TRABAJO DE FIN DE GRADO

Grado en Educación Primaria

Programación Didáctica dirigida a 5º de Educación Primaria

Annual syllabus for Arts & Crafts in 5th Grade Primary Education

Designing a greener future!

A STEAM-CLIL Approach to the 2030 Agenda through Arts

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And of course, to my parents, as without them, this would not have been possible. I am deeply grateful for the opportunity they have given me to study at this university and for their constant guidance, love and support. They inspire me to be a better person every day.

DECLARATION OF THE USE OF ARTIFICIAL INTELLIGENCE

The use of Artificial Intelligence (AI) tools in this Final Degree Project has been carried out in accordance with the educational objectives of the CLIL subject taken in the fifth year of the Degree in Early Childhood and Primary Education. Within this subject, the professional and pedagogical use of AI forms part of the development of student teachers' digital, linguistic, and methodological competences.

Specifically, AI tools have been used as support for the analysis of the linguistic demands of curricular content in a CLIL context, as well as for the design and refinement of scaffolding strategies aimed at facilitating students' reception, transformation, and production of knowledge in the foreign language. This includes support in identifying key language functions, vocabulary, and discourse features, and in developing strategies that promote meaningful content learning and language development.

At all times, AI has been used as an assistive resource to support reflection and decision-making, while the final pedagogical choices, interpretations, and designs presented in this project are the result of the author's own academic work and professional judgment.

ABSTRAC

This Final Degree Project presents an innovative annual syllabus designed for the 5th year of Primary Education (10-11 years old). The proposal integrates the STEAM (Science, Technology, Engineering, Arts, and Mathematics) and CLIL (Content and Language Integrated Learning) approaches, using Arts Education as the core vehicle to address the United Nations' 2030 Agenda. The project is structured into two main sections. The first presents the theoretical framework with an analysis of the synergy between bilingual education, the STEAM-CLIL approach, and Education for Sustainable Development (ESD). In the second, three learning situations ("Crafting a greener world," "The colours of humanity," and "Designing tomorrow") comprising 15 gamified challenges. The syllabus follows a narrative thread titled *The Junior United Nations Assembly* (JUNA), where students act as international delegates. Guided by E.L.I.A.S., a fictional secretary-general, students solve real-world problems to "unlock" specific Sustainable Development Goals (SDGs). Out of the 15 challenges distributed in the 3 Learning situations challenge 4 will be developed in detail, including the activities, materials and scaffolding strategies as an example of how this syllabus can be implemented in the classroom. The final output is a digital delegate's portfolio, which demonstrates the simultaneous growth of linguistic proficiency in English, scientific literacy, and social consciousness.

***Keywords*:** CLIL, STEAM, 2030 Agenda, Arts Education, Sustainable Development Goals (SDGs), Primary Education.

RESUMEN

Este Trabajo de Fin de Grado presenta una programación didáctica anual innovadora diseñada para el 5.º curso de Educación Primaria (10-11 años). La propuesta integra los enfoques STEAM (Ciencia, Tecnología, Ingeniería, Arte y Matemáticas) y AICLE (Aprendizaje Integrado de Contenidos y Lenguas Extranjeras), utilizando la Educación Artística como vehículo principal para abordar la Agenda 2030 de las Naciones Unidas. El proyecto se estructura en dos secciones principales. La primera presenta el marco teórico con un análisis de la sinergia entre la educación bilingüe, el enfoque STEAM-AICLE y la Educación para el Desarrollo Sostenible (EDS). En la segunda, se desarrollan tres situaciones de aprendizaje (Crafting a greener world, The colours of humanity y Designing tomorrow) que comprenden 15 retos gamificados. La programación sigue un hilo narrativo titulado The Junior United Nations Assembly (JUNA), donde los estudiantes actúan como delegados internacionales. Guiados por E.L.I.A.S., un secretario general ficticio, los alumnos resuelven problemas del mundo real para desbloquear Objetivos de Desarrollo Sostenible (ODS) específicos. De las 15 unidades didácticas distribuidas en las 3 situaciones de aprendizaje, se desarrollará en profundidad la unidad didáctica 4 incluyendo actividades, materiales y estrategias de andamiaje como ejemplo de cómo llevar a cabo esta propuesta en un aula real. El producto final es un porfolio del delegado digital, que demuestra el crecimiento simultáneo de la competencia lingüística en inglés, la alfabetización científica y la conciencia social.

Palabras clave: AICLE, STEAM, Agenda 2030, Educación Artística, Objetivos de Desarrollo Sostenible (ODS), Educación Primaria

INDEX

1. INTRODUCTION

Education nowadays, implies more than just academic achievement; it requires fostering socially responsible citizens committed to a sustainable future. This annual syllabus for the third cycle of primary education (5th Grade) focuses on the Sustainable Development Goals (SDGs) through STEAM and Content and Language Integrated Learning (CLIL) approach; placing a strategic emphasis on the “A” for Art as the core vehicle to integrate Science, Technology, Engineering and Mathematics. By combining cross-curricular projects with global awareness, students will improve their linguistic competence, creativity, and social consciousness simultaneously.

The syllabus is structured around 15 didactic units, divided into three terms. They are designed based on an engaging gamified narrative thread: "The Junior United Nations Assembly." This storyline ensures coherence and progression throughout the year. Each unit functions as a mission presented by a fictional AI-generated Secretary-General, challenging students—acting as international delegates—to "unlock" specific SDGs. Through Project-Based Learning (PBL) and Inquiry-Based Learning (IBL), these challenges focus on real-life problem solving, helping students think critically, collaborate in "national delegations," and produce meaningful artistic outputs with a STEAM focus while using the foreign language.

The first section of this project examines the theoretical framework, analysing the STEAM-CLIL approach, the role of Arts in the curriculum, and the integration of the UN's 2030 Agenda in Primary Education. The second section puts this theoretical framework into practice, presenting the syllabus design and the specific design of the units; demonstrating how Art and English integrated with a STEAM approach, can foster critical thinking and social awareness among students.

1.1 Justification

This project connects the European Union's framework on key competences, especially citizenship and cultural awareness and expression, with the interdependent relationship between Education for Sustainable Development (ESD), Art Education, and the CLIL approach. According to Coyle (2010), the "4Cs" framework (Content, Communication, Cognition, and Culture) fits perfectly with the goal of combining meaningful global issues and language learning. This helps students to think critically, be creative, and work together to solve complex problems.

I have chosen this focus on the Sustainable Development Goals (SDGs) through Art because it offers an engaging way to promote foreign language learning through tangible, creative experiences within the CLIL approach, which is widely implemented in the schools of the Community of Madrid. By rooting this proposal in the 2030 Agenda and supporting the UNESCO Roadmap for Arts Education, this interdisciplinary approach cultivates essential skills such as social responsibility, multilingual communication, and visual literacy, equipping students with the tools to become active global citizens.

On a personal level, the inspiration for this topic stems from my international academic experiences. During my Erasmus exchange, the subject *Global Citizenship* profoundly impacted my pedagogical view, highlighting the urgency of teaching sustainability in schools. Furthermore, during my international internship in Norway, I witnessed firsthand how English is successfully integrated across the curriculum in multicultural classrooms, serving as a natural bridge for communication among students from diverse backgrounds.

Finally, this annual syllabus represents not only my dedication to English teaching but also the culmination of my degree. It synthesizes the theoretical knowledge acquired at university with the practical insights gained abroad, embodying the educational values I strongly support.

1.2. Objectives

1.2.1. Objectives of the theoretical framework

- Analyse the synergy between the STEAM-CLIL approach (with an emphasis on the Art) and Education for Sustainable Development (ESD) to justify an interdisciplinary methodology.
- Analyse the theoretical and methodological foundations of the STEAM-CLIL approach in Primary Education.
- Explore how STEAM projects can serve as a universal language to help young students understand complex global concepts (SDGs) such as climate action and social equity.
- Support the syllabus design with current academic references and legal frameworks (LOMLOE) that demonstrate the necessity of fostering the Citizenship and Cultural Awareness competences in the 21st century.

1.2.2. Objectives of the curriculum design

- Design an innovative annual syllabus for Year 5 that integrates English, STEAM, and the 2030 Agenda in a practical and engaging way.
- Create a coherent gamified narrative ("The Junior UN Assembly") that contextualizes learning, motivating students to solve real-world problems through STEAM projects.
- Develop flexible learning situations based on the Project-Based Learning (PBL) methodology, ensuring they are adaptable to different learning rhythms and promote cooperative work.

1.2.3. Personal goals

- Integrate the practical insights from my international internship in Norway, specifically regarding the successful use of English as a vehicular language in multicultural environments.
- Demonstrate my professional identity as a teacher who values creativity, sustainability, and linguistic competence as essential tools for the future.
- To develop professional teaching competences in the design of interdisciplinary and bilingual materials.
- Foster an inclusive STEAM environment ensuring all students to feel capable and empowered to succeed.

2. THEORETICAL FRAMEWORK

2.1. Bilingual education

The implementation of bilingual education in the Community of Madrid represents a pioneering and consolidated model that has transformed the regional educational landscape since its foundation in the 2004-2005 academic year. This program was designed to provide students with a high level of communicative competence in English by using it as a vehicular language for content subjects; it has grown from a small group of public schools, 26 in 2004, to a widespread network that encompasses 418 public primary schools (CEIP) and 224 state-subsidized (*concertado*) primary schools (Comunidad de Madrid, 2026). The success of this regional context is rooted in its ability to integrate linguistic immersion with rigorous academic standards, ensuring that students develop the necessary tools to function in a globalized society while meeting the specific requirements of the Madrid curriculum.

The legislative framework governing this model is organized through a clear hierarchy of regulations that align regional practices with European and national mandates. At the European level, the foundation is established by the White Paper on Education and Training (Commission of the European Communities, 1995) and the Action Plan 2004-2006 (Commission of the European Communities, 2003); these documents emphasize plurilingualism as a fundamental right and a strategic necessity for all citizens. Nationally, the Organic Law 3/2020 (LOMLOE) and Royal Decree 157/2022 establish the competency-based framework that situates plurilingualism as a key element of the student exit profile. In the Community of Madrid, Decree 61/2022 provides the specific curricular structure for primary education, while Order 5958/2010 regulates the daily operation of bilingual schools, mandating that at least thirty percent of the school week be taught in the target language. These regulations ensure that the use of English in the classroom is not an isolated activity but a legally supported pedagogical strategy.

2.1.1. The knowledge age

The knowledge age represents the transition from an industrial economy to one based on the strategic management of information; this shift was defined in the 1995 White Paper as the birth of a "learning society" where knowledge is the motor of progress. In this context, traditional rote learning is replaced by lifelong learning and the mastery of multiple languages, which are essential tools for accessing global data. Education is no longer limited to transmitting local facts but seeks to empower students to participate in a worldwide exchange of ideas; therefore, the

Figure 1. Visual graphic of the regulatory hierarchy integrated into the STEAM-CLIL classroom. Source: Own elaboration.

2.2. The CLIL approach

Content and Language Integrated Learning (CLIL), known as AICLE (*Aprendizaje Integrado de Contenidos y Lenguas Extranjeras*) in Spain, is an educational approach that integrates the learning of content in a subject with the development of competencies in a foreign language. CLIL is characterized by its dual approach, since it combines linguistic and disciplinary objectives simultaneously (Dalton-Puffer & Nikula, 2006). CLIL not only seeks to teach a language as a communicative tool but also uses it as a vehicle to acquire knowledge in specific areas of the curriculum, such as science, mathematics, technology, and, most importantly for this syllabus, Art Education.

In recent decades, CLIL has expanded significantly in Europe and other international contexts due to factors such as the growing role of English as a *lingua franca* in the global economy, media, and culture (Mehisto, Frigols, & Marsh, 2008). In addition, this approach has been promoted by educational policies that favour multilingualism and early teaching based on meaningful and real contexts. As authors Coyle, Hood, and Marsh (2010) stated, the effects of globalization are most noticeable in some parts of the world, especially in Europe during the period of rapid integration; this impact meant the need to improve educational results in language and communication to address global challenges like the Sustainable Development Goals (SDG's).

However, the implementation of CLIL varies around Europe according to educational traditions, local needs, and available resources, both human and material (Wolff, 2009). In Spain, it is developed as a government policy to encourage bilingualism, following a top-down model. According to Coyle, Hood, and Marsh (2010), the fundamental principles of CLIL include active learning, meaningful interaction, cultural integration, and the development of cognitive competencies along with linguistic ones; these principles are essential when Art acts as the guiding axis of a STEAM proposal.

According to Mehisto, Marsh, and Frigols (2008) the successful implementation of CLIL is guided by several key principles. Firstly, learners are encouraged to take an active role in their education, creating their own knowledge and understanding; this personalized learning approach fosters a sense of ownership, which is vital in artistic and technical creation. Secondly, the linguistic demands of both content and cognitive processes must be carefully analysed to ensure accessibility and transparency. Thirdly, interaction within the learning environment is fundamental, particularly when instruction occurs in a foreign language; this promotes authentic communication and collaboration within the cooperative groups.

Moreover, CLIL recognizes the complex relationship between languages and cultures. Developing intercultural awareness is not only a key outcome but also a fundamental component of the learning process, directly contributing to the global citizenship required by the 2030 Agenda. Finally, CLIL must be adapted to the broader educational context, taking into account variables such as learners' needs, institutional goals, and societal demands. These principles ensure that CLIL remains flexible and effective across diverse educational settings, allowing the integration of STEAM areas through a common foreign language.

2.2.1. CLIL methodological principles

The methodological foundation of CLIL is built upon a "dual-focused" educational approach where the target language and the non-linguistic content are given equal pedagogical weight. According to Custodio Espinar (2019), the effectiveness of a CLIL syllabus is not accidental but depends on the deliberate and strategic planning of these principles within each teaching unit. This ensures that language progression is not dictated by a traditional grammar-based teaching, but by the specific communicative requirements of the content, in this case, the STEAM and SDG challenges.

A primary principle in this methodology is the transition from Basic Interpersonal Communicative Skills (BICS) to Cognitive Academic Language Proficiency (CALP). As Dale and Tanner (2012) suggest, while students might use English for everyday social interactions (BICS), the CLIL classroom must empower them to use formal, technical language (CALP) to describe scientific processes or artistic techniques. This transition is made possible through scaffolding, which acts as a temporary support system using visual aids, sentence frames, and graphic organizers; to help 5th-grade learners bridge the gap between their current linguistic level and the complex cognitive demands of the syllabus (Ioannou-Georgiou & Pavlou, 2011).

2.2.2. The 4Cs Framework

To achieve a truly integrated experience, this project adopts the 4Cs Framework proposed by Coyle, Hood, and Marsh (2010). This model serves as the primary pillar for the syllabus design, ensuring that learning goes beyond simple translation and moves toward a holistic development of the student.

- Content: This refers to the "subject matter" or the thematic heart of the project. In this TFG, content is not just a list of facts, but a journey through the STEAM disciplines with Arts as the guiding subject. By using the 2030 Agenda and the SDGs as the core content, students engage with meaningful global issues, making the learning process authentic and purposeful.
- Communication: In CLIL, communication goes beyond "learning a language"; it is about "using language to learn." This involves three perspectives: the language *of* learning (the specific vocabulary of Art and Science), the language *for* learning (the functional language needed to work in groups or debate), and the language *through* learning (new language that emerges during the creative process).
- Cognition: CLIL challenges students to think. By integrating Bloom's Taxonomy, the syllabus moves students from Lower-Order Thinking Skills (LOTS), such as identifying colours or shapes, toward Higher-Order Thinking Skills (HOTS), such as evaluating the environmental impact of a prototype or creating an original artistic solution to a sustainability problem.
- Culture: This pillar is essential for developing global citizenship. By connecting the syllabus to the United Nations' goals, students develop intercultural awareness and an ethical understanding of their role in the world. As Coyle et al. (2010) emphasize, the "Culture" C ensures that students understand their own identity while appreciating the global context of the challenges they are solving in the classroom.

By centring the 4Cs framework, CLIL will ensure that the target 5th-grade classroom of this syllabus proposal, located in Madrid, becomes a space where linguistic proficiency and scientific innovation grow together, preparing students for the ethical and professional demands of the Knowledge Age.

2.3. STEAM Education

The STEAM approach represents a significant 21st-century pedagogical innovation that intentionally integrates Science, Technology, Engineering, and Mathematics with the Arts. This methodology functions as a transdisciplinary meta-discipline, where traditional boundaries between subjects disappear in favor of solving real-world problems (Martín & Santaolalla, 2020). Its primary objective is to prepare students for a society defined by technological uncertainty, fostering transversal competencies such as critical thinking, creativity, and effective collaboration.

Historically, the concept emerged as STEM in the 1990s via the National Science Foundation to ensure economic competitiveness. However, it evolved into STEAM as researchers recognized that innovation arises not just from logic, but from the capacity to imagine human-centered solutions (Güemes González, 2020). Today, it serves as an active learning framework where students are the protagonists, focusing on experimentation and the construction of multidisciplinary prototypes.

The relationship between STEAM and CLIL is intrinsic; both share a constructivist foundation that prioritizes meaningful learning in authentic contexts (Martín-Carrasquilla & Custodio-Espinar, 2024). In a CLIL classroom, STEAM provides the dynamic content necessary for the foreign language to become a vehicular tool for investigation and design. Furthermore, the link with Project-Based Learning (PBL) is fundamental, as it requires a final product—such as the "Junior United Nations Assembly" narrative—to drive global citizenship and sustainability.

Regarding academic performance, the STEAM approach positively impacts standardized results and overall attitudes toward learning (Martín, 2020). By integrating creativity, the anxiety often generated by pure mathematics is reduced, improving student self-efficacy and fostering a "*con-ciencia"* that connects academic knowledge with social responsibility (Martín & Santaolalla, 2020). Finally, implementing STEAM is vital for dismantling gender stereotypes. By highlighting female role models and integrating the Arts, schools can challenge the misconception that scientific talent is gendered, fostering an inclusive environment that promotes equity and diverse perspectives (Gutiérrez Pereda, 2017; Martín, 2020).

2.3.1. Context and importance of STEAM

The contemporary educational landscape is defined by digital transformation and complex global issues; in this environment, the STEAM approach provides the necessary tools for students to become active participants in a technological world. The importance of this framework lies in its ability to overcome curricular fragmentation; it enables students to apply deep, interdisciplinary thinking to solve problems related to climate change, demographic shifts, and environmental sustainability (Santaolalla & de la Roz, 2019). Furthermore, as stated before, this approach is crucial for addressing gender stereotypes.

By fostering an inclusive environment that highlights the contributions of female inventors and engineers, schools can dismantle historical biases and ensure that the scientific community benefits from diverse perspectives (Gutiérrez Pereda, 2017). The context of Primary Education is particularly important for this implementation; it is during these years that students develop their academic identity and their interest in scientific vocations. Therefore, the STEAM framework is not just a methodological choice, but a requirement for modern schools that aim to cultivate socially responsible citizens capable of using technology for the common good

2.3.2 The relevance of the A in STEAM

The inclusion of the 'A' for Arts in the STEAM acronym marks the difference between mere technical application and innovation with a social and human purpose; art is not a decorative element, but the axis that allows science to connect with civic sensibility (Santaolalla & de la Roz, 2019). Artistic Education provide design tools and spatial thinking that are critical for engineering; they allow students to visualize solutions and create multidisciplinary prototypes before building them. In this TFG, Art is one of the pillars of the pedagogical framework serving as a multimodal tool to humanize technology and communicate sustainability. This approach provides a universal language that effectively overcomes the linguistic barriers of the CLIL classroom.

Moreover, Art in STEAM acts as a powerful engine for inclusion and equity; it facilitates that students with different learning styles or linguistic competence levels find creative avenues for expression (Ribas Borrego, 2020). The artistic dimension also allows for the integration of a gender perspective and the history of female inventors and engineers, fulfilling SDG 5 on gender equality (Gutiérrez Pereda, 2017). Through platforms like "*Mujeres con Ciencia*"[1], students can discover role models who inspire their own creative processes. Art gives soul to technical projects; it ensures that the solutions created in the classroom are not only functional, but also aesthetic, ethical, and communicative.

2.3.3. Cognition and Bloom's Taxonomy in STEAM-CLIL

In a CLIL environment, students are not merely required to remember and understand scientific or artistic facts; students will progress from learning basic concepts to analysing and

[1] Mujeres con Ciencia: https://mujeresconciencia.com/

applying their knowledge to solve real-life issues and creating STEAM prototypes. According to Coyle, Hood, and Marsh (2010), challenging students cognitively while providing linguistic support is essential for cognitive engagement; this ensures that the language learning process is intellectually stimulating and relevant to the students' developmental stage. By integrating these cognitive levels into the 5th-grade syllabus, learners develop the "learning to learn" competence, which is a vital skill for navigating the complexities of the Knowledge Age.

2.3.4. The scaffolding Process in STEAM-CLIL

Scaffolding is the methodological "bridge" that enables students to perform tasks that would otherwise be beyond their current linguistic or cognitive reach; it involves the temporary support provided by the teacher to facilitate the transition from what a student can do with help to what they can do independently (Ioannou-Georgiou & Pavlou, 2011). In this bilingual project scaffolding is implemented through various strategies such as visual aids, graphic organizers, and sentence starters that help students express complex scientific ideas in English. According to Dale and Tanner (2012), effective scaffolding must be "interwoven" into the lesson, moving from high-support activities during the initial modelling phase to low-support tasks as students gain proficiency. Consequently, scaffolding ensures that the bilingual experience remains inclusive, motivating, and academically rigorous for all learners.

2.4. The 2030 Agenda for sustainable development

The 2030 Agenda for Sustainable Development is a universal plan of action adopted by the United Nations General Assembly in September 2015; this international commitment, signed by 193 Member States, establishes 17 Sustainable Development Goals (SDGs) and 169 targets that aim to eradicate poverty, protect the planet, and ensure prosperity for all under the principle of "leaving no one behind" (United Nations, 2015). This agenda represents a comprehensive roadmap that balances the economic, social, and environmental dimensions of development; it is a global call for collaboration between governments, institutions, and civil society to transform our world by the year 2030. In the educational sphere, the integration of the SDGs is fundamental for developing an informed and conscious citizenship from an early age; working on these goals in Primary Education allows students to acquire values, attitudes, and critical skills to face current global challenges (*Ministerio de Derechos Sociales, Consumo y Agenda* 2030, 2024).

Academic research emphasizes that integrating the SDGs into the school curriculum fosters essential 21st-century competencies, including critical thinking, complex problem-solving, and socio-emotional skills such as empathy (UNESCO, 2017). By engaging with the 2030 Agenda, students transition from passive learners into active global citizens who understand the interconnected nature of social, economic, and environmental challenges; this educational approach transforms the classroom into a dynamic space for ethical reflection and social change (United Nations, 2015).

Furthermore, working with the SDGs provides a meaningful framework that significantly increases student motivation through the exploration of real-world issues such as climate action, gender equality, or social justice. This integration ensures that schooling is not only an academic exercise but also a process of developing the values and attitudes necessary to contribute to a more equitable world.

2.5. A CLIL approach to the 2030 Agenda with a STEAM focus

The convergence of CLIL the 2030 Agenda for Sustainable Development, and the STEAM framework (Science, Technology, Engineering, Arts, and Mathematics) constitutes the pedagogical cornerstone of this syllabus; in the contemporary Knowledge Age, bilingual education must transcend mere linguistic instruction to become a primary vehicle for global and scientific literacy. This integrated model responds to the vision articulated in the White Paper on Education and Training (Commission of the European Communities, 1995), which identified the need for a "learning society" capable of managing complex information across linguistic borders. The CLIL approach, as defined by Coyle, Hood, and Marsh (2010), provides the ideal structure for this integration through its 4Cs framework; Content is supplied by the global challenges of the Sustainable Development Goals (SDGs), while Cognition is stimulated through the higher-order thinking skills required in STEAM problem-solving. Furthermore, Communication occurs naturally as English is used as the vehicular tool to research and debate solutions, and Culture is manifested in the development of responsible global citizenship (UNESCO, 2017).

A distinctive feature of this syllabus is the strategic adoption of Arts as the guiding subject within the STEAM ecosystem; while traditional models often relegate the arts to a secondary role, this project positions them as the primary engine for inquiry and the visualization of abstract concepts. According to Yakman (2008), the STEAM approach is not simply the addition of various disciplines, but a holistic integration where the Arts provide the creativity, design, and humanistic perspective necessary to make scientific and technological innovations truly sustainable. By using Art Education as the backbone of the curriculum in a CLIL environment, "design thinking" is fostered among 5th-grade students; this allows them to not only learn about affordable energy (SDG 7) or climate action (SDG 13), but to materialize that knowledge through technical and artistic creation. This methodology bridges the gap between theoretical scientific data and practical, aesthetic communication, making the learning process more inclusive and multidimensional.

The implementation of this bilingual-artistic-scientific approach aligns directly with the requirements of the Community of Madrid, specifically Decree 61/2022; this regulation emphasizes the importance of cross-curricular competencies and active methodologies that prepare students for international environments. The long-standing implementation of the

Bilingual Program in the Community of Madrid has demonstrated that using English in non-linguistic areas like Art enhances CALP; it exposes students to technical and functional vocabulary that is highly significant for their development (Dale & Tanner, 2012). Working on the SDGs through a STEAM lens led by the Arts ensures that linguistic immersion is not an isolated process, but a deep learning experience where knowledge is constructed through experimentation and ethical commitment. This approach is particularly effective for 5th-grade students, as the visual and tactile nature of Art provides the necessary scaffolding to support their developing English skills.

Finally, the integration of the 2030 Agenda allows the school to function as a catalyst for social change. By implementing a simulated *Junior United Nations Assembly* (JUNA), the Project-Based Learning (PBL) model within this STEAM-CLIL framework empowers students to act as UN delegates. This methodology does not only promote the improvement of linguistic proficiency in English, but it also develops empathy, resilience, and critical thinking; these are essential competencies identified in the 1995 White Paper as requirements for the modern era. In conclusion, the proposed approach transforms the classroom into a space of innovation where English is the tool for co-creating a sustainable future; it validates Art as a fundamental discipline for understanding and solving the challenges of the 21st century. By the end of the syllabus, students will have moved beyond rote learning to achieve a profound understanding of how their creative and scientific efforts can contribute to the global goal of "leaving no one behind" (United Nations, 2015).

3. STEAM-CLIL ANNUAL SYLLABUS

3.1 Contextualization

3.1.1. School analysis

This syllabus has been designed for Loyola Horizonte a semi-private Catholic institution located in a prime area of Madrid. The institution benefits from a privileged location that offers easy access to cultural landmarks, services, and excellent public transport links (Metro and suburban trains), making it a preferred choice for families across the city.

The school's mission is centred on the Ignatian Pedagogical Paradigm, a framework that emphasizes the holistic growth of students as "men and women for others" by moving through the stages of context, experience, reflection, action, and evaluation. The school covers all educational stages from Pre-Primary to High School, ensuring a stable long-term community. It features high-quality facilities, including technological resources (interactive smart screens and iPads), specialized areas (Science laboratories, a chapel, a library, and extensive sports facilities like indoor gyms and outdoor courts)

As a semi-private centre, the school balances a strong values-based education integrated into the Catholic network with a commitment to modern pedagogical innovation. The families belonging to the school community typically come from a middle to upper-class background and a high percentage of parents are university graduates working in professional sectors such as law, medicine, technology, and finance. Education is a central pillar for these families, and they maintain a highly collaborative relationship with the teaching staff to ensure that academic progress is always paired with strong ethical and social development.

From the bilingual approach, Loyola Horizonte is integrated into the Bilingual English Development and Assessment (BEDA) program, coordinated by the *Federación de Escuelas Católicas de Madrid* in collaboration with Cambridge English Language Assessment. This program provides flexible and progressive bilingual education, adapting to the pedagogical identity and values of the school. English is the primary foreign language, and several subjects such as Natural Science, Art and crafts, and Physical Education are also taught in English to promote language acquisition in a meaningful and immersive manner, following the CLIL approach. Furthermore, in 5th Grade, students take the subject Technology & Robotics in English to foster their digital skills. The school also counts on the support of native language assistants who collaborate with the teaching staff to enhance students' communicative competence and cultural immersion

3.1.2. Classroom context

This syllabus is designed for a Year 5 Primary Education class (Group A) with 25 students (12 boys and 13 girls). The physical space is arranged to foster cooperative learning, with students distributed into 5 permanent groups of 5. The room includes specialized zones: a reading corner, a space for debates, and magnetic boards to display student projects. There is also a space for experimentation and prototype designs. The classroom is equipped with materials and resources that allow students to create and test their artistic and technological designs, and the tables can be easily distributed to simulate a laboratory.

The group is academically homogeneous, though it includes specific profiles requiring attention. This includes one student with dyslexia who receives support through modified reading materials and a student with ADHD who benefits from structured, segmented tasks to manage attention.

