



STEM + Art
= STEAM

Integrating Arts into STEM Education

Land Art and AI

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"Ocean Guardians: Art, AI, and Environmental Action"

The **Land Art + AI** segment of the **STEM + Art = STEAM Project** merges creativity and technology to explore the intersection of nature, art, and innovation. Through Land Art, students use natural materials to create impactful installations, while AI tools like PictoBlox empower them to analyze and enhance their work. This unique blend fosters environmental awareness, technical skills, and artistic expression, inspiring students to see art and science as interconnected forces for change.

Workshop Concept

The goal of the **Land Art + AI Workshop** is to bridge the gap between art and technology by combining the creative expression of Land Art with the innovative potential of artificial intelligence. Through this workshop, students learn to create art using natural materials while leveraging AI tools like PictoBlox to analyze, document, and enhance their work. The workshop aims to:

1. **Foster Creativity:** Encourage students to think outside the box by using nature as their canvas.
2. **Introduce AI:** Demystify artificial intelligence and show how it can be applied in creative and environmental contexts.
3. **Promote Sustainability:** Highlight the importance of environmental conservation through art and technology.
4. **Develop Problem-Solving Skills:** Challenge students to integrate STEM and art to address real-world issues.
5. **Inspire Innovation:** Empower students to see the interconnectedness of art, science, and technology as tools for positive change.

By the end of the workshop, students gain a deeper appreciation for both the natural world and the transformative power of AI, leaving with the skills and inspiration to create meaningful, interdisciplinary projects.

Target Group

Students aged 14-18 years

Duration

1 week (5 days, 4-6 hours per day)

Objective

To raise awareness about marine environmental issues, inspire creative solutions through land art, and explore the potential of AI technology in cleaning up beaches. Students will learn basic AI programming using PictoBlox and develop their own AI tool prototype to detect and classify beach trash.

Workshop Structure

Day 1: Introduction to Marine Environmental Issues

- **Morning Session:**
 - Interactive presentation on environmental issues affecting oceans (e.g., plastic pollution, overfishing, climate change).
 - Discussion: How does trash end up in the ocean, and what are the consequences for marine life and ecosystems?
 - Video screening: Documentaries or short clips on beach cleanups and innovative solutions.
- **Afternoon Session:**
 - Brainstorming: How can art and technology contribute to solving these problems?
 - Introduction to the concept of **land art** using beach trash.
 - Planning the field trip: What to collect, how to document, and safety measures.

Day 2: Field Trip to the Beach – Land Art Project

- **Morning Session:**
 - Travel to a local beach.
 - Collect trash responsibly (gloves, bags, and tools provided).
 - Document the types of trash found (e.g., plastic bottles, fishing nets, microplastics).
- **Afternoon Session:**
 - Collaborative land art project: Use the collected trash to create a large-scale art installation on the beach.
 - Reflect on the symbolism of the artwork and its message about marine pollution.
 - Take photos and videos of the artwork for documentation.

Day 3: Introduction to AI and PictoBlox

- **Morning Session:**
 - What is AI? Basics of artificial intelligence and its applications in environmental conservation.
 - Examples of AI being used to clean oceans (e.g., trash-detecting drones, AI-powered sorting systems).
- **Afternoon Session:**
 - Introduction to **PictoBlox**: A beginner-friendly platform for AI and coding.
 - Hands-on activity: Learn the interface, drag-and-drop coding, and basic commands.
 - Create a simple program (e.g., a virtual robot that moves and detects objects).

Day 4: AI Programming Workshop – Building a Trash Detection Tool

- **Morning Session:**
 - Introduction to AI in PictoBlox: Image recognition and object detection.
 - Teach the AI to recognize different types of beach trash (e.g., plastic bottles, cans, straws) using a pre-trained model.
- **Afternoon Session:**
 - Group work: Develop a prototype AI tool that can detect and classify trash.
 - Test the tool with images of beach trash collected during the field trip.
 - Discuss limitations and potential improvements.

Day 5: Presentation and Reflection

- **Morning Session:**
 - Finalize the land art documentation and AI tool prototype.
 - Prepare a group presentation showcasing:
 - The land art project and its message.
 - The AI tool prototype and its potential for beach cleanup.
 - Reflections on the workshop experience.
- **Afternoon Session:**
 - **Final Presentation:**
 - Each group presents their work to peers, teachers, and invited guests.
 - Open discussion: How can we scale up these ideas to make a real impact?
 - Certificate distribution and closing ceremony.

Materials Needed

- Trash collection tools (gloves, bags, grabbers).
- Cameras or smartphones for documentation.
- Laptops or tablets with PictoBlox installed.
- Projector and screen for presentations.
- Art supplies (optional for enhancing land art).

Learning Outcomes

1. **Environmental Awareness:** Students understand the impact of marine pollution and the importance of conservation.
2. **Creativity:** Students express environmental messages through land art.
3. **Technical Skills:** Students learn the basics of AI and coding using PictoBlox.
4. **Problem-Solving:** Students develop a prototype AI tool to address a real-world issue.
5. **Collaboration:** Students work in teams to create art and technology solutions.

