P4P

Play 4 the Planet

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Board games as instruments to teach sustainability

Empowering educators:

A comprehensive guide to implement Europe Plastic's Race in schools for environmental education and sustainability

ASOCIACION DESES 3

DAFO Gestión Estratégica S.L.

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GENISTA RESEARCH FOUNDATION

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OPENING – INTRO

Welcome to the 'Play together for a sustainable planet (P4P)' project guide for primary teacher training. This tool is designed to empower educators to implement an innovative and gamified approach to environmental education.

The Erasmus + P4P project stands as a beacon of innovation in the field of environmental education, addressing current environmental challenges with the need for collective awareness and action. It acts as a catalyst for change, offering secondary school teachers a unique opportunity to instill environmental awareness in the minds of the next generation.

P4P aims to bridge the gap between environmental awareness and practicable change through the creation of an engaging board game and app. The aim is to immerse students aged 6-12 in a gamified learning experience that goes beyond traditional classroom methods. By harnessing the power of gamification, the P4P project makes learning about environmental issues not only informative but also fun, promoting an authentic interest in the subject.

In an era of growing environmental concerns, the importance of the P4P project is crucial, focusing in particular on the alarming increase in single-use plastic, a problem exacerbated by the COVID-19 pandemic. By directly addressing this environmental threat, P4P aims to interrupt harmful habits and inspire sustainable practices among the younger generation.

Environmental education emerges as the key to forming responsible citizens who are aware of the complex connections between human actions and the well-being of our planet. The P4P project recognises that fostering a sense of environmental responsibility begins in the classroom, where students can acquire the knowledge and skills needed to address environmental challenges and contribute to positive change.

Teachers, as stewards of the environment, play a key role in shaping their students' perspectives and behavior. With the power to mold young minds into environmentally aware citizens, equipped with the knowledge, empathy and motivation to make sustainable choices, the P4P project celebrates the central role of teachers in raising a generation that values and protects our planet.

CONTEXT

P4P addresses the lack of comprehensive environmental education for primary school students, particularly concerning the critical issue of single-use plastics and their impact on the planet by introducing engaging board games and a game app, gamified educational instruments meticulously designed to resonate with primary school students. These tools not only respond to the ongoing changes induced by the pandemic but also serve as a proactive measure against the escalating use of single-use plastics. P4P recognizes the need to renew efforts in educating the younger generation on sustainable practices, acknowledging the unique challenges posed by discussing sensitive topics with young learners.

Key components of the P4P Project:

1. Aligning with Sustainable Development Goals (SDGs): P4P aligns with key United Nations Sustainable Development Goals (SDGs), specifically targeting quality education, climate action, and responsible consumption and production. The project aims to create ready-to-use educational resources integrated into curricular content, facilitating teachers in delivering impactful lessons on environmental protection.

   Sustainable Development and SDGs: Sustainable development, defined as development that satisfies present needs without compromising the ability of future generations to satisfy their needs, involves harmonizing economic growth, social inclusion, and environmental protection. The Sustainable Development Goals (SDGs) are a call for action by all countries to promote prosperity while protecting the planet and addressing poverty, economic growth, social needs, and environmental issues. P4P specifically aligns with three SDGs: quality education, climate action, and responsible consumption and production, contributing to the global effort towards sustainable development.

   "The 5 P" perspective of SDGs includes People, Planet, Prosperity, Partnership, and Peace. Established during the Sustainable Development Summit 2015, the 17 Goals of Development provide a comprehensive framework for addressing global challenges and promoting sustainable practices. P4P's commitment to **quality education, climate action, and responsible consumption** and **production** reflects a broader dedication to fostering positive environmental change and ensuring a harmonious future.

2. The power of Game-Based Learning (GBL): recognizing the potential of Game-Based Learning (GBL) in addressing sensitive topics, P4P employs it as a powerful methodology. GBL has proven to be a dynamic approach, bringing children closer to understanding environmental issues and motivating behavioral changes. Through the creation of a board game and a multimedia game, P4P introduces qualitative, gamified instruments designed to make learning entertaining and effective.

3. Educational instruments to foster civic awareness: P4P's board game and multimedia game serve a dual purpose: raising awareness about the issues caused by single-use plastics and providing practical solutions. By improving daily habits through these instruments, pupils are envisioned to become more civically aware and proactive in ecological activities, instigating a positive change in their ecological attitudes.

4. Global agreements and local shifts: while international agreements on plastic pollution exist, the context of the COVID-19 pandemic has witnessed shifts in the prioritization of values. Health concerns have, at times, taken precedence over environmental considerations, leading to changes in waste production and management. This shift emphasizes the need to reassess measures undertaken during the pandemic, ensuring a harmonious balance between health and environmental sustainability.

5. From Global Policies to Classroom Impact: To mitigate environmental threats and create a lasting impact, P4P recognizes the crucial role of teachers in shaping behaviors and civic attitudes. The creation of adequate materials, tools, and instruments, along with this comprehensive guide, aims to empower teachers to effectively address environmental issues in an engaging and non-formal manner. This approach fosters a generation committed to positive ecological change, making a meaningful impact from global policies to the classrooms.

PROJECT PARTNERS

Asociación Deses 3 is a dynamic organization dedicated to education, training, leisure, and personal and professional development. Operating at the intersection of societal needs, daily life, and the labor market, it engages with diverse demographics, offering activities for children, youth, and adults. A trailblazer in non-formal learning, the organization emphasizes the acquisition of transversal skills and e-learning for digital skill enhancement.

Actively addressing the mismatch between formal education and the labor market, DESES-3 focuses on improving employability through initiatives like entrepreneurship, career guidance, and European mobility. With a commitment to societal well-being, it participates in aid programs, raises awareness about cooperation for development, and organizes events on health, disease prevention, and environmental protection.

In collaboration with international organizations, regional administrations, schools, and youth organizations, the organization maintains a robust network, boasting a dedicated team contributing to the development of formal, non-formal, and informal education activities.

A leader in European projects, DESES-3 is involved in 13 KA2 projects, leading 5 of them, and focuses on improving competencies through non-formal and informal learning. With a strong commitment to equality and inclusion, the organization ensures safety standards in all activities, fostering an inclusive environment.

Within the P4P project, DESES-3 assumes a pivotal role as the leader, spearheading overall coordination and leveraging extensive experience in non-formal educational activities to lead WP2. Its dedication to promoting European values reflects a mission to transform the educational landscape and create engaged citizens.

DAFO Strategic Management, a consulting and training company based in Medina del Campo, Spain, is dedicated to enhancing the competitiveness of European society and organizations with limited resources. Established in 2014, initially focusing on event management and training, DAFO has evolved into a training center specializing in management, youth, and adult mobility.

With a commitment to European added value, DAFO excels in designing and managing European projects, contributing to management and education. The company operates across various lines of expertise, including education and training, facility management, event management, and European projects.

DAFO's core focus on education involves research, training, and content production on diverse areas of people development. Specialized in promoting skills such as literacy, numeracy, digital literacy, creativity, and problem-solving, DAFO is dedicated to fostering positive change and sustainability.

Within the P4P project, DAFO leads the Educational Design Research (EDR) methodology, focusing on creating this “Guide for training of teachers”. Additionally, DAFO ensures quality control, implements risk management, and plays a pivotal role in the project's success.

Esperino Gymnasio - L.T. Karditsas It is a school separated into two sub-units that provides its students with certification at the second or third level of the EQF system upon graduation. The school's goal is twofold: first, to provide public education to students who dropped out of school due to economic and social issues and return to complete their education; and second, to take all necessary steps to make their return to school as smooth as possible in order to engage and motivate them to complete their education. The majority of the students are underemployed or have inclusion concerns and are unable to attend regular school schedules.

Furthermore, the majority of them come from rural and poor communities, where the effects of the economic crisis exacerbate already existing difficulties. Despite the existing problems, we are proud that every year, some of our students are accepted to universities or technological institutions (after taking the final national exams in third grade), and we are also proud of their school behaviour and active participation in extracurricular school activities and projects. Our school's uniqueness stems from the considerable contact between teachers and students. Students are taught by educators, and teachers are taught by students in a welcoming educational setting.

DAMASISTEM - Operating at the Middle East Technical University TECHNOPOLIS, DamaSistem is a research and development company focused on the design and development of educational content and applications compatible with educational

DAMASISTEM standards SCORM and IMS; allowing them to be used in open-source Learning Management Systems without any cost along with 70 languages support.

Some key qualifications:
Mobile applications interacting with physical toys for preschool education, Augmented Reality, Content Development, Game Based Education, AI in Education, Learning Management System (LMS) installation, configuration, and customization, Interactive e-learning contents, 2D, 3D animations, Virtual-classroom video conferencing, Hosting for LMS and video conferencing in our servers, automatized backup in different geo-locations, European Innovative Teaching Award (EITA) with our e-Teach Project.

Genista Research Foundation was set up in 2002 and has 12 youth workers and teachers who give their time to youth work, organizing training, workshops, lectures, hands-on activities, etc. GRF works with children, youths and adults, focusing on empowering, educating and giving opportunities to people with educational, social, minorities and refugees through its dedicated team of youth workers. We have 2 offices 1 on Malta in the Cottonera region which is a working-class area with many social issues and one in the island of Gozo working in rural areas. GRF works on the following 5 main areas:

Training department: Genista has established its own training centre on the island of Gozo and for the past years has been providing training on new methods of education, effective management techniques and strategies, developing 21st-century skills, environmental sustainability, outdoor learning, inclusion and diversity, multisensory teaching, mindful sensory awareness, stress reduction, conflict management, project writing, project management, organic farming, media, communication, EU affairs, Economic affairs, internationalization, start-ups, company development and international network development in Malta and in various other EU and Non-EU countries.

Intercultural, Migration and social work. GRF works with minority groups namely refugees, social and economic areas and those with fewer abilities. In this area, we mainly work with youths focusing on gender based issues, discrimination and lack of opportunities for young females especially from the immigrant community and those with social and educational needs who face discrimination, bullying and rejection in society.

