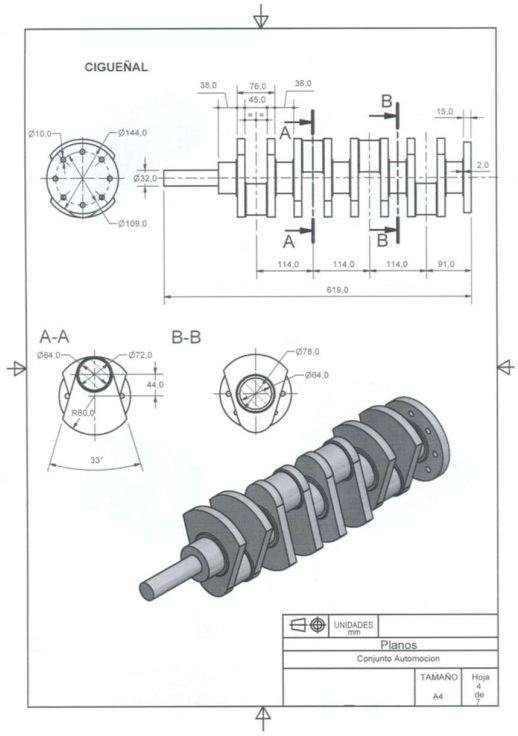

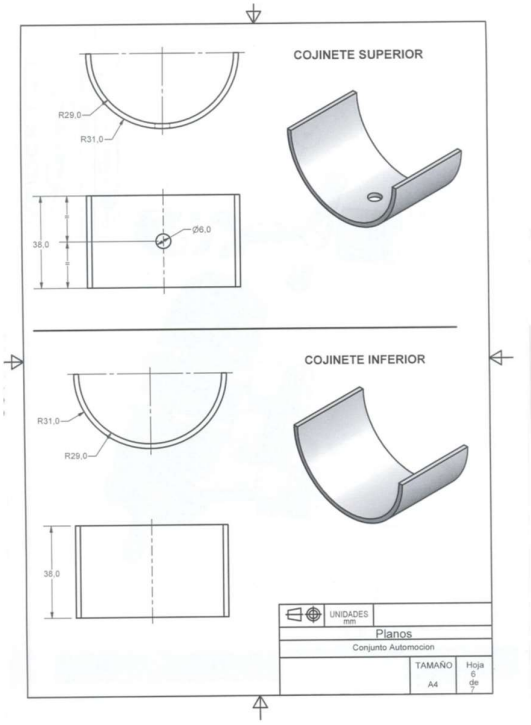

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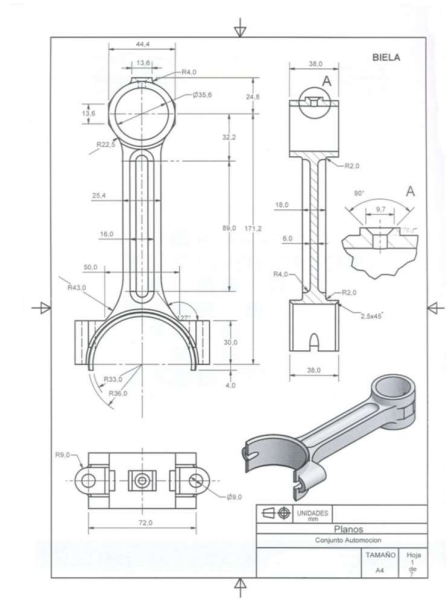

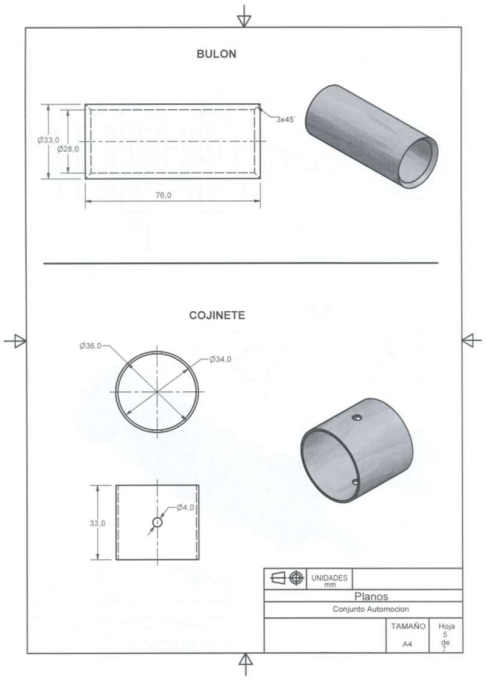

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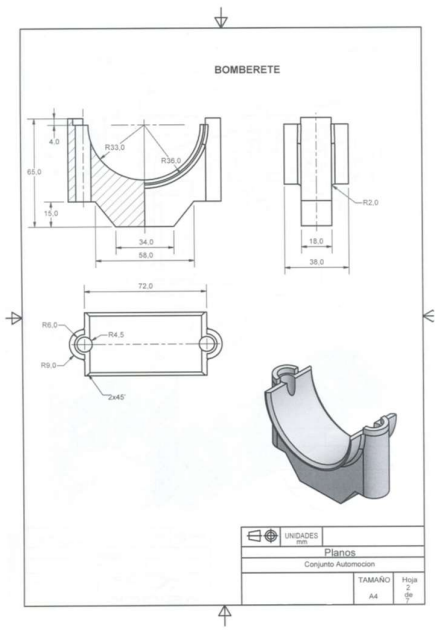

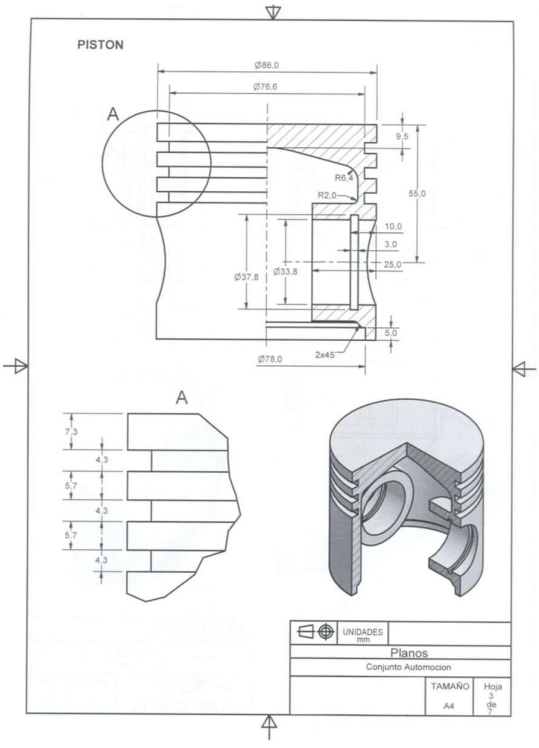

2 - When time is up, the engine turns into pieces.