Extension Ideas

- Partner with local environmental organizations to implement the AI tool in real beach cleanups.
- Organize an exhibition of the land art and AI tool for the community.
- Encourage students to participate in global environmental challenges or competitions.

This workshop combines art, technology, and environmental action to empower students to become proactive guardians of our oceans.

1. Interactive Introduction on Environmental Issues Affecting Oceans

Background information

The Ocean in Crisis: An Urgent Call for Action

The world's oceans are often referred to as the lungs of our planet, playing an instrumental role in sustaining life. They cover over 70% of the Earth's surface and are home to an astonishing diversity of life forms, from the microscopic phytoplankton that generate a significant proportion of the world's oxygen to the massive whales that cruise through the depths of the seas. Oceans regulate climate, support economies, and provide food for billions of people worldwide. However, alarming scientific evidence indicates that our oceans are in crisis, facing unprecedented challenges that threaten not only marine ecosystems but also human societies and economies reliant on these vital resources.

Climate Change and Ocean Warming

One of the most pressing threats to the oceans is climate change. As the planet warms due to greenhouse gas emissions, ocean temperatures are rising. Research shows that the upper layers of the ocean have warmed by about 0.6°C since 1901. This rise in temperature affects marine species and ecosystems, disrupting food webs and leading to coral bleaching, which has devastated coral reefs globally. Coral reefs, often referred to as the "rainforests of the sea," support a quarter of all marine species. Their degradation not only threatens marine biodiversity but also the livelihoods of millions who rely on them for food, tourism, and coastal protection.

Ocean Acidification

As the oceans absorb carbon dioxide from the atmosphere, they are undergoing a chemical transformation that leads to ocean acidification. Since the Industrial Revolution, ocean acidity has increased by approximately 30%. This change has dire implications for marine organisms, particularly those with calcium carbonate structures, such as shellfish, corals, and some plankton species. Acidification weakens their shells and skeletons, makes it more difficult for them to grow, and threatens the marine food web's foundational species. Moreover, the loss of shellfish and coral reefs disrupts local economies dependent on fishing and tourism, amplifying the consequences of this environmental crisis.

Overfishing and Biodiversity Loss

Overfishing is another significant contributor to the ocean crisis. Commercial fishing practices have led to the depletion of fish stocks, with approximately 34% of global fish populations overexploited or depleted. Unsustainable fishing methods not only target specific species but also result in bycatch, harming populations of non-target species, including marine mammals, sea turtles, and seabirds. The loss of biodiversity in the oceans has cascading effects, destabilizing ecosystems and reducing their resilience to environmental stressors such as climate change and pollution.

Pollution and Marine Debris

Pollution, particularly from plastic debris, poses a monumental threat to ocean health. An estimated 11 million metric tons of plastic enter the oceans each year, with projections

indicating this could triple by 2040 if current trends continue. Marine animals often mistake plastic for food, leading to ingestion that can cause malnutrition, internal injuries, or death. Furthermore, microplastics have infiltrated the food chain, affecting even the smallest organisms and ultimately human health as we consume seafood. Additionally, chemical pollutants, including pesticides, heavy metals, and pharmaceuticals, accumulate in marine habitats, further compromising the health of marine life.

The Path Forward: Conservation and Sustainable Practices

Given the multifaceted nature of the ocean crisis, a comprehensive approach to ocean conservation is crucial. International cooperation is necessary, as oceans transcend national boundaries. The Paris Agreement highlights the urgency of mitigating climate change, while initiatives like the United Nations Sustainable Development Goal 14 emphasize the need to conserve and sustainably use the oceans, seas, and marine resources. Educators play a vital role in raising awareness about ocean issues, imparting knowledge about marine ecosystems, and inspiring a new generation to advocate for sustainable practices, reduce plastic use, and support conservation efforts.

In conclusion, the ocean is at a crossroads; its health is declining perilously. The challenges of climate change, ocean acidification, overfishing, and pollution require immediate and concerted efforts from individuals, governments, and organizations worldwide. As stewards of our planet, it is our collective responsibility to advocate for the protection of our oceans, ensuring their vitality for generations to come. By fostering an understanding of ocean ecosystems and encouraging sustainable behaviors, we can work towards reversing the tide on this ocean in crisis.

Our Oceans in Crisis: Understanding the Problems

The slides could be used as presentation or handout to design your individual handout please consider:

- Use visuals like infographics, photos of land art, and diagrams of ocean pollution.
- Include space for students to jot down ideas or sketch their concepts.
- Add a QR code linking to resources like videos, articles, or websites.

As a handouts the slides will provide students with a clear understanding of the issues and inspire them to take action through art and technology!