3.1.3. Psych evolutive characteristics

At this stage, students are in the transition between concrete operations and the beginning of formal operations (Piaget). Students can perform complex mental tasks involving logic, classification, and reversibility. They are beginning to handle more abstract concepts, though they still benefit from relating new information to real-world experiences. At 10-11 years old, peer relationships become central. They are developing a stronger sense of justice and can understand different points of view, which makes cooperative group work highly effective, and they are increasingly capable of self-regulation and taking responsibility for their materials and their own learning process.

3.1.4. Linguistic development

At ages 10-11, students in Piaget's (1972) Concrete Operational Stage develop logical thinking and advanced social interaction. Vygotsky (1978) highlights that this learning is driven by classroom interaction, eventually becoming internalized for self-regulation. In bilingual settings, Cummins (2000) distinguishes between BICS (everyday social fluency) and CALP (academic proficiency). While students may appear fluent socially, they require targeted scaffolding to acquire the technical vocabulary necessary for subjects like Art and Technology. Therefore, a successful CLIL approach must strategically balance these cognitive and linguistic developmental stages to ensure meaningful academic achievement.

3.2. Objectives

3.2.1. Stage objectives

The pedagogical framework of this final project is governed by Decree 61/2022, which establishes the curriculum for Primary Education in the Community of Madrid, following the guidelines set by Royal Decree 157/2022. However, Decree 61/2022 introduces specific modifications to reflect the particularities of the region. A notable regional novelty introduced by the Community of Madrid is the inclusion of Technology and Robotics as a specific subject for the third cycle (5th Grade). This project integrates Art Education with a STEAM-CLIL approach to foster cultural awareness, digital literacy, and creative expression. These regulations focus on the development of students at the mental, emotional, and physical levels, aiming to ensure their success by the end of the primary education stage; and helping them develop the personality and foundational knowledge necessary for secondary education. ANNEX 1 presents the stage objectives for the Community of Madrid.

3.2.2. Sequence of the stage objectives in the annual syllabus

To contribute to the achievement of those stage objectives, the proposal uses a STEAM-CLIL approach having the Arts Education curriculum as the guiding area to design learning situations likely to encourage active learning through gamified challenges where students act as UN delegations. This narrative drives Inquiry-Based Learning (IBL), Project-Based Learning (PBL), and cooperative work, culminating in tangible artistic and structural creations that involve the use of different STEAM areas.

Learning objectives are clearly set to help students gain important 21st-century skills such as visual and digital literacy, global citizenship, creativity, and teamwork, which directly contribute to their integral formation and critical sense. Objectives, outcomes, and activities are based on Bloom's Taxonomy, moving from remembering and understanding global concepts, such as the SDGs; to applying techniques, analysing environmental and social issues and evaluating information. Ultimately, students reach the highest cognitive levels by creating multidisciplinary prototypes; these projects include the 'A' in STEAM, demonstrating how Art leads the integration of Science, Technology, Engineering, and Mathematics to solve real-world problems. This sequence encourages students to become confident communicators in the foreign language and capable of using art and design as innovative vehicles for social change and community transformation.

3.3. Contents

This STEAM-CLIL syllabus focuses on the subject of Art Education as the leading component of the STEAM approach, serving as the vehicle through which students explore and solve real world challenges. The contents of the didactic units are derived from Decree 61/2022 of the Community of Madrid, which is based on the national guidelines of Royal Decree 157/2022. The acquisition of this content is organized into three learning situations; these scenarios correspond to the specific curricular blocks distributed across the three terms, as detailed in the annexes section ANNEX 2.

3.4. Competences

3.4.1. Key competences

Key competences, regulated by LOMLOE 3/2020 and Madrid's Decree 61/2022, are essential for student success. Current legislation requires all curricular components, objectives, knowledge, and evaluation criteria; to align with these through specific competences.By implementing a STEAM-CLIL approach, this syllabus connects theoretical knowledge with practical, real-world skills. Through formative assessment, students develop the transversal competences required to successfully navigate the complexities of the modern world. The Key competences of this syllabus can be found in ANNEX 3.

3.4.2 Specific competences and assessment criteria

In accordance with Decree 61/2022, specific competences serve as the cornerstone of the primary curriculum in the Community of Madrid. Defined for each area of knowledge, these competences outline the essential capacities students must acquire by integrating knowledge, skills, and attitudes. They establish clear expectations for student performance by the end of the stage and are intrinsically linked to the evaluation criteria, ensuring a rigorous and accurate assessment process. Consequently, a comprehensive table organizing the specific competences and their corresponding evaluation criteria by term is provided in ANNEX 4, ensuring that all curricular components are aligned with the active learning situations proposed in this syllabus

3.5. Methodology

In the context of CLIL, it is essential to implement active methodologies that promote meaningful learning, the development of critical thinking, and language acquisition within a practical and interactive environment. The methodologies presented below have been selected to ensure a motivating and inclusive approach, placing the student at the center of the educational process while navigating the *Junior United Nations Assembly* (JUNA) narrative.

- **Inquiry-Based Learning (IBL)**

Inquiry-Based Learning has established itself as a key methodology within the teaching of science and arts, promoting an approach in which students develop knowledge through exploration and experimentation. Unlike traditional teaching, IBL positions the student as the protagonist of their own learning, aligning with constructivist principles. In this syllabus, IBL is used to foster the argumentation and problem-solving skills necessary to address the 2030 Agenda. This methodology adapts the scientific method to the classroom through two dimensions:

  - *Conceptual dimension*: Focuses on scientific and artistic concepts, organized within the 4Cs framework, that provide meaning to observations.
  - *Procedural dimension:* Emphasizes the processes of knowledge construction, such as observation and data analysis, through STEAM projects.

This methodology is structured around a cycle of five main phases:

1. Orientation: An environmental or social challenge is introduced by the AI Secretary-General to arouse curiosity.
2. Conceptualization: Students formulate research questions and raise hypotheses regarding specific SDGs.
3. Research: Delegations design and execute experiments to collect data using STEAM tools.
4. Conclusions: The results are interpreted and compared with the initial hypotheses.
5. Discussion: Findings are communicated in English, promoting reflection and new research questions.

- **Project-Based Learning (PBL)**

Project-Based Learning is the general methodology of this syllabus, as the entire year is organized as a series of challenges that culminate in tangible STEAM products. This approach allows students to learn through the design and construction of multidisciplinary prototypes within the JUNA narrative. To ensure an effective experience, the following elements are considered:

1. Define a clear objective: Each project is strictly aligned with the curricular content of Art Education and specific SDGs.
2. Transform learning into a challenge: Knowledge acquisition is presented as a mission to "unlock" different challenges.
3. Establish stages and milestones: Students are guided through the technical process, ensuring a clear progression in their STEAM designs.
4. Create a public product: Delegations produce artistic and structural creations, such as "Kinetic sculptures", to present to the Assembly.
5. Foster critical reflection: Students evaluate the social and environmental impact of their solutions, developing global citizenship.

3.6. Evaluation

Evaluation in this STEAM-CLIL syllabus is a continuous, formative, and integrative process based on Decree 61/2022 and Royal Decree 157/2022. Within the gamified JUNA narrative, assessment focuses on the students' ability to apply knowledge to real-world challenges. Coyle et al. (2010) highlight that CLIL evaluation must support the learning process itself, requiring both formative and summative approaches to track simultaneous content and language development.

Effective evaluation must be integrated into initial planning, ensuring students are assessed only on explicitly taught and scaffolded material to allow for real-time instructional adjustments (Jabbarifar, 2009). This syllabus employs a dual-focused model: content assessment aligns with specific competences in Decree 61/2022, while language follows the CEFR for 5th-grade learners. To evaluate cognitive, linguistic, and social growth across the 15 JUNA challenges, Otto (2018) recommends incorporating diverse tools such as rubrics and self-assessment sheets, ensuring a comprehensive view of student progress.

- **Formative Assessment** is implemented regularly throughout the learning process to gather information about students' understanding. This syllabus divides formative evaluation into three main components:
  - *Assessment for Interaction:* Various tools are used to encourage participation and monitor real-time understanding. These include random selection sticks (random pick-up tools), mini whiteboards for quick checks, "thumbs up/down" signals, and exit slips. The teacher (T) and the language assistant (LA) also use oral language demonstrations to ensure all groups are engaged and to provide immediate linguistic support.

- *Assessment for Active Observation*: Teacher observation is a key method for evaluating tasks during the learning situations. Using checklists, observation grids, and sheets, the teacher records student behaviour and performance during hands-on experiments, exploration, and creative activities.
- *Peer and Self-Assessment*: These tools promote metacognitive skills, autonomy, and responsibility. Using reflection wheels, "2 stars and 1 wish" and “sandwich” feedback, self-checklists and smiley charts; students evaluate their own contributions to their delegation and the work of their peers.

- **Summative Assessments** are gathered at the delegate’s portfolio as a conclusion of each didactic unit (challenges) to evaluate the acquisition of contents, skills, and language related to the final product. It is based on:
  - *Performance Tasks:* The creation of multidisciplinary STEAM prototypes, which are evaluated through analytical rubrics or checklists. These rubrics distinguish between content mastery and artistic execution to ensure a fair assessment.
  - *Written Productions*: Students develop science reports, chronicles or arguments that document their research and conclusions.
  - *Oral Representations*: videos, podcast or explanations where students act as UN delegates to demonstrate their understanding of processes, functions, or concepts using technical vocabulary (CALP).
  - *Tests and Quizzes:* Specifically designed to view students' retention and understanding of concepts and vocabulary, verifying the final learning outcomes of the unit.

The grading criteria for all of the summative and formative assessments of this syllabus can be found in ANNEX 6.

3.7. Attention to diversity

Attention to diversity is a fundamental pillar of this syllabus, ensuring that all students, regardless of their individual learning styles or specific needs, have equitable access to a high-quality education. In this STEAM-CLIL proposal, inclusion is not merely a legal requirement but a core value of the 2030 Agenda. To foster an environment where "no one is left behind," pedagogical strategies are designed to facilitate the understanding of scientific and artistic content in English, promoting active participation for all "delegates" in the JUNA.

3.7.1. Universal Design for Learning

Following the guidelines of Decree 61/2022, this syllabus applies the Universal Design for Learning (UDL) framework to ensure that the 5th-grade classroom remains a space of opportunity for everyone. The UDL principles are integrated into the JUNA missions as follows:

1. Multiple forms of **representation**: To support the "what" of learning, the AI Secretary-General provides multimodal input, including visual glossaries, interactive infographics, and hands-on experiments. Visual and tactile materials reinforce complex scientific concepts, while subtitles and auditory support ensure accessibility for the student with dyslexia.

2. Multiple forms of **action and expression**: Students demonstrate their progress as delegates through various channels beyond traditional writing. This includes building 3D STEAM prototypes, delivering oral "Delegation Reports," or creating digital presentations. Cooperative structures allow peers to support each other's linguistic and technical growth.

3. Multiple forms of **involvement**: The gamified narrative of the JUNA assembly serves as the primary engine for motivation. By connecting Science and Art to real-world sustainability challenges, students find a meaningful purpose in their learning, which is especially beneficial for maintaining the focus of students with ADHD.

3.7.2. Cognitive scaffolding: LOTS & HOTS

Analysing cognitive demand in STEAM-CLIL is essential for creating immersive scenarios where 5th-grade students act as global citizens. Task design ensures intellectual growth by progressing from Lower-Order Thinking Skills (LOTS), such as remembering vocabulary and understanding the SDGs, to Higher-Order Thinking Skills (HOTS), including analysing environmental data and creating original prototypes.

This cognitive evolution effectively addresses classroom diversity, accommodating various learning rhythms. To facilitate autonomy, students utilize reflection tools like KWL charts and visual traffic lights for self-assessment. Ultimately, the development of HOTS is fuelled by teamwork and real-world problem-solving, where English functions as a functional tool for articulating complex concepts.

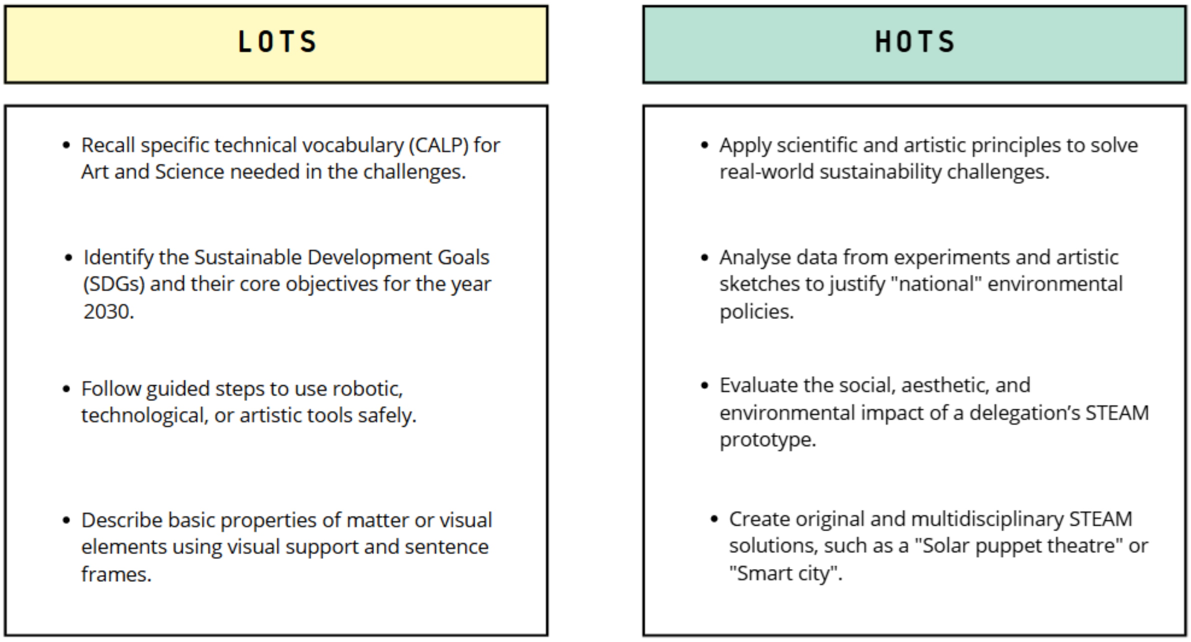


Figure 2. Visual graphic of the cognitive scaffolding. Source: own elaboration

3.7.3. Linguistic scaffolding

Following the principles of Dale and Tanner (2012), this proposal implements three levels of scaffolding to cater to the diverse cognitive and linguistic needs of 5th-grade students

- **Reception Scaffolding (Input)**: Information is provided through multimodal channels. The briefings from Secretary-General E.L.I.A.S. include videos with English subtitles and visual glossaries that pair key STEAM terms with icons.
- **Transformation Scaffolding (Processing)**: The project utilizes graphic organizers to bridge the gap between information and creation.
- **Production Scaffolding (Output)**: To document their progress in the *Delegate's Portfolio*, students receive support for specific linguistic genres (Brisk, 2015). The teacher provides writing frames and substitution tables for each mission, as well as peer-scaffolding for supporting each other.

3.7.4. Measures to address diversity

Attention to diversity is a fundamental principle (LOE 2006, Decree 23/2023) ensuring "no one is left behind." This project specifically supports Year 5 students with ADHD and Dyslexia (ACNEAE) through two levels of intervention.

- **Ordinary measures** adapt to individual needs without altering core curriculum elements. Strategies include spatial organization, task simplification, and using Bloom's Taxonomy to manage cognitive demand. Assessment utilizes visual tools like "traffic lights" or KWL charts to reduce cognitive overload, while JUNA role-playing fosters emotional support and positive reinforcement.

- **Extraordinary measures** are implemented for students with Special Educational Needs (SEN) when ordinary strategies are insufficient. Under LOMLOE, these involve Individualized Curriculum Adaptations (ACI) and guidance team intervention to modify objectives, content, or evaluation criteria. These adaptations ensure all students participate actively in STEAM-CLIL challenges, guaranteeing that every delegate in the Junior United Nations Assembly can contribute to a truly inclusive experience.

3.8. Other projects and school plans

This annual syllabus transcends technical instruction to foster essential values and transversal competencies for daily life. Rather than an isolated subjects, it serves as an interdisciplinary tool aligned with various school initiatives, connecting different curricular areas to ensure the development of both practical and life skills.

1. Education for Sustainable Development (SDGs): This syllabus integrates the 2030 Agenda as its core framework, fulfilling LOMLOE requirements by directly addressing SDG 4 (Quality Education) and SDG 5 (Gender Equality). Through the "Junior UN Assembly" structure, the project ensures equitable access to technology and highlights the role of women in science.

2. School Coexistence Plan: The proposal reinforces the school's Coexistence Plan through cooperative learning within "National Delegations." Students develop socio-emotional skills by negotiating roles, establishing team agreements, and resolving technical conflicts through diplomatic dialogue. This active methodology fosters mutual respect, empathy, and shared decision-making, transforming the classroom into a safe and collaborative environment with an international perspective.

3. Reading and Literacy Plan: Linguistic competence is enhanced through the CLIL approach. Students develop English literacy by interpreting E.L.I.A.S. missions and producing evidence in their *Delegate's Portfolio*. These tasks integrate technical vocabulary acquisition with the comprehension of informative texts, effectively connecting academic language with experimental practice.

4. ICT and Robotics Plan: The syllabus acts as a driver for the school's digital transformation, promoting the ethical and responsible use of technology. Students acquire computational thinking by programming sensors and prototypes while learning to manage information in the cloud and utilize augmented reality resources safely.

4. LEARNING SITUATIONS

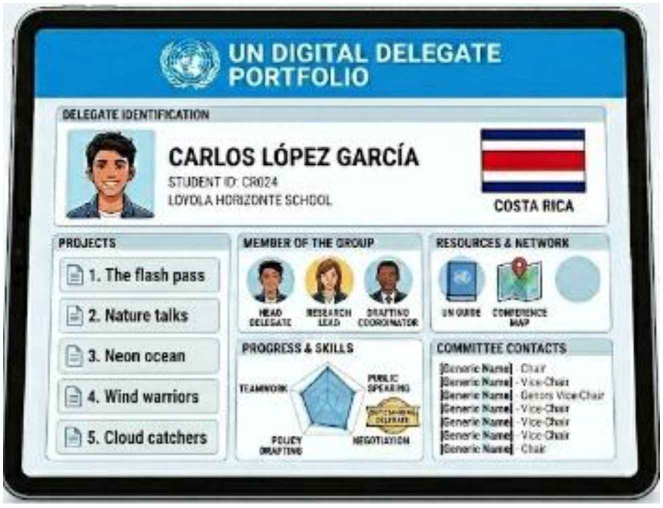
The instructional design of this syllabus is articulated through a gamified narrative titled "The Junior United Nations Assembly" (JUNA). This storyline serves as a transversal framework that provides coherence and purpose to every learning situation. In this simulated environment, students become "International Delegates" organized into "National Delegations".

The narrative unfolds through a series of "challenges" delivered by a fictional AI-generated Secretary-General called E.L.I.A.S. (*Educational Leader for Innovation and Assembly Solutions*). Each challenge acts as a mission that requires students to "unlock" a specific Sustainable Development Goal (SDG) by producing a tangible STEAM solution. This approach transforms the classroom into a centre for Inquiry-Based Learning (IBL) and Project-Based Learning (PBL). By placing Art at the centre of the STEAM ecosystem, students are motivated to humanize technology and solve real-world sustainability problems. Ultimately, JUNA creates an authentic context where linguistic proficiency in English and critical thinking grows through collaborative diplomatic action.

4.1 Learning situation I. Crafting a greener world

This first learning situation, titled "Crafting a greener world" responds to the structure and organization offered in Table 1. The secretary- general E.L.I.A.S will present the challenges that they have to accomplish.

<table>
<tr><th colspan="4">LEARINIG SITUATION I. CRAFTING A GREENER WORLD</th></tr>
<tr><td colspan="4">Contextualization
The first LS, titled "Crafting a Greener World", begins with an urgent diplomatic summons from Secretary-General E.L.I.A.S. He informs the National Delegations (the students) that the 2030 Agenda is at risk and that the Sustainable Development Goals can only be achieved through global collaboration and innovative thinking. To protect the planet's future, the Secretary-General requires every "country" in the classroom to work together, designing STEAM projects to solve five specific environmental crises related to nature, energy, and ecological balance. Throughout this term, students must complete five distinct missions, each presenting a real-world problem that demands a creative and scientific prototype. By successfully addressing the corresponding SDGs, the JUNA is honoured with the Bronze Medal.

Source: Image created with Gemini</td></tr>
<tr><td>Timing</td><td>September-December
(annex 7)</td><td>Genres</td><td>-Procedure (instructions)
-Explanation (Scientific)</td></tr>
<tr><td>Where?</td><td>It will take place in the classroom</td><td>Context</td><td>Students will receive an official video broadcast from ELIAS, who will appoint them as national delegations and call for their urgent cooperation to tackle and advance planet focused SDGs.</td></tr>
<tr><td>Final product</td><td colspan="3">The final product of this term will be the first part of the digital Delegate's Portfolio. It will contain procedural instructions as well as scientific explanations in different ways.</td></tr>
<tr><td colspan="4">Challenges</td></tr>
<tr><td colspan="4">- The flash pass
- Nature talks
- Neon ocean
- Wind warriors
- Cloud catchers</td></tr>
</table>

4.1.1 Challenge 1: The flash pass

<table>
<tr><th colspan="2">CHALLENGE 1. THE FLASH PASS</th></tr>
<tr><td colspan="2">Description (aim): To introduce basic electronics and the JUNA role-play by creating an official identification that represents the delegates' nations and diplomatic status.
Final product: A wearable paper-circuit badge that glows using copper tape and LED to verify the student's identity during assembly sessions.
Timing: 14th -23th September (6 sessions)</td></tr>
<tr><th colspan="2">CONTENT</th></tr>
<tr><th>Decree 61/2022</th><th>STEM</th></tr>
<tr><td>Artistic Education
• Elementos configurativos del lenguaje visual: punto, línea, plano, textura, color.
• Fases del proceso creativo.

Language content
Procedure (instructions)</td><td>Science
• La energía eléctrica.
• Vocabulario científico, técnico y aplicado básico, adecuado a su edad.
Technology and Robotics
• Electricidad y electrónica básica: cables y conectores, actuadores, circuitos, sensores, motores, baterías (fuentes de energía)
Mathematics
• Instrumentos (analógicos o digitales) y unidades adecuadas para medir longitudes, objetos, ángulos y tiempos: selección y uso.</td></tr>
<tr><td colspan="2">Sustainable Development Goal
17 PARTNERSHIPS FOR THE GOALS</td></tr>
<tr><th colspan="2">COGNITION</th></tr>
<tr><th><u>Learning goals</u></th><th><u>Learning outcomes</u></th></tr>
<tr><td>1.1. To remember the circuit components and the visual elements (Point, Line and Plane).
1.2. To understand how the electrical current flows from the source to the LED.
2.1. To apply the technical steps to construct the paper circuit and the badge.
2.2. To evaluate the functionality of the prototype through testing and troubleshooting.
3.1. To use the KWL chart and visual reflection tools to monitor the learning process.
4.1. To write the instructions of the steps followed to assemble the badge in the digital portfolio.</td><td>1.1. SS list and name components (LED, battery, copper tape).
1.2. SS identify the visual elements (point, line, plane) in their badge.
1.3. SS explain the path of the energy in their own words.
2.1. SS execute the physical assembly of the circuit following a model.
2.2. SS measure and cut materials using rulers and appropriate units.
2.3. SS test and fix the circuit if the LED does not glow.
3.1. SS complete the KWL chart to reflect on their electrical and artistic knowledge.
3.2. SS signal their level of confidence using "traffic light" cues during the task.
4.1. SS sequence the assembly steps using temporal markers (First, Next, Finally) in their digital Delegate's Portfolio.
4.2. SS use imperative verbs to give instructions in their portfolio entry.</td></tr>
<tr><th colspan="2">CULTURE</th></tr>
</table>

Learning goals	**Learning outcomes**
-To understand the role of a delegate and the importance of official identification in international diplomatic assemblies. -To develop a sense of diplomatic identity and respect for international protocols and national representation.	-SS. explain the purpose and function of an official identification badge in a diplomatic environment. -SS. represent their assigned nation's identity through the creative use of visual elements on their "Flash Pass".

COMMUNICATION

LANGUAGE OF:

- **Key language:** LED, coin battery, copper tape, conductivity, closed circuit, energy flow, point, line, plane, delegate, badge, nation.
- **Language content (genre):** Procedure (Giving instructions for creating the badge).
  - **Structure:** Title, list of materials, step-by-step instructions, final testing.
  - **Language Input:** Use of imperative mood to provide clear commands and the use of the present simple to describe the circuit's function.
- **Academic language:**
  - **To sequence the process:** First, then, next, after that, finally.
  - **To provide conditions:** If the light doesn't glow, check the connection.
  - **To explain purpose:** So that the circuit closes...

LANGUAGE FOR:

- **Language for describing the badge and circuit:** "The copper tape acts as a conductive line for the electricity."
- **Language for giving and following instructions:** "Stick the tape along the line", "Place the battery on the positive pole", "Test the LED".
- **Language for troubleshooting and explaining results:** "The LED glows because the circuit is closed", "The connection is loose, so it's not working".
- **Classroom language:**
  - **Group work:** Let's collaborate, can you help with the tape? Share the materials, work together as a delegation.
  - **Activities:** Follow the diagram, fold the corner, connect the components, test the light.
  - **Classroom Interaction:** Does it work? How did you fix the short circuit? What did you learn about conductivity? Compare your design with your partner's.

LANGUAGE THROUGH:

- Language through peer interaction within the national delegations.
- Language through interest in the JUNA diplomatic narrative.
- Language through interaction with scientific materials (conductive tape, batteries) and artistic tools.
- Language through documenting the process individually in the digital delegate's portfolio.

EVALUATION

Specific competences (decree 61/2022)	**Content evaluation criteria (decree 61/2022)**
-Artistic education: 3., 4. -Natural science: 1. -Mathematics: 8. -Technology and robotics: 5.	-Artistic education: 3.1./4.1. -Natural science: 1.1 -Mathematics: 8.1 -Technology and robotics: 5.1

Language evaluation criteria (CEFR, 2018)

WRITTEN REPORTS AND ESSAYS (A2): Can write simple texts on a familiar subject (describing the assembly steps of the paper-circuit badge for the portfolio), linking sentences with connectors like 'first', 'next' and 'finally'.

Assessment tools

For interaction	Random pick-up tools (sticks), language assistant.
For active observation	Individual checklist for circuit construction and safe use of materials.
For peer/self-evaluation	Self-evaluation checklist for assessing the individual entry in the digital portfolio.

For summative assessment	Analytical rubric to evaluate the individual procedural entry in the digital portfolio.
Grading criteria	
<u>Summative assessment</u> -Final product (badge): 30% -Delegate's portfolio (instructions of the badge): 20%	<u>Formative assessment</u> -Peer and self-assessment: 30% -Classwork and participation: 20%
ATTENTION TO DIVERSITY	
General measures • Use of real materials (leds, copper tape, batteries) and step-by-step video tutorials with subtitles. • Provide a printed checklist to tick off each completed part. • Work in "national delegations" to allow cooperation. • Provide word banks with images (flashcards) for technical terms like *conductivity*, *battery* or *copper tape*. • Provide a fill-in-the-blank template for the procedural text.	
LOTS→HOTS Ss identify the circuit components and troubleshoot why the led is not glowing.	**HOTS→LOTS** Ss design an original national emblem and label the visual elements used (point, line, plane) using word cards.

4.1.2. Challenge 2: Nature talks

CHALLENGE 2. NATURE TALKS	
Description (aim): Students investigate the flora of their assigned nations to solve the "silence of ecosystems" crisis. They apply artistic techniques like *frottage* and scientific illustration to visualize biodiversity and use block-based programming (Scratch) with Makey Makey to give plants a "voice". **Final product:** Interactive Biodiversity Mural (touch-sensitive) with a programmed scientific explanation in Scratch. **Timing**: 28th September -15th October (9 sessions)	
CONTENT	
Decree 61/2022	**STEM**
Artistic Education • Elementos configurativos del lenguaje visual y sus posibilidades expresivas y comunicativas: punto, línea, plano, textura, color. • Evaluación, respeto, interés y valoración tanto por el proceso como por el producto final en producciones plásticas, visuales, audiovisuales. **Language content** Scientific explanation	**Science** • Fases de la investigación científica (observación sistemática, formulación de preguntas, hipótesis y predicciones, planificación y realización de experimentos y modelos... **Technology and Robotics** • Extensiones de programación por bloques y aplicación a la robótica educativa (música, dibujo, sensor de vídeo, texto a voz, traductor…). **Mathematics** • Pensamiento computacional: Las ideas y las relaciones geométricas en el arte, las ciencias y la vida cotidiana.
Sustainable development goal 	
COGNITION	
Learning goals	Learning outcomes

<table>
<tr><td>1.1. To remember the main parts and functions of plants and the concept of biodiversity.
1.2. To understand the ecological importance of the flora in their assigned nations.
2.1. To apply artistic techniques and technological tools to develop an interactive biodiversity mural.
2.2. To analyse the relationship between a physical stimulus (touch) and a digital reaction (Scratch).
3.1. To evaluate the effectiveness of the mural in communicating scientific information.
4.1. To produce a scientific explanation using objective language and specific technical vocabulary.</td><td>1.1.1. SS list and label the anatomical parts of the plants studied.
1.2.1. SS identify and explain why specific plants are essential for their ecosystem.
2.1.1. SS illustrate plants using frottage and scientific drawing.
2.1.2. SS assemble the mural using Makey Makey circuits.
2.2.1. SS explain how touch triggers the digital response.
2.2.2. SS test and fix circuit and programming errors.
3.1.1. SS assess their own work and critique the clarity of their scientific explanation and the functionality of the interactive elements.
4.1.1. SS describe the plant's characteristics and its role in the ecosystem using factual language and the correct structure of a explanation.</td></tr>
<tr><th colspan="2">CULTURE</th></tr>
<tr><td><u>Learning goals</u>
-To remember that biodiversity loss is a global crisis caused by human disconnection from nature, and to understand the importance of forests.</td><td><u>Learning outcomes</u>
-SS. list examples of endangered plants in their assigned JUNA countries.</td></tr>
<tr><th colspan="2">COMMUNICATION</th></tr>
<tr><td colspan="2">LANGUAGE OF:

Key language: Flora, biodiversity, ecosystem, scientific illustration, frottage, texture, conductivity, circuit, block programming, sprite, input, interaction.
Language content (genre): Scientific explantation

Structure: Title, scientific illustration, description of flora, explanation of the Interaction, conclusion.
Language Input: Objective and factual language to describe species and processes. Use of Present Simple for scientific facts (e.g., "The oak tree grows...") and Imperatives for programming commands.