Students will be asked reassemble the engine back together in a time limited.

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They have to point and select the first object from the sides and drag them to the center piece.

There is a correct order to assembler the engine, so when they chose the wrong part, it will come back to the sides again.

Step 1: Modelling the eight parts of the engine;
Step 2: Assembly the upper and lower bearing on the crankshaft;
Step 3: Assembly the connecting rod and connecting road cap on the bearing;
Step 4: Assembly the bearing into the rod;
Step 5: Assembly the piston and piston pin on the rod;
Step 6: Check for the corrected mates;
Step 7: Animate the mechanism and check for the corrected running;

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3D PRINTING

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ACTIVITY 4.4 – 3D PRINTING

Introduction

Additive Manufacturing, also known as 3D printing, allows you to create objects from scratch, using digital models and optimizing resources. It refers to the set of processes that allow producing parts from the addition of matter, usually layer upon layer.

Nowadays it is possible to print on a wide variety of materials which makes this technology even more attractive, promising and applicable to a wide variety of industries.

From now on, you can think of an object, digitally design it, and "print" it in 3 dimensions.

Objectives

- Develop a fashion accessory using 3D printing
- Develop skills in the area of 3D printing, design, new technologies, new materials

Here's how the activity works:

-Develop relevant capabilities and apply their motivation and knowledge to practical solutions

- Meet the fashion industry (visits, workshops)
- Develop entrepreneurship skills

Subject Development

What is additive manufacturing?

Additive manufacturing (AM), commonly known as 3D printing, is a disruptive method to produce three-dimensional objects, from a 3D virtual model, by joining materials, usually layer upon layer, as opposed to subtractive manufacturing processes. [ASTM International, "ASTM F2792-12a - Standard terminology for additive manufacturing technologies." pp. 1–3, 2012, doi: 10.1520/F2792-12A.2].

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Additive manufacturing technology emerged in the 1980s with the stereolithography process, also known as SLA (Stereolithography Apparatus), associated with CAD/CAM (Computer-Aided Design / Manufacturing) technology, using photosensitive resins.

This process allowed the rapid construction of prototypes, models, inserts for moulds, etc., thus originating the term of rapid prototyping. This technology quickly scaled with the creation and development of new processes. It is now also possible to manufacture three-dimensional objects in ceramic, plastic, metal and composite materials. The evolution of the technologies allowed the production of not only aesthetic but also functional prototypes and, consequently, used for industrial production.

In addition to the type of products that AM allows to produce, its impact on the sustainability should be highlighted as well. For example, the fact that objects are built in layer-upon-layer processes, reduces raw material waste and residues generation, as opposed to other methods. Although in the case of resins, which are hardened by curing processes and are expensive to recycle or not even recyclable, most of the raw materials used in AM are thermoplastic polymers, and these are recyclable, further reducing the impact of technologies at an environmental level.

The footwear and leather goods industry, like many other industries, seeks to make the most of these disruptive processes. Currently, the most significant advantage is at the product development stage, which substantially reduces time and cost in the prototype conception. There has also been a strong focus on producing components and whole footwear, with the cooperation between footwear companies and producers of additive manufacturing equipment. This is the case of the collaboration between Carbon and Adidas, winning the "Creative Use of 3D Printing 2021" award by the prestigious 3D Printing Industry [https://3dprintingindustry.com/news/2021-3d-printing-industry-awards-winners-announced-198231/], that developed a technology to produce soles, midsoles, and whole footwear from photosensitive resins. Likewise, the cooperation between New Balance and the company specialised in additive manufacturing Formlabs, to make soles, or the collaboration between Nike and HP to develop their Nike Zoom Superfly Flyknit model for the athlete Allyson Felix to wear at the Rio de Janeiro Olympics in 2016. Recently, Nike

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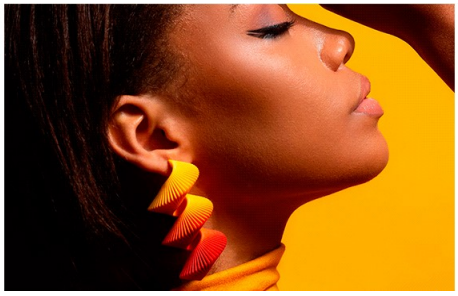
Sports Research Lab produced the first sports performance shoe with the 3D printed upper. In this case, the the Nike Flyprint technology was used, based on the FFF (Fused Filament Fabrication) process, to produce the upper for the shoes of the marathon runner Eliud Kipchige.

The foundations are thus laid for AM to become more and more a reality in the footwear industry, based on the pillars of sustainability and digital transformation that the sector needs (is experience, combined with the growing demand for unique products both in design and functionality. Despite this, there is still a long way to go. However, with the development of new and better technologies and materials, the future is getting closer, both for large and small companies, for designers and producers, for sellers and customers.

Examples 3D Printing Applications



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Additive manufacturing steps

The additive manufacturing process of a 3D model can be divided into five main steps: CAD modelling, conversion to STL/OBJ/AMF, the configuration of the 3D print file (gcode), 3D printing and finally, post-processing (if applied). These steps apply to any printer and material to be printed. A brief description of each of these steps follows:

1. **CAD Modelling**: the first step of additive manufacturing is 3D modelling of the object to be printed. This process is done using a CAD software, where the object will be modelled, i.e., drawn three-dimensionally. It is essential to consider the material that is going to be used to print the object and the printing technology during this step. That will optimise the printing time and the performance of the object in its final application.

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2. **Conversion to STL/OBJ/AMF**: after the object is modelled three-dimensionally, it is necessary to convert the 3D model into a file format, for instance STL, that can be imported into the printing software, which is usually called slicer. When converting the model to STL, or another format, it is crucial to ensure that all the geometric details of the model are kept, i.e., this step influences the resolution of the file to be printed and, consequently, the final appearance of the printed object.

3. **Slicing and converting to gcode**: slicing is one of the most critical steps in the 3D printing process. The term slicing is related to the division of the 3D model into layers. The printing parameters are defined in this step, such as printing temperatures, printing speed, layer thickness, object position and orientation, among others. The impact of these parameters will influence the final quality and performance of the printed object. The parameters to be set depend on the type of material, printer and the design of the object. After completing the slicing, this data is exported to a file to be read by the 3D printer, the gcode. The gcode file has the information necessary for the printer to print the object with the parameters defined by the user.