Slides

1. Climate Change:

- **What is it?** Rising global temperatures due to greenhouse gas emissions.
- **Impact:**
 - Ocean warming: Coral bleaching and loss of marine habitats.
 - Sea level rise: Coastal erosion and flooding.
 - Ocean acidification: Harm to shell-forming organisms like corals and oysters.
- **Example:** The Great Barrier Reef has lost over half of its coral since 1995.

2. Overfishing:

- **What is it?** Catching fish faster than they can reproduce.
- **Impact:**
 - Depletion of fish populations, disrupting marine ecosystems.
 - Loss of livelihoods for communities dependent on fishing.
- **Example:** Declining populations of tuna, cod, and other commercially important fish.

3. Plastic Pollution:

- **What is it?** Millions of tons of plastic waste enter the oceans every year.
- **Impact:**
 - Marine animals mistake plastic for food, leading to injury or death.
 - Microplastics (tiny plastic particles) enter the food chain, affecting human health.
- **Example:** The Great Pacific Garbage Patch, a floating island of trash twice the size of Texas.

4. Other Threats:

- Oil spills, chemical pollution, and habitat destruction (e.g., mangrove deforestation).

Student Activities

#1_Trash Timeline

The **Trash Timeline** activity is a powerful way to visually demonstrate the long-term environmental impact of everyday waste. By showing students how long common items take to decompose, they can better understand the urgency of reducing waste and adopting sustainable practices. Below are more examples and additional information to enrich this activity.

Trash Timeline: How Long Does It Take for Common Items to Decompose?

Examples of Decomposition Times:

Item	Decomposition Time	Environmental Impact
Plastic Bottle	450 years	Breaks into microplastics, polluting water and harming marine life.
Fishing Line	600 years	Entangles marine animals, causing injury or death.
Glass Bottle	1 million years	Does not decompose; can break into sharp fragments, posing risks to wildlife and humans.
Aluminum Can	200 years	Mining and production are energy-intensive; recycling saves 95% of energy.
Cigarette Butt	10 years	Contains toxic chemicals like nicotine and arsenic, leaching into water and soil.

Item	Decomposition Time	Environmental Impact
Plastic Bag	20 years	Clogs waterways, suffocates marine animals, and contributes to microplastic pollution.
Styrofoam Cup	500 years	Non-biodegradable; releases harmful chemicals as it breaks down.
Paper Towel	2-4 weeks	While biodegradable, production contributes to deforestation and water use.
Orange Peel	6 months	Biodegradable, but in large quantities, it can disrupt ecosystems.
Cotton T-shirt	6 months	Biodegradable, but production involves heavy water and pesticide use.

Interactive Elements for the Activity:

1. Visual Timeline:

- Create a large, physical timeline on a wall or floor using string or tape. Label intervals (e.g., 1 year, 10 years, 100 years, 500 years).
- Provide students with cards or images of common trash items and ask them to place each item on the timeline according to its decomposition time.

2. Discussion Questions:

- What surprised you the most about how long these items take to decompose?
- Which items do you use most frequently? How can you reduce your use of them?
- What alternatives exist for these items (e.g., reusable water bottles, cloth bags)?

3. Hands-On Experiment:

- Set up a decomposition experiment in the classroom or schoolyard. Bury items like a banana peel, plastic bag, and aluminum can in separate containers filled with soil. Monitor and document changes over weeks or months to observe decomposition rates firsthand.

4. Math Connection:

- Calculate the total decomposition time for all items used by a single person in a week. Extrapolate this to a lifetime or a community to illustrate the scale of the problem.

What Can We Do to Reduce Waste?

After students understand the impact of waste, guide them in brainstorming solutions. Here are some ideas to explore:

Reduce:

- **Single-Use Plastics:** Encourage the use of reusable water bottles, coffee cups, and shopping bags.
- **Packaging:** Choose products with minimal or biodegradable packaging.
- **Food Waste:** Plan meals, store food properly, and compost organic waste.

Reuse:

- **Upcycling:** Turn old items into something new (e.g., use glass jars for storage or create art from plastic waste).
- **Donate:** Give away clothes, electronics, and furniture instead of throwing them away.

Recycle:

- **Proper Sorting:** Teach students how to separate recyclables (e.g., paper, glass, metals) from non-recyclables.
- **E-Waste Recycling:** Dispose of electronics responsibly to recover valuable materials and prevent toxic chemicals from leaching into the environment.

Advocate:

- **Community Cleanups:** Organize beach or park cleanups to remove litter and raise awareness.
- **Policy Change:** Write letters to local officials advocating for bans on single-use plastics or improved recycling programs.

Connecting to Broader Environmental Issues

Use the Trash Timeline activity as a springboard to discuss related topics:

- **Microplastics:** Explain how larger plastic items break down into microplastics, which are ingested by marine life and enter the food chain.
- **Circular Economy:** Introduce the concept of designing waste out of systems by reusing and recycling materials.
- **Global Impact:** Discuss how waste in one region can affect ecosystems and communities far away (e.g., plastic waste from rivers ending up in the ocean).