Environment, climate change and rural affairs: GRF runs and manages the Rinella nature reserve-which is a nature reserve and organic farm in the Rinella valley an area of scientific importance where it does experiments on various vegetables and their

adaptability to our climate and grows and plants a variety of local and Mediterranean trees. At the centre, it provides training on organic farming, sustainable development, climate change and rural issues.
As part of our work on sustainability, we have produced 4 sustainable development plans for 4 local councils which were reports on the state of the municipality and how it should focus on going for alternative energy resources as part of their future plans. We organize training on alternative energy use with various local cities, promoting and advising on converting into alternative energy and how to become a more sustainable locality.
Our offices in Rinella are fully energized by solar power without the need for any other energy supply.

Project management- GRF prides itself that it is one of the leading project management organizations with 23 ERDF projects approved on the island and beyond, handling projects which are diverse from Communication, Media, Film production, management, research, development of public spaces, hotel improvements, sustainability projects, training and evaluation and producing ideas for new ventures and business opportunities both in Malta and abroad.

Media and communication: have successfully managed and organized several projects based on EU information and awareness, intercultural issues, social issues, and refugees. This led to several media projects where we coordinated training on documentary film production in Ramallah Palestine and producing 4 films; the creation of a Web TV with Italian, Spanish and Albanian partners; organizing training on Film production, Editing and dissemination. We also produced, and edited a number of short films for various projects, and wrote and produced information publicity material, booklets, books and other information material. For 4 years we also managed the Europe direct office of The EU DG Comm.

Ahmet Kabaklı Primary School

The Ahmet Kabaklı Primary School is located in a rural area (within conscription) of Ankara, the capital city of Turkey. The vision of the school is to be a productive school that helps every individual to learn and develop in line with the 21st century objectives. The mission of the school is to raise children in a natural environment, as self-confident, knowing what they want, using technology and foreign language well, honest, affectionate, loyal to international principles, and social people.
The school bears 20 Teachers, 203 Students, 17 Classrooms, 1 Multipurpose Activity Hall, 1 Science Lab, and a Library with 1700 books. It's a full time school between 09:00 – 14:20.
The school has a sports workshop, a music workshop, a mind games workshop, a drama workshop, it's also an EBA (education network of Turkish Ministry of National Education) support point. Many of our teachers are working as TEMA (Turkish Foundation for Combating Soil Erosion) volunteers. Our school

OBJECTIVES

Empowering primary school students to acquire the knowledge and values necessary to adopt sustainable environmental practices is critical to shaping future generations committed to positive change. P4P Project recognises the importance of initiating environmental awareness and education at the fundamental level of the education system. By introducing engaging educational resources, including a board game, a multimedia game and a comprehensive training plan, P4P aims to instill a deep understanding of environmental sustainability, specifically addressing the critical challenge of single-use plastics.

The project takes a long-term perspective, recognising that cultivating a generation capable of contributing to sustainable development requires early and impactful intervention. P4P seeks to go beyond conventional teaching methods, harnessing the power of Game-Based Learning (GBL) and gamification to make environmental education enjoyable and memorable. The objectives go beyond the mere dissemination of information; they aim to shape behavior, attitudes and lifestyles in line with the principles of responsible consumption and environmental protection.

- Create 3 educational resources (one board game, a multimedia game, training plan) to tackle the topic of environmental sustainability, especially related to the danger of single-use plastics for our planet.
- Train 40 teachers on the appliance of game-based learning and gamification methodologies to teach serious topics entertainingly.
- Foster the development of green skills of 200 pupils through game-based learning
- Raise awareness among education professionals and young pupils regarding the danger in which our planet is, if we don't take proper action to protect it;

Our commitment extends beyond tangible outcomes, with a focus on the intangible results of better-prepared teachers and motivated students. Through an impact analysis during and after pilot phases, we will measure and document positive changes, providing clear evidence of the project's effectiveness.

GBL METHODOLOGY IN SCHOOL

Game-Based Learning (GBL) plays a crucial role in the innovative approach adopted by the Play together for a sustainable planet (P4P) project. This dynamic methodology emerges as a transformative and indispensable tool, especially in the context of educating primary school students in complex environmental concepts.

Recognising that traditional teaching methods may be limited in engaging primary school students in environmental education, P4P uses GBL to harness children's innate affinity with play, transmitting knowledge in an engaging and fun way. This approach facilitates a deeper understanding of abstract concepts, making the learning experience accessible and memorable for young minds.

The P4P board game and application are designed as qualitative, gamified educational tools, integrating scenarios that address the growing problem of single-use plastics. These scenarios involve cause-effect dynamics, decision-making processes and problem-solving elements, helping not only to raise awareness but also to develop students' critical thinking skills.

The playful approach is not simply a teaching tool in P4P; it is a strategic methodology that aligns perfectly with the objectives of raising awareness of environmental issues, especially the dangers of single-use plastics. P4P uses GBL as a powerful tool not only to enhance pupils' learning, but also to make the learning process fun and impactful for primary school students.

P4P's board game and multimedia game are designed considering the ongoing changes caused by the COVID-19 pandemic and the increasing use of single-use plastics. They offer scenarios that address causes, outcomes, and possible solutions, encouraging critical thinking, active learning, and problem-solving skills among students.

The P4P GBL approach offers several benefits, including increased student engagement and motivation, promoting active learning, and enabling individualized learning. Furthermore, it encourages collaboration and the development of social skills, as well as promoting the development of a wide range of competences, preparing students for academic and professional success.

EDUCATIONAL COMPETENCIES AND CHALLENGES

Delve into a transformative educational experience as the "Play together for a sustainable planet" project addresses critical environmental topics, including single-use plastic, sustainability, ecology, and recycling. This initiative aims to equip students with a comprehensive set of green skills and attitudes, fostering awareness of environmental challenges and promoting a sustainable lifestyle.

Educational Competencies: The project's core mission is to instill in students a robust foundation of green skills and attitudes. These competencies encompass a holistic understanding of environmental issues, particularly the hazards associated with single-use plastics. Students will gain insights into sustainable practices, ecological consciousness, and the broader implications of their lifestyle choices. The focus extends beyond theoretical knowledge to practical applications, empowering students to become proactive contributors to environmental well-being.

Educational Challenges: Designed by a team of pedagogical experts, the educational challenges embedded within the project are strategically crafted to align with curriculum objectives. These challenges serve as dynamic learning experiences, allowing students to apply and develop the competencies within the educational framework. By engaging in hands-on activities, problem-solving scenarios, and critical-thinking exercises, students will navigate real-world challenges related to environmental protection, reinforcing the assimilation of green skills and attitudes.

Key Environmental Topics:

1. Single-use plastics pose a significant threat to our environment, contributing to pollution, habitat destruction, and harm to marine life. According to the World Wildlife Fund (WWF), plastic pollution is a global crisis affecting oceans and ecosystems. Reports from the United Nations Environment Programme (UNEP) further emphasize the urgency of addressing single-use plastics to safeguard the planet's health (WWF, UNEP).

   Exploring alternatives to single-use plastics is crucial. The Ellen MacArthur Foundation champions the circular economy, offering insights into sustainable alternatives and innovative solutions to minimize plastic waste (Ellen MacArthur Foundation).

2. **Sustainability:** Understanding sustainability involves aligning with the Sustainable Development Goals (SDGs) outlined by the United Nations. These goals provide a comprehensive framework for addressing global challenges, including environmental sustainability (United Nations SDGs).

   For organizations' sustainability efforts, the Global Reporting Initiative (GRI) sets widely adopted reporting standards. These standards allow businesses to measure and communicate their environmental and social impacts (GRI).

3. **Ecology:** Ecology delves into the intricate relationships within ecosystems. Resources from the Ecological Society of America (ESA) offer scientific insights into biodiversity, energy flow, and nutrient cycling within ecosystems (ESA).

   National Geographic provides accessible educational materials on ecology, ecosystems, and biodiversity, catering to various age groups and educational levels (National Geographic).

4. **Recycling:** Understanding the basics of recycling is essential for sustainable waste management. The Environmental Protection Agency (EPA) offers educational materials on recycling processes, waste reduction, and community-driven recycling programs (EPA Recycling Resources).

BOARD GAME RULES

INTRODUCTION

The city councils of major European cities organise the **“European Plastic's Race"** competition, where private plastic recycling companies apply to be recognised by the city and contracted to carry out the work throughout the country. You are the manager of one of these companies, will you be able to be the first to collect the most plastics while avoiding the city's daily traffic problems?

OBJECTIVE OF THE GAME

Your goal is to collect recycling points. To do this, you will have to collect plastic from the bins distributed throughout the city before anyone else. You will also be able to sell the plastics from the bins collected at the Recycling Plant and gain points. What will be the most profitable for your company? Sounds easy, doesn't it? But you won't always be able to take the shortest route and you'll have to avoid construction sites, mandatory directions or stop at unexpected punctures. Try to find the best route by managing the use of your cards or their powers, while trying to avoid the difficulties that the city itself or your opponents put in front of you.

Recycling points icon. The # symbol indicates the number of recycling points achieved.

Example:
4 recycling points

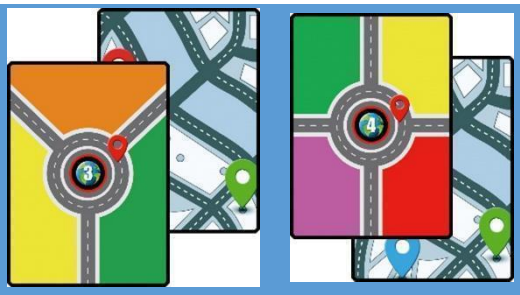
COMPONENTS

25 Bins Cards numbered 1 to 5

1 Bonus Card

5 Recycling Plant Cards

59 Street Cards



14 Route Cards

5 Wooden cylinders
(wooden trucks)

1 reward die WITH route cards

1 reward die WITHOUT route cards

4 coloured dice

Recycling point counters

Tokens: 2 Street Works, 2 one-way and 5 police tokens

4 double-sided boards with 8 European City Maps

Starting player token

PREPARING FOR THE GAME

1 – Choose one of the 8 available European city boards (maps) and place it in the centre of the table within easy reach of all players. Each of them tries to bring different

things to the table as explained at the end of this manual. Depending on the number of bins they can be:

- Two Cities with 3 bins: Paris and Victoria. These maps are recommended for beginners or for short games (20-25 min.). These boards stand out for their simplicity as they do not have a Recycling Plant, ideal for playing with children between 8-10 years old. You can increase the simplicity even more if you decide not to play with route cards.