4. **Printing:** this is the stage in which the physical object will be constructed and the printing process will be based on the parameters previously defined in the slicer.

5. **Post-processing**: some AM processes require post-processing steps to either improve the final appearance of the object (especially in the case of functional prototypes or even final parts), or its properties or just simply for cleaning. In the latter case, the common processes are the removal of support structures, resin or excess powder, surface polishing or thermal processing.

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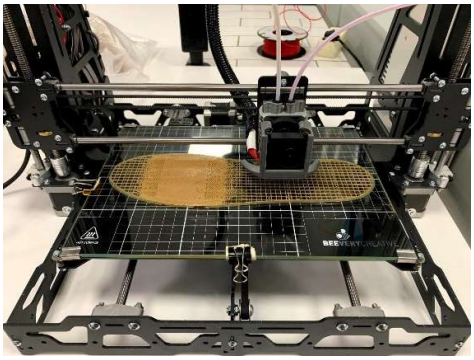

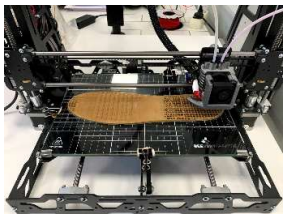

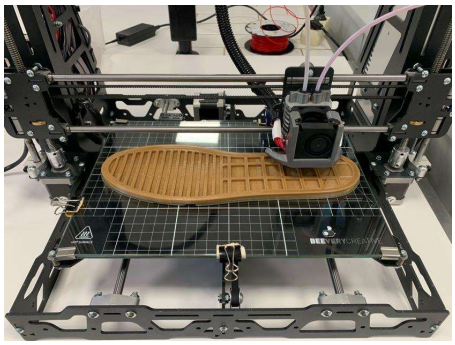

Product development

In the world of the footwear industry, design validation is a crucial process before launching a new model on the market or, in the case of private label services, for the development of samples for customer appreciation. Design validation is usually done by constructing prototypes and models to evaluate its design and functionality. However, this process is often slow and expensive, especially in the case of injected soles, as it is necessary to develop injection moulds. Therefore, to avoid the need to manufacture a mould for each version of the prototype soles, what usually is done is manufacture a rigid sole by subtractive manufacturing (machining). In this way, it is possible to obtain a physical model of the sole; however, it is not possible to evaluate the model's functionality due to its rigidity. This is where additive manufacturing brings numerous advantages, leveraging the possibility of quickly produce functional prototypes without resorting to mould making.

Exercise

Design and print a small personalized piece. Follow the correct steps to create your own shoe using a 3D Printer.

They have time limited

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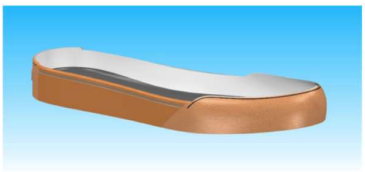
Step1

1 - Select your Sole to print:

The screen shows 3 different type of soles so they can select between: classy, high heal and sporty

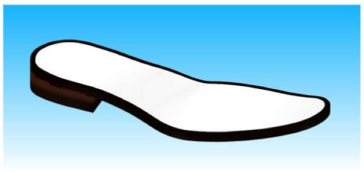
Example:

Sola 1 - Casual



Sola 2 - Lady

Sola 3 - Classic



Step2

Your sole is printed. Now complete your shoe with all components in the correct order. They will have to select the next steps on printing:

1) Convert Model to File - STL/OBJ/AMF (Optimize Printing)
2) Slice & Convert GCode
3) Send to 3D Printer
4) Run Post Processing

Step 3:

All parts of the shoe are on the table, they will have to assembler it all together, by pointing and dragging.

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Sola 1 - Casual

Sola 2 - Lady

Sola 3 - Classic

Fabrication Complete!

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SUSTAINABILITY

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ACTIVITY 4.5 - SUSTAINABILITY

Introduction

Sustainable manufacturing is the creation of manufactured products through economically-sound processes that minimize negative environmental impacts while conserving energy and natural resources. Sustainable manufacturing also enhances employee, community and product safety.

Objective

Sustainability is a social goal for individuals to co-exist on the Earth including economic, social, and environmental dimensions. A Sustainable industry would allow for growth in all three dimensions while maintaining the quality of the environment and countering major environmental issues.

In this game, students will be asked to make decisions on a more sustainable world.

Subject development

1: What Is Renewable Energy?

Renewable energy is energy derived from natural sources that are replenished at a higher rate than they are consumed. Sunlight and wind, for example, are such sources that are constantly being replenished. Renewable energy sources are plentiful and all around us.

2: What is Non-Renewable Energy?

Non-renewable energy comes from sources that will run out or will not be replenished in our lifetimes—or even in many, many lifetimes. Most non-renewable energy sources are fossil fuels, formed from the decomposition of buried carbon-based organisms that died millions of years ago. They create carbon-rich deposits that are extracted and burned for energy. They are non-renewable and currently supply around 80% of the world's energy.

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3: SOLAR ENERGY

Solar energy is the most abundant of all energy resources and can even be harnessed in cloudy weather. The rate at which solar energy is intercepted by the Earth is about 10,000 times greater than the rate at which humankind consumes energy.

Solar technologies can deliver heat, cooling, natural lighting, electricity, and fuels for a host of applications. Solar technologies convert sunlight into electrical energy either through photovoltaic panels or through mirrors that concentrate solar radiation.

Although not all countries are equally endowed with solar energy, a significant contribution to the energy mix from direct solar energy is possible for every country.

The cost of manufacturing solar panels has plummeted dramatically in the last decade, making them not only affordable but often the cheapest form of electricity. Solar panels have a lifespan of roughly 30 years, and come in variety of shades depending on the type of material used in manufacturing.

4: WIND ENERGY

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Wind energy harnesses the kinetic energy of moving air by using large wind turbines located on land (onshore) or in sea- or freshwater (offshore). Wind energy has been used for millennia, but onshore and offshore wind energy technologies have evolved over the last few years to maximize the electricity produced - with taller turbines and larger rotor diameters.

Though average wind speeds vary considerably by location, the world's technical potential for wind energy exceeds global electricity production, and ample potential exists in most regions of the world to enable significant wind energy deployment.

Many parts of the world have strong wind speeds, but the best locations for generating wind power are sometimes remote ones. Offshore wind power offers tremendous potential.

5: GEOTHERMAL ENERGY

Geothermal energy utilizes the accessible thermal energy from the Earth's interior. Heat is extracted from geothermal reservoirs using wells or other means.