Wrap-up

The **Trash Timeline** activity is a powerful tool for teaching students about the long-term consequences of waste and inspiring them to take action. By combining scientific facts with interactive and creative elements, educators can foster a deeper understanding of environmental issues and empower students to become agents of change. Through reduction, reuse, recycling, and advocacy, we can work together to protect our planet for future generations.

#2_Ecosystem Role-Play Activity: Understanding the Impact of Overfishing and Pollution

The **Ecosystem Role-Play** activity is an engaging and interactive way to help students understand the interconnectedness of marine ecosystems and the far-reaching consequences of human activities like overfishing and pollution. By assigning students roles such as fish, coral, plastic bags, and fishermen, they can act out scenarios that demonstrate how these activities disrupt marine ecosystems. Below is a detailed guide for conducting this activity, including a handout for students.

Objective:

- To help students understand the roles of different organisms and elements in a marine ecosystem.
- To demonstrate how overfishing and pollution disrupt ecosystems and affect all stakeholders.
- To encourage critical thinking about solutions to these problems.

Duration:

- 45-60 minutes

Materials Needed:

- Role cards (provided in the handout below)
- A large open space for acting out scenarios
- Props (optional, e.g., blue cloth to represent water, toy fish, plastic items)

Activity Steps

1. Preparation (10 minutes)

- Divide students into small groups (4-6 students per group).
- Assign each student a role from the handout (e.g., fish, coral, plastic bag, fisherman).
- Provide each student with their role card, which includes a description of their role and how they are affected by overfishing or pollution.

2. Role-Play Scenarios (20-30 minutes)

- **Scenario 1: Overfishing**
 - The fisherman catches too many fish, depleting the fish population.
 - The fish struggle to reproduce and maintain their population.
 - Coral, which relies on fish to keep algae levels in check, becomes overgrown with algae and dies.
 - The plastic bag, which was already in the water, entangles the remaining fish and coral.
- **Scenario 2: Pollution**
 - The plastic bag enters the water and is mistaken for food by the fish, causing harm.
 - Coral is smothered by the plastic bag and other debris, leading to bleaching.
 - The fisherman finds fewer fish due to pollution and struggles to make a living.
- Allow each group to act out both scenarios, encouraging creativity and collaboration.

3. Group Discussion (15-20 minutes)

- After the role-play, bring the class together for a discussion. Use the following questions to guide the conversation:
 - How did your role change during the scenarios?
 - What were the short-term and long-term effects of overfishing and pollution?
 - How did the actions of one role affect the others?
 - What solutions can we propose to address these issues?

Handout: Ecosystem Role-Play Role Cards

Role 1: Fish

- **Description:** You are a vital part of the marine ecosystem. You help maintain the balance by eating algae and smaller organisms.
- **Impact of Overfishing:** Your population is declining because the fisherman is catching too many of you.
- **Impact of Pollution:** You mistake plastic bags for food, which can block your digestive system and cause death.

Role 2: Coral

- **Description:** You are a coral reef, home to many marine species. You provide shelter and food for fish and other organisms.
- **Impact of Overfishing:** Without fish to control algae, you become overgrown and die.
- **Impact of Pollution:** Plastic bags and debris smother you, blocking sunlight and causing bleaching.

Role 3: Plastic Bag

- **Description:** You are a piece of plastic waste that has entered the ocean.
- **Impact of Overfishing:** You entangle fish and coral, making it harder for them to survive.
- **Impact of Pollution:** You break into microplastics, which are ingested by marine life and enter the food chain.

Role 4: Fisherman

- **Description:** You rely on fishing to make a living and feed your family.
- **Impact of Overfishing:** You catch too many fish, depleting the population and harming your future livelihood.
- **Impact of Pollution:** You find fewer fish because pollution has damaged the ecosystem.

Role 5: Algae

- **Description:** You are a type of seaweed that grows on coral reefs.
- **Impact of Overfishing:** Without fish to eat you, you grow out of control and smother the coral.
- **Impact of Pollution:** You thrive in polluted waters, further harming the coral.

Role 6: Sea Turtle

- **Description:** You are a sea turtle that feeds on jellyfish and helps maintain the ecosystem.
- **Impact of Overfishing:** You are accidentally caught in fishing nets (bycatch).
- **Impact of Pollution:** You mistake plastic bags for jellyfish, leading to ingestion and death.

Extension Activities

1. **Create a Solution:**
 - After the role-play, ask students to brainstorm solutions to the problems they acted out. For example:
 - Implementing fishing quotas to prevent overfishing.
 - Reducing plastic use and improving waste management to prevent pollution.
2. **Poster or Infographic:**
 - Have students create posters or infographics summarizing the impacts of overfishing and pollution and the solutions they proposed.
3. **Debate:**
 - Organize a debate on topics like "Should single-use plastics be banned?" or "Is sustainable fishing possible?"