Academic language:

To describe components: Consists of
To explain a sequence: When the user touches
To define concepts: Is defined as

LANGUAGE FOR:

Language for describing flora and biodiversity: "The nation's flora includes species such as...", "This plant is essential for the ecosystem because...".
Language for explaining the artistic and scientific process: "We applied the frottage technique to visualize the texture of the leaves", "This scientific illustration shows the anatomy of the plant".
Language for explaining how the interactive mural and code work: "Touching the conductive part completes the circuit", "The Scratch program triggers a voice recording when the sensor is activated".
Classroom language:

Group work: "Let’s share the research findings", "How should we arrange the plants on the mural?", "Can you help me with the Scratch code?".
Activities: "Connect the Makey Makey clips", "Test the conductivity of the leaf", "Record the scientific explanation", "Debug the program".
Classroom Interaction: "Does the interaction work?", "How did you solve the connection error?", "What did we learn about this nation's biodiversity?".

</td></tr>
</table>

<table>
<tr><td colspan="2">LANGUAGE THROUGH:
Language through peer interaction during research and mural assembly.
Language through the trial-and-error process of programming in Scratch and using Makey Makey.
Language through physical interaction with natural materials and artistic instruments while building the mural.
Language through watching scientific illustration tutorials and technical videos about conductivity.</td></tr>
<tr><th colspan="2">EVALUATION</th></tr>
<tr><th>Specific competences (decree 61/2022)</th><th>Content evaluation criteria (decree 61/2022)</th></tr>
<tr><td>-Artistic education: 2., 3.
-Natural science: 2.
-Mathematics: 4.
-Technology and robotics: 2.</td><td>-Artistic education: 2.1., 3.1, 3.2.
-Natural science: 2.5
-Mathematics: 4.2
-Technology and robotics: 2.2</td></tr>
<tr><th colspan="2">Language evaluation criteria (CEFR, 2018)</th></tr>
<tr><td colspan="2">ORAL PRODUCTION AND EXPLAINING (A2): Can give a short, simple scientific description of a plant’s characteristics and its role in the ecosystem (explaining the interactive mural for the portfolio), using basic connectors (and, but, because) and specific vocabulary.</td></tr>
<tr><th colspan="2">Assessment tools</th></tr>
<tr><td>For interaction</td><td>Teacher’s active observation scale</td></tr>
<tr><td>For active observation</td><td>Individual checklist</td></tr>
<tr><td>For peer/self-evaluation</td><td>"Two stars and a wish" feedback</td></tr>
<tr><td>For summative assessment</td><td>Analytical rubric</td></tr>
<tr><th colspan="2">Grading criteria</th></tr>
<tr><td><u>Summative assessments</u>
- Final product (Mural & Scratch Code): 30%
-Delegate’s portfolio (scientific explanation): 40%</td><td><u>Formative assessments</u>
- Peer and self-assessment: 10%
- Classwork and participation: 20%</td></tr>
<tr><th colspan="2">ATTENTION TO DIVERSITY</th></tr>
<tr><td colspan="2">General measures
Use of real materials: Use of natural leaves, conductive tape, and Makey Makey kits, accompanied by step-by-step video tutorials (with subtitles) on how to program the "voice" of the plants in Scratch.
Visual aids: Provide a printed checklist to tick off each completed stage (Research → Illustration → Circuit → Programming).
Cooperative learning: Work in "National Delegations" (small groups) to allow peer-tutoring and distribution of tasks according to students' strengths.
Scaffolded vocabulary: Provide word banks with images (flashcards) for technical and scientific terms like biodiversity, flora, conductivity, input, and sensor.
Writing frames: Provide a fill-in-the-blank template for the scientific explanation that will be recorded or written in Scratch.</td></tr>
<tr><td>LOTS→HOTS
Students identify the connection points between the mural and the Makey Makey and troubleshoot (debug) the logic of the code if the scientific explanation is not triggered when touching the plant.</td><td>HOTS→LOTS
Students design the interactive scientific illustration of their assigned plant and label its botanical parts and textures (obtained via frottage) using pre-written word cards and visual prompts.</td></tr>
</table>

4.1.3. Challenge 3: Neon ocean

CHALLENGE 3. NEON OCEAN
Description (aim): Students investigate the properties of matter to solve the marine crisis. They design a neon visual environment using digital art tools to represent the seabed and develop block-based algorithms to simulate an autonomous marine cleaning drone.

Final product: An interactive digital marine map featuring a drone simulation and a classifying report on marine materials. **Timing**: 19th October- 3rd November (7 sessions)	
CONTENT	
Decree 61/2022	**STEM**
Artistic Education • Recursos digitales de uso común para las artes plásticas, visuales y las artes audiovisuales. • Vocabulario específico de las artes plásticas, visuales y las artes audiovisuales **Language content** Procedure (instructions)	**Science** • Propiedades de la materia: generales (masa, volumen…) y específicas (color, dureza, densidad…). **Technology and Robotics** • Interpretación y ejecución de algoritmos sencillos (rutinas, instrucciones con pasos ordenados, reglas de juegos, instrucciones, secuencias, patrones repetitivos, programación por bloques) **Mathematics** • Estrategias para la interpretación, modificación y creación de algoritmos sencillos
Sustainable development goal 14 LIFE BELOW WATER	
COGNITION	
Learning goals	Learning outcomes
1.1. To **remember** properties of matter (mass, volume, density) and neon visual elements (colour, contrast, glow). 1.2. To **understand** how density affects buoyancy and how neon aesthetics create visibility in the dark. 2.1. To **analyse** material data to **evaluate** and **test** the effectiveness of the drone's navigation algorithm. 2.2. To **create** an original "Neon" digital seabed and a functional navigation algorithm for the drone. 3.1. To use the KWL chart and visual reflection tools to monitor the learning process. 4.1. To write the **instructions** for the drone's navigation steps in the digital Delegate's Portfolio	1.1.1. SS **list** and **name** properties of matter and neon art components. 1.2.1. SS **describe** the relationship between density and floating and **identify** neon elements in their design. 2.1.1. SS **compare** routes, **identify** risks, and **fix** mistakes in their block-based code. 2.2.1. SS **design**, **construct**, and **develop** the interactive map and the autonomous cleaning sequence. 3.1.1. SS **identify** what they have learned and **signal** their level of confidence using cues. 4.1.1. SS **sequence** the navigation commands using temporal markers (First, next, finally) and imperative verbs.
CULTURE	
<u>Learning goals</u>	**<u>Learning outcomes</u>**
-To **know** how different nations use technology and autonomous drones to protect their marine ecosystems. -To **interact** as a diplomatic delegation to solve a shared global environmental challenge.	- SS. **list** examples of robotic technology used in different countries for environmental protection. - SS. **collaborate** effectively within their national delegation to design a global solution.
COMMUNICATION	
LANGUAGE OF: • **Key language:** Density, buoyancy, mass, volume, Neon, glow, contrast, algorithm, block-based, sensor, navigation, drone. • **Language content (genre):** Procedure (Instructions for the drone). ○ **Structure:** Title, list of commands, numbered/bulleted steps, and final testing.	

- **Language Input:** Use of the imperative mood to provide clear commands (e.g., *Move*, *Turn*, *Detect*) and Present Simple for permanent facts (e.g., *Plastic floats*).

- **Academic language:**
  - To sequence the process: After, finally.
  - To provide conditions: If the sensor detects plastic…

LANGUAGE FOR:

- **Language for describing algorithms, routes, and instructions:** "The drone moves forward and turns 90 degrees to avoid the reef."
- **Language for comparing density and buoyancy:** "The plastic bottle floats because its density is lower than water."
- **Language for explaining why an algorithm is effective or not:** "The sequence works because it repeats the pattern, but it fails if the battery is low."
- **Classroom language:**
  - **Group work:** "Let's collaborate as a delegation", "Can you help with the code?", "Share your design ideas."
  - **Activities:** "Test the algorithm", "Adjust the neon glow", "Run the simulation", "Check the density values."
  - **Classroom Interaction:** "What worked in your code?", "How did you solve the visibility problem?", "Compare your neon map with mine."

LANGUAGE THROUGH:

- Language through peer interaction within the National Delegations.
- Language through interest in the E.L.I.A.S. mission and the "great marine visibility" crisis.
- Language through interaction with technology while programming the drone and using digital art tools.
- Language through documenting the procedure individually in the digital Delegate's Portfolio.

EVALUATION

Specific competences (decree 61/2022)	**Content evaluation criteria (decree 61/2022)**
-Artistic education: 3., 4. -Natural science: 1. -Mathematics: 1.,8. -Technology and robotics: 1., 5.	-Artistic education: 3.1, 4.1 -Natural science: 1.1, 1.2 -Mathematics: 1.3, 8.1 -Technology and robotics: 1.1., 1.2., 5.1

Language evaluation criteria (CEFR, 2018)

WRITTEN REPORTS AND ESSAYS (A2): Can write simple texts on familiar subjects of interest (the drone navigation steps in the portfolio), linking sentences with connectors like 'first', 'then' or 'finally'.

Assessment tools

For interaction	Random pick-up tools (name sticks) and a language assistant.
For active observation	Checklist
For peer/self-evaluation	-Two stars and a wish: Peer feedback -Self-evaluation checklist
For summative assessment	Analytic rubric

Grading criteria

Summative assessments	Formative assessments
- Final product (Digital map and drone): 40% -Delegate portfolio (instructions): 30%	- Self and peer evaluation: 10% - Classwork and participation: 20%

ATTENTION TO DIVERSITY

General measures

- **Use of real materials:** Hands-on density experiments using water tanks and physical objects (plastic, cork, stones) to visualize buoyancy before moving to the digital simulation. Digital tablets will include "glow" brush presets for the Neon art.
- **Visual aids:** Provide a printed checklist to tick off each completed stage of the mission: Density Experiment → Neon Map Design →Drone Programming →Portfolio Entry.
- **Cooperative learning:** Work in national delegations to allow peer-tutoring.

<table>
<tr><td colspan="2">• Scaffolded vocabulary: Provide word banks with images (flashcards) for technical and scientific terms like density, buoyancy, mass, volume, glow, sensor, and algorithm.
• Writing frames: Provide a fill-in-the-blank template for the drone's navigation instructions and the material classifying report in the digital portfolio.</td></tr>
<tr><td>LOTS→HOTS
Students identify the specific block in the code that is causing a navigation error and troubleshoot (debug) the logic to ensure the drone stops only when the sensor detects a high-density pollutant.</td><td>HOTS→LOTS
Students design the original "Neon" underwater environment and label the marine materials and their buoyancy properties using pre-written word cards and visual prompts to support their scientific explanation.</td></tr>
</table>

4.1.4. Challenge 4: Wind warriors

<table>
<tr><td colspan="2">CHALLENGE 4. WIND WARRIORS</td></tr>
<tr><td colspan="2">Description (aim): Students will design a butterfly automaton inspired by the artist Bordallo II, using waste materials and crank-and-linkage mechanisms to convert rotary motion into rhythmic flapping.
Final product: A butterfly automaton with a scientific video report on its mechanical movement.
Timing: 4th November – 16th November (6 sessions)</td></tr>
<tr><td colspan="2">CONTENT</td></tr>
<tr><td>Decree 61/2022</td><td>STEM</td></tr>
<tr><td>Artistic Education
• Medios, soportes y materiales de expresión plástica y visual.
• Propuestas artísticas de diferentes corrientes estéticas, procedencias y épocas producidas por creadoras y creadores locales, regionales, nacionales e internacionales.
• Recepción y apreciación de obras artísticas.

Language content
Procedure (instructions through a video)</td><td>Science
• Fases de la investigación científica (recogida y análisis de información y datos, comunicación y presentación de resultados...)
Technology and Robotics
• Herramientas y útiles necesarios para la fabricación y montaje de artefactos.
• Técnicas de diseño y fabricación manual y mecánica.
Mathematics
• Estrategias para la creación de algoritmos sencillos (secuencias de pasos ordenados, esquemas, instrucciones anidadas y condicionales…)</td></tr>
<tr><td colspan="2">Sustainable development goal
</td></tr>
<tr><td colspan="2">COGNITION</td></tr>
<tr><td>Learning goals
1.1. To remember the artistic style of Bordallo II and the types of industrial waste.
1.2. To understand the impact of recycling on Climate Action (SDG 13).
1.3. To understand how simple machines (crank-and-linkage) function to convert motion.
2.1. To apply design strategies to plan the animal model and its movement.
2.2. To apply manual and mechanical techniques to build the final prototype.
2.3. To analyse the functionality of the mechanism and the artistic coherence.</td><td>Learning outcomes
1.1.1. SS identify industrial waste materials found in Bordallo II's artworks.
1.1.2. SS list different waste materials found in their own environment.
1.2.1. SS explain the relationship between recycling and the achievement of SDG 13.
1.3.1. SS label the parts of a crank-and-linkage system (axle, linkage, crank).
1.3.2. SS describe how the crank-and-linkage system allows mechanical movement.
2.1.1. SS sketch their animal before assembly.</td></tr>
</table>

3.1. **To monitor** the creative process using "traffic light" cues. 3.2. **To appraise** the final product using a self-correction checklist. 4.1. **To use** the procedural recount genre to document the result in a video.	2.1.2**. SS create** a simple algorithm (ordered sequence of steps) for the construction process. 2.2.1. SS **execute** the construction of the butterfly automaton using recycled materials**.** 2.3.1. **SS examine** the mechanism to detect movement errors or friction. 2.3.2. **SS contrast** their chosen materials with the Bordallo II aesthetic. 3.1.1**. SS monitor** and communicate their progress (green, yellow, red) 3.2.1**. SS value** their own work by verifying if the product meets the mechanical and artistic criteria. 4.1.1. **SS script** and rehearse the construction steps using sequence markers (*first, next, then*). 4.1.2. **SS record and edit** a short video explaining the mechanical outcome for the portfolio.

CULTURE

Learning goals	Learning outcomes
-To **analyse** the relationship between consumption habits in different societies and the achievement of SDG 13.	**-**SS **compare** waste management policies and recycling initiatives across their assigned JUNA countries.

COMMUNICATION

LANGUAGE OF

- **Key language**: Crank, linkage, stability, waste, assembly, responsible production, textures, joint, durability.
- **Language content (Genre)**: Procedural recount (instructions)
- **Structure**: Material inventory (listing the recycled waste used and its properties) construction and mechanical analysis, problem solving and demonstration.
- **Language Input**: Present simple to describe the function of the mechanism (*"The axle holds the wings"*) and cause and effect to explain movement (*"When you rotate the crank, the wings flap"*). Imperative mode for instructions ("*Bend the wire to create the crank.").*
- **Academic language:**
  - To explain functionality: *It is designed to...*
  - To address issues: *Despite the...*

LANGUAGE FOR:

- **Language for describing construction and mechanical movement:** The crank allows the wings to flap when we rotate the handle manually.
- **Language for explaining recycled materials:** "We have used fruit nets to make the wings because…."
- **Language for explaining mechanical effectiveness or errors:** "The movement is effective because the linkage is well-aligned, but the wings get stuck if…"
- **Classroom language:**
  - **Group work:** Let's collaborate, can you hold the peg? Share the materials, work together as a delegation, split the assembly tasks.
  - **Activities:** Measure the components, attach the waste material, test the mechanical movement, check the alignment.
  - **Classroom Interaction:** Does it move correctly? How did you reduce the friction? What materials did you reuse?

LANGUAGE THROUGH:

- Language through peer interaction within the national delegations.
- Language through interest in the eco-engineer narrative and Bordallo II's art.
- Language through interaction with physical materials and mechanical instruments while building the prototype.
- Language through documenting and recording the mechanical process in the digital delegate's portfolio.

<table>
<tr><th colspan="2">EVALUATION</th></tr>
<tr><th>Specific competences (decree 61/2022)</th><th>Content evaluation criteria (decree 61/2022)</th></tr>
<tr><td>-Artistic education: 1., 4.
-Natural science: 6.
-Mathematics: 5.
-Technology and robotics: 2.</td><td>-Artistic education: 1.3., 4.1, 4.3
-Natural science: 6.1, 2.5
-Mathematics: 5.2.
-Technology and robotics: 2.4.</td></tr>
<tr><th colspan="2">Language evaluation criteria CEFR (2018)</th></tr>
<tr><td colspan="2">ORAL PRODUCTION AND EXPLAINING (A2): Can give a short, rehearsed oral presentation or video-report about a simple process (describing the construction steps of the butterfly for the portfolio), linking sentences with connectors like ‘first’, ‘next’ u ‘after that’.</td></tr>
<tr><th colspan="2">Assessment tools</th></tr>
<tr><td>For interaction</td><td>Exit slips and language assistant for understanding.</td></tr>
<tr><td>For active observation</td><td>Observation checklist for the construction of the product.</td></tr>
<tr><td>For peer/self-evaluation</td><td>Feedback sandwich for self-evaluation.</td></tr>
<tr><td>For summative assessment</td><td>Analytic rubric final product (video and demonstration of product)</td></tr>
<tr><th colspan="2">Grading criteria</th></tr>
<tr><td><u>Summative assessments</u>
-Delegate’s portfolio (instruction video of the butterfly automaton) analytic rubric: 60%
-Quiz of mechanical concepts: 10%</td><td><u>Formative assessments</u>
- Individual evaluation (feedback sandwich): 10%
- Classwork and participation checklist: 20%</td></tr>
<tr><th colspan="2">ATTENTION TO DIVERSITY</th></tr>
<tr><td colspan="2">General measures
• Use of real materials: recycled materials.
• Visual aids: Provide a "construction road map" with icons to track the mission stages: Waste collection →3D Sketching →Mechanical assembly →Video script→ Recording.
• Cooperative learning: Structured work in mixed-ability "National Delegations" where the lead engineer supports peers with the mechanism, while the spokesperson guides the video recording.
• Scaffolded vocabulary: Visual glossary (flashcards) pairing key terms with images.
• Production frames: Provide a "video script template" with sentence starters for the procedural recount: "To build our animal, first we...", "The crank moves the..."</td></tr>
<tr><td>LOTS→HOTS
Students find a mistake in the video timing (Remember) and fix the digital timeline to make the sound and images match perfectly (Evaluate/Create).</td><td>HOTS→LOTS
Students make an original video report (Create) but use word cards and sentence help (Remember) to speak their final arguments clearly.</td></tr>
<tr><th colspan="2">MATERIALS</th></tr>
<tr><td rowspan="2">Human and physical resources
• Teacher
• Language assistant
• Students
• Classroom materials (pens, scissors, glue)
• Recycled materials (fruit nets, skewers, cardboard)
• World map and corkboard
• "Top Secret" box and envelopes</td><td>Others
• Appendices (Bingo, Flow charts, Worksheets)
• Rubrics and assessment checklists
• Exit slips and sticky notes
• Butterfly automaton model</td></tr>
<tr><td>Technological resources
• Interactive whiteboard
• Computer
• Recording devices (tablets)
• Video editing apps
• Digital portfolio platform</td></tr>
<tr><th colspan="2">PROCEDURES</th></tr>
<tr><th colspan="2">SESSION 1. ECO-MISSION (50’)</th></tr>
<tr><td>Cognition</td><td>1.1., 1.2.</td></tr>
</table>

Culture	To analyse the relationship between consumption habits in different societies and the achievement of SDG 13.	
Timing	**Activities**	**Grouping**
10’	**Activity 1. Activation:** The teacher enters the classroom with a box that says “top secret” inside of it there is QR with the letter of E.L.I.A.S explaining the crisis. (appendix 1) Reception scaffolding: The language assistant writes a sentence wall on the board: *"I think the problem is..."*, *"We can help by..."* to facilitate initial reactions.	Big group
5’	**Activity 2. I see I think I wonder:** T projects an image of a Bordallo II creation and students fill in a sheet of I see, I think, I wonder (appendix 2)	Individual
15’	**Activity 3**. Teacher shows a **visual glossary** with pictures of the materials use by the artist and their names (reception scaffolding) as well as the materials that they are needed to use for their prototype (appendix 3). SS participate in a **scavenger hunt** where they have to find those materials in pictures pasted around the classroom and fill in a checklist of which material the found on each picture. (appendix 3).	Big group/small groups
15’	**Activity 4. Word wall and map hunt:** SS learn the target vocabulary of SDG 13 through a word wall (appendix 4). Using a large world map displayed in the classroom, students move to the location of their assigned JUNA nation. There, they will find a **sealed envelope** containing 3 or 4 cards describing specific consumption habits or waste management policies from that country. After analysing the cards they pin them onto the classroom corkboard, which is divided into two columns: • **Column A: Effective Mitigation** (Actions that help the planet). • **Column B: Increased Carbon Footprint** (Actions that harm the planet). Finally, **spokesperson** for each nation stands up and reads aloud the single measure from their country that they believe will be the **most effective** in achieving SDG 13.	Big groups and small groups
5’	**Activity 5. Exit slips:** SS are given a simple exit slip (reception scaffolding) about one thing they have learnt in the class (appendix 5).	Individual
	SESSION 2. GEAR LOGIC (50’)	
Cognition	1.3.	
Timing	**Activities**	**Grouping**
10’	**Activity 1. Activation task:** The language assistant will select students to physically model the slider-crank mechanism with their bodies. One student performs a rotary motion as the crank, while the other translates it into a linear movement as the linkage. **Video Analysis:** The teacher plays an instructional video (appendix 6) showing the movement of a slider-crank mechanism. In the first viewing, students watch for general understanding and use a **"Thumbs Up/Down"** signal to provide immediate feedback on their level of comprehension. **Listening for Detail (Bingo):** Students are provided with a **Bingo card** (appendix 6) containing key technical terms. During the second viewing, students must listen actively and mark the words as they are mentioned in the video.	Individual
10’	**Activity 2**. The teacher displays **images** of the mechanism's components on the screen without labels (appendix 7). Students must identify the part and write its technical name on their **mini whiteboards**. Once the teacher projects the correct answers, students perform **immediate self-correction** to monitor their own learning. They also make a quick quiz to check their understanding of the key vocabulary (appendix 7)	Individual

10’	**Activity 3.** SS fill in a **flow chart** (appendix 8) to map the mechanical stages of the slider-crank mechanism. (Transformation scaffolding: converting input into a visual sequence).	Small groups
5’	**Activity 4.** To introduce **algorithms**, two volunteers will perform the **"Literal Robot"** activity. One acts as the programmer, giving step-by-step instructions for a simple task (like putting on a coat), while the other acts as a robot following them strictly literally.	Big group
10’	**Activity 5. Algorithm Sequencing Activity:** Students are provided with scrambled instruction (appendix 9) cards featuring different mechanical steps. Their task is to arrange them in a logical sequence to create a functional algorithm that describes the movement of the crank-and-linkage system.	Small groups
SESSION 3. BLUEPRINT 3D (50’)		
Cognition	2.1.	
Timing	**Activities**	**Grouping**
10’	**Activity 1. Activation (reception):** The teacher presents the final finished product (appendix 10) and students act as "technical inspectors" and must through brainstorming identify: 1. Which recycled materials were used. 2. Where the crank-and-linkage mechanism is hidden.	Big group
15’	**Activity 2. Sketching (transformation):** SS label the materials needed for every butterfly’s part, as well as naming the necessary parts for the mechanism. **Blueprint Template:** A visual organizer including a butterfly diagram, material photos with label boxes, and an inventory list for component mapping. (appendix 11)	Small groups
20’	**Activity 3. The assembly algorithm (transformation): SS** use a **flow chart** (appendix 8) to map out the logical sequence of construction and to program the order of steps.	Small groups
5’	**Activity 4. The peer logic check (metacognition):** Two groups swap their algorithms. They must read the steps and determine if the sequence is logical or if there is a "bug" (a missing step) that would prevent the mechanism from working.	Small groups
SESSION 4. SCRIPT CODE (50’)		
Cognition	4.1	
Timing	**Activities**	**Grouping**
5’	**Activity 1. Activation (reception):** The teacher presents two contrasting instructional texts (appendix 12): one disorganized and one clearly sequenced. Students through **thumbs up/thumbs down** have to say if the instructions are clear or not. (modelling and genre awareness scaffolding)	Big group
10’	**Activity 2. Spot the Feature (reception):** The teacher projects the sample of instructions (appendix 12). Students identify the two golden rules of the genre: **imperative verbs** (e.g., *cut, attach*) and s**equence markers** (e.g., *first, next*). They write *action* in their mini whiteboards when they see imperative verbs and *order* when they see sequence markers. (Language input scaffolding)	Individual
5’	**Activity 3. Choosing materials (transformation):** Each group makes their own final list of recycled materials that they are going to use. They specify for which part is each of the materials.	Small groups
20’	**Activity 4. Scriptwriting (production):** SS transform their algorithm into their final script for the video with a **writing frame** (appendix 13) with sequence markers and action verbs.	Small groups
10’	**Activity 5. Assessment checklist (metacognition):** The final product checklist (appendix 14) is distributed to each group. Students review their	

	own scripts to ensure they meet all the project requirements, specifically focusing on pronunciation, logical sequencing of steps, and the correct use of technical terminology.	Small groups
SESSION 5. ACTION BUILD (50')		
Cognition	2.2, 2.3, 3.1.	
Timing	**Activities**	**Grouping**
5'	**Activity 1. Activation task (reception scaffolding):** The teacher provides a quick safety briefing and distributes again the **final product rubric** (appendix 14). This acts as a **modelling scaffold**, showing students exactly what "functionality" and "artistic coherence" look like.	Big group
40'	**Activity 2. Build and record**: Students build their prototypes using manual techniques (cutting, gluing, assembling). Simultaneously, they record the process following their "procedure" script. The teacher and the language assistant rotate, providing **verbal scaffolding** and with an observation checklist (appendix 15) to encourage the use of technical terms (*axle, linkage*) during the recording.	Small groups
5'	**Activity 3. Traffic light (metacognition):** As a group students use a **traffic light template** (appendix 16) to monitor and communicate their progress. They must agree on their current status and colour the corresponding circle: **green (t**he project is nearly finished or successfully complete), **yellow (**We are making progress but still need more time to fix minor issues) and **red** (we are struggling and need immediate teacher support to solve mechanical or recording problems).	Small groups
SESSION 6. FINAL CUT (50')		
Cognition	3.2., 4.1	
Timing	**Activities**	**Grouping**
5'	**Activity 1. Activation task:** Groups hold a "stand-up meeting" using **sentence starters** to organize their final workflow with sequence markers. This linguistic rehearsal ensures technical accuracy and procedural clarity before video recording begins.	Big group
30'	**Activity 2.** Ss finish assembling their **final products** and editing their videos with all of the clips they have been recording in the previous session.	Small groups
15'	**Activity 3.** Final rubric (metacognition): Ss fill in the self-evaluation sandwich (appendix 17), and they upload the video to their digital's portfolio	Individual

4.1.5. Challenge 5: Cloud catchers

CHALLENGE 5. CLOUD CATCHERS	
Description (aim): To design an artistic "cloud catcher" using fractal geometry and DC-motor vibration to harvest water. **Final product:** A DC-powered "cloud catcher" with a fractal-patterned mesh, accompanied by a blog post in the delegates portfolio. **Timing**: 17th November – 9th December (8 sessions)	
CONTENT	
Decree 61/2022	**STEM**
Artistic Education • Medios, soportes y materiales de expresión plástica y visual. Técnicas bidimensionales y tridimensionales en dibujos y modelados incluidos los formatos artísticos contemporáneos.	**Science** • Fases de la investigación científica (observación sistemática, formulación de preguntas, hipótesis y predicciones, planificación y realización de experimentos) **Technology and Robotics**

Language content Scientfic explanation (blog post)	• Herramientas y útiles necesarios para la fabricación y montaje de artefactos. Funcionamiento de engranajes y poleas. **Mathematics** • Figuras geométricas en objetos de la vida cotidiana.