Reservoirs that are naturally sufficiently hot and permeable are called hydrothermal reservoirs, whereas reservoirs that are sufficiently hot but that are improved with hydraulic stimulation are called enhanced geothermal systems.

Once at the surface, fluids of various temperatures can be used to generate electricity. The technology for electricity generation from hydrothermal reservoirs is mature and reliable, and has been operating for more than 100 years.

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6: HYDROPOWER

Hydropower harnesses the energy of water moving from higher to lower elevations. It can be generated from reservoirs and rivers. Reservoir hydropower plants rely on stored water in a reservoir, while run-of-river hydropower plants harness energy from the available flow of the river.

Hydropower reservoirs often have multiple uses - providing drinking water, water for irrigation, flood and drought control, navigation services, as well as energy supply.

Hydropower currently is the largest source of renewable energy in the electricity sector. It relies on generally stable rainfall patterns, and can be negatively impacted by climate-induced droughts or changes to ecosystems which impact rainfall patterns.

The infrastructure needed to create hydropower can also impact on ecosystems in adverse ways. For this reason, many consider small-scale hydro a more environmentally-friendly option, and especially suitable for communities in remote locations.

7: OCEAN ENERGY

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Ocean energy derives from technologies that use the kinetic and thermal energy of seawater - waves or currents for instance - to produce electricity or heat.

Ocean energy systems are still at an early stage of development, with a number of prototype wave and tidal current devices being explored. The theoretical potential for ocean energy easily exceeds present human energy requirements.

8: BIOENERGY

Bioenergy is produced from a variety of organic materials, called biomass, such as wood, charcoal, dung and other manures for heat and power production, and agricultural crops for liquid biofuels. Most biomass is used in rural areas for cooking, lighting and space heating, generally by poorer populations in developing countries.

Modern biomass systems include dedicated crops or trees, residues from agriculture and forestry, and various organic waste streams.

Energy created by burning biomass creates greenhouse gas emissions, but at lower levels than burning fossil fuels like coal, oil or gas. However, bioenergy should only be used in limited applications, given potential negative environmental impacts related to large-scale increases in forest and bioenergy plantations, and resulting deforestation and land-use change.

9: Coal

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Coal is a nonrenewable fossil fuel that is combusted and used to generate electricity. Mining techniques and combustion are both dangerous to miners and hazardous to the environment. However, Coal is the largest source of energy for generating electricity in the world, and the most abundant fossil fuel in the United States.

10: Petroleum

Petroleum, or crude oil, is a fossil fuel that is used widely in the daily lives of global consumers. In its refined state, petroleum is used to create gasoline, kerosene, plastics, and other byproducts. Petroleum is a finite material and non-renewable energy source.

11: Natural Gas

Natural gas is a fossil fuel energy source, formed from the remains of plants, animals and microorganisms that lived millions of years ago. The energy that the decayed

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organisms originally obtained from the sun via photosynthesis is stored as chemical energy within the molecules of methane and other hydrocarbons.

Natural gas can be burned for heating, cooking, and electricity generation. It is also used as a chemical feedstock in the manufacture of plastics and other commercially important organic chemicals and less commonly used as a fuel for vehicles.

Exercise

Manage your own planet! Choose the energy source you would like to use as needed. Don't forget to pay attention to your environment quality!
You have time limit.
On the right side they will manage: Environment, Energy, Budget and Population. On the left side all renewable and non-renewable resources with corresponded impact on environment, energy and budget.
In this game they will see the world in the center. For each good decision regarding using reneweble energy, the word will be more green and blue and sustainable. For every non-renewable usage of energy, the world will be more grey and burning.

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ITC COMPUTING

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ACTIVITY 4.6 - ITC COMPUTING

Introduction

Information and Communications Technology (ICT) is the use of computing and telecommunication technologies, systems and tools to facilitate the way information is created, collected, processed, transmitted and stored. It includes computing technologies like servers, laptop computers and software applications, as well as the wired and wireless communication technologies that support telephones, the Internet, the Internet of Things (IoT) and the metaverse. The goal of ICT is to improve access to information and make human-to-human, human-to-machine and machine-to-machine (communication easier and more efficient.

Objective

The main goal of this module is, through a challenge, reach the knowledge and understanding of the functionality of ICT devices and the interaction with human-lives.

Subject development

When it comes to conducting data research, you'll need different collection, hypotheses and analysis methods, so it's important to understand the key differences between quantitative and qualitative data:

- **Quantitative data** is numbers-based, countable, or measurable. **Qualitative data** is interpretation-based, descriptive, and relating to language.

- **Quantitative data** tells us how many, how much, or how often in calculations. **Qualitative data** can help us to understand why, how, or what happened behind certain behaviors.

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- **Quantitative data** is fixed and universal. **Qualitative data** is subjective and unique.

- **Quantitative research** methods are measuring and counting. **Qualitative research** methods are interviewing and observing.

- **Quantitative data** is analyzed using statistical analysis. **Qualitative data** is analysed by grouping the data into categories and themes.

Exercise

Match the qualitative and quantitative data correctly.
They will have time limited.

Students will enter in a SYL ICT Computing Training and make a test:

1 - BLONDE HAIR – quality
2 – FIRST PLACE – quantitive
3 – ROMANIAN – qualitive
4 - 100°C – quantitive
5 – LEATHER – qualitive
6 – 18:30 – quantitive
7 – COMFORTABLE – qualitive
8 – 25€ - quantitive
9 – DURABLE – qualitive
10 – 183CM – quantitive

You have successfully completed this activity!
Now discuss among yourselves:

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How far should we go on giving access to our personal data in order to guaranty security and still have privacy?

The objective is to generate critical thinking and teachers should guide the students in this way

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MARKETING

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ACTIVITY 4.7 MARKETING

Introduction

In the dynamic landscape of business, successfully promoting a brand requires a comprehensive understanding of the company, its market, and the audience it seeks to engage. Without this foundational knowledge, any promotional strategy is bound to falter. This text underscores the importance of a strategic approach by highlighting key steps to effectively promote a brand or product.

The initial step emphasizes the need for a profound understanding of the company's position in the market, identifying target audiences, and recognizing the opportunities and challenges within the sector. By delving into these aspects, businesses can discern how to differentiate themselves and attract a broader audience for their solutions.

Objective

The aim of this module is to highlight the critical importance of a strategic approach in successfully promoting a brand within the dynamic business landscape. It emphasizes the necessity of thoroughly understanding the company, its market, and the target audience. The intention is to address the significance of companies having a well-defined brand identity to be easily recognized by consumers. We will analyse some brands from various industries in different countries.

Subject development

1- Know your company and your market

There is no way to promote a brand without it.