Wrap-up

The **Ecosystem Role-Play** activity is a dynamic and memorable way to teach students about the interconnectedness of marine ecosystems and the consequences of human actions. By stepping into the roles of fish, coral, plastic bags, and fishermen, students gain a deeper understanding of these issues and are inspired to think critically about solutions. This activity not only educates but also empowers students to become advocates for ocean conservation.

Let's dive in and save our oceans!

#3_Quiz: Ocean Conservation and Environmental Awareness

A fun and educational quiz is a great way to engage students and test their knowledge about ocean conservation and environmental issues. Below are **30 quiz questions**, complete with answers and solutions, to help students understand the problems facing our oceans and what can be done to address them.

How to Use the Quiz

- **Format:** Use a mix of multiple-choice, true/false, and open-ended questions.
- **Prizes:** Offer small rewards for correct answers to keep students engaged.
- **Discussion:** After the quiz, discuss the solutions and encourage students to take action in their daily lives.

This quiz is a fun and interactive way to educate students about ocean conservation while inspiring them to become part of the solution!

Quiz: Questions and Answers

Section 1: Plastic Pollution

1. **How much plastic ends up in the ocean each year?**
 - **Answer:** 8 million tons.
 - **Solution:** Reduce plastic use, recycle properly, and support policies that limit single-use plastics.
2. **What percentage of marine debris is plastic?**
 - **Answer:** 80%.
 - **Solution:** Participate in beach cleanups and advocate for better waste management systems.
3. **How long does it take for a plastic bottle to decompose?**
 - **Answer:** 450 years.
 - **Solution:** Use reusable water bottles and support companies that use biodegradable materials.
4. **What is the Great Pacific Garbage Patch?**
 - **Answer:** A massive collection of floating plastic debris in the North Pacific Ocean.
 - **Solution:** Support organizations like The Ocean Cleanup that are working to remove ocean plastic.
5. **What are microplastics?**
 - **Answer:** Tiny plastic particles less than 5mm in size.
 - **Solution:** Avoid products with microbeads and support research on microplastic removal technologies.

Section 2: Overfishing

6. **What percentage of global fish stocks are overexploited?**
 - **Answer:** 34%.
 - **Solution:** Choose sustainably sourced seafood and support fishing regulations.
7. **What is bycatch?**
 - **Answer:** Non-target species caught unintentionally in fishing gear.

- **Solution:** Use selective fishing gear and support policies to reduce bycatch.
- 8. **What happened to the Atlantic cod fishery in the 1990s?**
 - **Answer:** It collapsed due to overfishing.
 - **Solution:** Implement and enforce fishing quotas to prevent overexploitation.
- 9. **What is shark finning?**
 - **Answer:** The practice of cutting off shark fins and discarding the rest of the body.
 - **Solution:** Support bans on shark finning and promote shark conservation.
- 10. **What is a marine protected area (MPA)?**
 - **Answer:** A designated region where human activities are restricted to protect marine ecosystems.
 - **Solution:** Advocate for the creation and enforcement of MPAs.

Section 3: Climate Change

- 11. **What percentage of coral reefs are threatened by climate change?**
 - **Answer:** 75%.
 - **Solution:** Reduce carbon emissions and support coral restoration projects.
- 12. **What is coral bleaching?**
 - **Answer:** When corals expel their symbiotic algae due to stress, turning white.
 - **Solution:** Combat climate change and reduce local stressors like pollution.
- 13. **How much has global sea level risen in the past century?**
 - **Answer:** About 20 cm (8 inches).
 - **Solution:** Support renewable energy and coastal conservation efforts.
- 14. **What is ocean acidification?**
 - **Answer:** The decrease in ocean pH due to absorption of excess CO₂.
 - **Solution:** Reduce carbon emissions and protect marine habitats that absorb CO₂.
- 15. **What is the main cause of rising ocean temperatures?**
 - **Answer:** Climate change driven by greenhouse gas emissions.
 - **Solution:** Transition to renewable energy and reduce fossil fuel use.

Section 4: Biodiversity and Ecosystems

- 16. **What percentage of marine species depend on coral reefs?**
 - **Answer:** 25%.
 - **Solution:** Protect coral reefs through conservation and sustainable tourism.
- 17. **What is the largest living structure on Earth?**
 - **Answer:** The Great Barrier Reef.
 - **Solution:** Support efforts to reduce pollution and climate change impacts on the reef.
- 18. **What is a keystone species?**
 - **Answer:** A species that has a disproportionately large impact on its ecosystem.
 - **Solution:** Protect keystone species like sea otters and sharks to maintain ecosystem balance.
- 19. **What is the main threat to sea turtles?**
 - **Answer:** Plastic pollution and habitat destruction.
 - **Solution:** Reduce plastic use and protect nesting beaches.
- 20. **What is the role of mangroves in marine ecosystems?**
 - **Answer:** They provide nursery habitats for fish and protect coastlines from erosion.
 - **Solution:** Restore and protect mangrove forests.

Section 5: Solutions and Actions

21. What is the 3R principle?

- **Answer:** Reduce, Reuse, Recycle.
- **Solution:** Practice the 3Rs in daily life to minimize waste.