Sustainable development goal

COGNITION	
Learning goals	Learning outcomes
1.1. To **understand** the properties of matter (mass, volume, density) and the logic of fractal geometry in nature. 2.1. To **apply** technical drawing rules and geometric classification by following a provided model. 2.2. To **apply** assembly techniques to build the "Cloud Catcher" using a step-by-step guide. 3.1. To **evaluate** the construction process and the fidelity to the original design. 4.1. To **produce** a scientific explanation for the blog in the delegates portfolio based on the results.	1.1.1. SS **list** and **define** mass, volume, and density using the materials of the "Cloud catcher". 1.1.2. SS **identify** fractal patterns in nature and art and **describe** their repetitive nature. 1.1.3. SS **explain** how the surface area of a mesh increases through geometric repetition. 2.1.1. SS **sketch** the artistic blueprint of the prototype **reproducing** the shapes and dimensions of the given model. 2.1.2. SS **label** the angles and lines of the structure according to the technical model provided. 2.2.1. SS **assemble** the frame and the fractal mesh **following** the instructions of the prototype's manual. 2.2.2. SS **integrate** the DC motor and the battery circuit **as shown** in the technical diagram. 3.1.1. SS **detect** and **correct** errors made while following the assembly instructions. 3.1.2. SS **assess** the final quality of their work based on the provided rubric. 4.1.1. SS **write** the technical description of the prototype using specific lexis (mass, density, polyhedrons). 4.1.2. SS **describe** the mechanical movement of the motor using cause-effect connectors.

CULTURE	
Learning goals	**Learning outcomes**
-To **evaluate** the role of sustainable engineering as a tool for social justice and the human right to water (SDG 6). -To **analyse** and relate their own environmental reality with the water-harvesting challenges faced by different cultures.	-SS **evaluate** how a low-cost geometric prototype can positively impact the health and economy of a water-stressed rural community. - SS **compare** their personal daily water consumption with the limited water-collection routines in fog-dependent regions.

COMMUNICATION
LANGUAGE OF

- **Key language:** Matter, polyhedrons, faces, vertices, edges, angles, fractal patterns, mesh, DC motor, offset weight, vibration, water harvesting, sustainable innovation.
- **Language content (Genre) :** Scientific explanation (Blog post).
    - **Structure:** Introduction, design, development, results and conclusion.
    - **Language Input:** Objective and factual language. Present simple: For scientific facts ("Fractals increase the surface area") and past tense: For the construction process ("We assembled the frame using...").
- **Academic language:**
    - To introduce the first step: Initially, to begin with.
    - To give an example: Such as.
    - To explain the outcome: As a result, therefore.

LANGUAGE FOR

- **Language for describing 3D structures and math:** "This triangular pyramid has 4 faces and 6 edges; it provides the necessary stability for the motor."
- **Language for comparing material properties:** "Material A (cardboard) has a lower density than Material B (plastic), allowing the motor to vibrate more effectively."
- **Language for explaining how the system works:** "The DC motor triggers a vibration because of the unbalanced weight, which causes the droplets to fall into the collector."
- **Classroom language:**
    - **Group work**: Let's brainstorm the fractal design, can you help me stabilize the frame? Let's split the assembly tasks.
    - **Activities**: Follow the blueprint steps, Test the circuit, Assemble the mesh, Adjust the motor speed, Run the humidifer test.
    - **Classroom Interaction**: Why did the water not fall? How can we improve the mesh density? Compare your results with other delegates.

LANGUAGE THROUGH

- Language through debating which fractal pattern is more "sticky" for the fog during the design phase.
- Language through the vocabulary emerging while troubleshooting the DC motor and the battery connections.
- Language through discovering "texture" and "tension" while handling different mesh types and bamboo dowels.
- Language through analysing the "Fog Test" (humidifier) and identifying the exact moment the molecules condense on the mesh.
- Language through researching real-world "Fog Catchers" in places like the Atacama Desert to enrich their blog post.

EVALUATION	
Specific competences (decree 61/2022)	**Content evaluation criteria (decree 61/2022)**
-Artistic education: 3., 4. -Natural science: 2 -Mathematics: 5 -Technology and robotics: 2.	-Artistic education: 3.2, 4.1, 4.3 -Natural science: 2.3, 2.5 -Mathematics: 5.2 -Technology and robotics: 2.1, 2.2, 2.4
Language evaluation criteria (CEFR, 2018)	
WRITTEN PRODUCTION AND SCIENTIFIC EXPLANATION (A2): Can produce a short, structured technical blog post for the Delegates Portfolio, describing the physical properties of materials (mass, volume, density) and the 3D geometric components of the Cloud Catcher using simple, factual sentences.	
Assessment tools	
For interaction	Random pick-up tools (sticks) and thumbs up/down.
For active observation	Observation grid
For peer/self-evaluation	Peer-feedback "2 stars and a wish"
For summative assessment	Analytic rubric and quiz.
Grading criteria	
<u>Summative assessments</u>	<u>Formative assessments</u>

<table>
<tr><td>- Final product (cloud catcher): 30%
-Delegate’s portfolio (Blog post): 40%</td><td>- Self and peer evaluation: 10%
- Classwork and participation: 20%</td></tr>
<tr><td colspan="2">ATTENTION TO DIVERSITY</td></tr>
<tr><td colspan="2">General measures
Use of real materials: Tactile exploration of different mesh textures (netting, cotton, synthetic) and "fog" simulation using cold-water humidifiers or sprayers to visualize condensation before building the prototype.
Visual aids: Provide a multimodal flow chart mapping the condensation process: Mist →Fractal Mesh Contact →Droplet Formation →Collection.
Cooperative learning: Work in national delegations where "Tech-leads" provide peer-tutoring for the DC motor circuit assembly, ensuring positive interdependence.
Scaffolded vocabulary: Provide visual glossaries with icons for technical terms like density, condensation, fractal, vibration, mass, volume, and polyhedron.
Writing frames: Provide a substitution table and a fill-in-the-blank template for the "Tech-Review Blog Post" to support the scientific explanation genre in the digital portfolio.</td></tr>
<tr><td>LOTS→HOTS
Students identify the number of vertices, edges, and faces in their 3D frame and then evaluate its structural stability.</td><td>HOTS→LOTS
Students assemble the complex "Cloud Catcher" prototype following the technical model (HOTS) and then label the physical properties of the used materials (density and hardness) using pre-written word cards and visual prompts (LOTS).</td></tr>
</table>

4.2. Learning situation II. The colours of humanity

LEARNING SITUATION II. THE COLOURS OF HUMANITY

Contextualization

At the beginning of the second term, Secretary-General E.L.I.A.S. sends new challenges to the National Delegations, but this time to focus on human well-being, health, and inclusion, following the core principle of "leaving no one behind". In this stage, students use Art to humanize technology, addressing five new crises through missions 6 to 10. By designing STEAM prototypes that foster empathy, the delegations "unlock" the corresponding social SDGs. Upon successful completion of these five challenges, the assembly is awarded the Silver Medal. This milestone recognizes their ability to prioritize the human dimension in global solutions while continuing to enhance their linguistic proficiency in English.

Source: Image created with Gemini

Timing	January-March (Annex 7)	**Genres**	-Report (descriptive) -Chronicle
Where?	It will take place in the classroom.	**Context**	Students will receive another official video broadcast from ELIAS. He will congratulate them on their bronze medal and will call them again for cooperation to tackle and address the next SDGs focused on the people.
Final product	The final product of this term will be the second part of the digital **Delegate's Portfolio** focused on a human rights & Health Repository. It will feature descriptive reports and chronicles on technical and artistic features.		
Challenges			

- Kind-click app
- Sky Garden
- Bionic body
- Magic lens
- Science heroes

4.2.1. Challenge 6: Kind-click app

CHALLENGE 6. KIND-CLICK APP
Description (aim): To design a resource exchange app for the school community through digital artistry and UX/UI Design. Students create original iconography to build an inclusive digital platform that tackles resource scarcity. **Final product:** A resource exchange app for the school community as well as an “app store card” (descriptive report) in the delegate’s portfolio. **Timing**: 11th January – 18th January (4 sessions)
CONTENT

Decree 61/2022	STEM
Artistic Education • Técnicas, materiales y recursos informáticos y tecnológicos • Recursos digitales de uso común para las artes plásticas, visuales y las artes audiovisuales **Language content** Descriptive report	**Science** • Fases de la investigación científica (observación sistemática, formulación de preguntas, hipótesis y predicciones, planificación) **Technology and Robotics** • Interpretación y ejecución de algoritmos sencillos (rutinas, instrucciones con pasos ordenados…)

Sustainable development goal

COGNITION	
Learning goals	Learning outcomes
1.1. To **remember** the core targets of SDG 1. 1.2. To **understand** the principles of pixel art and how digital icons facilitate navigation in a User Interface (UI). 2.1. To **apply** digital art tools to design original Pixel Art iconography and the app’s interface layout. 2.2. To **analyse** and execute navigation algorithms (logical steps) to ensure the app functions correctly for the user. 2.3. To **evaluate** the effectiveness of the digital design in terms of accessibility and its potential to foster solidarity**.** 3.1. To **use** reflection tools to monitor the learning process and develop empathy toward social challenges. 4.1. To **produce** a structured descriptive report (The app store card) to explain the technical and artistic features of the prototype.	1.1.1. SS **list** elements of visual language and **identify** the social needs of the school community related to resource scarcity. 1.2.1. SS **identify** the functional sections of a resource exchange app and **describe** the meaning of their pixel art icons. 2.1.1. SS **execute** the pixel art design of the app interface on tablets, applying digital creation techniques. 2.1.2. SS **implement** a consistent resolution (e.g., 32x32 pixels) to maintain a unified artistic style across all screens. 2.2.1. SS **test** and troubleshoot the navigation flow (logic steps) of the prototype to verify the correct functioning of buttons and menus. 2.2.2. SS **break down** the resource exchange process into a sequence of interactive screens (Home, Donation, Success). 2.3.1. SS **judge** their own design and their peers' work through a feedback process, justifying the choice of icons for an inclusive platform. 3.1.1. SS **complete** a KWL chart and use **"**traffic light**"** cues to monitor their confidence during the design of the app. 4.1.1. SS **write** the "app store card" entry using specific STEAM vocabulary (CALP), present

<table>
<tr><td></td><td>simple for facts, and passive voice for technical descriptions.</td></tr>
<tr><td colspan="2">CULTURE</td></tr>
<tr><td><u>Learning goals</u>
-To analyse and relate their own environmental reality with the resource-sharing challenges faced by different cultures.
- To evaluate the role of digital collaborative tools as instruments for social justice and the protection of human rights.</td><td><u>Learning outcomes</u>
- SS compare their personal resource consumption and access to goods with the realities of different regions represented in the assembly.
- SS justify how a low-cost app can positively impact the economy and well-being of a community facing economic difficulties.</td></tr>
<tr><td colspan="2">COMMUNICATION</td></tr>
<tr><td colspan="2">LANGUAGE OF
• Key language: No Poverty, resource scarcity, digital art, pixel art, resolution, UI (User Interface), icons, navigation, algorithm, interactive buttons, solidarity.
• Language content (Genre): Descriptive Report (App store card).
• Structure: Title and Logo, app description and SDG 1 Goal, visual features, technical specs, social impact and conclusion.
• Language Input: Objective and factual language. Present simple: (“The app features three main menus”). Passive voice: For technical descriptions (“The icons are designed in a 32x32 grid”).
• Academic language:
o To introduce the first step: To begin with.
o To give an example: For instance,
o To explain the outcome: Consequently
LANGUAGE FOR
• Language for describing Pixel Art and design: “This icon represents a book; it is designed with a 32x32 pixel resolution to keep the style consistent”.
• Language for explaining the navigation logic: “If the user clicks the 'Donate' icon, the app triggers the inventory screen”.
• Classroom language:
o Group work: Let’s choose the app style, can you draw the food icon? Let’s decide the navigation flow.
o Activities: Draw the grid, Link the screens, Design the button, Test the prototype, Write the app description.
o Classroom interaction: Does the button work? How can we make it more inclusive? Compare your icons with other delegates.
LANGUAGE THROUGH
• Language through peer interaction: Debating which icons are easiest to understand for a global audience during the design phase.
• Language through interaction with technology: Vocabulary emerging while linking screens in Canva or Genially and troubleshooting the "clickable" areas.
• Language through interaction with materials: Discovering "resolution" and "aliasing" while creating art on a digital grid.
• Language through observation: Analysing real app store entries to identify the most effective way to describe their solidarity tool.
• Language through interests: Students researching real-world "sharing economy".</td></tr>
<tr><td colspan="2">EVALUATION</td></tr>
<tr><td>Specific competences (decree 61/2022)</td><td>Content evaluation criteria (decree 61/2022)</td></tr>
<tr><td>-Artistic education: 3., 4.
-Natural science: 2.
-Technology and robotics: 1.</td><td>-Artistic education: 3.1, 4.3
-Natural science: 2.5.
-Technology and robotics: 1.2.</td></tr>
<tr><td colspan="2">Language evaluation criteria (CEFR, 2018)</td></tr>
<tr><td colspan="2">WRITTEN PRODUCTION AND DESCRIPTION (A2): Can write a simple, structured descriptive report (the app store card for the Delegate’s Portfolio) explaining the technical functions and the pixel</td></tr>
</table>

art iconography of the resource exchange app, linking sentences with connectors like ‘and’, ‘because’, ‘initially’, or ‘therefore’.	
Assessment tools	
For interaction	Random pick-up tools (sticks) and mini whiteboards.
For active observation	Observation grid
For peer/self-evaluation	“2 stars and a wish” (oral) and reflection wheel.
For summative assessment	Analytic rubric.
Grading criteria	
<u>Summative assessments</u> - Final product (App): 30% -Delegate’s portfolio (descriptive report): 40%	<u>Formative assessments</u> - Self and peer evaluation: 10% - Classwork and participation: 20%
ATTENTION TO DIVERSITY	
General measures • Use of **real materials**: Physical graph paper and markers to sketch Pixel Art icons before digital prototyping • **Visual aids**: A printed checklist with icons to track mission stages • **Writing frames**: Fill-in-the-blank template for the App Store Card descriptive report.	
LOTS→HOTS Students identify pixel icons and their functions (LOTS) and then **evaluate** the app's accessibility for vulnerable users (HOTS).	HOTS→LOTS Students **analyse** the app's social impact on SDG 1 (HOTS) and then label the geometric elements of their pixel designs using word cards (LOTS).

4.2.2. Challenge 7: Sky garden

CHALLENGE 7. SKY GARDEN	
Description (aim): To design a modular vertical farming tower using proportional reasoning for nutrient solutions and IoT sensors, decorated with traditional artistic patterns and techniques reflecting the delegate's assigned nation to ensure food security in urban school environments. **Final product:** A "Smart National Totem": a modular hydroponic tower controlled via tablet/mobile, customized with cultural artistic techniques and accompanied by a technical descriptive report in the delegate’s portfolio. **Timing**: 19 January – 1st February (6 sessions)	
CONTENT	
Decree 61/2022	**STEM**
Artistic Education • El proceso creativo. • Evaluación, respeto, interés y valoración tanto por el proceso como por el producto final en producciones plásticas, visuales, audiovisuales. **Language content** Descriptive report (Blog post)	**Science** • Fases de la investigación científica **Technology and Robotics** • Dispositivos conectables. Pautas para la instalación de dispositivos que puedan conectarse entre sí y controlarse de forma centralizada. **Mathematics** • Resolución de problemas de proporcionalidad.
Sustainable development goal 	
COGNITION	
Learning goals	Learning outcomes

1.1. To **understand** the biological process of plant nutrition in hydroponic systems and the importance of IoT sensors for automated farming. 2.1. To **apply** mathematical scales and proportional reasoning to prepare nutrient solutions and assemble the structure following a provided prototype. 2.2. To **analyse** the data from the soil moisture sensors to ensure the plants' survival. 3.1. To **evaluate** the effectiveness of the "Smart National Totem" as a solution for urban food security. 4.1. To **use** the descriptive report genre to explain the technical and artistic features of the sky garden.	1.1.1 SS **describe** the path of the nutrient solution through the vertical tower. 1.1.2. SS **identify** and **locate** the technological components (sensors, micro:bit) and artistic elements (points, lines) used in the model. 1.1.3. SS **classify** the recycled materials according to their properties and suitability for the sculpture. 2.1.1. SS **execute** the assembly of the modular tower by **following** the step-by-step technical guide. 2.1.2. SS **sketch** national artistic patterns on the bottles, **demonstrating** the correct use of cultural textures and colors. 2.1.3. SS **solve** proportion problems to calculate the exact percentage of water and minerals needed. 2.2.1. SS **test** the connection between the sensor and the tablet to **detect** errors in the centralized irrigation system. 3.1.1. SS **judge** the quality of their final product using a self-correction rubric. 4.1.1. SS **write** a technical blog post for the Delegate's Portfolio including materials, measurements, and cultural meaning.
CULTURE	
Learning goals	**Learning outcomes**
-To **show** curiosity and openness toward the diverse artistic and scientific solutions proposed by other nations.	-SS. **demonstrate** empathy toward societies facing water or food scarcity through their descriptive reports
COMMUNICATION	

LANGUAGE OF

- **Key language:** Hydroponics, nutrient solution, soil moisture sensor, IoT, micro:bit, irrigation, rule of three, proportions, scale, percentage, point, line, plane, texture, cultural identity, totem, food security, urban farming, JUNA delegation.
- **Language content (Genre):** Descriptive report (blog post).
- **Structure:** Introduction, design (technical drawings and cultural patterns). 3. Development: Nutrient proportions and sensor setup. 4. Results: Data monitoring and plant growth. 5. Conclusion: Impact on food security and urban farming.
- **Language Input:** Objective and factual language. Present Simple: For plant biology and tech facts ("Sensors detect moisture levels"). Past Tense: For construction steps ("We painted the bottles following the pattern"). Passive Voice: For technical descriptions ("The nutrient solution is mixed in...").
- **Academic language:**
  - To introduce the first step: Initially
  - To give an example: For instance.
  - To explain the outcome: Consequently.

LANGUAGE FOR

- **Language for describing 3D structures and math:** "This totem is built at a 1:5 scale; the rule of three ensures the correct nutrient mix."
- **Language for comparing material properties:** "The painted surface has a smoother texture than the raw plastic, creating a vibrant national design."
- **Language for explaining how the system works:** "The sensor sends a signal to the tablet when the moisture is below 20%, triggering the alert."
- **Classroom language:**

- **Group work:** Let's choose our national patterns, can you help me scale the drawing? Let’s divide the painting tasks.
- **Activities:** Assemble the modular bottles, connect the sensors, mix the nutrients, check the tablet dashboard.
- **Classroom Interaction:** Is the sensor connected to Wi-Fi? How did you calculate the ratio? Compare your national patterns with other delegations.

LANGUAGE THROUGH

- Language through peer interaction: Negotiating the cultural symbols and patterns for the national identity during the design phase.
- Language through interaction with technology: Vocabulary emerging while debugging the micro:bit connection and setting up the IoT dashboard.
- Language through interaction with materials: Discovering "viscosity" and "absorption" while handling nutrient solutions and coconut fiber.
- Language through observation: Analysing the water flow through the modular bottles and identifying leaks or clogs.
- Language through interests: Students researching their assigned nation's traditional agriculture to add cultural depth to their report.

<table>
<tr><th colspan="2">EVALUATION</th></tr>
<tr><th>Specific competences (decree 61/2022)</th><th>Content evaluation criteria (decree 61/2022)</th></tr>
<tr><td>-Artistic education: 1., 4.
-Natural science: 6
-Mathematics: 5.
-Technology and robotics: 3.</td><td>-Artistic education: 1.3., 4.3.
-Natural science: 6.1.
-Mathematics: 5.2.
-Technology and robotics: 3.2.</td></tr>
<tr><th colspan="2">Language evaluation criteria (CEFR, 2018)</th></tr>
<tr><td colspan="2">WRITTEN REPORTS AND ESSAYS (A2): Can write a simple, structured technical blog post for the Delegates Portfolio, describing the technical specifications of the "sky garden", the cultural artistic patterns of their nation, and the scientific data from the sensors. This involves linking sentences with connectors like ‘initially’, ‘because’, ‘therefore’, or ‘finally’</td></tr>
<tr><th colspan="2">Assessment tools</th></tr>
<tr><td>For interaction</td><td>Random selection sticks and thumbs up/down</td></tr>
<tr><td>For active observation</td><td>Observation grid</td></tr>
<tr><td>For peer/self-evaluation</td><td>Self-evaluation checklist</td></tr>
<tr><td>For summative assessment</td><td>Analytic rubric</td></tr>
<tr><th colspan="2">Grading criteria</th></tr>
<tr><td><u>Summative assessments</u>
- Final product (vertical farming tower): 30%
-Delegate’s portfolio (blog post): 40%</td><td><u>Formative assessments</u>
- Self and peer evaluation: 10%
- Classwork and participation: 20%</td></tr>
<tr><th colspan="2">ATTENTION TO DIVERSITY</th></tr>
<tr><th colspan="2">General measures</th></tr>
<tr><td colspan="2">Use of real materials: Hands-on assembly of modular bottle towers and physical manipulation of nutrient solutions to visualize proportionality (proportional reasoning) before digital monitoring.
Visual aids: Provide a printed mission checklist to track every stage: Nutrient Calculation → Bottle Decoration →IoT Setup →Blog Entry.
Writing frames: Provide a substitution table and sentence starters for the technical descriptive report in the digital portfolio to support the "scientific explanation" genre.</td></tr>
<tr><td>LOTS→HOTS
Students identify the mathematical "rule of three" components and troubleshoot why the nutrient solution ratio is incorrect to ensure the plants' survival.</td><td>HOTS→LOTS
Students design the original "smart national totem" and label the specific geometric elements (points, lines, planes) and cultural textures used in their artistic creation.</td></tr>
</table>

4.2.3. Challenge 8: The health shield

CHALLENGE 8. THE HEALTH SHIELD

<table>
<tr><td colspan="2">Description (aim): To design a smart posture brooch using the metal embossing technique integrated with a tilt-sensor circuit that monitors postural health and the sensory-motor response.
Final product: An embossed metallic brooch with a hidden electronic tilt-sensor and LED, accompanied by an Interactive Digital Museum Card in the delegate's portfolio.
Timing: 2nd February – 16th February (6 sessions)</td></tr>
<tr><td colspan="2">CONTENT</td></tr>
<tr><td>Decree 61/2022</td><td>STEM</td></tr>
<tr><td>Artistic Education
• Elementos configurativos del lenguaje visual y sus posibilidades expresivas y comunicativas: punto, línea, plano, textura, color. / Medios, soportes y materiales de expresión plástica y visual.</td><td rowspan="2">Science
• Identificación y localización de los órganos implicados en la función de relación: órganos de los sentidos, sistema nervioso (nervios, neuronas y cerebro) y aparato locomotor.
Technology and Robotics
• Electricidad y electrónica básica: cables y conectores, actuadores, circuitos, sensores.
Mathematics
• Instrumentos (analógicos o digitales) y unidades adecuadas para medir longitudes, objetos, ángulos y tiempos: selección y uso.</td></tr>
<tr><td>Language content
Descriptive report (museum card)</td></tr>
<tr><td colspan="2">Sustainable development goal
</td></tr>
<tr><td colspan="2">COGNITION</td></tr>
<tr><td>Learning goals
1.1. To understand the human relation function (senses, nervous system, and locomotor system) and the physical properties of metal for creating reliefs.
2.1. To apply the metal embossing technique and use mathematical measurement tools to calibrate the posture sensor.
2.2. To analyze the data from the tilt-sensor to ensure the posture alert triggers at the correct angle.
3.1. To evaluate the effectiveness of the brooch in improving postural health and personal well-being.
4.1. To use the descriptive report genre to document the artistic technique and the health purpose of the brooch.</td><td>Learning outcomes
1.1.1. SS identify and locate the sensory organs and the parts of the nervous system involved in postural correction.
1.1.2. SS describe the components of the tilt-sensor circuit and their function.
1.1.3. SS classify the different types of textures and lines used in the metal embossing technique.
2.1.1. SS execute the metal embossing process using pressure tools to transform a flat surface into a national relief.
2.1.2. SS measure and sketch the brooch's dimensions and the specific tilt angles using rules and protractors.
2.2.1. SS operate the electronic circuit and test the tilt sensor to detect malfunctions in the connection.
3.1.2. SS judge their own sitting habits and value how wearable technology can prevent future spinal injuries.
4.1.1. SS write a structured "Interactive Digital Museum Card" for the Delegate's Portfolio.
4.1.2. SS report and interpret the technical specifications of the project using specific STEAM vocabulary (CALP).</td></tr>
<tr><td colspan="2">CULTURE</td></tr>
<tr><td><u>Learning goals</u></td><td><u>Learning outcomes</u></td></tr>
</table>

<table>
<tr><td>-To evaluate the impact of technology on the universal right to health and physical well-being.</td><td>-SS. justify how their brooch provides a creative and accessible solution to a global health problem.</td></tr>
<tr><th colspan="2">COMMUNICATION</th></tr>
<tr><td colspan="2">LANGUAGE OF

Key language: Relation function, senses, brain, nervous system, spine, posture, tilt sensor, circuit, LED, metal embossing, relief, texture, patterns, angles, protractor, ODS 3, well-being, ergonomics.
Language content (Genre): Descriptive Report (Interactive Digital Museum Card).

Structure: Introduction, artistic design, technical function and conclusion.
Language Input: Objective and factual language. Imperatives: For instructional steps (“Press the metal to create texture”) and modals: For health advice (“You should sit straight to protect your spine”).

Academic language:

To introduce the first step: to start with.
To give an example: Like.
To explain the outcome: This means that.

LANGUAGE FOR

Language for describing art and health: “This metal relief has a rough texture to represent my nation; the sensor protects my spine when I lean forward.”
Language for explaining the circuit: “The tilt sensor closes the circuit because the metal ball touches the pins, then the LED lights up to alert my brain.”
Language for measuring angles: “The protractor shows a 45-degree angle; we need to calibrate the sensor to be more precise for our posture.”
Classroom language:

Group work: Which national symbol should we emboss? Let’s connect the LED to the battery. Can you help me tape the sensor?
Activities: Trace the pattern on the aluminium, press firmly with the tool, Test the tilt angle, Record the video clip for the card.
Classroom interaction: Why is the light not turning on? Does your back feel better with the brooch? Compare your design with other delegations.

LANGUAGE THROUGH

Language through peer interaction during the debating of cultural icons and embossing designs in the planning phase.
Language acquired through the trial-and-error process of troubleshooting sensor sensitivity and electronic circuit connections.
Language through physical interaction with aluminium sheets and embossing tools while discovering terms like malleability and pressure.
Language through watching and analysing personal posture habits to determine the exact inclination angles for the alert.
</td></tr>
<tr><th colspan="2">EVALUATION</th></tr>
<tr><th>Specific competences (decree 61/2022)</th><th>Content evaluation criteria (decree 61/2022)</th></tr>
<tr><td>-Artistic education: 3., 4.
-Natural science: 6.
-Mathematics: 5.
-Technology and robotics: 2.</td><td>-Artistic education: 3.2, 4.3
-Natural science: 6.1
-Mathematics: 5.2
-Technology and robotics: 2.1, 2.2</td></tr>
<tr><th colspan="2">Language evaluation criteria (CEFR, 2018)</th></tr>
<tr><td colspan="2">ORAL PRODUCTION AND EXPLAINING (A2): Can give a short, rehearsed oral presentation or video-report about a simple process (describing the artistic relief and the functional steps of the brooch for the portfolio), linking sentences with connectors like ‘first’, ‘then’, ‘because’ or ‘so’.</td></tr>
<tr><th colspan="2">Assessment tools</th></tr>
<tr><td>For interaction</td><td>Thumbs up/down and mini whiteboards</td></tr>
<tr><td>For active observation</td><td>Individual checklist during creation process.</td></tr>
<tr><td>For peer/self-evaluation</td><td>Feedback sandwich for peers</td></tr>
</table>

For summative assessment	Analytic rubric for the technical functionality of the brooch.
Grading criteria	
<u>Summative assessments</u> - Final product(posture brooch): 30% -Delegate's portfolio (museum card): 40%	<u>Formative assessments</u> - Self and peer evaluation: 10% - Classwork and participation: 20%
ATTENTION TO DIVERSITY	
General measures **Visual aids:** Provide a printed checklist to tick off each completed stage of the mission: National Symbol Design → metal embossing →tilt-circuit assembly →digital museum card entry. **Cooperative learning:** Work in national delegations to allow peer-tutoring, where students with stronger technical skills support peers with ADHD or dyslexia during the circuit assembly. **Writing frames:** Provide a fill-in-the-blank template for the "Artist's Statement" and the technical report of the brooch's health benefits in the digital portfolio.	
LOTS→HOTS Students identify the specific components of the electronic circuit (LED, battery, sensor) and troubleshoot (debug) the connection to ensure the light activates only when the tilt sensor reaches the calibrated 30-degree posture limit.	HOTS→LOTS Students design the original brooch using complex embossing techniques and label the biological organs (eyes, brain, nerves) involved in the human relation function using pre-written word cards and visual prompts.