- Four Cities with 4 bins: Athens, Berlin, Madrid and Rome. These boards contain the Recycling Plant and the route cards. The route cards add more options to the game and a little more complexity. Games last about 35 minutes. Recommended for children over 10 years old.

- Two Cities with 5 bins: London and Ankara. They have the same difficulty as the cities with 4 bins, but require more playing time (about 45 minutes). They are recommended for children over 10 years old.

2 – Shuffle the entire deck of street cards and deal X cards to each player according to the number of players (see table). Leave the rest of the deck face down next to the board. The starting player is the player who has most recently seen a rubbish truck picking up containers. The game is played clockwise, in turns, starting with the starting player and ending with the last player.

Nº players	Nº cards Player 1	Nº cards Player 2	Nº cards Player 3	Nº cards Player 4	Nº cards Player 5
2	4	5			
3	4	5	6		
4	4	5	5	6	
5	4	5	5	5	6

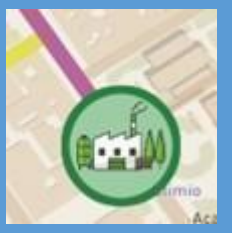
3 – Select a color token (truck) from among those available; this will be your tile to move around the map. Place it at the traffic light (starting point) on the chosen map. If you have caught a board with several traffic lights, you can first see your cards to choose which traffic light you will start at. The combination of the colors of your cards will allow you to move around the

Starting Point

board, so choose your starting point well. This will be explained later, don't worry for now.

4 – Place the bins cards next to the board. Place as many different bins as the board has. The number of cards in each bin must match the number of players in the game. Place the Bonus card next to these bins cards. ***Example: In a game with 3 players, on a map with bins 1 to 4, place 3 cards from bin 1; 3 cards from bin 2; 3 cards from bin 3 and 3 cards from bin 4***

5 – If the board **has** a Recycling Plant, shuffle the 5 Recycling Plant cards and remove one of them. Leave it next to the board and return the rest to the box. The card chosen will determine the operation of the Recycling Plant for the entire game. Place as many recycling points on the card as there are bins purchased as a reminder. The operation of the plant will be explained later.



* If you are playing with a board without a Recycling Plant, leave these cards in the box. You will not play with them in this game.

6 – If you are going to play with the route cards (mini objectives) that add more options to the game, place them on one side of the board (you **don't need to place these cards if you want a simple game**).

7 – Leave next to the board, within reach of all players, the dice, the recycling point tokens (values 1, 5, 10) and the remaining tokens (street works, one-way and police).

8 – The starting player picks up starting player token and begins his actions. When his turn is over, the player to the left (clockwise) continues.

PREPARATION OF THE GAME

Example of a 4-player game with a board with 4 bins including a recycling plant.

WHAT IS EUROPE PLASTIC'S RACE?

PLAYING STREET CARDS

Play your street cards to your advantage or against your opponents (effects) by trying to get close to the bins or the Recycling Plant.

WALKS AROUND THE CITY

Access bins to earn recycling points and/or route cards (mini-objectives). You also have the option to take the collected plastics to the Recycling Plant and sell them.
There are various points in the city that give you rewards (white circles). You may want to pass by them on your way to the containers or the Recycling Plant and get these rewards.

END THE GAME

The game ends when a player has collected all the bins in the city or has gone through the recycling plant a certain number of times. One more round will be played in both cases and recycling points will be counted to determine the winner.

HOW TO PLAY

PLAYING STREET CARDS

These cards are the basis of the game. Usually, you will have to play cards combining the colors of the same to match the colors of the route you want to do in the board.

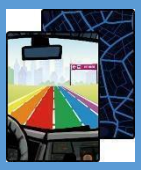
As good drivers, we need to know some rules of Road Education, such as the discontinuous line and the continuous line. In principle, discontinuous lines allow you to choose between the colors represented as long as they are connected directly in the board. However, the continuous line will ONLY allow you to choose one of the colors shown. Dashed line cards that only show one color will also show an effect on our truck's GPS. Street names provide thematic content and have no role in the game.

You have 4 types of street cards:

One colour and one effect cards. Play the card colour or the card effect, but you will not be able to play both (the effects will be explained later).

Cards of two colours connected (dashed line). You can use it if on the board the two colours of the card are connected directly without any other colour between them (the Recycling Plant, the bins, and the printed rewards do not interrupt the connection between the colours). Both colours can be used independently of the order drawn in the board.

Two-colour cards (continuous double line). You must choose one of the two colours, but you cannot choose both.



Wild cards. You can use it replacing any color you need (only one color).

IMPORTANT: you can spend any 2 street cards to turn them into a wild card. This prevents the possible blocking that could be given in your turn by not having the colors necessary to move around the map.

On your turn, you can use all the cards you want from your hand to advance through the board by matching the colors of your cards with the displacement of your truck on the map. Each card only advances one section of its color or more if all of them are the same color and are connected to each other (Example: 2 blue sections separated by a bin can be played with a single blue card).

Example 1: You are the blue player. You have 4 cards and you are in bin 4 (point **A**).

You use this card to move from **A** to **B**. You pass through a reward area (white circle) without stopping.

You use this to move from **B** to **C**. Although they are two different sections, they are the same color (green). In addition, you pass through an area where you can get a One Way token.

You use this «wildcard» to choose the yellow color and scroll from **C** to **D**.

You use this card to choose the red color and move from D to E. In the next turn you can reach bin 3 if you manage to use your cards to cover that orange stretch.

This card does not allow you to reach bin 3 this turn. You decide to keep it to apply the pinch effect on an opponent who is about to reach a bin.

End of the Turn: Once you have played all the cards you want from your hand (you can save some for later turns), you can discard the cards you don't want and steal again until you have a total hand of 5 cards (no matter how many cards you started the game). Finish your turn and continue with the next player on your left. We recommend taking the turn of other players to think about your next move. *IMPORTANT: The card hand is replenished ALWAYS at the end of turn, never during turn when playing one or more cards.*

EFFECTS OF STREET CARDS

Single color street cards have many effects that will help you; the "prick" you can use to hurt your opponents. Remember that if you use the effect, you will NOT be able to

use the color of the card. They are of a single use and, although there are several, they are very intuitive (in the second game you will have them controlled); anyway, you have a summary of all the effects at the end of the manual.

Throw 2 colored dice and place them on the board. Place each of them on any section of the map without dice, which will cause that section to change to the colour of the face of the die resulting from the roll. This will help you to use your street cards or more easily achieve your route cards (mini objectives). If all the dice are on the board when you use this effect, select 2 of them, throw them and place them in the sections you consider.

Change the face of one of the colored dice already placed on the board. This effect does not allow dice to be rolled.

Draw a random card from an opponent's hand. You cannot steal from an opponent who has 4 cards or less in the hand (must have a minimum of 5 cards).

Ask an opponent if they have a card of a particular colour or effect (the colour can appear alone or in combination). If he has it in your hand, he is obliged to give it to you.

Swap one of your cards for an opponent's card. Everyone chooses the one they are willing to exchange. Do you have any cards you are not interested in? Now is the time to exchange them for another. Maybe you'll get lucky and get one that suits you!

+2 cards in hand. Extend your hand with two more cards. You can continue to use cards during your turn, but at the end of your turn, you must have a maximum of 5 cards in your hand.

+3 cards in hand. Extend your hand with three more cards. You can continue to use cards during your turn, but at the end of your turn, you must have a maximum of 5 cards in your hand.

Street Works: place a Street works token on one of the board sections. If the 2 are already placed, remove one of the already placed and place it where you want. No one can pass through that area. *IMPORTANT: You cannot put Street Works to block a player's only exit and thus prevent their movement. You can make him take a detour or annoy him, but he always must have an exit available (even if it's not his choice).*

One-Way: place this token on the section of your choice. You will only be able to pass through that section in the direction indicated by the arrow. If both are already in place, remove one of the tokens already in place and change it to where you want it to go. *IMPORTANT: As with the Street works, you cannot place a One-Way to block a player's only exit and therefore prevent him from moving. You can make him take a detour or annoy him, but he must always have an exit available (even if it's not the one that suits him).*

Shortcut: You can skip the colour of a section (or several if they are connected by the same colour). You can even avoid the Works and One-Way if you decide that this is the section to skip.

Police: You may remove a One-Way token from the board, or you may skip the Street Works and One-Way of a section. With this effect you discard the card, you **do not take** a Police token.

Puncture: prevents an opponent from reaching a bin in that turn, even if he is playing and has the necessary cards to arrive. The puncture will cause you to spend all the cards (even the last stage), but you will have to return just to the stage before the bin. You can play it at any time of your turn or others, placing it in the opponent's playing area. The opponent will discard the puncture card once his turn is over. *IMPORTANT: This card is the only card that can be played on your turn or on the turn of others; used outside of your turn will make it possible to start the round with less than 5 cards if you have decided to throw one or more punctures against the others, since the hand is always replenished at the end of the turn.*

EXPLORE THE CITY

Explore the city to:

- PASS THROUGH BINS TO COLLECT PLASTIC
- GO THROUGH THE RECYCLING PLANT TO DELIVER THE PLASTIC
- GO THROUGH POINTS THAT GIVE YOU BENEFITS

STOP BY THE BINS TO COLLECT PLASTIC:

When you reach a bin to collect plastic YOU ARE OBLIGED TO STOP. You won't be able to move any further during that turn even if you have cards for it.

IMPORTANT: You can pass by a bin without stopping at it if you do not intend to collect plastic there (e.g. when you already have that bin or because you are interested in continuing the route to the central or another bin).

COLLECT PLASTIC: when you arrive at a bin follow the steps below:

1. Pick up the card corresponding to that bin (**you cannot have a repeated card from the same bin**). Each bin card will give you 2 recycling points if you keep it at the end of the game.