22. What is sustainable seafood?

- **Answer:** Seafood caught or farmed in ways that support long-term ocean health.
- **Solution:** Look for certifications like MSC (Marine Stewardship Council) when buying seafood.

23. What is the goal of The Ocean Cleanup project?

- **Answer:** To remove plastic from the oceans using advanced technologies.
- **Solution:** Support or donate to organizations working on ocean cleanup.

24. What is a circular economy?

- **Answer:** An economic system aimed at eliminating waste by reusing and recycling materials.
- **Solution:** Support businesses and policies that promote a circular economy.

25. What is the Paris Agreement?

- **Answer:** A global agreement to combat climate change by reducing greenhouse gas emissions.
- **Solution:** Advocate for strong climate policies and individual action to reduce emissions.

Section 6: Fun Facts

26. How much of the Earth's oxygen is produced by the oceans?

- **Answer:** 50%.
- **Solution:** Protect marine ecosystems to maintain oxygen production.

27. What is the deepest part of the ocean?

- **Answer:** The Mariana Trench (about 11,000 meters deep).
- **Solution:** Support deep-sea research and conservation efforts.

28. What is the largest animal on Earth?

- **Answer:** The blue whale.
- **Solution:** Protect whales by reducing ship strikes and ocean noise pollution.

29. What is the main food source for many marine animals?

- **Answer:** Plankton.
- **Solution:** Reduce pollution to protect plankton populations.

30. What is the role of seagrass in marine ecosystems?

- **Answer:** It provides habitat, food, and helps sequester carbon.
- **Solution:** Protect and restore seagrass beds.

2. Introduction to the Concept of Land Art Using Beach Trash

Background information:

Land art, also known as Earth art, environmental art, and Earthworks, emerged as an art movement in the 1960s and 1970s, primarily in Great Britain and the United States. This innovative form of art seeks to expand the boundaries of traditional art by utilizing natural materials such as soil, rocks, vegetation, and water found on-site, as well as incorporating found objects, including trash. Land art is often situated in remote, outdoor locations, far from urban centers, yet its impact resonates globally through photo documentation and exhibitions. This essay explores the concept of land art using beach trash, examining its historical background, artistic significance, and environmental message.

Historical Background

The genesis of land art can be traced back to a period of profound societal change and growing environmental consciousness. Artists sought to challenge the conventions of gallery-based art by creating works that engaged directly with the landscape. These artists were inspired by the natural world and sought to integrate their creations into the environment, making a statement about humanity's relationship with nature. Notable early land artists include Robert Smithson, whose iconic work "Spiral Jetty" epitomizes the movement's principles, and Nancy Holt, whose "Sun Tunnels" explored the interplay between human-made structures and natural phenomena.

As the movement gained momentum, artists began to experiment with a variety of materials and methods. The use of found objects, particularly trash, became a means of commenting on consumer culture and environmental degradation. By incorporating discarded items into their artworks, land artists highlighted the impact of human activity on the natural world and urged viewers to reconsider their relationship with their surroundings.

Artistic Significance

Land art using beach trash occupies a unique space within the broader context of environmental art. Beaches, often seen as pristine natural spaces, are increasingly marred by pollution and debris. By collecting and repurposing this trash, artists transform waste into powerful visual statements. The resulting works not only possess aesthetic value but also serve as poignant reminders of the environmental challenges we face.

One of the key aspects of land art is its site-specific nature. Each piece is created in response to the characteristics of its location, making it an intrinsic part of the landscape. This approach fosters a deeper connection between the artwork and its environment, encouraging viewers to engage with the natural world in a meaningful way. When beach trash is used as a medium, the artwork becomes a testament to the pervasive issue of marine pollution and the urgent need for action.

Environmental Message

The incorporation of beach trash in land art carries a potent environmental message. It draws attention to the staggering amounts of waste that end up in our oceans and on our shores, posing a threat to marine life and ecosystems. By repurposing this trash into art, artists not only raise awareness but also inspire a sense of responsibility and stewardship in their audience.

Projects like the [Washed Ashore Project](#), founded by artist Angela Haseltine Pozzi, exemplify this approach. Using debris collected from beaches, Washed Ashore creates large-scale sculptures of marine creatures, emphasizing the consequences of plastic pollution. These artworks travel to various locations, educating the public about the importance of reducing waste and protecting our oceans.

Moreover, land art using beach trash encourages a dialogue about sustainability and the role of art in effecting change. It challenges viewers to reflect on their own consumption habits and consider how they can contribute to a more sustainable future. By transforming discarded materials into meaningful art, these artists demonstrate that creativity and environmental consciousness can go hand in hand.

Wrap-up

Land art, with its roots in the 1960s and 1970s, continues to evolve and adapt, addressing contemporary issues such as pollution and environmental degradation. The use of beach trash in land art not only elevates discarded materials to the realm of high art but also imparts a powerful message about our impact on the natural world. Through their innovative and thought-provoking creations, land artists inspire us to see beauty in the unexpected and to take action in preserving our planet for future generations.