4.2.4. Challenge 9: Magic lens

CHALLENGE 9. MAGIC LENS	
Description (aim): To create a magic lens book to show how education has changed from the past to the present in their JUNA nation, combining drawings, stop-motion animations and augmented reality (AR). **Final product:** An augmented reality storybook with hand-drawn illustrations and digital animations, integrated directly into the delegate's portfolio. **Timing**: 17th Feb – 2nd Mar (6 sessions)	
CONTENT	
Decree 61/2022	**STEM**
Artistic Education • Las herramientas y las técnicas básicas de animación. El cine de animación como género. Creación, montaje y difusión de una película, sencilla, de animación. **Language content** Chronicle (historical recount)	**Science** • Vocabulario científico, técnico y aplicado básico, adecuado a su edad, relacionado con las diferentes investigaciones. **Technology and Robotics** • Iniciación a la edición y creación de códigos QR o contenidos con realidad aumentada. **Mathematics** • Estrategias para la interpretación, modificación y creación de algoritmos sencillos (secuencias de pasos ordenados, esquemas, simulaciones...).
Sustainable development goal 	
COGNITION	
Learning goals	Learning outcomes

1.1. To **understand** the historical evolution of education and the basic principles of cinematic animation. 2.1. To **apply** animation techniques and logical algorithms to narrate historical changes through Augmented Reality. 2.2. To **analyse** the chronological order of educational rights to build a coherent timeline. 3.1. To **evaluate** the progress of educational rights and the effectiveness of digital tools in modern learning. 4.1. To **use** the "Historical Recount" genre to document the journey of education in their assigned nation.	1.1.1. SS **identify** and **list** key historical milestones and school materials from different eras in their JUNA nation. 1.1.2. SS **describe** how a "stop-motion" sequence works (frame-by-frame movement). 2.1.1. SS **execute** a stop-motion sequence using paper-cut characters to represent a specific historical scene. 2.1.2. SS **test** and **adjust** a logical algorithm (input/trigger→ output/animation) to ensure the AR functions correctly. 2.2.1. SS **organize** historical facts into a sequential timeline using mathematical measurements of time (decades, centuries). 3.1.1. SS **judge** the importance of the Right to Education by comparing the difficulties of the past with the opportunities of the present. 4.1.1. SS **write** a chronological narrative for the storybook using past tenses and time markers.
CULTURE	
Learning goals	**Learning outcomes**
-To **understand** the historical evolution of education and the diversity of school environments in different JUNA nations. -To **evaluate** the universal right to quality education and its impact on the development of different societies.	-SS. **describe** how school environments and educational tools vary across different cultures and historical periods. - SS. **justify** the importance of global cooperation in ensuring quality education for all children, regardless of their nation or historical context.

COMMUNICATION

LANGUAGE OF

- **Key language:** Animation, stop-motion, frame, sequence, AR trigger, marker, algorithm, historical recount, timeline, milestones, educational rights, nowadays, century, decade.
- **Language content (Genre):** Chronicle (historical recount).
  - **Structure:** Orientation, record of events, reorientation and reflection on SDG 4.
  - **Language Input:** Narrative and chronological language. **Past Simple:** For historical facts ("In the past, students used slates"). **Used to:** For abandoned habits ("They used to walk long distances to school").
- **Academic language:**
  - To introduce the first step: At the start of the century.
  - To give an example: Like.
  - To explain the outcome: This led to.

LANGUAGE FOR

- **Language for describing historical changes:** "In the past, schools in Japan were made of wood; however, nowadays they have high-tech robotics labs."
- **Language for explaining animation steps:** "First, move the character slightly; next, take a photo to create the frame; finally, check the sequence speed."
- **Language for discussing AR logic:** "If the tablet scans this specific marker, then the stop-motion animation about the 19th century starts playing."
- **Classroom language:**
  - **Group work:** Let's decide the timeline order, Who is the photographer? Can you help me draw the historical background?
  - **Activities**: Trace the timeline, Capture the frame, Set up the AR trigger, Test the synchronization, Bind the book pages.
  - **Classroom interaction**: Why is the animation too fast? How does the school in the past compare to ours? Check the algorithm for the AR scan.

LANGUAGE THROUGH

<table>
<tr><td colspan="2">

- Language through peer interaction during the debating of historical facts and the collaborative design of the storybook pages.
- Language through the trial-and-error process of synchronizing the stop-motion frames with the AR digital triggers.
- Language through physical interaction with paper-cut characters, cameras, and artistic materials while building the historical scenes.
- Language through watching historical documentaries and technical tutorials about stable frame-by-frame animation techniques.

</td></tr>
<tr><th colspan="2">EVALUATION</th></tr>
<tr><th>Specific competences (decree 61/2022)</th><th>Content evaluation criteria (decree 61/2022)</th></tr>
<tr><td>-Artistic education: 1., 3.
-Natural science: 1., 2.
-Mathematics: 4.
-Technology and robotics: 1., 6.</td><td>-Artistic education: 1.3, 3.1.
-Natural science: 1.1, 2.5
-Mathematics: 4.1
-Technology and robotics: 1.2., 6.2.</td></tr>
<tr><th colspan="2">Language evaluation criteria (CEFR, 2018)</th></tr>
<tr><td colspan="2">ORAL PRODUCTION AND EXPLAINING (A2): Can give a short, rehearsed oral presentation or video-report about a historical sequence (narrating the evolution of schools for the "Magic Lens" storybook and the stop-motion animation process), linking sentences with connectors like ‘long ago’, ‘then’, ‘after that’ or ‘nowadays’.</td></tr>
<tr><th colspan="2">Assessment tools</th></tr>
<tr><td>For interaction</td><td>Mini whiteboards and exit slips</td></tr>
<tr><td>For active observation</td><td>Individual checklist for the stop-motion filming process.</td></tr>
<tr><td>For peer/self-evaluation</td><td>Reflection wheel</td></tr>
<tr><td>For summative assessment</td><td>Analytic rubric and digital quiz.</td></tr>
<tr><th colspan="2">Grading criteria</th></tr>
<tr><td><u>Summative assessments</u>
- Final product (AR storybook): 30%
-Delegate’s portfolio (historical recount in the storybook): 40%</td><td><u>Formative assessments</u>
- Self and peer evaluation: 10%
- Classwork and participation: 20%</td></tr>
<tr><th colspan="2">ATTENTION TO DIVERSITY</th></tr>
<tr><td colspan="2">General measures

- **Use of real materials**: Physical paper-cut characters and cardboard school settings for tactile scene-building before capturing frames for the digital stop-motion animation.
- **Cooperative learning**: Work in national delegations with assigned roles (e.g., historian, animator, tech-lead) to foster peer-tutoring and reduce cognitive load for students with ADHD.
- **Scaffolded vocabulary**: Provide visual glossaries and flashcards for technical and historical terms like *milestone, century, frame, trigger, algorithm,* and *educational rights*.

</td></tr>
<tr><td>LOTS→HOTS
Students identify the correct chronological sequence of educational milestones in their nation and troubleshoot (debug) the AR trigger logic to ensure the correct historical video plays when the marker is scanned.</td><td>HOTS→LOTS
Students create an original stop-motion animation depicting a "future school" for ODS 4 and label the innovative technological tools and learning spaces using pre-written word cards and visual prompts.</td></tr>
</table>

4.2.5. Challenge 10: Science heroes

CHALLENGE 10. SCIENCE HEROES
Description (aim): To design an interactive portrait of a female scientist by constructing a custom frame, creating a scaled portrait, and integrating a push-button circuit that triggers a recorded biography narrated by the students. **Final product:** A handmade canvas with a custom-built frame and an integrated audio system, accompanied with the written biography in the delegate’s portfolio.

<table>
<tr><td colspan="2">Timing: 3rd March – 16th March (4 sessions)</td></tr>
<tr><th colspan="2">CONTENT</th></tr>
<tr><th>Decree 61/2022</th><th>STEM</th></tr>
<tr><td>Artistic Education
• Obras artísticas, plásticas, visuales y audiovisuales de diferentes corrientes estéticas, procedencias y épocas producidas por creadores locales, regionales, nacionales e internacionales.
• Recepción y apreciación de obras artísticas.

Language content
Chronicle (biography)</td><td>Science
• Fases de la investigación científica (recogida de datos)
Technology and Robotics
• Extensiones de programación por bloques y aplicación a la robótica educativa.
Mathematics
• Resolución de problemas de proporcionalidad, (regla de tres, reducción a la unidad e igualdad entre proporciones), porcentajes y escalas de la vida cotidiana.</td></tr>
<tr><th colspan="2">Sustainable development goal</th></tr>
<tr><td colspan="2">
</td></tr>
<tr><th colspan="2">COGNITION</th></tr>
<tr><th>Learning goals</th><th>Learning outcomes</th></tr>
<tr><td>1.1. To remember female pioneers in science and understand the scaling process in art and frame construction.
2.1. To apply mathematical scales to build a frame that fits the portrait and analyse the best layout for the electronic components.
2.2. To create a unique interactive frame, deciding on materials, aesthetic finishes, and the structural integration of the button and cables.
3.1. To evaluate the creative and technical decisions made during construction and reflect on how this "voice-box" honours women in science.
4.1. To use the Biography genre to narrate achievements.</td><td>1.1.1. SS list facts about the scientist and identify the basic components of an audio-circuit.
1.1.2. SS describe how a push-button closes a circuit to send a signal to the micro-controller.
2.1.1. SS calculate proportions and test the placement of cables to avoid short circuits or visible wires.
2.2.1. SS design and build the frame structure, choosing materials and integrating the push-button and speaker.
2.2.2. SS organize the recording process within their delegation.
3.1.1. SS judge if their design is functional and aesthetically pleasing and reflect on the importance of visibility for female scientists.
4.1.1. SS write and record a biographical script using third-person past tenses.</td></tr>
<tr><th colspan="2">CULTURE</th></tr>
<tr><th><u>Learning goals</u></th><th><u>Learning outcomes</u></th></tr>
<tr><td>-To develop an attitude of respect and appreciation for the diversity of women's contributions to global progress.</td><td>SS. show interest in researching and sharing stories of women who overcame social barriers in different cultural contexts.</td></tr>
<tr><th colspan="2">COMMUNICATION</th></tr>
<tr><td colspan="2">LANGUAGE OF (Language of learning)
• Key language: Scientist, biography, achievements, legacy, SDG 5, proportion, dimensions, frame, housing, circuit, push-button, input, output, wires, battery, Micro: bit, speaker.
• Language content (Genre): Biography (Third-person narrative).
    ○ Structure: Introduction, career, conclusion: legacy and impact on global science.
    ○ Language Input: Narrative and descriptive language. Past Simple (3rd person): For historical facts (“She studied radioactivity”, “She won the Nobel Prize”).</td></tr>
</table>

Possessive Adjectives: To link achievements to the person (“Her work”, “Her discovery”).

- **Academic language:**
  - To introduce facts: She became known for.
  - To link events: furthermore
  - To explain the result: As a result of her discovery.

LANGUAGE FOR

- **Language for engineering and scales:** “The frame must be 3 cm wider than the portrait to hide the battery.” “According to the 1:3 scale, the final width of the frame is 30 cm.”
- **Language for explaining the circuit:** “When the button is pressed, the circuit is completed and the Micro: bit triggers the recorded audio file.”
- **Language for the "Create" process:** “Our group decided to build a deep shadow-box frame to protect the electronic components and hide the wires.”
- **Classroom language:**
  - Group work: Let’s decide the frame materials, Let's check the scale calculations together.
  - Activities: Measure the portrait, cut the cardboard strips
  - Classroom Interaction: Why is the sound not playing? Is the button properly connected to the Pin 0?

LANGUAGE THROUGH

- Language through deciding which materials provide better structural stability for the hidden compartment during the brainstorming phase.
- Language through troubleshooting the connection between the button and the controller.
- Language through interaction with materials: Understanding "depth" and "volume" while building the physical housing for the speakers and battery pack.
- Language through observation: Analysing how the audience interacts with the tactile button and the audio clarity during the final assembly.
- Language through interests: Students researching real scientific tools.

EVALUATION

Specific competences (decree 61/2022)	Content evaluation criteria (decree 61/2022)
-Artistic education: 3., 4. -Natural science: 2. -Mathematics: 5. -Technology and robotics: 2.	-Artistic education: 3.1, 4.1, 4.3. -Natural science: 2.5. -Mathematics: 5.2. -Technology and robotics: 2.1, 2.2

Language evaluation criteria (CEFR, 2018)

WRITTEN PRODUCTION AND NARRATION (A2): Can write a short, simple biography about a historical figure (summarising the life and scientific contributions of the chosen female scientist for the delegate’s portfolio), linking sentences with chronological connectors like ‘first’, ‘later’, ‘after that’ or ‘finally’.

Assessment tools

For interaction	Mini whiteboards and thumbs up/down
For active observation	Observation sheet
For peer/self-evaluation	2 stars and a wish for peers
For summative assessment	Analytic rubric

Grading criteria

Summative assessments	Formative assessments
- Final product (interactive portrait): 30% -Delegate’s portfolio (biography): 40%	- Self and peer evaluation: 10% - Classwork and participation: 20%

ATTENTION TO DIVERSITY

General measures

- **Cooperative learning:** National delegations with assigned roles (Engineer, Designer) to facilitate peer-tutoring.
- **Scaffolded vocabulary:** Visual word banks and flashcards for terms like *push-button, housing, circuit,* and *legacy*.

• **Writing frames:** Sentence starters in third person (*"She was born in...", "She discovered..."*) for the audio script.	
LOTS→HOTS Debug the circuit logic to ensure the recorded biography triggers correctly when the button is pressed.	HOTS→LOTS Design an original interactive frame and label the scientific facts using pre-written word cards.

4.3. Learning situation III. Designing tomorrow

THIRD TERM. DESIGNING TOMORROW

Contextualization

In the final term, "Designing Tomorrow", E.L.I.A.S. challenges the National Delegations to act as the architects of a resilient and peaceful society. This stage focuses on sustainable cities, innovation, and global partnerships, requiring students to synthesize all the knowledge acquired throughout the academic year.Through missions 11 to 15, delegations address complex urban and ethical crises by creating advanced STEAM solutions, such as Smart City prototypes or Robotic cranes for peace. Upon "unlocking" the final set of SDGs, the assembly is awarded with the Gold Medal. This prestigious recognition marks the successful conclusion of the JUNA assembly, certifying the students' mastery of both the 2030 Agenda values and their high-level communicative competence in English.

Source: Image created with gemini

Timing	March-June (annex 7)	**Genres**	-Arguments/exposition - Procedure (procedural recount)
Where?	It will take place in the classroom	**Context**	Students will receive another official video broadcast from ELIAS. He will congratulate them on their silver medal and will call them again for cooperation to tackle and address the final SDGs focused on prosperity and peace.
Final product	The final product of this term will be the **third part of the digital Delegate's Portfolio** presented as a future & peace blueprint. It will include argumentative discussions on smart cities, critical reviews and technical procedural recounts.		

Challenges

-Sun stories
-The school of tomorrow
-Eco-couture
-Peace in motion
-Delegate’s legacy

4.3.1. Challenge 11: Sun stories

CHALLENGE 11. SUN STORIES	
Description (aim): To construct a solar-powered shadow theatre and film its assembly through Stop-Motion animation. **Final product:** A physical solar-powered theatre and a stop-motion video in the delegate's portfolio featuring the step-by-step construction and a sample shadow play demonstration. **Timing**: 31st March – 12th April (7 sessions)	
CONTENT	
Decree 61/2022	**STEM**
Artistic Education • Las herramientas y las técnicas básicas de animación. • El cuerpo y sus posibilidades motrices, dramáticas y creativas: interés en la experimentación a través de la representación teatral como medio de comunicación, expresión, diversión y fomento de la creatividad.	**Science** • La energía eléctrica. Fuentes, transformaciones, transferencia y uso en la vida cotidiana. **Technology and Robotics** • Electricidad y electrónica básica: cables y conectores, actuadores, circuitos, sensores, motores, baterías. **Mathematics** • Figuras geométricas de dos y tres dimensiones.
Language content Procedure (procedural recount)	
Sustainable development goal 7 AFFORDABLE AND CLEAN ENERGY	
COGNITION	
Learning goals	Learning outcomes
1.1. To **remember** renewable energy sources and the components of a basic electrical circuit (LED, solar panel, battery). 1.2. To **understand** the physical principles of light and shadow and their application in shadow theatre. 1.3. To **understand** the importance of SDG 7 on environmental sustainability. 2.1. To **apply** mathematical scaling and measuring to design the theatre and scenery. 2.2. To **analyse** the logical order of steps required to build a technical artifact. 2.3. To **create** a stop-motion animation with the assembly of a solar theatre. 3.1. To **evaluate** the efficiency of team collaboration in technical-artistic tasks and **reflect** on how energy choices affect global environmental problems. 4.1. To **use** sequence connectors and imperative verbs to deliver technical instructions.	1.1.1. SS **list** and **label** the elements of the solar-powered theatre. 1.1.2. SS **explain** the relationship between light source distance and shadow size. 1.2.1. SS **identify** and **classify** energy sources as renewable or non-renewable. 2.1.1. SS **calculate** proportions and **measure** materials using rules and geometric principles. 2.2.1. SS **sequence** the assembly steps into a logical flow for the tutorial. 2.3.1. SS **produce** a stop-motion video and **perform** a shadow play demonstration. 3.1.1. SS **assess** their own contribution to the project and identify areas for improvement. 3.1.2. SS **justify** the choice of solar energy based on its ecological benefits. 4.1.1. SS **sequence** the process in their script using *first, then, next,* and f*inally and the corresponding commands.*
CULTURE	
Learning goals	**Learning outcomes**
-To **understand** the historical and cultural origins of shadow puppetry and the global relevance of SDG 7 (Affordable and Clean Energy).	SS **identify** the origins of shadow theatre in different cultures (e.g., China, Indonesia, or Turkey) and **list** global energy challenges.
COMMUNICATION	

LANGUAGE OF

- **Key language:** Solar panel, circuit, LED, renewable energy, shadow, scale, proportion, stop-motion, frame rate, sequence.
- **Language content (Genre):** Procedure (procedural recount)
    - **Structure:** Introduction, materials list, assembly steps, stop-motion filming and final demonstration.
    - **Language Input:** Imperatives (*Connect, place, film*). Present simple for facts (*"Panels capture energy"*).
    - **Academic language:** To begin with, for instance, consequently,

LANGUAGE FOR

- **Language for technical design:** “This theatre uses a 1:2 scale; the solar panel must catch direct light to charge the battery.”
- **Language for explaining the process:** “The LED lights up because of the solar circuit; we film 12 frames per second for the animation.”
- **Classroom language:**
    - **Group work**: Let’s organize the frames, can you help me stabilize the camera? Let’s divide the assembly tasks.
    - **Activities**: Cut the cardstock, Connect the wires, Take the photo, Move the piece, Test the circuit.
    - **Classroom interaction**: Why is the shadow blurry? How many frames do we need? Compare your results with other groups.

LANGUAGE THROUGH

- Language through debating the assembly order for the stop-motion script and the best puppet proportions.
- Language through vocabulary emerging while troubleshooting the LED polarity and using the animation app.
- Language through discovering "opacity" and "translucency" while testing different screen textures.
- Language through analysing the relationship between light distance and shadow sharpness on the theatre screen.
- Language through **r**esearching traditional shadow theatre history to inspire their final performance.

EVALUATION

Specific competences (decree 61/2022)	**Content evaluation criteria (decree 61/2022)**
-Artistic education: 3., 4. -Natural science: 6. -Mathematics: 5. -Technology and robotics: 2.	-Artistic education: 3.1, 4.1, 4.3. -Natural science: 6.1 -Mathematics: 5.2. -Technology and robotics: 2.1, 2.2

Language evaluation criteria (CEFR, 2018)

ORAL PRODUCTION AND EXPLAINING (A2): Can give a short, rehearsed oral presentation or video-report about a simple process (explaining the assembly and the functioning of the solar-powered shadow theatre for the portfolio), linking sentences with connectors like ‘first’, ‘next’ or ‘finally’.

Assessment tools

For interaction	Cooperative role cards and random selection sticks.
For active observation	Individual checklist
For peer/self-evaluation	Peer- feedback sandwich
For summative assessment	Analytical rubric for the stop-motion video

Grading criteria

Summative assessments	Formative assessments
- Final product (solar power theatre): 30% -Delegate’s portfolio (stop motion video): 40%	- Self and peer evaluation: 10% - Classwork and participation: 20%

ATTENTION TO DIVERSITY

General measures

- **Real materials**: Physical solar circuit and theatre assembly to visualize energy and opacity.

<table>
<tr><td colspan="2">• Visual aids: Printed checklist of the mission stages to ensure structured progress.
• Cooperative learning: National delegations with peer-tutoring for ADHD and Dyslexia support.
• Scaffolded vocabulary: Visual word banks for technical terms (circuit, opacity, frame).
• Writing frames: Sentence starters for the "Procedure" script in the digital portfolio.</td></tr>
<tr><td>LOTS→HOTS
Students identify a malfunction in the solar circuit and troubleshoot the connections or light exposure to ensure the theatre is functional.</td><td>HOTS→LOTS
Students create an original stop-motion animation and label the technical components and energy steps using visual prompts and word cards.</td></tr>
</table>

4.3.2. Challenge 12: The school of tomorrow

<table>
<tr><th colspan="2">CHALLENGE 12. THE SCHOOL OF TOMORROW</th></tr>
<tr><td colspan="2">Description (aim): To design and build an interactive, tactile scale model of the school building that uses ultrasonic sensors to provide acoustic guidance, ensuring accessibility for all students within their immediate community.
Final product: A 3D tactile scale model of the school with integrated sensors and buzzers, accompanied by a podcast in the delegate’s portfolio.
Timing: 13th April – 26th April (6 sessions)</td></tr>
<tr><th colspan="2">CONTENT</th></tr>
<tr><th>Decree 61/2022</th><th>STEM</th></tr>
<tr><td>Artistic Education
• El cuerpo y sus posibilidades motrices, dramáticas y creativas.</td><td rowspan="2">Science
• Identificación y localización de los órganos implicados en la función de relación
Technology and Robotics
• Electricidad y electrónica básica: cables y conectores, actuadores, circuitos, sensores, motores, baterías.
Mathematics
• Localización y desplazamientos en planos y mapas a partir de puntos de referencia.</td></tr>
<tr><td>Language content
Exposition (argument essay)</td></tr>
<tr><th colspan="2">Sustainable development goal

</th></tr>
<tr><th colspan="2">COGNITION</th></tr>
<tr><td>Learning goals
1.1. To remember the body's movement possibilities and the organs involved in the relation function (senses and nervous system).
1.2. To understand how electronic sensors mimic human senses to collect information from the school environment.
2.1. To apply mathematical scales and cardinal points to represent the school's dimensions on a 3D model.
2.2. To evaluate the effectiveness of the tactile relief and the electronic feedback through sensory testing.</td><td>Learning outcomes
1.1.1. SS. list the body parts used in the dance session and locate the sense organs on a diagram.
1.2.1. SS. explain the path of energy from the ultrasonic sensor to the buzzer in their own words.
2.1.1. SS. calculate distances using scales and situate key reference points using cardinal directions.
2.2.1. SS. judge the prototype's functionality and fix the circuit if the acoustic signal is not accurate.</td></tr>
</table>

2.3. To **create** an original 3D tactile school model using artistic textures, movement-inspired paths, and electronic components 3.1. To **use** the KWL chart and reflection tools to monitor learning and empathy during the "blind" navigation experience 4.1. To script and record an **argumentative podcast** justifying the importance of universal accessibility in schools	2.3.1. SS. **design** and **assemble** a functional school model. 2.3.2. SS. **construct** a detailed sensory relief using diverse materials and textures to represent the school's pathway. 3.1. SS. **identify** what they have learned about accessibility and **demonstrate** critical thinking about their own progress. 4.1.1. SS. produce an **argumentative text** using evaluative adjectives, sensing verbs, and logical connectors to defend inclusive schools.

CULTURE

Learning goals	**Learning outcomes**
-To **understand** how different countries and cultures design inclusive urban spaces and to **identify** global landmarks of accessibility. -To **evaluate** the impact of inclusive design on a community's well-being and to **justify** the importance of universal accessibility.	-SS. **judge** the level of inclusion in their local environment compared to international protocols. -SS. **identify** and **list** examples of inclusive design from different countries (e.g., tactile paving in Japan vs. audio-signs in Europe)

COMMUNICATION

LANGUAGE OF:

- **Key language:** Senses, nervous system, skeleton, muscles, ultrasonic sensor, buzzer, cables, battery, scale (1:10), cardinal points, inclusive design.
- **Language content (Genre):** Descriptive report through a podcast.
  - **Structure:** Introduction, development, technical assembly, conclusion and final reflection on inclusion.
  - **Language Input:** Narrative and sensory language. Present Simple: For defining characteristics ("The model features three main blocks"). Adjectives of Quality: Rough, smooth, acoustic, accessible.
- **Academic language:**
  - To introduce the first step: Initially
  - To give an example: For instance
  - To explain the outcome: Therefore.

LANGUAGE FOR

- **Language for describing the school model and math:** "This map uses a 1:10 scale to represent the playground; it is located North of the main entrance".
- **Language for comparing textures and symbols:** "Texture A (sandpaper) is rougher than Texture B (clay), making it a better warning signal for the stairs."
- **Language for explaining the system:** "The ultrasonic sensor triggers the buzzer when it detects a hand, acting like an artificial sense organ".
- **Classroom language:**
  - **Group work:** Let's choose the textures together, can you help me connect the sensor? Let's script the intro.
  - **Activities:** Measure the real distances, test the circuit, assemble the 3D relief, Record the podcast episode.
  - **Classroom Interaction:** Does the buzzer work? How did you calculate the scale? Compare your tactile map with other delegates.

LANGUAGE THROUGH

- Language through debating which materials they need during the construction phase.
- Language through interaction with technology: Vocabulary emerging while troubleshooting the sensor's range and battery connections.
- Language through discovering "relief" and "friction" while handling different artistic textures for the map.
- Language through analysing the "blind test" where classmates navigate the model to identify navigation errors.

• Language through researching real-world "smart buildings" and accessibility laws to enrich their podcast chronicle.	
EVALUATION	
Specific competences (decree 61/2022)	**Content evaluation criteria (decree 61/2022)**
-Artistic education: 3., 4. -Natural science: 2. -Mathematics: 5., 8. -Technology and robotics: 2.	-Artistic education: 3.1, 4.3 -Natural science: 2.5 -Mathematics: 5.2, 8.1 -Technology and robotics: 2.1, 2.4
Language evaluation criteria (CEFR, 2018)	
ORAL PRODUCTION AND DESCRIBING(A2): Can give a short, rehearsed oral description of a product (the inclusive school map), identifying its main parts and explaining its functions, using simple descriptive language and spatial connectors.	
Assessment tools	
For interaction	Thumbs up/down and language assistant.
For active observation	Observation grid.
For peer/self-evaluation	Peer feedback sandwich.
For summative assessment	Analytical rubric
Grading criteria	
<u>Summative assessments</u> - Final product (inclusive school): 30% -Delegate's portfolio (argumentative podcast): 40%	<u>Formative assessments</u> - Self and peer evaluation: 10% - Classwork and participation: 20%
ATTENTION TO DIVERSITY	
General measures • **Visual aids:** Provide a multimodal printed checklist to tick off each completed stage of the mission: Blind navigation →Scale mapping →Circuit assembly →Podcast recording. • **Scaffolded vocabulary:** Visual flashcards of science terms (sense organs, nervous system, skeleton, and muscles) with icons for dyslexia support. • **Recording frames:** Provide a fill-in-the-blank script template and sentence starters for the podcast for example "Consequently our school will be…" "Accessibility is…"	
LOTS→HOTS Students identify the specific component in the electronic circuit (e.g., loose cable or sensor placement) that is causing a failure and troubleshoot (debug) the logic to ensure the buzzer triggers only when a hand reaches a specific distance in the school model.	HOTS→LOTS Students design the original "Inclusive Campus" 3D model and label the architectural barriers and sensory pathways using pre-written word cards and visual prompts to support their oral explanation in the podcast.