2. How much plastic is in that bin? You will have to roll a die:

2a. If you are playing without the route cards, roll the recycling die and note the recycling points obtained (0, 1, 2, 3). Pick up as many recycling point counters equivalent to the die face shown and take them to your playing area. These points are yours until the end of the game.

2b. If you are playing with route cards (mini objectives), throw the dice that has faces with the route symbol and recycling points. Grab as many recycling points and route cards as you got on the spin.

Example 2a: we have chosen to play without the route cards. We have stopped at bin 1. We take the corresponding bin card 1 and launch the recycling die. It comes out a "2", so we immediately catch two recycling points.

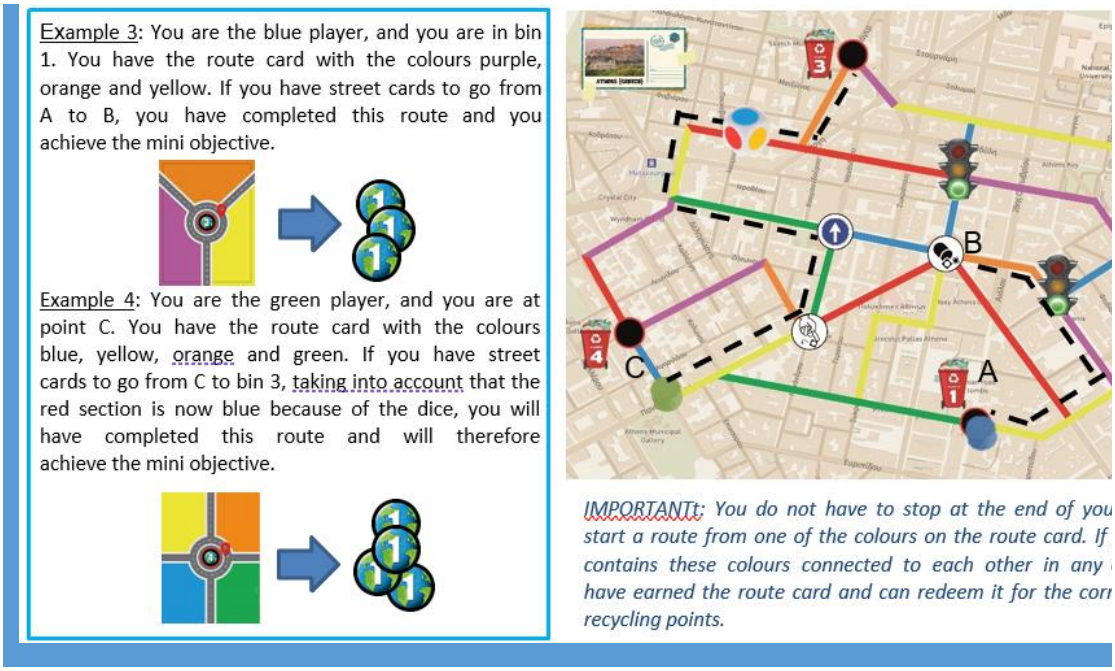
Example 2b: we have chosen to play with the route cards. We have stopped at bin 1. We take the corresponding bin card 1 and launch the route/recycling die. The result is 2 recycling points and a road map, which we take immediately.

5. If it is your last bin **and you are the first to have all the bins in your play area,** take the Bonus card. When this happens, finish the current round, and all players will have one more final round to finish the game.
This bonus card will give you 3 points at the end of the game for being the fastest.

THE ROUTE CARDS (mini objectives) - OPTIONAL

As we have told you throughout this manual, you will have to choose whether to play with these cards from the start of the game (they add more options to the game and therefore more complexity). You can only have a maximum of 3 route cards in your playing area, placed face down and hidden from the other players (if you have to draw more, you will have to discard some of the previous ones). When you get a card, turn

it over and take as many recycling points as are marked on that card. Return the card to the discard pile face up.
These cards give you extra recycling points when you go through the sections marked on the card IN ONE SAME TURNOVER. You have cards with 3 and 4 sections. The sections must be **connected to each other regardless of their order.** Remember that if a section has a die on top of it, the colour of the section will be the one marked with the colour of the die and must match your card.



NOTE: Some bins, due to special circumstances and provided that you pick up the bin, will give you extra recycling points when you get to them.

STOP AT THE RECYCLING PLANT TO DELIVER THE COLLECTED PLASTIC

During the preparation of the game, if the plan contains the Recycling Plant, you will have to play with this mode. Draw a card from the recycling center and leave it next to the board. This chart will tell you the characteristics of that location for the entire game (the anatomy of these cards is shown below).

If you want to access the Recycling Plant, YOU HAVE TO TAKE INTO ACCOUNT THE FOLLOWING:

• If you want to sell bins, you must stop at the Recycling Plant. You will not be able to continue your journey and you will not move during that turn, even if you had cards to do so.

• You can sell all the bins you want at once; remember that you cannot have two bins at the same time with the same numbering (example: you cannot have 2 containers 1).

• Returns the sold bin card to the corresponding bin card deck. You can stop at that bin in future shifts in the normal way, as it is no longer in your possession.

• Take the corresponding recycling points (marked on the letter for each bin sold).

Example 5: In the case of the top left card, I would give you 3 points for each bin you carry that is neither 1 nor 2. Suppose you carry 3 and 5, which would give you a total of 6 points (3 for each bin) and the Recycling Plant could only buy another 4 bins (it can buy 6 in total, and it just bought 2, so it can accept only 4 more). Recommendation: You can mark with extra recycling points the total of the purchases accepted by the

factory and in this way know how many are sold (in the example above, you place 6 starter tokens and when you buy 2, you leave 4 and so on).

• **Whenever someone sells bins at the Plant,** remove **all** dice and tokens on it from the board (works, one-way). This may help you to get some annoying tokens or dice off the board.

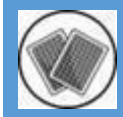
• When the **last bin** is sold at the Recycling Plant, the current round ends. All players will have **one last round** before the end of the game.

NOTE: Selling bins is a good way to earn recycling points and clear the board of annoying tokens and dice; but the Plant is almost always interested in the furthest bins, so you should consider whether you are interested in this strategy.

GOING THROUGH POINTS ON THE MAP THAT GIVE YOU BENEFITS

Bins are usually located on the perimeter of the board; however, it may be a good idea to pass through the city center to access various points that give you benefits (circles with white background). You get these rewards by going through those points **from the moment you reach them; therefore, you do not need to stop your movement in any case.** You will see that the iconography partly matches that shown in the effects of street cards:

Draw a new card from the street deck (it doesn't matter if you have more cards than you are allowed), but only at the end of your turn can you have a maximum of 5 cards after drawing. You can use it in the same turn in which you draw it.



Draw two new cards from the street deck (it doesn't matter if you have more cards than you are allowed), but only at the end of your turn can you have, after drawing, a maximum of 5 cards. You can use it in the same turn in which you draw it.

Roll two colored dice and place them on two sections of the board. These sections will change colour to those represented on the dice (same rules as the street card effect).

Choose the face of one of the dice placed on the board (same rules as the street card effect). This benefit does NOT allow dice to be rolled and therefore does not apply if there are no dice placed on any section of the map.

Place a One-Way token on the desired section of the board to force movement in that direction (same rules as the street card effect).

Take a police token from the reserve. You can use it or keep it for when you need it. Once used, it is discarded and returned to the general pool. This token allows you to bypass the Street Works and One-Way restrictions. *IMPORTANT: You cannot have more than 1 police token at a time.*

END OF GAME

The game can therefore end in two ways (described above):

COLLECT ALL BINS:

• If this is your last bin and you are the first to have all the bins in the map in your play area (i.e. you have a bin card from all available areas) take the Bonus card. It will give

you 3 points at the end of the game and will be the trigger for the end of the game. Finish the current round and play one last round of the game in the usual way.

TAKE THE LAST BIN REQUIRED BY THE RECYCLING PLANT:

• If you are the player who brings the last bin (or bins) that the Plant can receive to, charge for the sale according to the Plant's characteristics. This will trigger the end of the game. End the current round and play one last round of the game in the usual way.

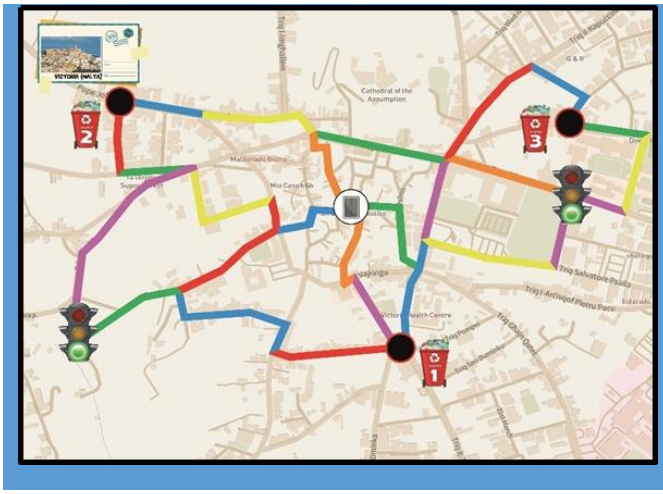
WINNING THE GAME

The player with the most **RECYCLING POINTS** wins the game. If there is a tie, the players share the victory.

Scoring example: 23 recycling points

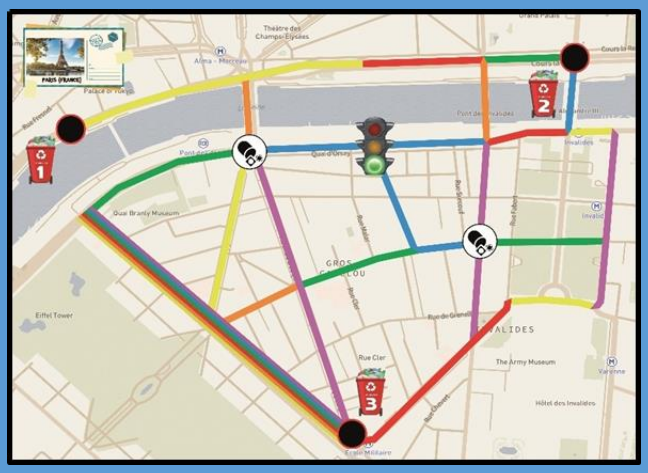
THE DIFFERENT MAPS AND THEIR CHARACTERISTICS

Each map has characteristics and peculiarities that distinguish it from the others.