Land art using beach trash is a testament to the enduring power of creativity and its ability to transform even the most mundane and overlooked materials into something extraordinary and meaningful. In doing so, it invites us to reimagine our relationship with the environment and to become more mindful stewards of the Earth.

Turning Trash into Treasure: The Art of Environmental Storytelling

The slides could be used as presentation or handout to design your individual handout please consider:

- Use visuals like infographics, photos of land art, and diagrams of ocean pollution.
- Include space for students to jot down ideas or sketch their land art concepts.
- Add a QR code linking to resources like videos, articles, or websites.

As a handouts the slides will provide students with a clear understanding of the issues and inspire them to take action through art and technology!

What is Land Art?

- Land art is a form of art that uses natural materials (like rocks, sand, and plants) or found objects (like trash) to create large-scale works in outdoor spaces.
 - It often carries a message about the environment, society, or culture.
-

Why Use Beach Trash for Land Art?

1. **Raise Awareness:**
 - Transforming trash into art highlights the scale of marine pollution.
 - It creates a visual impact that words alone cannot achieve.
 2. **Spark Conversation:**
 - Art can inspire people to think differently about waste and take action.
 3. **Be Part of the Solution:**
 - By collecting trash for art, you're helping clean the beach while creating something meaningful.
-

Famous Examples of Environmental Land Art:

1. **"Washed Up" by Alejandro Durán:**
 - Durán collected trash from beaches in Mexico and arranged it into colorful installations that mimic natural forms like waves and roots.
 - <https://alejandroduran.com/>
 2. **"Plastic Ocean" by Mandy Barker:**
 - Barker photographs marine debris arranged into striking patterns, highlighting the beauty and tragedy of ocean pollution.
 - <https://www.mandy-barker.com/installations>
-

How to Create Your Own Land Art:

1. **Plan Your Message:**
 - What do you want to say about marine pollution? (e.g., "Plastic is choking our oceans.")
 2. **Collect Materials:**
 - Gather trash from the beach (safely and responsibly).
 - Look for interesting shapes, colors, and textures.
 3. **Choose a Location:**
 - Find a spot on the beach where your art will be visible and impactful.
 4. **Design Your Artwork:**
 - Arrange the trash into patterns, shapes, or symbols that convey your message.
 - Use natural elements (like sand or rocks) to enhance your design.
 5. **Document Your Work:**
 - Take photos or videos to share your art with others.
-

Activity: Brainstorm Your Land Art Project

- In small groups, discuss:
 - What message do you want to convey?
 - What materials will you use?
 - How will you arrange the trash to create an impact?
-

Tips for Success:

- **Safety First:** Wear gloves and avoid sharp or hazardous objects.
 - **Work Together:** Collaborate to create something larger and more impactful.
 - **Be Creative:** There are no rules—let your imagination guide you!
-

3. Introduction of AI and Picotoblox

Background

Harnessing Artificial Intelligence for Coastal Cleanup: A New Frontier in Environmental Stewardship

In an era where technology permeates nearly every aspect of our lives, artificial intelligence (AI) emerges as a transformative force capable of addressing some of humanity's most pressing challenges. One of these challenges is the alarming state of our oceans and coastlines, which suffer from pollution, particularly plastic waste. By leveraging AI, we can enhance our efforts to clean beaches, safeguard marine ecosystems, and foster sustainable practices that benefit both the environment and society as a whole.

Artificial intelligence refers to systems or machines that simulate human intelligence to perform tasks and can improve their performance based on the data they collect. While many associate AI with concepts like self-driving cars or intelligent virtual assistants, its applications extend far beyond these realms. In environmental contexts, AI can analyze vast amounts of data, identify patterns, and enable predictive modeling, making it a powerful ally in our mission to restore and protect natural habitats.

Coastal cleanup initiatives are often hampered by the sheer scale of the problem. According to recent statistics, millions of tons of plastic waste enter our oceans annually, posing threats to wildlife and coastal communities. Traditional cleanup efforts typically rely on volunteer organizations, which, while commendable, can struggle with logistical challenges such as identifying hotspots for pollution and optimizing resource allocation. This is where AI steps in as a game changer.

Utilizing AI-powered systems can enable us to create comprehensive databases that map pollution levels and types across different beach ecosystems. Algorithms can analyze data collected from drones, satellites, and even beach-goers' smartphones to pinpoint areas with the highest concentrations of waste. By employing machine learning techniques, these systems can continuously refine their models, learning from previous cleanups to anticipate future waste accumulation patterns.

Moreover, advanced computer vision technologies can aid in sorting and classifying waste during cleanup operations. Equipped with cameras and sensors, robotic systems, for example, can identify different types of debris, segregating recyclables from non-recyclables automatically. Not only does this streamline the cleanup process, but it also enhances the efficiency of recycling efforts, ensuring that a greater percentage of collected materials are properly processed.