4.3.3. Challenge 13: Eco-couture

CHALLENGE 13. ECO-COUTURE	
Description (aim): To design garments from upcycled materials using geometric block printing and precise measurements, showcased in a digital catalogue with AR of the garment; that argues for circular fashion and sustainability. **Final product:** A physical garment piece created with geometric block printing, featured in a digital lookbook. Each entry includes an argumentative article as well as a QR code that leads to seeing the garment being worn on a runway through augmented reality. **Timing**: 27th April- 10th May (6 sessions)	
CONTENT	
Decree 61/2022	**STEM**

<table>
<tr>
<td>Artistic Education

Medios, soportes y materiales de expresión plástica y visual. Técnicas bidimensionales y tridimensionales en dibujos y modelados.
Evaluación, respeto, interés y valoración tanto por el proceso como por el producto final en producciones plásticas, visuales, audiovisuales
</td>
<td rowspan="2">Technology and Robotics

Herramientas y útiles necesarios para la fabricación y montaje de artefactos. Funcionamiento de engranajes y poleas.

Mathematics

Instrumentos (analógicos o digitales) y unidades adecuadas para medir longitudes.
</td>
</tr>
<tr>
<td>Language content
Argument (Argument article)</td>
</tr>
<tr>
<td colspan="2">Sustainable development goal

</td>
</tr>
<tr>
<td colspan="2">COGNITION</td>
</tr>
<tr>
<td>Learning goals
1.1. To remember the principles of SDG 12 and circular fashion through the use of upcycled materials.
1.2. To understand the function of fabrication tools and the metric units required for 3D construction.
2.1. To apply geometric block printing and precise measurements on upcycled fabric.
2.2. To analyse the relationship between 2D geometric patterns and the final 3D garment structure.
2.3. To analyse the integration of AR technology within the physical garment presentation.
3.1. To evaluate the personal effort and the value of the artistic process during the unit.
4.1. To write an article that supports circular fashion based on their project results.</td>
<td>Learning outcomes
1.1.1. SS describe the importance of responsible consumption and classify different upcycled supports for artistic expression.
1.2.1. SS identify the tools needed for garment assembly and select the appropriate units of length (cm, mm) for their patterns.
2.1.1. SS execute block printing and use measuring instruments to solve assembly needs.
2.2.1. SS differentiate between flat patterns and 3D forms, organizing how they relate to the human body.
2.3.1. SS examine the functionality of the QR code and test how the digital AR runway connects with the physical piece.
3.1.1. SS appraise their interest and respect for the transformation of waste into a professional product.
3.1.2. SS value the importance of precision in their work and its impact on the final aesthetic result.
4.2. SS write an article that supports a sustainable stance by reporting on their technical and artistic process.</td>
</tr>
<tr>
<td colspan="2">CULTURE</td>
</tr>
<tr>
<td><u>Learning goals</u>
-To value the transformation of discarded materials into artistic pieces and show openness to sustainable lifestyle changes.</td>
<td><u>Learning outcomes</u>
-SS show interest and respect for the process of upcycling, changing their perception of "trash" as a valuable resource.
-SS demonstrate curiosity about how other cultures maintain their clothes longer or reuse materials.</td>
</tr>
<tr>
<td colspan="2">COMMUNICATION</td>
</tr>
<tr>
<td colspan="2">LANGUAGE OF</td>
</tr>
</table>

- **Key language**: Upcycling, circular fashion, SDG 12, geometric patterns, block printing, 3D garment, AR, QR code, measurement, symmetry, textile, assembly tools, lookbook, length (cm/mm), proportions.
- **Language content** (Genre): Argumentative Article (Scientific/Technical).
  - **Structure**: Introduction, technique, construction, digitalization and conclusion.
  - **Language Input:** Present Simple: To describe facts ("Upcycling reduces textile waste"). Modals of Possibility: To argue benefits ("Sustainable fashion can save resources"). Connectors: firstly, secondly, furthermore, in addition, however, consequently, to conclude.
- **Academic language:**
  - **To introduce a thesis:** It is often argued that
  - **To link evidence**: According to the data

LANGUAGE FOR

- **Language for describing the process:** "We applied geometric blocks to create a symmetrical pattern; the piece measures exactly 40 cm to ensure a 3D fit."
- **Language for justifying decisions**: "We chose this upcycled material because of its durability; therefore, it supports the circular economy model."
- **Language for explaining the AR:** "Scanning the QR code triggers the AR experience, allowing the viewer to see the garment in a digital runway context."
- **Classroom language:**
  - **Group work**: Let's decide on the geometric layout, Can you check the measurements? We need to synchronize the QR link.
  - **Activities**: Ink the blocks, Measure the fabric, Align the patterns, Record the AR video, Draft the article.
  - **Classroom interaction**: Is the print consistent? How does the 3D structure hold up? Compare your lookbook with the physical piece.

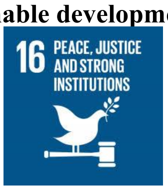
LANGUAGE THROUGH

- Language through debating the most effective geometric arrangement to minimize fabric waste during the assembly phase.
- Language through troubleshooting the AR trigger and learning specific digital vocabulary while linking the QR codes to the lookbook.
- Language through discovering "texture," "absorbency," and "rigidity" while printing on different types of upcycled textiles.
- Language through analysing the 3D fit on the mannequin and identifying areas were mathematical precision needs adjustment.
- Language through researching global sustainable designers to find inspiration and professional terminology for their argumentative article.

EVALUATION	
Specific competences (decree 61/2022)	**Content evaluation criteria (decree 61/2022)**
-Artistic education: 3., 4. -Natural science: 2. -Mathematics: 5. -Technology and robotics: 2.	-Artistic education: 3.1, 4.1, 4.3. -Natural science: 2.5. -Mathematics: 5.2. -Technology and robotics: 2.1, 2.2
Language evaluation criteria (CEFR, 2018)	
WRITTEN PRODUCTION AND ARGUMENTATION (A2): Can write a short, simple argumentative article for the digital lookbook about circular fashion and SDG 12, describing the technical process and justifying the choice of materials using basic connectors like 'because', 'so', or 'however'.	
Assessment tools	
For interaction	Sticks and thumbs up/down
For active observation	Observation checklist
For peer/self-evaluation	2 stars and wish
For summative assessment	Analytic rubric and quiz
Grading criteria	
<u>Summative assessments</u>	<u>Formative assessments</u>

- Final product (garment): 30% -Delegate’s portfolio (argumentative article): 40%	- Self and peer evaluation: 10% - Classwork and participation: 20%
ATTENTION TO DIVERSITY	
General measures • Use of real materials: Hands-on testing of geometric blocks on upcycled scraps before final garment application. • Cooperative learning: Mixed-ability delegations to facilitate peer-tutoring during 3D construction. • Scaffolded vocabulary: Visual glossaries with icons for key terms (upcycling, symmetry, AR). • Writing frames: Sentence starters and templates for the argumentative article and AR report.	
LOTS→HOTS Students identify metric errors in their patterns and troubleshoot dimensions to ensure the 3D structure fits the physical form correctly.	HOTS→LOTS Students evaluate the impact of SDG 12 and defend their design using pre-written sentence banks to organize their scientific explanation.

4.3.4. Challenge 14: Peace in motion

CHALLENGE 14. Peace in motion	
Description (aim): To build a peace-maker bot that uses video sensors to detect tension and responds with student-written arguments for justice (SDG 16). **Final product:** A recorded demonstration in their portfolio where the students' body movements activate the robot. The robot then "speaks" the students' own arguments using the text-to-speech and translator extensions. **Timing**: 11th May- 19th May (5 sessions)	
CONTENT	
Decree 61/2022	**STEM**
Artistic Education • El cuerpo y sus posibilidades motrices, dramáticas y creativas. **Language content** Arguments (Argument essay)	**Science** • Identificación y localización de los órganos implicados en la función de relación: órganos de los sentidos y sistema nervioso. **Technology and Robotics** • Extensiones de programación por bloques y aplicación a la robótica educativa (música, dibujo, sensor de vídeo, texto a voz, traductor…).
Sustainable development goal 	
COGNITION	
Learning goals	Learning outcomes
1.1. To **identify** the organs involved in the "relationship function" (senses and nervous system) and their role in detecting external stimuli. 1.2. To **understand** how technology extensions (video sensors, TTS, translator) can mimic human senses and communication. 2.1. To **apply** body expression and dramatic possibilities to represent and detect tension through a video sensor.	1.1.1. SS **locate** and **describe** the main organs of the nervous system and senses in a diagram. 1.1.2. SS **explain** and **classify** the functions of the different programming blocks they will use for the robot. 2.1.1. SS **demonstrate** and **sketch** specific body movements that represent "tension" to calibrate the video sensor.

2.2. To **create** an original robotic system that responds to human movement with peaceful solutions. 3.1. To **evaluate** the effectiveness of using art and technology as tools for conflict resolution and peacebuilding. 4.1. To **apply** the structure of an argument to defend a stand on justice and peace.	2.2.1. SS **construct** and **formulate** a block-based program that integrates music, translation, and movement to promote justice (SDG 16). 3.1. SS **critique** and **justify** their choice of arguments and movements, reflecting on how their "peace-maker bot" helps others understand justice. 4.1. SS **write** and **defend** clear arguments for SDG 16, using appropriate connectors and vocabulary, to be programmed into the robot's speech.

CULTURE

Learning goals	Learning outcomes
-To **identify** different cultural symbols and gestures of "tension" and "peace" around the world.	-SS **list** and **describe** how body language for conflict or reconciliation varies in at least two different cultures.

COMMUNICATION

LANGUAGE OF

- **Key language:** Nervous system, senses, stimuli, receptors, video sensor, block programming, text-to-speech, translator, body expression, tension, posture, gesture, justice, SDG 16, arguments, conflict resolution.
- **Language content (Genre):** Argumentative script (Robotic demonstration).
    - **Structure:** Introduction, detection, coding, argumentation, conclusion.
    - **Language Input:** 0 and 1^{st} Conditional ("If the sensor detects tension, the robot triggers the message"). Connectors for arguments: Firstly, furthermore, on the other hand, in conclusion. Modals of Advice/Possibility: Should, must, could, might (for peaceful solutions).
- **Academic language:**
    - **To state a claim:** I strongly believe.
    - **To show cause/effect:** As a consequence.
    - **To propose a solution:** We should consider.

LANGUAGE FOR

- **Language for describing movement and biology:** "The video sensor detects the movement of the arms, which mimics how the human nervous system processes an external stimulus."
- **Language for programming the bot:** "We need to drag the translator extension so the robot can speak the arguments in different languages."
- **Language for arguing for justice:** "Justice is essential because it ensures everyone is treated fairly; therefore, the robot must propose a dialogue."
- **Classroom language:**
    - **Group work:** Let's record the tension movement, Can you check the code logic? Let's refine the peace argument.
    - **Activities:** Calibrate the sensor, Draft the argument, Test the text-to-speech, Role-play the conflict, Link the blocks.
    - **Classroom Interaction:** Why did the robot not respond? How can we make the argument more convincing? Which language should we choose for the translation?

LANGUAGE THROUGH

- Language through debating which body gesture best represents "tension" versus "relaxation" during the sensor calibration phase.
- Language through discovering "dramatic possibilities" and "motor control" while performing the movements for the robot's camera.
- Language through analysing the recorded portfolio and identifying the exact second the robot's "brain" (code) reacts to the human stimulus.
- Language through researching global peace symbols or historical activists to enrich the robot's "speech" and arguments.

EVALUATION

Specific competences (decree 61/2022)	Content evaluation criteria (decree 61/2022)
-Artistic education: 3., 4. -Natural science: 6. -Technology and robotics: 1., 3.	-Artistic education: 3.1, 4.3. -Natural science: 6.2. -Technology and robotics: 1.2, 3.2
Language evaluation criteria CEFR (2018)	
COHERENCE AND ARGUMENTATION (A2): Can present simple, clear arguments for **justice and SDG 16** during the robot's performance, using basic structures to justify a stand and express a point of view, linking ideas with connectors like **'so', 'but' 'in my opinion' or 'on the other hand'.**	
Assessment tools	
For interaction	Thumbs up/down and language assistant for comprehension of robotic video sensors.
For active observation	Systematic observation for block programming.
For peer/self-evaluation	Feedback sandwich for peer evaluation.
For summative assessment	Analytic rubric for the recorded demonstration.
Grading criteria	
<u>Summative assessments</u> - Final product and delegate's portfolio (video and arguments): 70%	<u>Formative assessments</u> - Self and peer evaluation: 10% - Classwork and participation: 20%
ATTENTION TO DIVERSITY	
General measures • **Multimodal:** Using video sensors and body expression to visualize the biological "relationship function." • **Visual Aids:** Mission checklists and icon-based flashcards for STEAM/Biology lexis. • **Scaffolding:** Writing frames for arguments and "Text-to-Speech" for auditory self-correction. • **Cooperative:** Mixed-ability "National Delegations" to facilitate peer-tutoring and support.	
LOTS→HOTS Students identify a coding error (Remember) and debug the sensor logic to accurately distinguish between tension and neutral gestures (Analyse/Evaluate)	HOTS→LOTS Students create original and persuasive arguments for peace (Create) supported by visual word banks and pre-written connector cards (Remember).

4.3.5. Challenge 15: Delegate's legacy

CHALLENGE 15. DELEGATE'S LEGACY	
Description (aim): To close the JUNA assembly with an edited digital report. Students combine audiovisual editing and argumentative skills to communicate their final results and complete the delegate's portfolio. **Final product:** An edited video with digital transitions, sound effects, and a recorded argumentative speech defending the students' favourite mission or learning achievement. **Timing**: 24th May- 2nd June (6 sessions)	
CONTENT	
Decree 61/2022	**STEM**
Artistic Education • Evaluación, respeto, interés y valoración, tanto por el proceso como por el producto final. • Recursos digitales de uso común para las artes plásticas, visuales y las artes audiovisuales.	**Science** • Fases de la investigación científica: comunicación y presentación de resultados. **Technology and Robotics** • Extensiones de programación por bloques y aplicación a la robótica educativa (música, texto a voz, traductor…) **Mathematics** • Estrategias para la interpretación, modificación y creación de algoritmos
Language content Arguments	

<table>
<tr><td></td><td>sencillos (secuencias de pasos ordenados)</td></tr>
<tr><td colspan="2">Sustainable development goal
</td></tr>
<tr><td colspan="2">COGNITION</td></tr>
<tr><td>Learning goals
1.1. To remember the key scientific concepts and missions completed during the JUNA assembly.
1.2. To understand how digital tools (sound effects and transitions) enhance the communication of a message.
2.1. To apply audio-visual editing techniques to capture and manipulate sound and image.
2.2. To create an original digital report that synthesizes their journey as international delegates.
3.1. To evaluate the global impact of their work and their own development during the JUNA assembly.
4.1. To apply argumentative structures to defend their final "verdict" about the course.</td><td>Learning outcomes
1.1.1. SS list and identify their most significant learning achievements and scientific terms.
1.2.1. SS explain the function of the different editing tools they will use for their final video.
2.1.1. SS use, operate and record their final arguments using digital tablets and editing software.
2.2.1. SS construct and assemble a creative video montage with synchronized audio and visual effects.
2.2.2. SS author and produce a unique digital synthesis that blends their scientific arguments with a creative sequence of audiovisual transitions and effects.
3.1.1. SS critique and justify their choice of their favourite mission, reflecting on their personal and group progress.
4.1. SS defend, argue and support their opinions in the video script using specific connectors.</td></tr>
<tr><td colspan="2">CULTURE</td></tr>
<tr><td><u>Learning goals</u>
-To relate their specific scientific and artistic achievements with the global objectives of the 2030 Agenda.
- To evaluate the importance of international cooperation and communication in solving global sustainability problems.</td><td><u>Learning outcomes</u>
-SS compare and relate their final results with the global challenges addressed during the assembly.
- SS justify their commitment to the SDGs and argue why global collaboration is essential for the future of the planet in their final video.</td></tr>
<tr><td colspan="2">COMMUNICATION</td></tr>
<tr><td colspan="2">LANGUAGE OF
Key language: JUNA assembly, legacy, achievements, digital editing, sound effects, transitions, argumentative script, evidence, audio track, voice-over, assembly closure, global goals.
Language content (Genre): Argumentative Speech (JUNA legacy video).
Structure: 1. Introduction: Hook and statement of the chosen mission. 2. Justification: Arguing the importance of the learning achievements. 3. Evidence: Linking to portfolio entries. 4. Creative Process: Describing the digital editing steps. 5. Final Message: Closing the assembly.
Language Input: Present Perfect: For reflecting on achievements (“We have learned how to code...”). Modals of Opinion: Should, must, believe (“I believe this mission was the most vital because...”). Sequence Connectors: For video montage logic (“First the audio, then the transition”).
Academic language:
To express opinion: From my perspective
To provide evidence: This is proven by.</td></tr>
</table>

- **To conclude the project:** To sum up.

LANGUAGE FOR

- **Language for justifying the best mission:** “This mission was the most significant because we applied scientific laws to solve a real-world problem (SDG 16).”
- **Language for digital editing:** “We should add a fade-in transition here and increase the volume of the background music to make it more dramatic.”
- **Language for reflecting on the JUNA journey:** “Our delegation has successfully completed the mandate; therefore, our legacy is based on cooperation and science.”
- **Classroom language:**
    - **Group work:** Let’s choose the best clips, can you record the voice-over? Let’s synchronize the audio with the video.
    - **Activities:** Import the files, Edit the timeline, Apply the filter, Export the final video, Upload to the portfolio.
    - **Classroom Interaction:** Does the audio sound clear? How can we make our argument more persuasive? Which transition looks more professional?

LANGUAGE THROUGH

- Language through debating which specific mission had the biggest impact on their learning during the scripting phase.
- Language through vocabulary emerging while troubleshooting video render times, audio synchronization, and digital transitions.
- Language through discovering "pace" and "rhythm" while manipulating the video timeline and aligning audio tracks.
- Language through analysing the work of other delegations and identifying the most effective argumentative strategies in their videos.
- Language through choosing their favourite mission based on personal curiosity, leading to more authentic and passionate arguments.

EVALUATION	
Specific competences (decree 61/2022)	**Content evaluation criteria (decree 61/2022)**
-Artistic education: 3., 4. -Natural science: 2. -Mathematics: 4. -Technology and robotics: 1.,2.	-Artistic education: 3.1, 4.3. -Natural science: 2.5. -Mathematics: 4.1 -Technology and robotics: 1.2, 2.2
Language evaluation criteria (CEFR, 2018)	
ORAL PRODUCTION AND EXPLAINING (A2): Can give a short, rehearsed oral presentation or video-report about a learning journey (defending the most significant mission of the JUNA assembly for the final legacy video), linking sentences with connectors like ‘firstly’, ‘because’, ‘then’ or ‘finally’.	
Assessment tools	
For interaction	Oral demonstration to language assistant of the argumentative script.
For active observation	Individual checklist for responsible use of tablets
For peer/self-evaluation	Reflection wheel for their individual contribution
For summative assessment	Analytic rubric for the video
Grading criteria	
<u>Summative assessments</u> - Final product and delegate’s portfolio (argumentative video): 70%	<u>Formative assessments</u> - Self and peer evaluation: 10% - Classwork and participation: 20%

ATTENTION TO DIVERSITY

General measures

- **Visual aids:** Step-by-step checklist for the video production stages.
- **Scaffolded vocabulary:** Flashcards for editing terms (sync, transition) and argumentative connectors.
- **Writing frames:** Fill-in-the-blank templates for the final argumentative script.
- **Digital support:** Simple "drag-and-drop" editing tools with auditory feedback.

• **Cooperative learning:** Peer-tutoring within mixed-ability delegations for technical support.	
LOTS→HOTS Students identify a synchronization lag (Remember) and troubleshoot the digital timeline to align audio with visual transitions (Analyze/Evaluate).	HOTS→LOTS Students author an original digital legacy (Create) using pre-written sentence starters and visual prompts (Remember) to structure their final arguments.

4.4. Temporalization

The temporalization of this annual syllabus is provided in **Annex 4**, ensuring a balanced and progressive implementation of the STEAM-CLIL syllabus throughout the school year.

5.CONCLUSION

Finishing this Annual Syllabus has been an incredible learning experience and a profound personal challenge. Throughout this process, I have not only learned how to design a complex educational proposal from scratch, but I have also discovered the immense potential of integrating the STEAM-CLIL approach to address global issues like the 2030 Agenda. This work represents the beginning of my path towards bilingual teaching, showing me that beyond technical knowledge, a true teacher needs vocation, motivation, and the desire to help students grow as global citizens.

One of the most rewarding aspects of this journey was discovering how Arts Education can serve as the "soul" and primary vehicle for scientific and technological learning. By placing the "A" at the center of the STEAM ecosystem, I realized that we can humanize technology and make complex concepts like sustainability or social equity accessible and meaningful for 5th-grade students. Implementing the gamified narrative of "The Junior United Nations Assembly (JUNA)" and the guidance of the AI-generated Secretary-General E.L.I.A.S. has shown me that creativity and innovation are essential tools for navigating the 21st century.

This project also synthesizes my own international experiences. The lessons learned during my Erasmus exchange and my internship in Norway regarding Global Citizenship and the natural integration of English in multicultural classrooms have been the compass for this design. I firmly believe that as educators, we must adapt to technological and social changes to ensure that our students are empowered to solve real-world problems while "leaving no one behind".

To conclude, I would like to thank the Universidad Pontificia Comillas for these years of continuous learning, which have provided me with the theoretical and practical foundations to develop my professional identity. And, of course, I want to express my deepest gratitude to Dr. Magdalena Custodio Espinar, my tutor. I must thank her for her constant support, her kindness, and for encouraging me to "jump into the pool" with the STEAM approach. Her guidance and professionalism have been key to helping me reach my full potential and for never letting go of

my hand throughout this entire process. Thanks to her passion for CLIL, I feel ready and motivated to face my future as a teacher.

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7. ANNEXES

7.1. Annex 1. Stage objectives in the Decree of the CM

Decree of the Community of Madrid 61/2022, of 13 July
a) Conocer y apreciar los valores y las normas de convivencia, aprender a obrar de acuerdo con ellas de forma empática, prepararse para el ejercicio activo de la ciudadanía y respetar los derechos humanos, así como el pluralismo propio de una sociedad democrática. b) Desarrollar hábitos de trabajo individual y de equipo, de esfuerzo y de responsabilidad en el estudio, así como actitudes de confianza en sí mismo, sentido crítico, iniciativa personal, curiosidad, interés y creatividad en el aprendizaje, y espíritu emprendedor. c) Adquirir habilidades para la resolución pacífica de conflictos y la prevención de la violencia, que les permitan desenvolverse con autonomía en el ámbito escolar y familiar, así como en los grupos sociales con los que se relacionan. d) Conocer, comprender y respetar las diferentes culturas y las diferencias entre las personas, la igualdad de derechos y oportunidades de hombres y mujeres y la no discriminación de personas por motivos de etnia, orientación o identidad sexual, religión o creencias, discapacidad u otras condiciones. e) Conocer y utilizar de manera apropiada la lengua castellana y, si la hubiere, la lengua cooficial de la comunidad autónoma y desarrollar hábitos de lectura. f) Adquirir en, al menos, una lengua extranjera la competencia comunicativa básica que les permita expresar y comprender mensajes sencillos y desenvolverse en situaciones cotidianas. g) Desarrollar las competencias matemáticas básicas e iniciarse en la resolución de problemas que requieran la realización de operaciones elementales de cálculo, conocimientos geométricos y estimaciones, así como ser capaces de aplicarlos a las situaciones de su vida cotidiana. h) Conocer los aspectos fundamentales de las Ciencias de la Naturaleza, las Ciencias Sociales, la Geografía, la Historia y la Cultura. i) Desarrollar las competencias tecnológicas básicas e iniciarse en su utilización, para el aprendizaje, desarrollando un espíritu crítico ante su funcionamiento y los mensajes que reciben y elaboran. j) Utilizar diferentes representaciones y expresiones artísticas e iniciarse en la construcción de propuestas visuales y audiovisuales. k) Valorar la higiene y la salud, aceptar el propio cuerpo y el de los otros, respetar las diferencias y utilizar la educación física, el deporte y la alimentación como medios para favorecer el desarrollo personal y social. l) Conocer y valorar los animales más próximos al ser humano y adoptar modos de comportamiento que favorezcan la empatía y su cuidado.

7.2. Annex 2. Contents from the BOCM

EDUCACIÓN ARTÍSTICA	**BLOQUE I. Música y danza**	
	A. Recepción y análisis	-Propuestas artísticas de diferentes corrientes estéticas, procedencias y épocas producidas por creadoras y creadores locales, regionales, nacionales e internacionales. -Recepción y apreciación de obras artísticas. -Recursos digitales de uso común para la música y las artes escénicas.
	B. Creación e interpretación	-Fases del proceso creativo: planificación, interpretación, experimentación y evaluación. -Evaluación, respeto, interés y valoración, tanto por el proceso como por el producto final en producciones musicales y escénicas.
	C. Música y artes escénicas	-El cuerpo y sus posibilidades motrices, dramáticas y creativas: interés en la experimentación a través de ejecuciones individuales y grupales vinculadas con el movimiento, la danza, la dramatización y la representación teatral como medio de comunicación, expresión, diversión y fomento de la creatividad.
	BLOQUE II. Educación plástica y visual	
	A. Recepción y análisis	-Obras artísticas, plásticas, visuales y audiovisuales de diferentes corrientes estéticas, procedencias y épocas producidas por creadores locales, regionales, nacionales e internacionales. -Recursos digitales de uso común para las artes plásticas, visuales y las artes audiovisuales. -Vocabulario específico de las artes plásticas, visuales y las artes audiovisuales.
	B. Creación e interpretación	-El proceso creativo -Evaluación, respeto, interés y valoración tanto por el proceso como por el producto final en producciones plásticas, visuales, audiovisuales.
	C. Música y artes escénicas	-Elementos configurativos del lenguaje visual y sus posibilidades expresivas y comunicativas: punto, línea, plano, textura, color. -Medios, soportes y materiales de expresión plástica y visual. Técnicas bidimensionales y tridimensionales en dibujos y modelados incluidos los formatos artísticos contemporáneos. -Elementos geométricos fundamentales. Nociones básicas para la creación de obras relacionadas con el dibujo técnico. -Técnicas, materiales y recursos informáticos y tecnológicos: su aplicación para la captura, creación, manipulación y difusión de obras plásticas y visuales de manera responsable. -Las herramientas y las técnicas básicas de animación. El cine de animación como género. Creación, montaje y difusión de una película, sencilla, de animación.
	BLOQUE A. CULTURA CIENTÍFICA	
	Iniciación en la actividad científica	-Fases de la investigación científica (observación sistemática, formulación de preguntas, hipótesis y predicciones, planificación y realización de experimentos y modelos, control de variables y muestras, recogida y análisis de información y datos, comunicación y presentación de resultados...

CIENCIAS DE LA NATURALEZA	**La vida en nuestro planeta**	-Identificación y localización de los órganos implicados en la función de relación: órganos de los sentidos, sistema nervioso (nervios, neuronas y cerebro) y aparato locomotor (esqueleto y musculatura
	Materia, fuerzas y energía	-Propiedades de la materia: generales (masa, volumen…) y específicas (color, dureza, densidad…). -La energía eléctrica. Fuentes, transformaciones, transferencia y uso en la vida cotidiana. Los circuitos eléctricos y las estructuras robotizadas.
MATEMÁTICAS	**BLOQUE A. NÚMEROS Y OPERACIONES**	
	Razonamiento proporcional	-Resolución de problemas de proporcionalidad, (regla de tres, reducción a la unidad e igualdad entre proporciones), porcentajes y escalas de la vida cotidiana, mediante la igualdad entre razones, la reducción a la unidad o el uso de coeficientes de proporcionalidad
	BLOQUE B. MEDIDA	
	Medición	-Instrumentos (analógicos o digitales) y unidades adecuadas para medir longitudes, objetos, ángulos y tiempos: selección y uso.
	BLOQUE C. GEOMETRÍA	
	Figuras geométricas de dos y tres dimensiones	-Figuras geométricas en objetos de la vida cotidiana: identificación y clasificación atendiendo a sus elementos (caras, ángulos, aristas, vértices en los tridimensionales) y a las relaciones entre ellos.
	Localización de sistemas de representación	-Localización y desplazamientos en planos y mapas a partir de puntos de referencia (incluidos los puntos cardinales), direcciones y cálculo de distancias (escalas): descripción e interpretación con el vocabulario adecuado en soportes físicos y virtuales
	BLOQUE D. ÁLGEBRA	
	Pensamiento computacional	-Estrategias para la interpretación, modificación y creación de algoritmos sencillos (secuencias de pasos ordenados, esquemas, simulaciones, patrones repetitivos, bucles, instrucciones anidadas y condicionales, representaciones computacionales, programación por bloques, robótica educativa...) -Las ideas y las relaciones geométricas en el arte, las ciencias y la vida cotidiana.
	BLOQUE A	
	Pensamiento computacional	-Interpretación y ejecución de algoritmos sencillos (rutinas, instrucciones con pasos ordenados, reglas de juegos, instrucciones, secuencias, patrones repetitivos, programación por bloques). -Extensiones de programación por bloques y aplicación a la robótica educativa (música, dibujo, sensor de vídeo, texto a voz, traductor…).
	BLOQUE B	
	Mecánica-Ingeniería (Diseño)	-Herramientas y útiles necesarios para la fabricación y montaje de artefactos. Funcionamiento de engranajes y poleas. -Diseño y construcción de robots sencillos.
	BLOQUE C	

TECNOLOGÍA Y ROBÓTICA	**Electricidad**	-Electricidad y electrónica básica: cables y conectores, actuadores, circuitos, sensores, motores, baterías (fuentes de energía).
	BLOQUE E	
	Internet de las cosas (IoT)	-Dispositivos conectables. Pautas para la instalación de dispositivos que puedan conectarse entre sí y controlarse de forma centralizada desde un ordenador, Tablet o móvil
	BLOQUE F	
	Realidad virtual o aumentada	-Iniciación a la edición y creación de códigos QR o contenidos con realidad aumentada.