VICTORIA MAP (MALTA): is a map with only three bin points and no Recycling Plant. Very easy to play and short in duration. Ideal for the little ones or to introduce you to the game. The central bonus that gives you a street card every time you pass through it is also worth mentioning. The two traffic lights allow you to choose the starting point.

PARIS MAP: This is a plan with only three bin points and no Recycling Plant. Very easy to play and short in duration, ideal for the youngest or to introduce you to the game. It has a unique peculiarity, and it is that multicolored street: YOU CAN USE ANY COLOUR TO PASS THROUGH IT (joker street). In addition, you have 2 zones where you can throw the dice. Take advantage of this to match the colours of the streets on the map with the colours of your cards and be the fastest to pass through the 3 zones and get the Bonus card.



MADRID MAP: is a map with four bin points and a Recycling Plant. Simple to play, ideal to introduce you to the game by adding the Recycling Plant. You have a central area that gives you a reward of one more card. It also brings the icon of being able to change the dice already placed (you will have to use the effects of "throwing dice" on the street cards of a single colour beforehand). It is a very good plan to be able to make many routes (mini objectives) given the convolutedness of the central streets.

ATHENS MAP: is a map with four bin points and a Recycling Plant. Dominated by those three central points that allow you to roll the dice, change the face of one of them and acquire a One-Way token, it allows constant circulations through the centre of it and thus be able to use the dice to change the colour of the various sections.

BERLIN MAP: is a map with four bin points and a Recycling Plant. It has a unique peculiarity and that is the two double white lanes. To pass through them you must use two cards of the same colour. The colour you have selected is also valid for completing route cards. To help you get through these special lanes you have two central points on the map with bonuses of one extra card. You also have bin 4 which, because it is so far away, gives you an extra recycling point (this container requires the obligatory stop, because the section ends there).

ROME MAP: is a map with four bin points and a Recycling Plant. The peculiarity of this map is bin 4, which is inside the Vatican City (and gives you 2 extra recycling points). The Vatican is a special area with its own rules: You have only one entrance, one exit and only one mandatory direction. The printed One-Way icons indicate that they cannot be changed in any way (not even the police can change them). Nor can you place a Street work token inside the Vatican or place dice. The streets of the Vatican are UNTOUCHABLE (indicated by the forbidden icon).

To help you in your task you have several bonus points on this board (acquire 2 extra cards, roll the dice and acquire a police token). These bonuses will be indispensable if you put street works or One-Way at the entrance of the Vatican and you cannot pass.

ANKARA MAP: is a plan with five bin points and a Recycling Plant. The complexity of this map lies in the fact that bins 3, 4 and 5 have only one entrance and exit. To help you, you have an extra card bonus point and another one that gives you a police token (essential in case someone blocks the access route you are interested in).

Reminder: You cannot block a player's only exit (Street Works or one-way). However, blocking the shortest routes is not only advisable, but can also be a lot of fun.

LONDON MAP: is a map with five bin points and a recycling plant. It is an ideal map for making routes thanks to its network of streets and short stretches. You can use bonus points with extra cards, roll dice or look for the face of the die that interests you.

EUROPE PLASTIC'S RACE ICONOGRAPHY SUMMARY

THROW TWO COLOURED DICE AND PLACE THEM ON ANY TWO SECTIONS OF THE BOARD FREE OF DICE.

CHOOSE THE FACE YOU WANT FROM ONE OF THE PLACED DICE. THE DICE WILL STILL BE IN THE SAME PLACE BUT WITH THE NEW COLOUR.

DRAW A RANDOM CARD FROM AN OPPONENT.

ASK AN OPPONENT IF HE HAS A CARD OF A PARTICULAR COLOUR OR EFFECT. IF HE DOES, HE MUST GIVE IT TO YOU.

EXCHANGES A CARD FOR AN OPPONENT'S CARD.

DRAW 2 CARDS FROM THE STREET DECK AND TAKE THEM INTO YOUR HAND.

DRAW 3 CARDS FROM THE STREET DECK AND TAKE THEM INTO YOUR HAND.

STREET WORK: PLACE A WORKS TOKEN ON A SECTION OF THE BOARD.

ONE-WAY: TAKE A ONE-WAY TOKEN AND PLACE IT ON THE STREET SECTION OF YOUR CHOICE.

SHORTCUT: YOU CAN SKIP ANY SECTION (INCLUDING ROAD WORKS OR ONE-WAY).

POLICE: YOU CAN REMOVE A ONE-WAY TOKEN, CHANGE DIRECTION ON THE STRETCH OR YOU CAN ALSO PASS THROUGH ROAD WORKS.

PUNCTURE: THE OPPONENT CANNOT REACH A BIN THIS TURN (HE SPENDS THE INTENDED CARDS BUT WILL NOT GET THE LAST STRETCH.

PICK UP A STREET CARD AND TAKE IT TO YOUR HAND.

PICK UP TWO STREET CARDS AND TAKE THEM INTO YOUR HAND.

ROLL TWO DICE AND PLACE THEM ON ANY TWO SECTIONS OF THE BOARD THAT ARE FREE OF DICE.

CHOOSE THE FACE YOU WANT FROM ONE OF THE PLACED DICE.

ONE-WAY: TAKE A ONE-WAY TOKEN AND PLACE IT ON THE STREET SECTION OF YOUR CHOICE.

TAKE A POLICE TOKEN. USE ITS POWER ON YOUR TURN OR SAVE IT FOR LATER (SAME POWER AS THE POLICE EFFECT).

MULTIMEDIA GAME DESCRIPTION

Dive into a vibrant, interactive race against plastic pollution in Europe's Plastic Race, a captivating new board game brought to life with multimedia experiences. Step onto beautifully illustrated game boards showcasing some of Europe's most iconic cities, from the bustling streets of London to the sun-drenched canals of Venice. Each location presents a unique environmental challenge, urging players to strategize and collaborate in the ultimate quest: recycle as much plastic waste as possible and reclaim Europe's pristine landscapes.

Immerse Yourself in Multimedia Storytelling:

1. Engaging Trailers: Captivate your audience with two compelling trailers, crafted to ignite the eco-conscious adventurer within. Share them on your YouTube channel and Facebook page, enticing players to join the Race.

- **Trailer 1:** The Call to Action: Begin with a sweeping view of Europe's breathtaking scenery, gradually darkened by the insidious spread of plastic pollution. Introduce the player characters, diverse individuals united by their passion for environmental stewardship. Highlight the game mechanics, showcasing exciting challenges and the rewarding satisfaction of cleaning up iconic landmarks. End with a powerful call to action – join the Race and help reclaim Europe's beauty!
- **Trailer 2:** Behind the Scenes: Offer a glimpse into the heart of the project. Feature interviews with the game designers, artists, and environmental experts who poured their passion into creating this impactful experience. Showcase the painstaking care taken to accurately represent each city's unique charm and ecological challenges. Spark curiosity and build anticipation for players to delve into the depths of the Race.

2. Beyond the Board: The game transcends the physical board, offering players an extended multimedia experience:

- **Interactive City Websites:** Each city on the board has a corresponding website brimming with engaging content. Players can access captivating documentaries about local environmental initiatives, virtual tours of green spaces, and educational quizzes about recycling and sustainability.
- **Augmented Reality Overlays:** Download the Europe's Plastic Race app to unlock a whole new layer of interaction. Point your phone's camera at the game board and watch cityscapes come alive with Augmented Reality features. Witness plastic pollution magically disappear as players recycle tokens, and observe virtual green shoots sprout in reclaimed areas.
- **Social Media Challenges:** Foster a sense of community and global impact through ongoing social media challenges. Encourage players to share their gameplay experiences, recycling tips, and creative solutions to plastic pollution using dedicated hashtags. Organize online competitions for the most recycled waste or the most innovative eco-friendly ideas.

Europe's Plastic Race is more than just a game; it's a multimedia movement, uniting players across Europe and beyond in a common goal: to raise awareness about plastic pollution and empower individuals to become agents of change. By seamlessly blending immersive gameplay, captivating storytelling, and interactive learning, the

Race offers a powerful and engaging platform for fostering environmental consciousness and driving positive action. Join the Race, reclaim Europe's beauty, and be a part of the solution!

LESSON PLANS

Lesson Plan 1: Plastic pollution - Causes and consequences

Activity title	Plastic Planet vs. Polluted Planet

Topic	Plastic pollution, its causes, consequences, and biodegradability of different types of plastic.
Aim	To raise awareness about the issue of plastic pollution, its impact on the environment and living beings, and to explore alternatives to single-use plastics.
Target group	High School students (adaptable)
Duration	60 minutes (can be extended)
Objective/ Learning objectives	• Students will be able to define plastic pollution and identify its various sources. • Students will be able to explain the negative consequences of plastic pollution on animals, humans, and the environment. • Students will be able to differentiate between various types of plastic based on their biodegradability. • Students will be able to brainstorm and suggest alternatives to single-use plastics.
Needed materials	• Whiteboard or projector • Markers or pens • Chart paper or sticky notes • Pictures or videos depicting plastic pollution (optional) • Different types of plastic samples (e.g., water bottles, straws, food packaging) • Information cards on different types of plastic and their biodegradability (optional)

Steps for implementation	1. Engage: Begin by showing pictures or videos of plastic pollution in different environments (oceans, beaches, landfills). Ask students: ○ What do you see in these pictures/videos? How do you think it got there? ○ What are the possible consequences of this situation? 2. Explore: ○ Activity: Divide students into small groups and distribute different types of plastic samples. Ask them to: ▪ Task: Identify the type of plastic (e.g., PET, PE, PP) based on markings or research. ▪ Task: Research the biodegradability of each type of plastic and create a simple chart outlining their decomposition rates. ○ Group Discussion: Facilitate a class discussion where students share their findings and answer questions like: ▪ Why is biodegradability important when it comes to plastic pollution? ▪ Which types of plastic pose the biggest threat to the environment? 3. Explain: ○ Presentation: Briefly explain the different sources of plastic pollution, how it enters the environment, and its harmful effects on ecosystems, wildlife, and human health. Encourage students to ask questions and participate in the discussion. 4. Evaluate: ○ Exit Ticket: Have students write a short summary of what they learned about plastic pollution and its consequences. Ask them to suggest one action they can take to reduce their own plastic footprint. 5. Extend: ○ Challenge: Encourage students to research and present on solutions to plastic pollution, such as reusable alternatives, improved waste management systems, or innovative bioplastics. ○ Action Project: Organize a school clean-up event or collaborate with a local environmental organization to raise awareness about plastic pollution in the community.