After all, there is no strategy that works perfectly if you don't know what your business is, who it is aimed at and what the opportunities, shortcomings and competitiveness of the sector are.

Therefore, it is advisable to analyse in depth how your company is positioned in the market, and what you can do differently so that more people reach your solutions.

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2- Know your target audience

Next, entrepreneurs who ask themselves "how to promote my brand/product" should extend their scope of attention to the consumer. Who, after all, can benefit from your services or products?

Through these responses, you can draw an approximate profile of your consumer, those who would be willing to listen to your proposal and follow your news.

In addition, this information helps you better understand your Ideal customer's consumption habits and, especially, where they are most concentrated. With this, you discover how to better interact with them and where to focus the main actions to know how to promote your brand/product.

3- Follow your own recipe

Even if you keep an eye on the competition's movement, not always their successful strategy will have the same effect on your business.

After all, you can be at different times, with different actions and with different goals. Therefore, each hefty strategy must be made exclusively to meet your needs and the demand of your consumer.

So, if Instagram is the best solution found on how to promote my brand/product, in a hypothetical example, that doesn't mean it will be the best alternative for you.

Which brings us back to the previous topic: understand the habits of your target audience and learn to interact with them according to their goals and what they are most looking for.

4- Combine strategies

Consumers may be increasingly online, but that does not mean that the internet should be the only channel used to promote a brand/Product.

Mixing online and traditional advertising campaigns is still a good way to impact your consumer wherever they are, allowing you to expand your brand awareness in their minds.

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Even so, the importance of having a responsive and updated website, a blog with constant publications and production of relevant content for your target audience and pages on social networks that allow consumer engagement is significant.

They are strategies that complement each other in order to answer your question so repeated in your mind: "how to promote my brand/Product"?

5- Work on your visual identity

Finally, an excellent strategy for those who want to know how to promote a brand/Product is to start with the work of creating their own identity.

This means working on an attractive logo that is consistent with its mission and values, a visual identity that establishes a relationship with the consumer and a defined positioning — something we talked about in the first topic.

In this way, it is easier for consumers to pay attention to your brand/Product and what it has done to attract them. Then a good communication strategy will help spark and retain their interest in your business.

Exercise

STEP 1:

Study the companies from four different countries. Select a country first and then select a company.

They will have time limited.

BELGIUM

NEUHAUS

NEUHAUS

BELGIUM • 1857

Brand logo

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Jean Neuhaus I was a Swiss student who moved to Brussels in 1857 where he opened a pharmacy in the prestigious Queen's Gallery in central Brussels. To delight his customers in the apothecary, Jean Neuhaus started covering his medicines with the finest Belgian chocolate. The Neuhaus family run the pharmacy from generation to generation using the same technique to sell their medecines. In 1912, Jean III, grandson of Jean Neuhaus I, evolved this idea into the Belgian praline as we know it today: chocolate filled with delight instead of medicine.

For over 100 years, ever since Jean Neuhaus Jr. invented the Belgian praline in 1912, all Neuhaus chocolates have been made entirely in Belgium.

Belgian chocolate is recognized worldwide for its quality and taste. Belgian chocolatiers are known worldwide for their creativity and innovation. In 2015 Belgium had more than 500 chocolatiers and 2,000 chocolate shops. Belgium produces 172,000 tons of chocolate per year mostly intended for export.

LEFFE

Brand logo

The Leffe history has its origin in Notre-Dame de Leffe, in the province of Namur in southern Belgium, where an abbey of Premonstratensian canons was founded in 1152. The canons started to brew beer at Leffe in 1240, developing a unique beer with a subtle taste and high alcohol content, brewed only at the abbey.

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It was in fact a difficult period: the numerous epidemics which plagued the European territory during the 13th and 14th century made drinking water unsafe. Fortunately, an ideal solution emerged: brewing beer. During the brewing process, the boiling temperature killed the microbes, which made beer safe to drink.

Today, there are five beers under the Leffe label: blonde, brune, Leffe 9°, triple, and radieuse, which are still being produced in Belgium. Leffe beers are now available in more than 60 countries worldwide.

On average, Belgians drink 68 litres of beer each year. In 2016, UNESCO inscribed Belgian beer culture on their list of the intangible cultural heritage of humanity.

PORTUGAL

BELCINTO

-

Belcinto®
SINCE 1961

Brand logo

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Belcinto history began in 1961 in S. João da Madeira, a city in the north of Portugal, which is internationally characterized by its art in creating leather goods for generations

Their birth is marked by the architecture of leather belts hand crafted out of cow and calf leather. As Belcinto excelled in the manufacturing of hand-made leather belts, they broaden their product lines to kid´s school bags, men´s travel bags, wallets, hats and even women´s purses and accessories

Today, 56 years later, Belcinto continues to produce with passion, characterized by a unique legacy of craftmanship with incomparable quality which permits them to concede national market leadership.

LUÍS ONOFRE

LUIS ONOFRE
SHOES & ACCESSORIES

Brand logo

Inspired by his family shoemaking tradition and the desire of feathering design shoes for the future generations, Luís Onofre designed his first collection that led to the birth of his brand. The year was 1993. Since then, Onofre has become an international brand, synonymous with luxury. It has gained the trust and patronage of some of the world's most famous women, from Michelle Obama to Princess Letizia of Spain.

In order to make shoes and accessories of extremely high quality, which fall into the luxury segment of the market, it is important to select high-class materials, as well as to combine innovation and technology with the level of detail of a handmade production.

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Quality assurance is held-up as perhaps Onofre’s most important business operation. Each produced piece (every single one, there is no sampling) is manually inspected by our people. The next step is the delicate packing and delivery process. A shoe is born, the shoe fits, wear it with pride.

Since 2009, the group assures the technical development and production of several collections of accessories, leather goods and footwear for partnerships developed between the H&M Group and other brands such as Jimmy Choo, Marni, Anna dello Russo, MMMargiela, Isabel Marant, Balmain, Erdem, Giambattista Valli and Simone Rocha .

In 2016, Luis Onofre launched men’s footwear collection.

Currently, 93% of the production by the group is exported to clients located throughout the world.

ROMANIA

BITDEFENDER

Brand logo

Bitdefender is a recognized leader in IT security, offering superior solutions for preventing, detecting and responding to cyber security incidents. Protecting millions of individual users and businesses since 2001 Global leader in cyber security.

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Bitdefender offers cyber security solutions with leading efficiency, performance and ease of use for small and medium-sized companies, mid-market companies and individual users. Guided by the vision of being the world's most trusted provider of cyber security solutions, Bitdefender is committed to defending businesses and individual users around the world from cyber attacks to transform and improve their digital experience.