7.3. Annex 3. Key competences

KEY COMPETENCES	OPERATIONAL DESCRIPTORS
a) Competencia en comunicación lingüística (CCL)	CCL1, CCL2, CCL3
b) Competencia Plurilingüe (CP)	CP1, CP2
c) Competencia matemática y competencia en ciencia, tecnología e ingeniería (STEM)	STEM2, STEM3, STEM4, STEM5
d) Competencia digital (CD)	CD2, CD3, CD5
e) Personal, Social y Aprender a Aprender (CPSAA)	CPSAA3, CPSAA5
f) Competencia Ciudadana (CC)	CC2, CC4
g) Competencia Emprendedora (CE)	CE1, CE3
h) Conciencia y Expresión Culturales (CCEC)	CCEC3, CCEC4

7.4. Annex 4. Specific competences and evaluation criteria

	SPECIFIC COMPETENCES	EVALUATION CRITERIA
ARTISTIC EDUCACION	**1.** Descubrir propuestas artísticas de diferentes géneros, estilos, épocas y culturas, para desarrollar la curiosidad y el respeto por la diversidad.	**1.3.** Aproximarse a la lectura, análisis e interpretación del arte en sus situaciones culturales e históricas comprendiendo su significado y función social.
	2. Investigar sobre manifestaciones culturales y artísticas y sus épocas, empleando diversos canales, medios y técnicas, para disfrutar de ellas, entender su valor y empezar a desarrollar una sensibilidad artística propia.	**2.1.** Seleccionar y aplicar métodos para la búsqueda de información sobre manifestaciones culturales y artísticas, a través de diversos canales y medios de acceso, tanto de forma individual como grupal.
	3. Expresar y comunicar de manera creativa ideas, sentimientos y emociones, experimentando con las posibilidades del sonido, la imagen, el cuerpo y los medios digitales, para producir obras propias.	**3.1.** Producir obras propias básicas, utilizando las posibilidades expresivas del cuerpo, el sonido, la imagen y los medios digitales básicos, mostrando confianza en las capacidades de uno mismo, entre ellas danza, teatro, música, pintura…. **3.2.** Expresar con creatividad ideas, sentimientos y emociones a través de diversas manifestaciones artísticas, utilizando los diferentes lenguajes e instrumentos a su alcance, mostrando

		confianza en las propias capacidades y perfeccionando la ejecución.
	4. Participar del diseño, la elaboración y la difusión de producciones culturales y artísticas individuales o colectivas, teniendo en cuenta el proceso y asumiendo diferentes funciones en la consecución de un resultado final, para desarrollar la creatividad y la noción de autoría.	**4.1.** Planificar y diseñar producciones culturales y artísticas colectivas, trabajando de forma grupal en la consecución de un resultado final, asumiendo diferentes funciones. **4.3.** Compartir los proyectos creativos, comunicándolos a través de diversos medios, explicando el proceso y el resultado final obtenido, y respetando y valorando las experiencias de uno mismo y de los demás.
NATURAL SCIENCE	**1.** Utilizar dispositivos y recursos digitales de forma segura, responsable y eficiente, para buscar información, comunicarse y trabajar de manera individual, en equipo y en red, y para reelaborar y crear contenido digital.	**1.1.** Utilizar recursos digitales de acuerdo con las necesidades del contexto educativo de forma responsable, segura, eficiente y autónoma, buscando información, comunicándose y trabajando de forma individual, en equipo y en red, reelaborando y creando contenidos digitales sencillos.
	2. Plantear y dar respuesta a cuestiones científicas sencillas, utilizando diferentes técnicas, instrumentos y modelos propios del pensamiento científico, para interpretar y explicar hechos y fenómenos que ocurren en el medio.	**2.3** Diseñar y realizar experimentos guiados, cuando la investigación lo requiera, utilizando diferentes técnicas de indagación y modelos, empleando de forma segura los instrumentos y dispositivos apropiados, realizando observaciones objetivas y estructuradas y mediciones precisas y registrándolas correctamente. **2.5** Comunicar los resultados de las investigaciones adaptando el mensaje y el formato a la audiencia a la que va dirigido, utilizando lenguaje científico o aplicado y explicando los pasos seguidos de forma pormenorizada y aportando argumentos para defender las propuestas que considere veraces
	6. Identificar las causas y consecuencias de la intervención humana en el entorno, desde los puntos de vista social, económico, cultural, tecnológico y ambiental, para mejorar la capacidad de afrontar problemas, buscar soluciones y actuar en su resolución fomentando el respeto, el cuidado y la protección de las personas y del planeta.	**6.1** Promover estilos de vida adecuados y consecuentes con el respeto, los cuidados, y la protección de las personas y del planeta, a partir del análisis de la intervención humana en el entorno. **6.2** Participar en la búsqueda, contraste y evaluación de propuestas para afrontar problemas, buscar soluciones y actuar para su resolución.
	1. Utilizar el pensamiento computacional para la resolución de problemas, generando un producto creativo y original que responda a cada uno de los retos planteados	**1.1.** Conocer los fundamentos básicos de la programación por bloques. **1.2.** Realizar un conjunto de operaciones sistemáticas o algoritmos que cumplan un

TECHNOLOGY AND ROBOTICS	o generados a través de la observación del entorno.	patrón previamente fijado para el funcionamiento correcto del programa.
	2. Resolver problemas planteados aplicando los conocimientos de mecánica, electricidad, diseño y programación, desarrollando soluciones automatizadas, diseñando o construyendo sistemas de control programables y/o robóticos adecuados a su nivel.	**2.1.** Aplicar los conocimientos elementales de electricidad y mecánica para el montaje de artefactos. **2.2.** Realizar, de forma guiada, un producto final sencillo que dé solución a un problema de diseño, probando en equipo, diferentes prototipos y utilizando de forma segura los materiales de mecánica, electricidad o programación. **2.4.** Desarrollar diseños en 2D o en 3D utilizando técnicas de prototipado o distintas aplicaciones informáticas para construir un objeto determinado.
	3. Observar, comprender e interpretar las distintas situaciones del entorno para identificar problemas y buscar soluciones, actuando de manera individual y en grupo en su resolución, poniendo en práctica la interconexión digital de dispositivos con internet.	**3.2.** Utilizar el volumen de datos que generan los dispositivos conectados para realizar un análisis de estos y utilizar esta información.
	6. Conocer y utilizar los distintos sistemas y aplicaciones de realidad virtual o aumentada para explorar el entorno y disfrutar de un aprendizaje interactivo y enriquecedor.	**6.2.** Crear proyectos en los que incluyan la realidad virtual o aumentada como recurso.
MATHEMATICS	**4.** Utilizar el pensamiento computacional, organizando datos, descomponiendo en partes, reconociendo patrones, generalizando e interpretando, modificando y creando algoritmos de forma guiada, para modelizar y automatizar situaciones de la vida cotidiana.	**4.1.** Modelizar situaciones de la vida cotidiana utilizando, de forma pautada, principios básicos del pensamiento computacional. **4.2.** Emplear herramientas tecnológicas adecuadas en la investigación y resolución de problemas.
	5. Reconocer y utilizar conexiones entre las diferentes ideas matemáticas, así como identificar las matemáticas implicadas en otras áreas o en la vida cotidiana, relacionando conceptos y procedimientos, para interpretar situaciones y contextos diversos.	**5.2.** Utilizar las conexiones entre las matemáticas, otras áreas y la vida cotidiana para resolver problemas en contextos no matemáticos.
	8. Desarrollar destrezas sociales, reconociendo y respetando a los compañeros y participar en equipos de trabajo para fomentar un adecuado desarrollo personal y social.	**8.1.** Trabajar en equipo activa, respetuosa y responsablemente, mostrando iniciativa, comunicándose de forma efectiva, valorando la diversidad y estableciendo relaciones basadas en el respeto, la igualdad, la libertad y la resolución pacífica de conflictos. **8.2.** Colaborar en el reparto de tareas, asumiendo y respetando las responsabilidades individuales asignadas y empleando estrategias de colaboración sencillas dirigidas a la consecución de objetivos compartidos

7.5. Annex 5. Temporalization

LEARNING SITUATION I	CHALLENGES	TEMPORALIZATION	SESSIONS
Crafting a greener world	1.The flash pass	14th -23th September	6 sessions (50 mins)
	2.Nature talks	28th September -15th October	9 sessions (50 mins)
	3.Neon ocean	19th October- 3rd November	7 sessions (50 mins)
	4.Wind warriors	4th November – 16th November	6 sessions (50 mins)
	5.Cloud catchers	17th November – 9th December	8 sessions (50 mins)

LEARNING SITUATION II	CHALLENGES	TEMPORALIZATION	SESSIONS
The colours of humanity	6.Kind-click App	11th January – 18th January	4 sessions (50 mins)
	7. Sky garden	19 January – 1st February	6 sessions (50 mins)
	8. The health shield	2nd February – 16th February	6 sessions (50 mins)
	9. Magic lens	17th Feb – 2nd Mar	6 sessions (50 mins)
	10.Science heroes	3rd March – 16th March	4 sessions (50 mins)

LEARNING SITUATION III	CHALLENGES	TEMPORALIZATION	SESSIONS
Designing tomorrow	11. Sun stories	31st March – 12th April	7 sessions (50 mins)
	12. The school of tomorrow	13th April – 26th April	6 sessions (50 mins)
	13. Eco-couture	27th April- 10th May	6 sessions (50 mins)
	14. Peace in motion	11th May- 19th May	5 sessions (50 mins)
	15.Delegate's legacy	24th May- 2nd June	6 sessions (50 mins)

7.6. Annex 6. Grading criteria.

Each of the following criteria are for each of the challenges of this annual syllabus.

ASSESSMENT TYPE	EVALUATION CRITERIA & TOOLS	WEIGHT (%)
Summative assessment	**Acquisition of content, skills, and language**	**70 %**
Final product (STEAM prototypes)	Technical execution of the artistic piece, functionality of electronic/robotic components, and successful resolution of the challenge.	30%
Delegate's portfolio	Quality of written reports (genres: description, chronicle, argument), oral productions (podcasts/videos), and results from specific unit quizzes.	40%
Formative assessment	**Continuous process and active participation**	**30%**
Self and peer evaluation	Development of metacognitive skills using reflection wheels, "2 stars and 1 wish" feedback, and individual self-checklists.	10%
Classwork and participation	Daily observation of cooperative work within "National Delegations," responsible use of materials, and engagement in JUNA assembly sessions.	20%

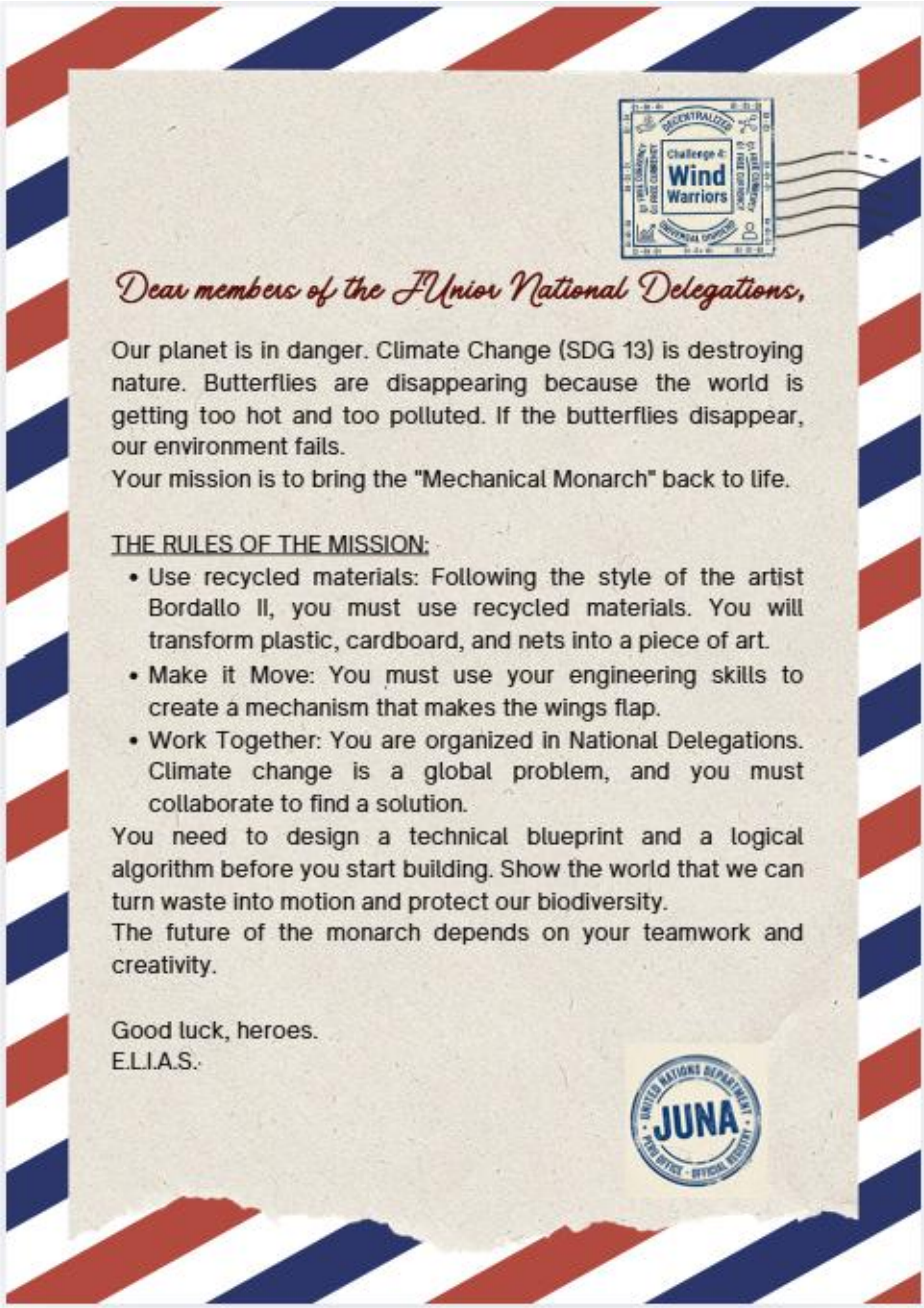
7.7. Annex 7. Timetable

According to the regulations stablished by the BOCM, this weekly schedule has been designed to provide a cohesive structure for this annual syllabus. To ensure the successful implementation of the syllabus, it will be carried out during two sessions of Educación plástica y visual with an additional weekly STEM session. This extra session will be flexibly assigned to a specific STEM subject depending on the requirements and technical demands of the challenge currently being addressed in the classroom.

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Lengua	**Lengua**	**Matemáticas**	**Lengua**	**Religión**
Matemáticas	**Matemáticas**	**Natural science**	**Matemáticas**	**English**
		RECREO		
Natural Science	**P.E**	**Tecnology and robotics**	**P.E**	**Matemáticas**
		COMIDA		
English	**Natural science**	**Lengua**	**English**	**Lengua**
Art	**Art**	**Religión**	**Natural Science**	**Technology and Robotic**

8. APPENDICES

8.1. Appendix 1. Letter from E.L.I.A.S



Dear members of the JUnior National Delegations,

Our planet is in danger. Climate Change (SDG 13) is destroying nature. Butterflies are disappearing because the world is getting too hot and too polluted. If the butterflies disappear, our environment fails.
Your mission is to bring the "Mechanical Monarch" back to life.

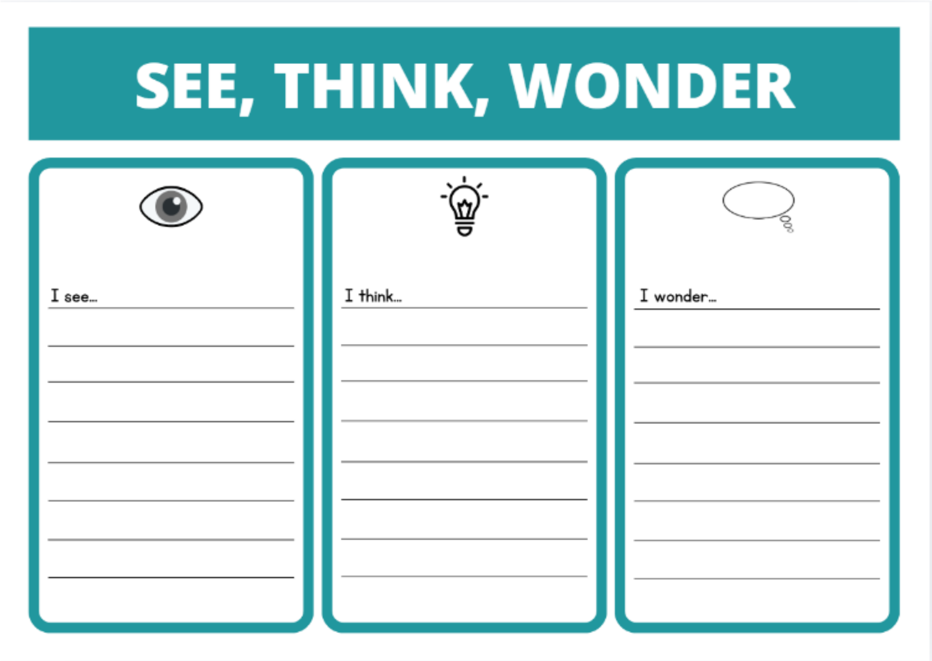
<u>THE RULES OF THE MISSION:</u>

- Use recycled materials: Following the style of the artist Bordallo II, you must use recycled materials. You will transform plastic, cardboard, and nets into a piece of art.
- Make it Move: You must use your engineering skills to create a mechanism that makes the wings flap.
- Work Together: You are organized in National Delegations. Climate change is a global problem, and you must collaborate to find a solution.

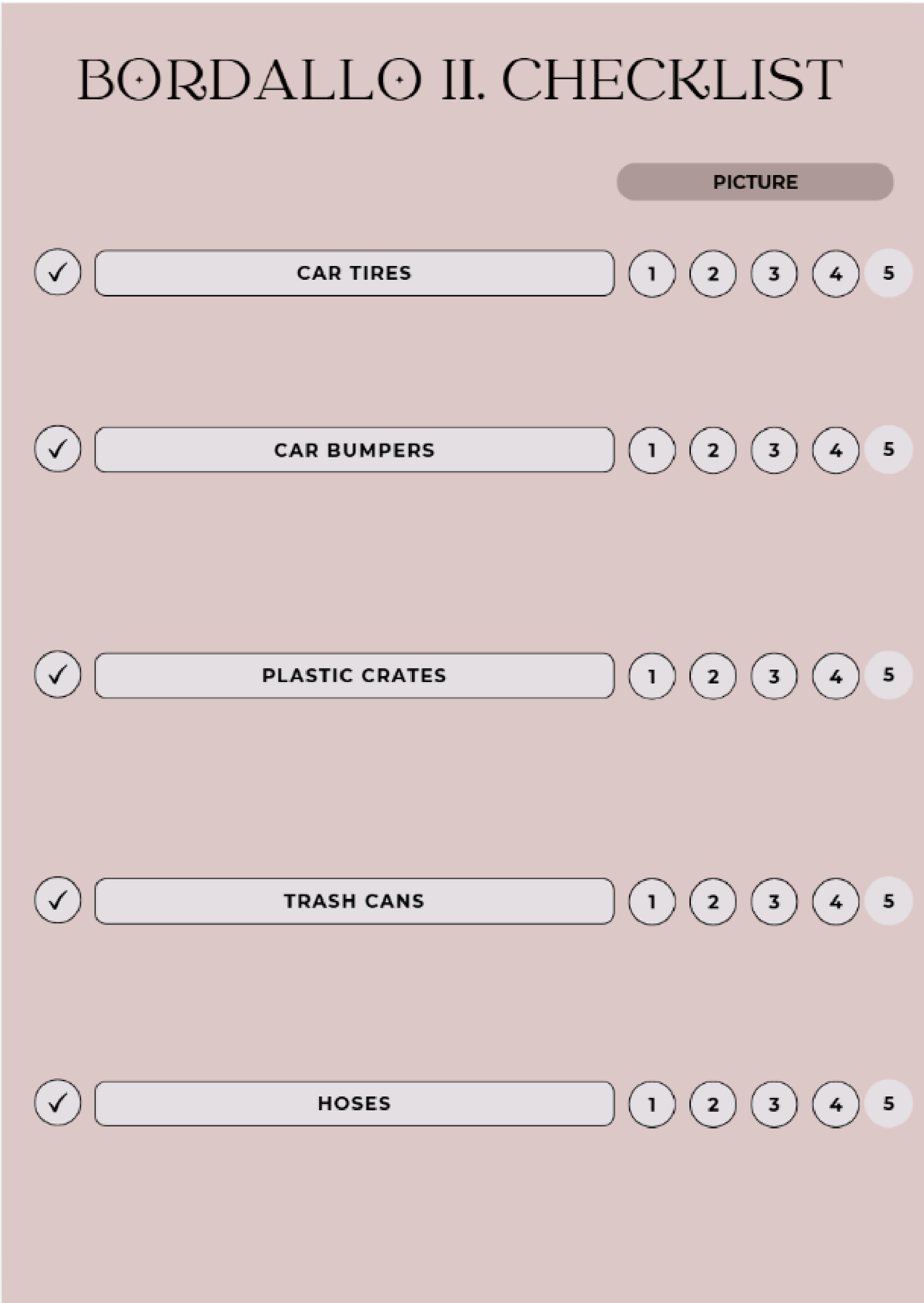
You need to design a technical blueprint and a logical algorithm before you start building. Show the world that we can turn waste into motion and protect our biodiversity.
The future of the monarch depends on your teamwork and creativity.

Good luck, heroes.
E.L.I.A.S.

8.2. Appendix 2. I see, I think, I wonder sheet



8.3. Appendix 3. Visual glossary and scavenger hunt


BORDALLO II. CHECKLIST

PICTURE

✓ CAR TIRES 1 2 3 4 5

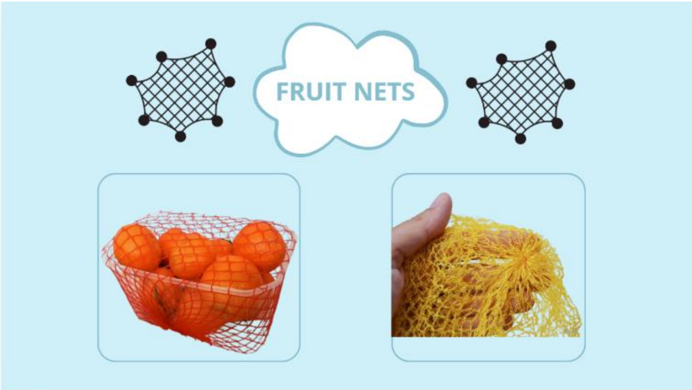
✓ CAR BUMPERS 1 2 3 4 5

✓ PLASTIC CRATES 1 2 3 4 5

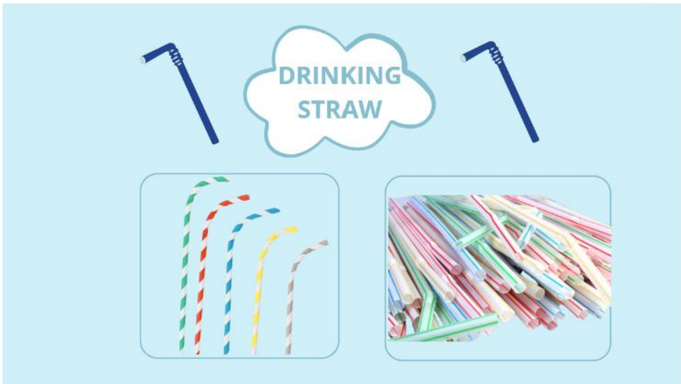
✓ TRASH CANS 1 2 3 4 5

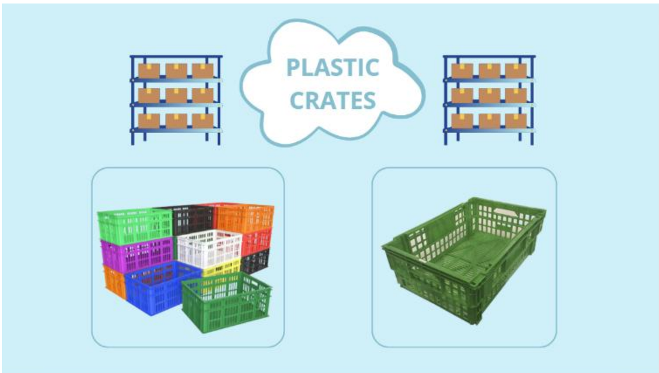
✓ HOSES 1 2 3 4 5


CAR BUMPERS

PLASTIC
WRAPPERS

FRUIT NETS

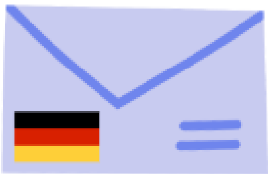
BUBBLE WRAP

HOSES

DRINKING
STRAW

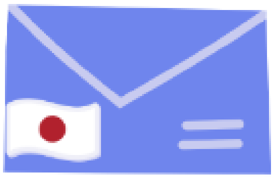
TRASH CANS

PLASTIC
CRATES

8.4. Appendix 4. Word wall and map hunt

Link to the wordwall: https://wordwall.net/es/resource/111590631

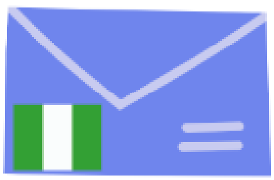


- **Card 1:** The "Pfand" system ensures 98% of plastic bottles are recycled, promoting long-term Sustainability.
- **Card 2:** The country is closing coal plants and investing heavily in wind and solar as Renewable Energy sources.
- **Card 3:** Frequent travel on the Autobahn at high speeds significantly increases the national Carbon Footprint.
- **Card 4:** Heavy industrial manufacturing still releases large amounts of Greenhouse Gases into the atmosphere

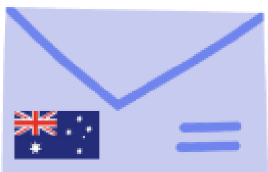


- **Card** 1: Strict "waste-sorting" laws require citizens to divide trash into 20+ categories to ensure Sustainability.
- **Card** 2: Excessive plastic packaging on food items contributes to a higher individual Carbon Footprint.
- **Card** 3: The government is investing in "Hydrogen Power" as a form of Renewable Energy for public buses.
- **Card** 4: Limited land space means waste is often incinerated, which can release Greenhouse Gases if not filtered

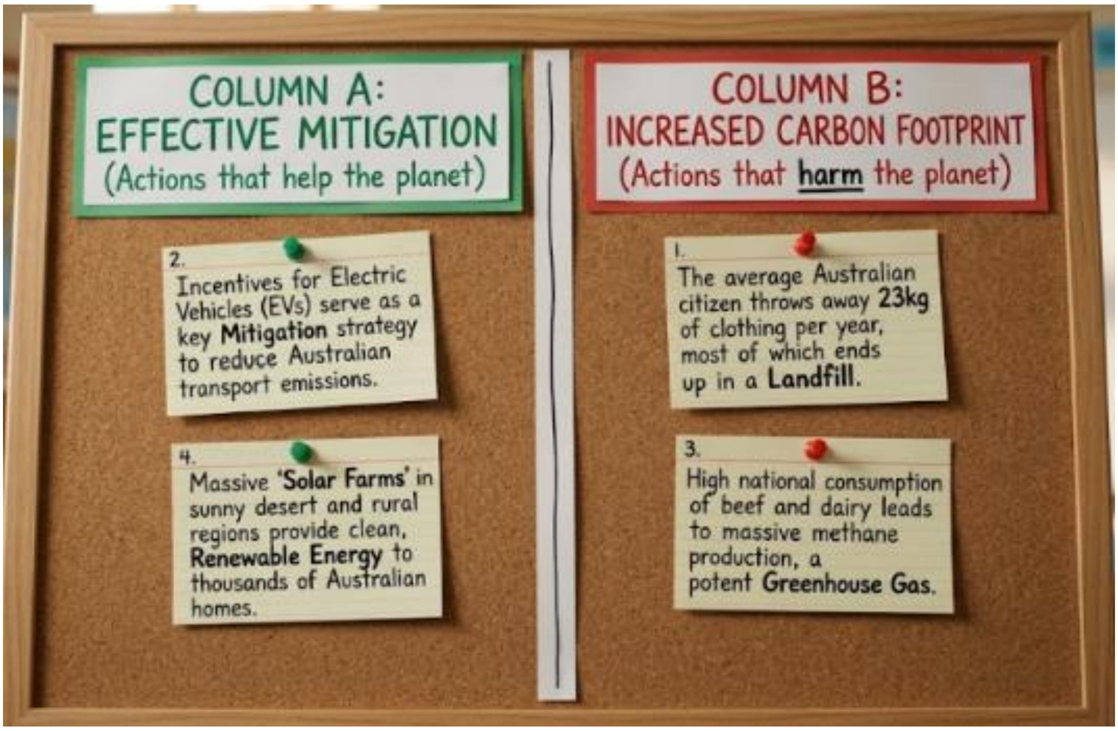
- **Card** 1: Most cars run on Ethanol (made from sugarcane), a Renewable Energy source that reduces oil dependence.
- **Card** 2: Deforestation in the Amazon for cattle ranching removes trees that act as a natural Mitigation tool.
- **Card** 3: Large urban areas struggle with illegal dumping, creating massive, unmanaged Landfills.
- **Card** 4: Growing "Green Cities" like Curitiba focus on public transit to lower the city's Carbon Footprint.