Method	This lesson uses a combination of inquiry-based learning, collaborative activities, and direct instruction to engage students and deepen their understanding of plastic pollution.
Evaluation (questions)	Assess student learning through observations during group activities, discussions, exit tickets, and presentations. The clarity and accuracy of their responses, participation in discussions, and proposed solutions will demonstrate their understanding of the topic.
Links/ References	• Ocean Conservancy: https://oceanconservancy.org/ • National Geographic: https://education.nationalgeographic.org/resource/resource-library-plastic-pollution/ • The Plastic Pollution Coalition: https://www.plasticpollutioncoalition.org/

Lesson Plan 2: Recycling plastic - How does it work?

Activity title	From Bottle to Backpack: The Journey of Recycled Plastic
Topic	Recycling, Plastic Pollution, Material Science
Aim	To understand the process of plastic recycling, explore the challenges and benefits, and inspire sustainable choices.
Target group	Grade 5-8 (adaptable for younger or older students)
Duration	60 minutes

Objective/ Learning objectives	• Students will describe the different stages of plastic recycling: collection, sorting, processing, and manufacturing. • Students will identify different types of plastic and their recycling symbols. • Students will explain the challenges and limitations of plastic recycling. • Students will evaluate the environmental benefits of recycling plastic compared to producing new plastic. • Students will propose ways to reduce plastic waste in their daily lives.
Needed materials	• Various plastic items (bottles, containers, packaging) with different recycling symbols • Large sheet of paper or whiteboard • Markers or pens • Short video clip on plastic recycling process (optional) • Worksheet with sorting activity or creative project instructions
Steps for implementation	1. Warm-up (5 minutes): Show students a variety of plastic objects and ask them to identify which ones they think can be recycled. Discuss the recycling symbols and their meanings. 2. Presentation (10 minutes): Explain the different stages of plastic recycling using the diagram on the board or playing a short video clip. (1) Collection: Discuss different collection methods and the importance of proper sorting. (2) Sorting: Explain how plastics are sorted by type using machines and human sorting. (3) Processing: Describe the shredding, melting, and cleaning processes that prepare plastic for new products. (4) Manufacturing: Showcase examples of new products made from recycled plastic. 3. Activity (20 minutes): Divide students into groups and provide them with a set of plastic items. Challenge them to sort the items based on their recyclability, using the recycling symbols and any additional information provided. Alternatively, assign students a creative project to design a product made from recycled plastic, considering its functionality and environmental impact. 4. Discussion (15 minutes): Gather students as a class and discuss the activity. Ask questions like: What were the challenges in sorting the plastics? What are some limitations of plastic recycling? Why is it important to recycle plastic? What are some ways we can reduce our plastic waste?

	5. Conclusion (5 minutes): Summarize the key takeaways of the lesson and reemphasize the importance of responsible plastic consumption and recycling. Encourage students to think about their own choices and share their ideas for reducing plastic waste in their daily lives.
Method	Interactive lecture, hands-on activity, group discussion, creative project (optional)
Evaluation (questions)	• Can you explain the three main steps of plastic recycling? • What are the challenges of recycling plastic? • What are some environmental benefits of recycling plastic? • How can you reduce your own plastic waste in your daily life? • Describe a product you could create from recycled plastic. Explain its benefits and how it would be made.
Links/ References	• American Chemistry Council: https://www.plasticsindustry.org/ • The Recycling Partnership: https://recyclingpartnership.org/ • National Geographic: https://www.nrdc.org/stories/10-ways-reduce-plastic-pollution • PBS NewsHour: https://www.pbs.org/newshour/show/why-it-will-take-more-than-basic-recycling-to-cut-back-on-plastic

Lesson Plan 3: “Alternative materials to plastic”

Activity title	The Material Matchup: Finding Plastic-Free Solutions
Topic	Sustainability, Material Science, Consumer Choices
Aim	To understand the environmental impact of plastic and explore sustainable alternatives through research and creative problem-solving.
Target group	Grade 6-12 (adaptable for younger or older students)
Duration	60 minutes
Objective/ Learning objectives	• Students will analyze the environmental and social drawbacks of plastic use. • Students will research and identify alternative materials to plastic for common products. • Students will compare and contrast the advantages and disadvantages of different materials. • Students will propose creative solutions for reducing plastic use in everyday life. • Students will communicate their findings and ideas effectively through presentations or design projects.
Needed materials	• Internet access or library resources • Large sheet of paper or whiteboard • Markers or pens • Chart paper or presentation software (optional)

	• Craft materials like recycled paper, cardboard, fabric, clay, wood (optional for design project)
Steps for implementation	1. Introduction (10 minutes): Start with a class discussion about plastic. Ask students to brainstorm common plastic products and discuss their concerns about plastic pollution. Show images or videos highlighting the environmental impacts of plastic waste. 2. Research & Analysis (20 minutes): Divide students into groups and assign each group a different alternative material (e.g., paper, glass, metal, wood). Encourage them to research the material's origins, sustainability, advantages (durability, reusability, biodegradability), and disadvantages (production costs, energy consumption, potential waste). 3. Material Matchup (20 minutes): Ask students to return to the class discussion and create a large chart on the board. List common plastic products (e.g., water bottles, grocery bags, food containers) across the top and alternative materials down the side. Students collaborate to brainstorm and suggest which materials could best replace plastic for each product, considering their research and the product's specific needs. 4. Creative Solutions (10 minutes): Challenge students to think beyond the chart and design a product or packaging solution that completely eliminates plastic from a chosen everyday item. Provide optional craft materials for students to create prototypes or models. 5. Sharing & Reflection (10 minutes): Invite groups to present their research findings and creative solutions to the class. Encourage discussion about the challenges and potential of alternatives to plastic. Conclude by emphasizing the importance of individual choices and collective action in reducing plastic waste.
Method	Group research, interactive discussion, chart activity, creative design (optional), presentations
Evaluation (questions)	• What are the main environmental concerns associated with plastic use? • Describe the advantages and disadvantages of the alternative material your group researched. • How can the characteristics of different materials influence their suitability for replacing plastic? • Explain your rationale for choosing a specific alternative material for a particular product.

	• What are some additional ways we can reduce our dependence on plastic in daily life?
Links/ References	Plastic Pollution Coalition: https://www.plasticpollutioncoalition.org/: https://www.plasticpollutioncoalition.org/ GreenBlue: https://www.greenblue.org/: https://www.greenblue.org/ The Natural Resources Defense Council: https://www.nrdc.org/: https://www.nrdc.org/ Sustainable Brands: https://www.sustainablebrands.com/: https://www.sustainablebrands.com/

Lesson Plan 4: Ditch the disposable, embrace the durable - Reducing single-use plastic

Activity title	Plastic Patrol: Mission reusable revolution
Topic	Sustainability, Environmental Awareness, Personal Action
Aim	To empower students to become conscious consumers and advocates for reducing single-use plastic in their daily lives.
Target group	Grades 4-8 (adaptable for younger or older students)

Duration	60 minutes
Objective/ Learning objectives	• Students will identify common single-use plastic items in their daily routines. • Students will explore and evaluate reusable alternatives to single-use plastic products. • Students will create a personal action plan to reduce their reliance on single-use plastic. • Students will collaborate and present their ideas for promoting a plastic-free future.
Needed materials	• Large sheet of paper or whiteboard • Markers or pens • Chart paper or presentation software • Images of single-use plastic items and their reusable alternatives (printed or digital) • Craft materials for creating personal action plan posters (optional)

Steps for implementation	1. Plastic Detectives (10 minutes): Begin by asking students to list all the single-use plastic items they encounter in a typical day (e.g., water bottles, straws, cutlery, packaging). Create a large web diagram on the board, categorizing the items by their use (food and beverage, shopping, etc.). Discuss the environmental impact of this plastic footprint. 2. Alternative Arsenal (20 minutes): Introduce students to reusable alternatives for common single-use plastic items. Show images or bring in actual examples of reusable water bottles, cloth bags, metal straws, bamboo cutlery, and beeswax wraps. Discuss the advantages and disadvantages of each alternative compared to plastic, considering factors like durability, convenience, and cost. 3. Mission Reusable Revolution (20 minutes): Challenge students to become ambassadors for reducing plastic waste. Divide them into groups and ask them to create personal action plans focusing on specific areas (e.g., lunchboxes, school supplies, shopping habits). Encourage them to set achievable goals, identify resources and support systems, and brainstorm creative ways to promote their chosen alternatives. 4. Presenting the Plastic-Free Pledge (10 minutes): Invite groups to present their action plans to the class. Encourage them to be creative and persuasive in their presentations, incorporating slogans, visuals, and practical tips. Facilitate a class discussion about the collective impact of individual actions and ways to inspire others to join the "Ditch the Disposable" movement. 5. Beyond the Classroom (Bonus): Motivate students to take their action plans beyond the classroom. Encourage them to share their ideas with family, friends, and the school community. They can organize awareness campaigns, petition for plastic-free policies, or even start a school recycling club.
Method	Interactive discussion, brainstorming, group work, presentations, creative expression
Evaluation (questions)	• What are some single-use plastic items you encounter most often in your daily life? • What are the benefits of using reusable alternatives to single-use plastic? • Describe some specific goals you included in your personal action plan. • How can you inspire others to reduce their reliance on single-use plastic? • What are some creative ways you could promote a plastic-free future in your school or community?
Links/ References	• The Ocean Cleanup: https://theoceancleanup.com/ • Plastic Pollution Coalition: https://www.plasticpollutioncoalition.org/ • National Geographic Kids: https://kids.nationalgeographic.com/nature/kids-vs-plastic/article/pollution-1 • Be a Straw Hero: https://noheroes-comic.com/cast/straw/

Lesson Plan 5: “How plastic decomposes in nature”

Activity title	The Persistent Problem - How Plastic Pollutes Our Planet
Topic	Environmental Science, Sustainability, Animal Conservation
Aim	To understand the slow decomposition of plastic in nature, its impact on ecosystems and animals, and explore solutions to mitigate plastic pollution.
Target group	Grades 6-12 (adaptable for younger or older students)
Duration	60 minutes
Objective/ Learning objectives	• Students will describe the different types of plastic and their varying decomposition rates. • Students will analyze the negative consequences of plastic pollution on animals and the environment. • Students will evaluate potential solutions and individual actions to reduce plastic consumption and waste. • Students will collaborate and communicate their findings through creative presentations or projects.
Needed materials	• Internet access or library resources • Chart paper or presentation software • Images of plastic pollution impacts on animals and environment • Craft materials for creating awareness posters or models (optional)
Steps for implementation	1. Plastic Persistence Puzzle (10 minutes): Begin by showing students images of plastic debris in various natural environments (oceans, forests, landfills). Ask them

to brainstorm how long it might take for plastic to decompose in nature. Discuss the concept of biodegradability and introduce different types of plastics and their varying decomposition rates (e.g., PET bottles can take hundreds of years, while some bioplastics can decompose in months).