BitDefender: the well-known Romanian company producing the antivirus solution with the same Romanian brand name, BitDefender, is already a hit on the international market. The company's representatives expressed, in September this year, the desire to control 2% of the international market of antivirus solutions, a not modest ideal and, fortunately, not at all impossible for the Romanian programmers so appreciated abroad. Currently, BitDefender has open offices in large countries such as Romania, USA, Great Britain, Spain and Germany. Regarding the income balance, only 5% of these come from the domestic market.

MUSETTE

Brand logo

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One of the main Romanian accessories brands, Musette is a 15 million euro family business, and currently has 15 stores in Romania, USA, Israel and Bulgaria. The company plans to expand its activity in Luxembourg, Russia, Germany, France and Italy.

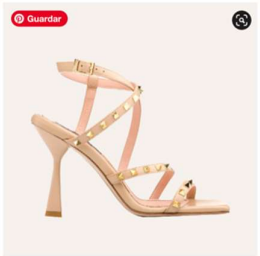
Musette represents a spirit that emanates and imposes respect for people, for life and for quality

Musette is a company dealing with the production and retail of shoes and bags in Romania owned by Roberto and Cristina Bâtlan. In April 2014, the company owned 28 stores, of which 19 were in the national market, and the rest outside the country, respectively in Israel (2), Bulgaria (2), Mongolia (1), Lebanon (1), France (1), Austria (1) and USA (1).[1]

In September 2010, the company also opened a store in New York.[2] The company opened a bag factory in 2002, and a shoe factory in 2004, both in Bucharest.[3] In 2007, the shoe factory was moved to Huși.[4]

The brand brings to the Romanian market an original breath, a creative spirit and comfortable shoes of the best quality, produced with care and professionalism

Being in the industry means being aware of the news and trends for the next seasons, knowing which type of leather and accessories would be the most suitable to which we add safety, quality, technology and attention to details.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ITALY

Massimiliano Gatti - Carni pregiate - Atelier

Brand logo

The bison raised in the pastures along Lake Trasimeno is the *Bison Bison*.

But did you know that the bison had already lived in this territory 14 000 years ago? Right around the company's farm, the fossils of his ancestor, the Bison Priscus, have been found!

The fossils are kept at the Paleontological Museum of Pietrafitta!

After the first taste of the tenderest meat ever tried, in 2015, the bison became Massimiliano Garri's obsession, and only after three years of studies, in 2018, exploiting a vast plot of land in Panicale (PG), he created his breeding of these impressive animals by bringing 17 giants bison bison (weighing 6 quintals each) to Umbria.

The breeding of the bison, immediately showed itself in all its complexities: bison run fast, very fast, reach 60 km/h and jump about 1.70 meters, as well as being shy and if disturbed, potentially aggressive animals.

Thus, the company have designed a Hi-Tech feeder, to integrate the feeding of grass and hay of the Bison, leaving them to live completely undisturbed. The bisons are all equipped with a microchip that controls their motor activity and weight, and the manger delivers food according to the needs of each head.

This first essential step to "raise them to absent man" was fundamental in a breeding in which respect for animals ranks first. The animals live free, in the wild and in herds,

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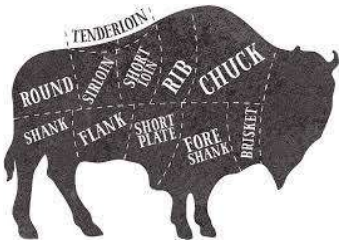
without being bothered by the human presence. They feed on the grass of the pasture and reproduce naturally.

Breeding according to nature is breeding with the Sioux philosophy

Massimiliano Gatti company shares the values of Native Americans of respect and love for nature and is honored to collaborate with them to spread the “according to nature” farming system.



As the natives teach, the company protects animals and the environment in which they live, they slaughter only when necessary for human consumption and they practice gratitude for having offered us their life, they honor their sacrifice by using everything the nature offers as a gift: this is how skins, horns, bones and wool become useful objects, like frames for glasses, belts, shoes, bags, which you can discover on Massimiliano Gatti Atelier.

COOPERATIVA OLEIFICIO POZZUOLESE

COP
COOPERATIVA
OLEIFICIO
POZZUOLESE

Brand logo

The Cooperativa Oleificio Pozzuolese, located among the green hills of Umbria, is located just 4 km from Castiglione del Lago, a splendid medieval town, included in the guide of the “most beautiful villages in Italy”, which overlooks the shores of Lake Trasimeno.

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It was born in 1969, as a derivation of an old oil mill dating back to 1900, with the aim of enhancing and improving the quality of the oil of over 250 members, highlighting its qualities and offering it to consumers with a fair quality / price ratio.

COP technologically advanced oil mill allow them to operate cold, limiting the use of water to a minimum while respecting environmental resources. The entire processing cycle is controlled in order to guarantee the very high quality of our oil. Storage and packaging are carried out in rooms with a controlled temperature of 17 ° C, the steel tanks are blanketed with food nitrogen, to safeguard the organoleptic and chemical characteristics of the product.

Last but not least, the Cooperative uses 100% of electricity produced from renewable sources.

STEP 2

Now match the products with the brands based on what you have learnt.

They have time limited:

CHOCOLATE	NEUHAUS LOGO
BEER	LEFFE LOGO
SHOES	LUIS ONOFRE LOGO
CHALLIE BAG	BELCINTO LOGO
BISON MEET	MASSIMILIANO LOGO
OLIVE OIL	COP LOGO
CYBER SECURITY	BITDEFENDER LOGO
LADY BAG	MUSSETE LOGO

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HISTORY AND HERITAGE

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ACTIVITY 4.8 - HISTORY AND HERITAGE

Introduction

Learning and development can be traced back to the very first attempts of humans to acquire knowledge and skills. Historical evidence shows that people were learning through observation, apprenticeships, trial and error, and even oral instruction long before formal methods of education were introduced. Since then, our practices have become a little more sophisticated; however, the main goal of L&D has remained essentially the same – to help learners acquire knowledge, understand concepts, cultivate skills, and develop abilities for personal and professional growth.

Objective

The introduction of the industrial revolution in the late 19th century changed the learning and development landscape forever. New machines and technologies enabled manufacturing, production, and transportation to occur much faster. As a result, many organizations started investing in training initiatives to help equip their workforce with the necessary knowledge and skills. Corporate training programs became popular during this period, focusing on teaching technical skills within an organization's defined area of expertise. This marked the beginning of learning and development as an organized industry.

Subject development

1st Industrial Revolution (1712 – 1850)

This was a period of major changes in the way products are made. It greatly affected the way people lived as well as the way they worked. Many factories were built and labourers began making large numbers of things using machines powered by engines.