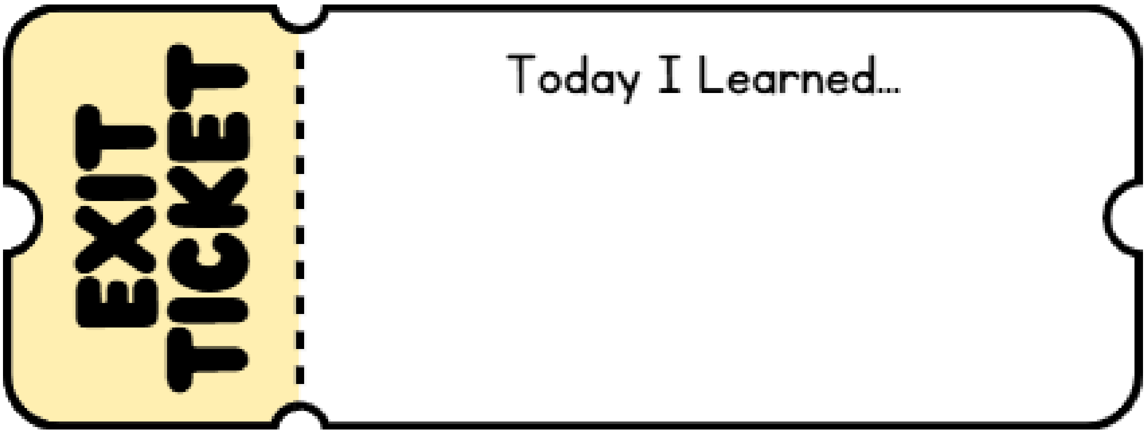
- **Card** 1: "Gas Flaring" (burning natural gas) during oil extraction releases immense amounts of Greenhouse Gases.
- **Card** 2: New community projects are installing solar panels in rural villages to provide Renewable Energy.
- **Card** 3: Informal "Recycling Hubs" in cities turn scrap metal into new tools, supporting a culture of Sustainability.
- **Card** 4: The lack of formal trash collection leads to open-air burning of waste, which is worse for the planet than a managed Landfill.



- **Card 1**: The average Australian citizen throws away 23kg of clothing per year, most of which ends up in a Landfill.
- **Card** 2: Incentives for Purchasing Electric Vehicles (EVs) serve as a key Mitigation strategy to reduce Australian transport emissions.
- **Card 3:** High national consumption of beef and dairy leads to massive methane production, a potent Greenhouse Gas.
- **Card 4:** Massive "Solar Farms" in sunny desert and rural regions provide clean, Renewable Energy to thousands of Australian homes.



8.5. Appendix 5. Exit slips

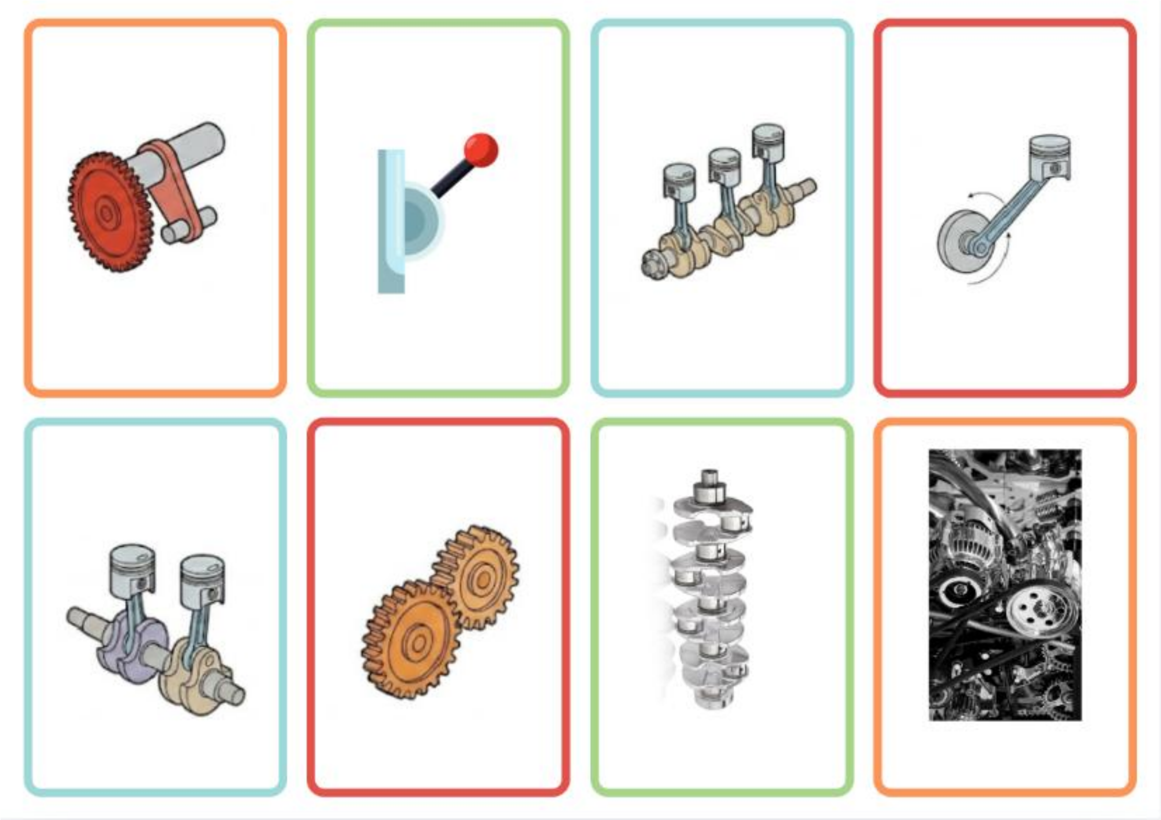


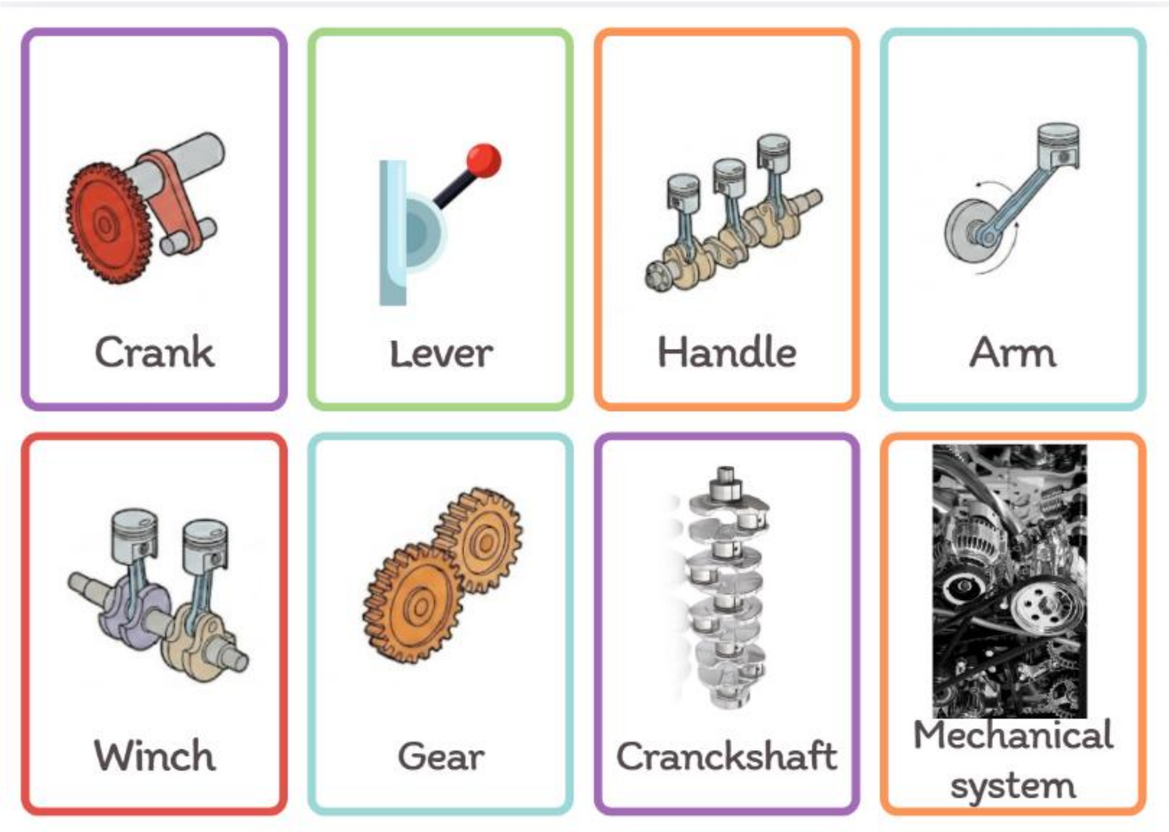
8.6. Appendix 6. Video and bingo

https://www.youtube.com/watch?v=kx0151u-hyw

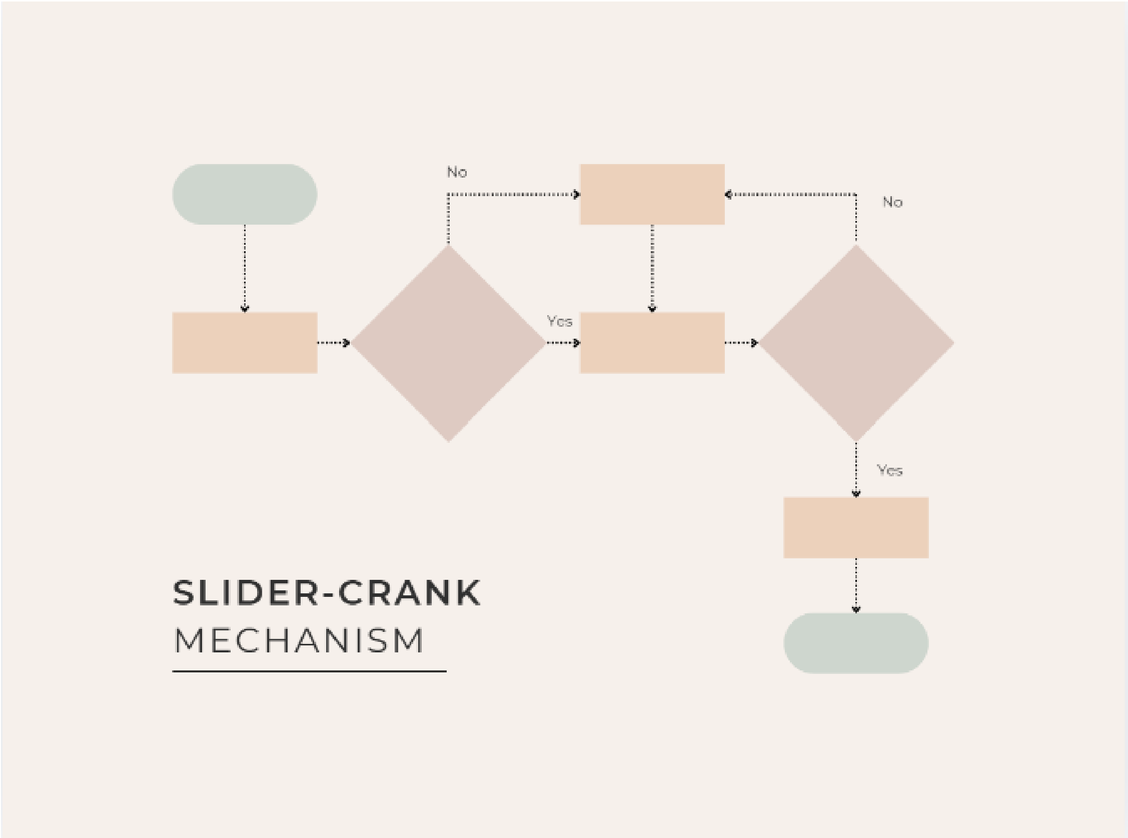
8.7 Appendix 7. Mechanism components images

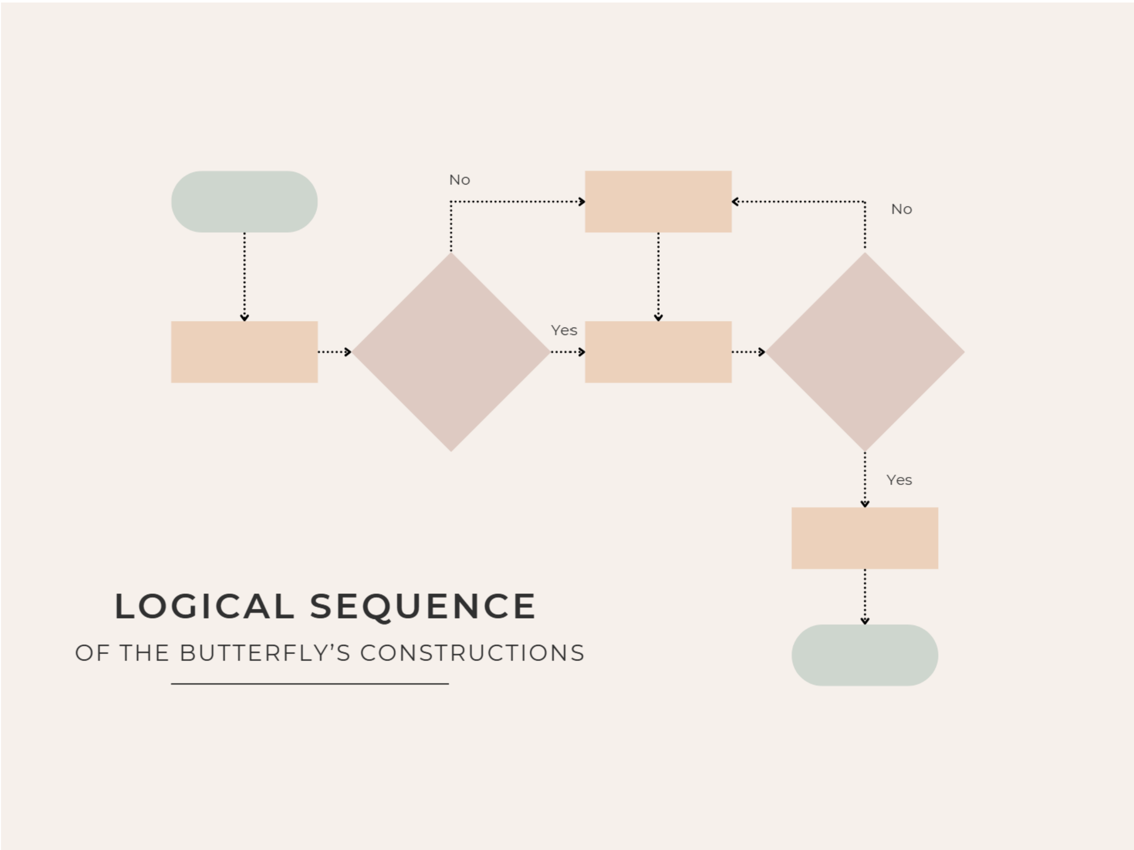
Link to the quiz: https://docs.google.com/forms/d/e/1FAIpQLSe3-rkK_6KLHBtZZutF8jcFzHjMr3gXdrvw4Hd3y9uqkhsksA/viewform?usp=publish-editor





8.8. Appendix 8. Flow chart





8.9. Appendix 9. Algorithm sequencing activities

The linkage rod pulls the output part back down to the starting position.

The crank arm converts the turning force into a circular rotation.

The crank pushes the linkage rod upward in a straight line.

One full mechanical cycle is complete.

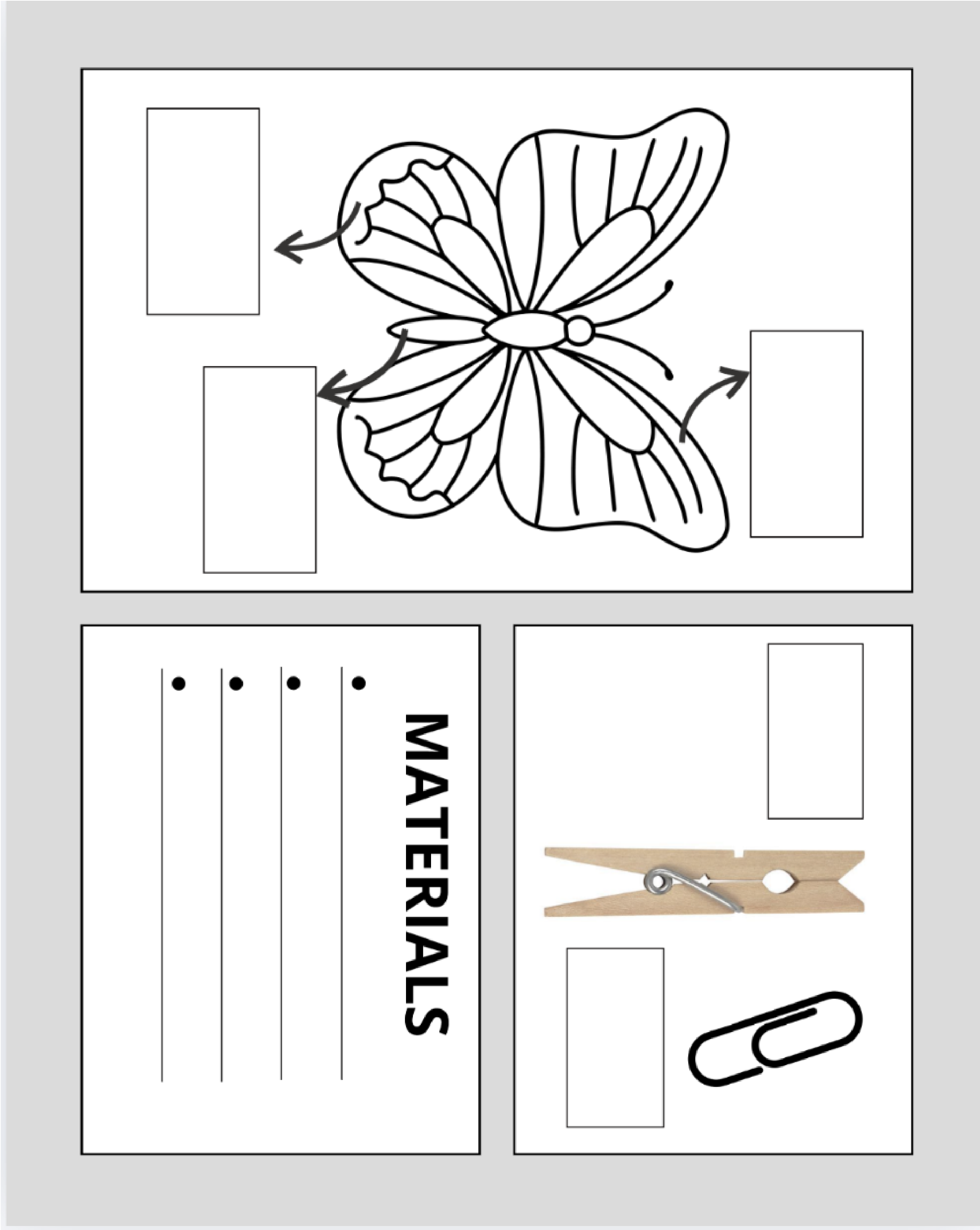
Apply a rotary input force to the main axle.

The output part reaches its highest vertical point.

8.10. Appendix 10. Example of final product

https://drive.google.com/file/d/1_F8PVZ11o6Xlv7_DZvEaGzp_KCAc-n-v/view?usp=sharing

8.11. Appendix 11. Sketching template



8.12. Appendix 12. Examples of instructions for the teacher

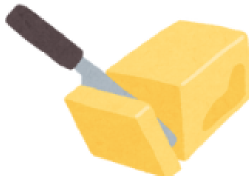
HOW TO MAKE A SANDWICH

1

First, **get** two slices of bread

2

Second, **spread** some butter on the bread.

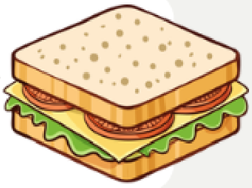


3

Next, **place** the ingredients in the middle.

4

Then, **close** the sandwich carefully.



5

Finally, **eat** your delicious sandwich

8.13. Appendix 13. Writing frame for instructions

DELEGATION ______________________ DATE: ______________________

VIDEO SCRIPT. INSTRUCTIONS

IMAGINE

Write a clear tutorial script of how to build a mechanical butterfly using waste materials. Use the imperative form (commands) and the word bank to help you!"

TECHNICAL VERBS AND PARTS

- Attach / Connect
- Insert / Secure
- Turn / Rotate
- Axle / Crank
- Linkage / Support

SEQUENCE MARKERS

- First / Second
- Next / Then
- After that
- Subsequently
- Finally

WRITE YOUR SCRIPT HERE

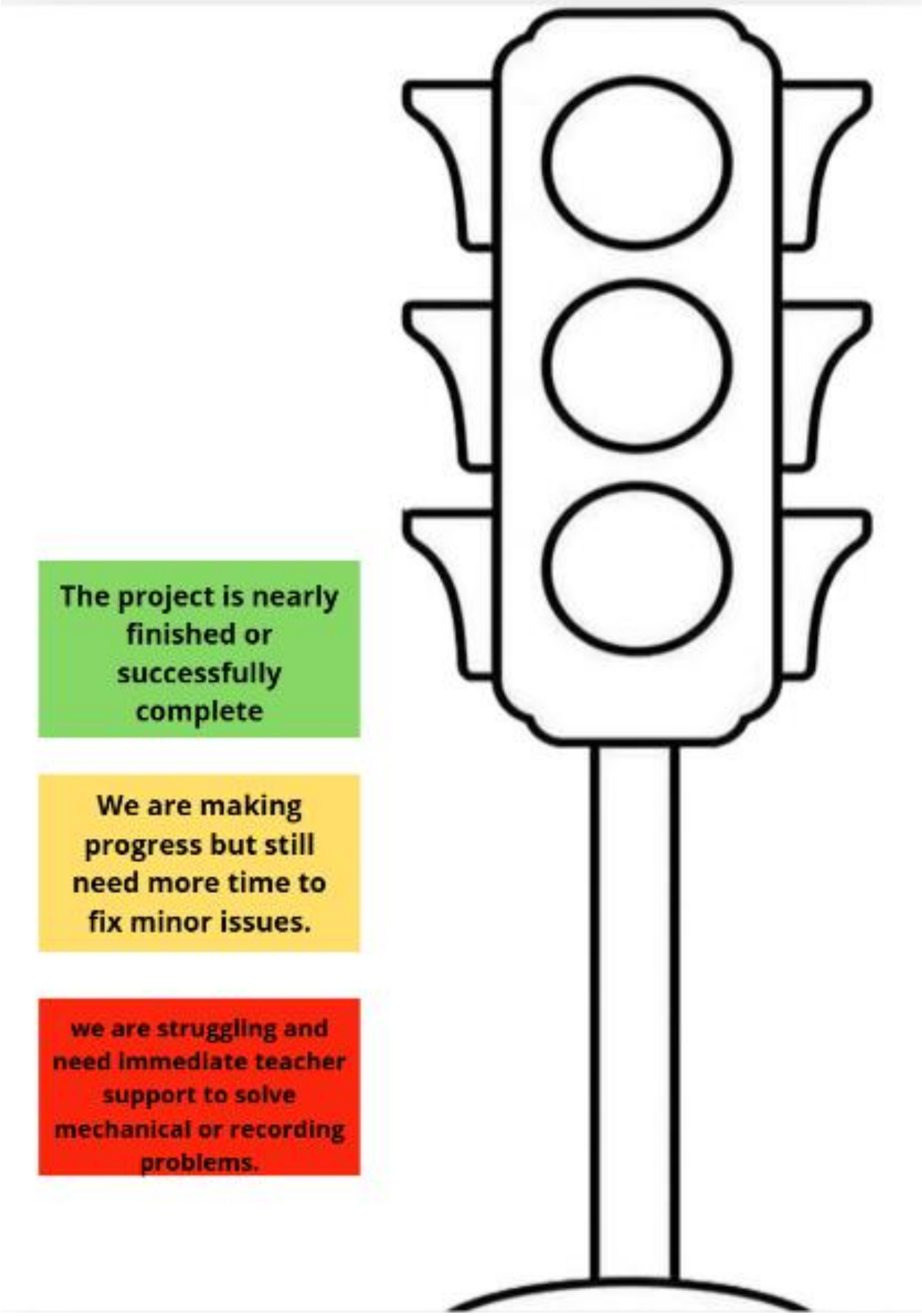
8.14. Appendix 14. Final product checklist (Teacher)

ASSESSMENT CRITERIA	EXCELLENT (4)	GOOD (3)	FAIR (2)	UNSATISFACTORY (1)
Declarative Knowledge: SDG 13 & Design	The video clearly explains the choice of recycled materials (fruit nets, skewers) and their relation to reducing carbon footprint (SDG 13).	The video identifies the recycled materials used but the connection to SDG 13 or mitigation is mentioned briefly/unclearly.	Materials are listed, but there is no explanation of why they were chosen or their environmental impact.	No mention of recycled materials or the environmental purpose of the project.
Procedural Knowledge: Mechanical Functionality	The butterfly wings move smoothly. The slider-crank mechanism (axle, linkage, crank) is perfectly assembled and functional.	The wings move, but the mechanism catches occasionally. All parts are present but may need minor manual adjustment.	The mechanism is rigid or has limited movement. The assembly shows structural weaknesses that affect functionality.	The mechanism does not work. The butterfly wings do not move or the assembly is incomplete.
Digital Production & Delivery	Video is well-edited, clear, and follows the script perfectly. Pronunciation is clear and easy to follow.	Video is clear and follows the script but editing transitions or audio levels are slightly inconsistent.	Video is disorganized or some steps from the script are missing. Pronunciation makes it difficult to follow at times.	Video is poor quality, incomplete, or does not follow the instructional script at all.
Language Proficiency: Instructional Genre	Excellent use of sequence markers (First, Next, Then) and imperative verbs (Cut, Glue, Attach). Technical terms (axle, linkage) are used accurately.	Good use of sequence markers and imperatives, though 1-2 technical terms might be misused or missing.	Limited use of sequence markers. Instructions are understandable but rely on simple verbs (Do, Put) instead of technical ones.	No logical sequence. Instructions are disorganized. Failure to use imperative forms or technical vocabulary.

8.15. Appendix 15. Observation grid

COOPERATIVE LEARNING OBSERVATION CHECKLIST- TEACHER												
Group:	Date:											
Group members: 1._____________ 2._____________ 3._____________ 4._____________ 5._____________	Focus on technical language (CLIL)	Group members					Focus on the group	Group members				
	1. High Proficiency: Consistently uses technical terms (*axle, linkage, crank*) accurately during the recording without prompts.	1	2	3	4	5	**1. Excellent Coordination:** Follows the script perfectly while assembling. Manual techniques (*cutting, gluing*) are precise.	1	2	3	4	5
	2. Good Proficiency: Uses technical terms correctly but occasionally needs a reminder or "scaffold" from the assistant.	1	2	3	4	5	**2. Good Coordination:** Follows the procedure script. The prototype is functional and the recording matches the steps.	1	2	3	4	5
	3. Developing: Uses simple vocabulary (*this part, the stick*) and only uses technical terms when directly prompted.	1	2	3	4	5	**3. Minor Issues:** Struggles to record and build simultaneously. Some steps in the script are skipped or manual assembly is messy.	1	2	3	4	5
	4. Low Proficiency: Does not use technical vocabulary. Struggles to repeat terms even with verbal scaffolding.	1	2	3	4	5	**4. Poor Coordination:** The build does not follow the script. Significant help is needed to complete the manual assembly.	1	2	3	4	5

8.16. Appendix 16. Traffic light template (student)



8.17. Appendix 17. Self-evaluation "Sandwick feedback" (students)