2. Plastic's Perilous Path (20 minutes): Divide students into groups and assign each group a specific aspect of plastic pollution's impact. Some options include:

   - Animal Ingestion: Research how animals mistake plastic for food, leading to entanglement, starvation, and internal injuries.
   - Habitat Destruction: Explore how plastic debris disrupts ecosystems, harms marine life, and pollutes food chains.
   - Microplastic Mayhem: Investigate the breakdown of plastic into microplastics, their infiltration into ecosystems, and potential human health risks.

Each group will research their assigned topic, gather evidence (images, statistics, videos), and prepare a short presentation for the class.

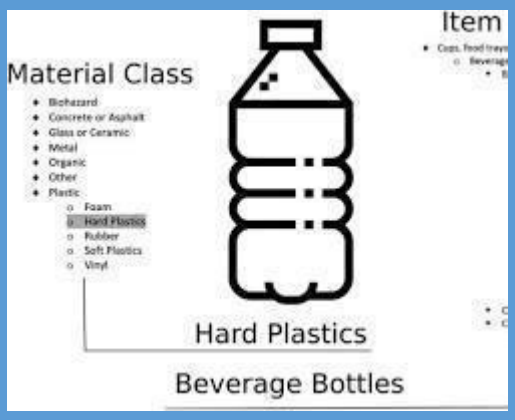
3. Solutions for a Plastic-Free Future (20 minutes): After the presentations, facilitate a class discussion about potential solutions to the plastic pollution crisis. Encourage students to brainstorm individual actions they can take (reducing plastic consumption, choosing reusable alternatives, proper waste disposal) and collective strategies (advocating for plastic bans, supporting recycling initiatives, raising awareness campaigns).

4. Creative Call to Action (10 minutes): Challenge students to express their understanding and solutions through creative projects. They can create awareness posters, design eco-friendly packaging alternatives, or write persuasive letters to local authorities advocating for plastic reduction policies.

Method	Group research, interactive discussion, presentations, creative expression
Evaluation (questions)	• What are the main differences in decomposition rates between different types of plastic? • Describe some of the negative consequences of plastic pollution on animals and the environment. • What are some individual actions we can take to reduce our plastic footprint? • How can we collectively advocate for a more sustainable future free from plastic pollution? • What message do you want to convey through your creative project about plastic pollution?
Links/ References	• National Geographic: https://education.nationalgeographic.org/resource/resource-library-plastic-pollution/ • The Ocean Cleanup: https://theoceancleanup.com/ • Plastic Pollution Coalition: https://www.plasticpollutioncoalition.org/ • Beat the Microbead: https://www.beatthemicrobead.org/

Lesson Plan 6: "How plastic is used in everyday life"

Activity title	Plastic Everywhere! Unmasking the Ubiquitous Material
Topic	Materials Science, Sustainability, Consumer Awareness
Aim	To understand the pervasiveness of plastic in everyday life, explore its applications, and identify potential alternatives for a more sustainable future.

Target group	Grades 4-8 (adaptable for younger or older students)
Duration	60 minutes
Objective/ Learning objectives	• Students will identify and categorize common plastic products in their daily lives. • Students will analyze the advantages and disadvantages of using plastic in various applications. • Students will research alternative materials that can replace plastic in certain products. • Students will create awareness campaigns or design prototypes to promote plastic-free alternatives.
Needed materials	• Large sheet of paper or whiteboard • Markers or pens • Images of everyday objects made from plastic (printed or digital) • Craft materials for creating awareness posters or product prototypes (optional)
Steps for implementation	1. Plastic Safari (10 minutes): Start by asking students to look around the classroom and identify as many objects as possible that contain plastic. Create a web diagram on the board, categorizing the items by their use (e.g., clothing, food packaging, electronics, toys). Discuss the surprising extent of plastic's presence in everyday life. 

	2. Plastic Pros and Cons (20 minutes): Divide students into groups and assign each group a specific category of plastic products (e.g., food packaging, toys, clothing). Encourage them to research the advantages and disadvantages of using plastic in their assigned category. Consider factors like durability, cost, convenience, and environmental impact. 3. Plastic Alternatives Brainstorm (20 minutes): After the research, challenge students to think outside the plastic box! Ask them to brainstorm and research alternative materials that could replace plastic in their assigned category. Consider factors like functionality, sustainability, and potential consumer appeal. 4. Creative Call to Action (10 minutes): To share their findings and inspire action, students can choose one of the following activities: • Awareness Posters: Create posters highlighting the pervasiveness of plastic and advocating for alternative materials. • Prototype Pitch: Design and present prototypes of products made from sustainable alternatives to plastic, showcasing their functionalities and benefits. • Public Service Announcement: Write and perform a short skit or video raising awareness about plastic pollution and promoting responsible consumption. Bonus Activity: Take your students on a "Plastic Scavenger Hunt" in the schoolyard or a nearby store. Challenge them to find items made from different types of plastic and categorize them based on their recyclability or potential for replacement with sustainable materials. This hands-on activity can further solidify their understanding of the ubiquity of plastic and the need for responsible choices.
Method	Interactive exploration, group research, creative expression
Evaluation (questions)	• How many plastic items could you identify in the classroom? What surprised you about the extent of plastic usage? • Discuss the advantages and disadvantages of using plastic in some everyday products. • What are some alternative materials that could replace plastic in certain applications? Consider their benefits and challenges.

	• How can your chosen creative project raise awareness about plastic use and inspire others to choose sustainable alternatives?
Links/ References	• Plastic Pollution Coalition: https://www.plasticpollutioncoalition.org/ • National Geographic: https://education.nationalgeographic.org/resource/resource-library-plastic-pollution/ • The Ocean Cleanup: https://theoceancleanup.com/ • GreenBlue: https://greenblue.org/

Lesson Plan 7: The benefits of sustainable packaging

Activity title	Packaging Planet: Unwrapping Sustainability
Topic	Sustainable packaging, its benefits for the environment, and its growing presence in the marketplace.
Aim	To raise awareness about the importance of sustainable packaging, explore its environmental benefits, and encourage students to make informed choices as consumers.
Target group	High School students (adaptable)
Duration	60 minutes (can be extended)

Objective/ Learning objectives	• Students will be able to define sustainable packaging and distinguish it from traditional packaging. • Students will be able to explain the environmental benefits of using sustainable packaging, including resource conservation, waste reduction, and pollution prevention. • Students will be able to identify different types of sustainable packaging materials and their unique properties. • Students will be able to analyze the packaging of everyday products and evaluate their sustainability features.
Needed materials	• Whiteboard or projector • Markers or pens • Chart paper or sticky notes • Pictures or videos showcasing different types of sustainable packaging (optional) • Samples of various sustainable packaging materials (e.g., recycled paperboard, compostable food containers, refillable bottles) • Information cards on different sustainable packaging materials and their benefits (optional)

Steps for implementation	1. Engage: Begin by showing pictures or videos of landfills overflowing with packaging waste. Ask students:
	  ○ What do you see? How much packaging waste do you think we generate daily?
	  ○ What are the environmental consequences of all this packaging?
	2. Explore:
	  ○ Activity: Divide students into small groups and distribute samples of different sustainable packaging materials. Ask them to:
	  ▪ Task: Identify the material used and research its origin and sustainability characteristics (e.g., recycled content, biodegradability, reusability).
	  ▪ Task: Create a short presentation explaining the benefits of their assigned material compared to traditional packaging options.
	3. Explain:

	○ Presentation: Briefly present the concept of sustainable packaging, emphasizing its environmental advantages over traditional packaging. Discuss topics such as resource conservation, waste reduction, pollution prevention, and lifecycle analysis. 4. Analyze: ○ Activity: Have students bring in examples of packaging from everyday products (e.g., food containers, cleaning supplies, electronics boxes). In pairs, they will: ▪ Task: Analyze the packaging materials used, identifying any sustainable features (e.g., recycled content, compostability). ▪ Task: Suggest alternative, more sustainable packaging options for the chosen products. 5. Evaluate: ○ Exit Ticket: Have students write a short reflection on their key takeaways from the lesson. Ask them to: ▪ Identify one specific benefit of sustainable packaging that resonated with them. ▪ Share one action they can take as consumers to support the use of sustainable packaging. 6. Extend: ○ Challenge: Encourage students to research and present on innovative advancements in sustainable packaging technologies, such as edible coatings, bioplastics, and self-healing materials. ○ Action Project: Organize a school recycling drive or partner with a local organization to promote awareness and encourage the adoption of sustainable packaging practices in the community.
Method	This lesson uses a combination of inquiry-based learning, hands-on activities, and group discussions to actively engage students and deepen their understanding of the benefits and importance of sustainable packaging.
Evaluation (questions)	Assess student learning through observations during group activities, discussions, presentations, exit tickets, and reflections. Their ability to identify and explain the benefits of sustainable packaging, analyze existing packaging options, and suggest alternative solutions will demonstrate their grasp of the topic.