1712 - 1st Steam Engine.

Thomas Newcomen invented the first productive steam engine. Before steam power, most factories and mills were powered by water, wind, horse, or man.

The steam engine as we think of it from the Industrial Revolution was largely replaced by electricity and the internal combustion engine (gas and diesel).

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1793 - Cotton gin invention

A cotton gin is a device that separates the seeds from cotton fibre. Eli Whitney used a wire screen in combination with small hooks to pull the cotton fibres through.

The invention of a cotton gin made everyday lives much easier because people can have cotton clothing and other products made of cotton much faster.

1801 - 1st steam-powered locomotive

Richard Trevithick test drove the world's first steam-powered locomotive, called the "Puffing Devil". This gives people the option to travel at a faster rate and safer than ever before. Although steam locomotives are no longer the mainstay of modern railways, many locomotives around the world are preserved on display for the observance of current and future generations.

1844 - Telegraph Invention

Samuel Morse invented the telegraph, which allows people to communicate quickly over long distances. This system allowed for messages to be transmitted much quicker and cheaper than old methods.

Although the telegraph has since been replaced by the even more convenient telephone, fax machine and Internet, its invention stands as a turning point in world history.

2nd Industrial Revolution

During this period important advances were made in the system of mass production and standardised products to more efficient manufacturing. If an item is produced in large quantities, this is usually called mass production. During this period, breakthroughs in the study of electricity and magnetism provided the basis for a large electrical industry.

1879 - Incandescent light invention

Although Thomas Edison did not invent the first electric light, he made the first practical electric light bulb that could be manufactured and used in the home. After the invention, people could safely, cleanly, and economically extend the hours of productivity, or use it for entertainment and literal enlightenment.

1908 - 1915 - Ford Motor Assembly line

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Henry Ford was the first to master the moving assembly line, and was able to reduce labour hours needed to make a car, and increased numbers of cars and parts. Ford was the first company to build large factories around the assembly line concept.

Interchangeable parts

Interchangeable parts is a basic concept of creating identical or nearly identical parts to be mass produced. These parts can then be put together to form a product. For example, cars, computers, furniture, almost all products used today, are made from interchangeable parts. This lowers the cost of the product.

3rd Industrial Revolution

During this period computers were developed, which laid a strong foundation for the development of modern-day machines. Information technology (IT) and electronics were introduced in many production processes, furthering automation in the manufacturing processes. Manufacturing and automation advanced considerably thanks to Internet access, connectivity and renewable energy.

1946 – Computer Invention

ENIAC was the first all-electronic computer designed to be capable of being reprogrammed by rewiring to solve a full range of computing problems.The first electronic computers were huge devices that weighed tons, occupied entire rooms, and were so expensive that only governments and large research organisations could afford them.

1993 - Release of World Wide Web

The World Wide Web was invented by Sir Tim Berners-Lee, na invention that made the internet technology into something that linked information together and made it accessible to everyone, connecting the world in a way that made it much easier for people to get information, share, and communicate

4th Industrial Revolution

The digitalization of manufacturing will change the way that goods are made and distributed, and how products are serviced and refined. Production systems that already have computer technology are expanded by a network connection and have a digital twin on the Internet, so to speak. This is the next step in production automation.

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1962 – today - Robotics

The world's first industrial robot was brought to life in the United States in 1962. Today, industrial robots are revolutionising manufacturing with capabilities that mimic human traits like memory and dexterity, which makes them more effective in industries like manufacturing.

1985 – today - Artificial intelligence

The applications of AI in the field of manufacturing are widespread and revolutionary. It has radically changed how products are designed, offering actionable insights into each level of designing and manufacturing.

1987 - 3D printer

3D printing is a manufacturing process that produces objects in accordance with a 3D digital model. Inventor Chuck Hull was the first person to actually build a 3D printer. At the time, the machines also cost hundreds of thousands of dollars, so 3D printing devices were installed only in heavy manufacturing plants.

2003 – Industrial Internet of Things (IIoT)

ILoT is the use of smart sensors and actuators to enhance manufacturing and industrial processes. IoT allows these devices to communicate, analyse and share data about the physical world around us via networks and cloud-based software platforms and is widely used among the big companies.

Exercise

Put the milestones in the correct historical position.

Students will have time limit to organize the timeline correctly, with the

1st Industrial Revolution (1712 – 1850)

Steam Engine.

Cotton Gin

steam-powered locomotive

Thelegraph

2nd Industrial Revolution

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Incandescent light

Ford Motor

Interchangeable parts Concept Creation

3rd Industrial Revolution

Computers

World Wide Web

4th Industrial Revolution

Robotics

Artificial intelligence

3D printer

Industrial Internet of Things (IIoT)

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Virtual Reality App

The Virtual Reality App (VR App) includes challenges where the students can interact with machines and cooperate.
It aims to provide a immersive smart environment, to be used simultaneously with the pack of contents or eventually alone, focused on the feature of i4.0 as well as other subject that compose what the students need to be skilled about and most important to call their attention to the new industry and its new opportunities.
The challenges are connected with the topics developed in the educational KIT namely: **chemistry**, **science lab**, **mechanics**, **3d printing**, **sustainability**, **itc computing**, **marketing** and **history and heritage**.

An integral video is presented in the project website It can be download to the specific Video demonstration of the SYL steam-based educational package result | Gallery (shoesyourlife.eu)

How to access the App?
It's necessary to have "vitual reality Oculus Headset" which can be of many types.

It's mandatory to download the Oculus app from the App Store (iOS) or Google Play Store (Android):

- Log in to Your Account
- Open the app and log in with your Oculus account or create a new one if you don't have an account yet.
- Connect Your Oculus Headset
- Ensure your Oculus headset is turned on and nearby.
- In the app, go to "Devices" and select your headset to pair it with the app if it's not already paired.

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Browse the Store:

- Tap on the Store icon at the bottom of the screen to browse available VR apps and games.
- Find ShoesYourLife App - Search for the app to install. You can use the search bar or browse through categories.
- Once you find the app, tap on it to view its details.
- Tap "Get." as it is free.

Install the App:

- After selecting the app, tap "Install" or "Download." The app will be added to your library and begin downloading to your headset.

Using the Oculus Headset:

- Turn on Your Oculus Headset
- Make sure your headset is powered on and you are logged in.

Open the Oculus Store:

- From the home screen, select the Store icon to open the Oculus Store.