Links/ References	• Sustainable Packaging Coalition: https://sustainablepackaging.org/ • Green America: https://greenamerica.org/our-victories • The World Wildlife Fund: https://www.worldwildlife.org/initiatives/plastics

Lesson Plan 8: The future of sustainable packaging

Activity title	Packaging Time Machine: Exploring Sustainability's Next Chapter
Topic	Emerging innovations and technologies in sustainable packaging that are shaping the future of waste reduction and environmental responsibility.
Aim	To spark curiosity and critical thinking about the future of sustainable packaging, encouraging students to envision and discuss potential solutions to the global packaging waste crisis.
Target group	High School students (adaptable)
Duration	90 minutes (can be extended)

Objective/ Learning objectives	• Students will be able to analyze the current state of packaging waste and its environmental impact. • Students will be able to identify and explain key trends and innovations in sustainable packaging technologies. • Students will be able to critically evaluate the potential benefits and challenges of different sustainable packaging solutions. • Students will be able to develop creative ideas and propose innovative approaches for future sustainable packaging advancements.
Needed materials	• Whiteboard or projector • Markers or pens • Chart paper or sticky notes • Access to internet devices for research (optional) • Images or videos showcasing futuristic sustainable packaging concepts (optional)
Steps for implementation	1. Engage: Begin by presenting statistics and facts about the global packaging waste problem and its environmental consequences. Ask students: ○ What are your thoughts on the current state of packaging waste? ○ What are the biggest challenges we face in achieving sustainable packaging practices? 2. Explore: ○ Activity: Divide students into small research groups and assign them different emerging trends or technologies in sustainable packaging (e.g., bioplastics, edible coatings, self-healing materials, smart packaging). Ask them to: ▪ Task: Research their assigned topic, including its potential benefits, limitations, and real-world applications. ▪ Task: Create a short presentation or infographic summarizing their findings and highlighting the unique features of their chosen technology. 3. Debate: ○ Activity: Organize a class debate where students present their research findings and engage in a moderated discussion about the potential benefits and challenges of different sustainable packaging solutions. Encourage critical

	thinking and evaluation of each technology's feasibility, environmental impact, and economic viability. 4. Innovate: ○ Challenge: Have students brainstorm and sketch ideas for their own innovative solutions to the packaging waste problem. Encourage them to think outside the box and consider factors like material choice, functionality, reusability, and end-of-life options. 5. Showcase: ○ Activity: Students can present their creative ideas and futuristic packaging concepts to the class, showcasing their sketches, models, or digital mockups. This can be done through individual presentations, group projects, or even a mini-exhibition format. 6. Evaluate: ○ Exit Ticket: Ask students to reflect on their learning in the form of a short essay or questionnaire. Prompt them to: ▪ Identify one specific innovation or technology that resonated with them and explain its potential impact. ▪ Share their own ideas for future sustainable packaging advancements and discuss the challenges associated with implementing them.
Method	This lesson uses a combination of research, group work, debate, and creative thinking activities to engage students in a critical exploration of the future of sustainable packaging. It encourages them to actively participate, analyze information, and develop their own innovative solutions to a pressing global issue.
Evaluation (questions)	Assess student learning through observations during research activities, presentations, debates, and creative showcases. Evaluate their understanding of the current state of packaging waste, their ability to analyze and discuss emerging technologies, their critical thinking skills during the debate, and their creativity and originality in proposing future solutions. The exit ticket can provide further insights into their individual learning takeaways and reflections.
Links/ References	● World Packaging Organisation: https://www.worldpackaging.org/: https://www.worldpackaging.org/ ● The Ellen MacArthur Foundation: https://www.ellenmacarthurfoundation.org/: https://www.ellenmacarthurfoundation.org/

	• The Association of Plastic Recyclers: https://www.plasticsrecycling.org/: https://www.plasticsrecycling.org/

Lesson Plan 9: The Impact of Plastic on Marine Life

Activity title	Lost at Sea: A Voyage Through Plastic-Polluted Waters
Topic	The detrimental effects of plastic pollution on marine ecosystems and the diverse array of animals that call them home.
Aim	To raise awareness about the devastating impact of plastic pollution on marine life, inspiring students to become advocates for change and adopt sustainable practices.
Target group	Middle School or High School students (adaptable)
Duration	60 minutes (can be extended)
Objective/ Learning objectives	• Students will be able to define plastic pollution and identify its various sources. • Students will be able to explain the diverse ways plastic pollution harms marine animals, including entanglement, ingestion, and habitat destruction. • Students will be able to research and describe the specific vulnerabilities of different types of marine animals (e.g., seabirds, fish, turtles) to plastic pollution. • Students will be able to propose individual and collective actions to reduce plastic pollution and protect marine life.

Needed materials	• Whiteboard or projector • Markers or pens • Chart paper or sticky notes • Pictures or videos showcasing the impact of plastic pollution on marine animals (optional) • Research materials about different types of marine animals and their interaction with plastic pollution (e.g., books, websites, documentaries)

Steps for implementation	1. Engage: Begin by showing impactful pictures or videos depicting marine animals entangled in plastic or harmed by ingesting plastic debris. Ask students:
	  ○ What do you see in these images/videos? How do you think the animals ended up in this situation?
	  ○ What emotions does this evoke in you? Why is it important to address this issue?
	2. Explore:
	  ○ Activity: Divide students into small groups and assign them different types of marine animals (e.g., sea turtles, seabirds, coral reefs). Ask them to:
	  ▪ Task: Research the chosen animal and its natural habitat.
	  ▪ Task: Identify the specific ways plastic pollution could threaten this animal's survival (e.g., entanglement, ingestion, habitat degradation).
	  ▪ Task: Create a short presentation or infographic summarizing their findings, highlighting the animal's unique vulnerabilities and the potential consequences of plastic pollution.
	3. Connect:
	  ○ Class Discussion: Facilitate a group discussion where students share their research findings and insights about the diverse impacts of plastic pollution on various marine animals. Encourage comparisons and connections between different species and the common threats they face.
	4. Action:
	  ○ Brainstorming: Prompt students to brainstorm individual and collective actions they can take to reduce their own plastic footprint and contribute to protecting marine life. This could include actions like:
	  ▪ Reducing use of single-use plastics (bottles, straws, bags)
	  ▪ Choosing products with minimal or sustainable packaging
	  ▪ Participating in beach cleanups or community awareness campaigns

	▪ Supporting organizations working to combat plastic pollution 5. Evaluate: ○ Exit Ticket: Ask students to summarize one key takeaway from the lesson and propose one specific action they plan to take to combat plastic pollution in their daily lives. This can be done through written reflections or individual pledges. 6. Extend: ○ Challenge: Encourage students to research and present on inspiring initiatives or technologies combating plastic pollution at various levels (individual, community, global). ○ Action Project: Organize a school campaign to raise awareness about plastic pollution and promote sustainable practices within the school community. This could involve collaborating with the cafeteria to reduce plastic waste, hosting educational events, or launching a recycling program.
Method	This lesson utilizes a combination of research, group work, class discussion, and student action planning to actively engage students in understanding the multifaceted impact of plastic pollution on marine life. It empowers them to become informed citizens and advocates for positive change.
Evaluation (questions)	Assess student learning through observations during group activities, discussions, presentations, exit tickets, and action plans. Evaluate their understanding of the issue, their ability to research and connect information about different marine animals, their critical thinking skills when discussing potential solutions, and their commitment to taking action in their own lives.
Links/ References	• Ocean Conservancy: https://oceanconservancy.org/: https://oceanconservancy.org/ • National Geographic: https://education.nationalgeographic.org/resource/resource-library-plastic-pollution/: https://education.nationalgeographic.org/resource/resource-library-plastic-pollution/ • The Plastic Pollution Coalition: https://www.plasticpollutioncoalition.org/: https://www.plasticpollutioncoalition.org/ • Sea Shepherd Conservation Society: https://www.seashepherd.org/: https://www.seashepherd.org/

CONCLUSION AND SUMMARY

Designed for ages 8 an up, the Race empowers primary school students to embark on a transformative journey, exploring the challenges and solutions surrounding plastic pollution in iconic European cities.

More than just a game, Europe's Plastic Race is an educational toolkit:

- Curriculum Alignment: Aligned with the UN's Sustainable Development Goals (SDGs) and integrated into formal and informal learning settings, the Race connects classroom curriculum with real-world sustainability challenges.
- Interdisciplinary Exploration: Through engaging activities and challenges, students delve into diverse topics like environmental science, geography, recycling systems, and civic responsibility, fostering holistic understanding.
- Nurturing Future Changemakers: The Race ignites a passion for environmental action, equipping students with the knowledge and skills to become proactive changemakers in their communities.

Unleash a Multifaceted Learning Experience:

- Vibrant Game Boards: Each city on the board – from London's bustling streets to Venice's picturesque canals – presents unique challenges and rewards, offering a captivating introduction to Europe's diverse landscapes and environmental realities.
- Interactive Storytelling: Engaging narratives woven throughout the game enhance players' understanding of local environmental issues and inspire collaboration as they race to recycle plastic waste and reclaim iconic landmarks.
- Multimedia Enrichment: Educational materials, including online content, virtual city tours, and augmented reality features, extend the learning journey beyond the board, fostering curiosity and deepening knowledge.

The P4P Toolkit:

- Comprehensive Resources: This accompanying toolkit equips teachers and educators with lesson plans, activities, and assessment tools, making it easy to integrate the Race into existing curriculum and maximize its educational impact.
- Non-Formal Learning: Interactive exercises and engaging activities go beyond traditional classroom settings, promoting active participation and experiential learning.

- Building a Community of Change: Teachers and families can utilize the toolkit to facilitate discussions, share experiences, and encourage collaborative action, fostering a sense of community and collective responsibility towards sustainability.

Europe's Plastic Race is more than just a game – it's a transformative learning experience. By combining immersive gameplay with engaging educational resources, the Race empowers young minds to understand, navigate, and ultimately tackle the critical issue of plastic pollution, paving the way for a brighter and more sustainable future.