Tips

- Wi-Fi Connection: Ensure your Oculus headset is connected to a stable Wi-Fi network for downloading apps.
- Storage Space: Check that you have enough storage space available on your headset for new apps.
- Updates: Keep your Oculus software and apps updated for the best performance and new features.
- By following these steps, you can easily install and manage VR apps on your Oculus headset.

Enjoy your virtual reality experiences!

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Resources

The study of the subjects mentioned here may require various resources, depending on the focus and approach of the program. Some of the resources that may be required include:

Laboratory Materials: For chemistry and science lab activities, access to laboratory equipment, chemical reagents, glassware, microscopes, among others, will be necessary.

3D Printers: For activities related to 3D printing, access to 3D printers and the corresponding printing materials will be necessary.

Computers and Software: For IT computing activities, students will need access to computers and relevant software for programming and IT.

Marketing Materials: For marketing activities, access to marketing resources such as advertising materials, product samples, etc., may be required.

Construction and Mechanical Materials: For mechanical activities, construction materials, tools, assembly kits, etc., may be necessary.

Sustainability Resources: For sustainability activities, students may need access to information and resources related to environmental conservation and sustainable practices.

Access to History and Heritage: For history and heritage activities, access to historical resources, cultural heritage sites, and historical documents may be necessary.

Books and Educational Materials: In addition, study materials, textbooks, and relevant learning resources may be required to support the curriculum.

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Internet Access: For online research and learning, internet access is often essential.

Virtual Reality Glasses: For virtual reality activities, virtual reality glasses are required, along with compatible hardware and software.

It is important to plan and provide these resources according to the needs of each content kit, ensuring that students have access to an effective and enriching learning environment.

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Conclusions

In closing this guide on the General Programme Structure, it is evident that the foundation of any comprehensive educational program is crucial to its success. In our educational context, we have paid meticulous attention to designing a General Programme Structure comprising eight distinct hands-on Kits of Contents, each focusing on a specific area of knowledge and skill development.

Each of these kits has been crafted with the intention of providing a comprehensive and engaging learning experience for our target audience. These eight activity kits encompass topics ranging from chemistry and science labs to mechanics, 3D printing, sustainability, IT computing, marketing, and history and heritage.

These eight kits form the cornerstone of our program, providing a wide range of experiences that cater to the varied interests and needs of our students. Together, they create a holistic and engaging educational journey that prepares well-rounded individuals to face the challenges and opportunities of the future. As we explore these activities, we encourage curiosity, innovation, critical thinking, and creativity, empowering our students to excel in an ever-evolving world.

We are excited about the prospect of sharing these resources and learning opportunities with our educational community. We hope that these content kits inspire a lasting passion for learning and encourage the next generation to embrace knowledge as a tool for shaping a better future. We look forward to witnessing the positive impact these activities will have on our students and to witnessing the achievements that will arise from this solid foundation of learning. The future is promising, and our program is poised to empower it.

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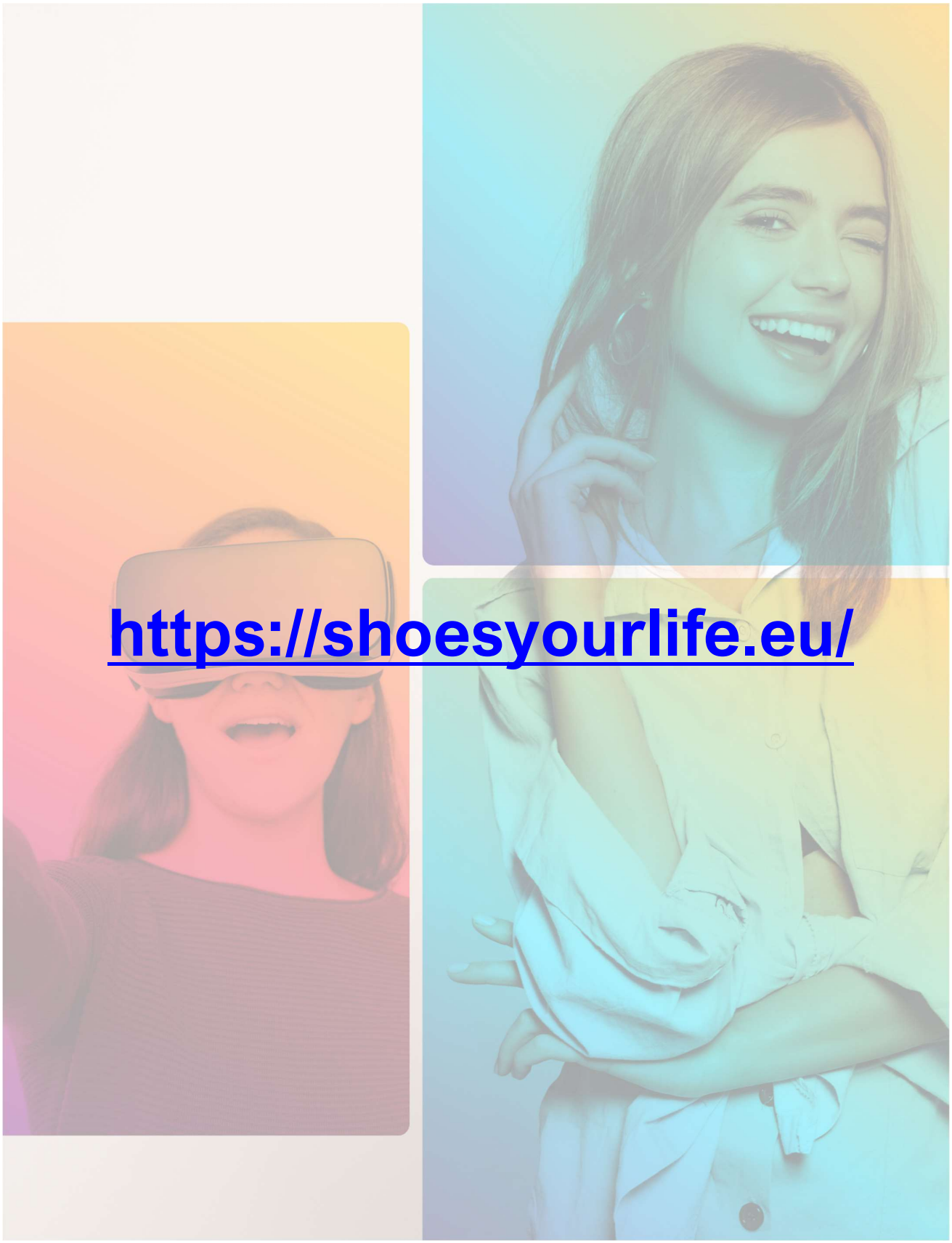

https://shoesyourlife.eu/

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