AI can also play a critical role in raising awareness about beach pollution through educational platforms. Interactive applications powered by AI can engage users, encouraging them to contribute to beach cleanups or even monitor pollution levels themselves. By gamifying environmental stewardship, we empower individuals to take ownership of their local environments, cultivating a culture of responsibility and mindfulness.

While the integration of AI in beach cleanup initiatives showcases immense potential, it is crucial to approach this innovative solution with careful consideration. Ethical implications, such as data privacy and the impact of automation on employment, must be accounted for to

ensure that technological advancement aligns with societal values. Furthermore, collaboration between scientists, technologists, conservationists, and local communities is essential to create holistic, inclusive strategies for implementing AI-driven solutions.

In conclusion, artificial intelligence presents an unprecedented opportunity to enhance our coastal cleanup efforts, creating a synergy between technology and environmental stewardship. By harnessing AI's analytical power, we can transform our approach to beach cleanup, making it smarter, more efficient, and deeply rooted in community engagement. As educators and advocates for a sustainable future, let us embrace this technological revolution, inspiring a new generation to take action in protecting our oceans and, ultimately, our planet. The future of our beaches depends on our collective efforts to innovate and adapt.

PICTOBLOX

PictoBlox is an innovative platform designed to empower users of all ages to bring their creative ideas to life through coding and interactive projects. Positioned as a user-friendly visual programming environment, PictoBlox allows users to develop games, animations, and interactive stories using a block-based coding interface. This approach demystifies programming concepts, making them accessible even to beginners and young learners.

One of the standout features of PictoBlox is its integration of AI tools, which enhances the coding experience and opens up a world of possibilities for users. These tools, powered by artificial intelligence, enable students and enthusiasts to incorporate advanced functionalities such as image recognition, voice commands, and machine learning into their projects. For instance, users can create applications that respond intelligently to user inputs or analyze data patterns, thereby fostering critical thinking and problem-solving skills.

By combining creativity with cutting-edge technology, PictoBlox not only teaches the fundamentals of coding but also encourages experimentation and exploration in the realm of artificial intelligence. Its intuitive interface and rich set of features position PictoBlox as an essential tool for aspiring coders looking to harness the power of AI in their creative endeavors. Whether for educational purposes, personal projects, or just for fun, PictoBlox serves as a gateway into the engaging and ever-evolving world of technology and innovation.

Fundamentals of AI and PictoBlox

The slides could be used as presentation or handout to design your individual handout please consider:

- Use visuals like infographics, photos of objects, and diagrams.
- Include space for students to jot down ideas or sketch their concepts.
- Add a QR code linking to resources like videos, articles, or websites.

As a handouts the slides will provide students with a clear understanding of the issues and inspire them to take action through AI and PictoBlox!

We recommend the official PictoBlox resources! A list of them is included in the resources.

Tips for Teachers

- Start with simple projects to build confidence (e.g., making a sprite move or change color).
- Gradually introduce AI concepts using PictoBlox's pre-trained models.
- Encourage students to experiment and explore their own ideas.
- Use real-world examples to show how AI is used in everyday life.

Slides

1: What is AI?

- **Definition:** AI is the ability of machines to perform tasks that typically require human intelligence.
- **Examples of AI in Everyday Life:**
 - Virtual assistants (e.g., Siri, Alexa).
 - Recommendation systems (e.g., Netflix, Spotify).
 - Self-driving cars.
- **AI in Environmental Conservation:**
 - Trash-detecting drones.
 - AI-powered recycling systems.

2: How Does AI Work?

- **Machine Learning:** AI systems learn from data to make predictions or decisions.
- **Neural Networks:** Inspired by the human brain, these systems recognize patterns in data.
- **Training Data:** AI models are trained using large datasets to improve accuracy.

3: Introduction to PictoBlox

- **What is PictoBlox?**
 - A platform for learning AI and coding.
 - Uses a drag-and-drop interface for easy programming.
- **Features of PictoBlox:**
 - AI blocks for image recognition, object detection, and text-to-speech.
 - Compatibility with hardware like Arduino and EV3 robots.
- **Why Use PictoBlox?**
 - No prior coding experience required.
 - Fun and interactive way to learn AI.

4: Hands-On Activity – Getting Started with PictoBlox

- **Step 1:** Open PictoBlox and explore the interface.
- **Step 2:** Drag and drop blocks to create a simple program (e.g., make a sprite move).
- **Step 3:** Add interactions (e.g., sprite changes color when clicked).
- **Step 4:** Create a virtual robot that moves and detects objects.

Fundamentals

Duration: 3 hours

Objective: Familiarize participants with PictoBlox and create a simple program.

Agenda:

- 1. Introduction to PictoBlox (30 minutes)**
 - What is PictoBlox?
 - A beginner-friendly platform for AI and coding.
 - Overview of the interface:
 - Blocks palette, workspace, stage, and sprite controls.
- 2. Hands-on Activity: Basic Commands (1 hour)**
 - Task 1: Make a sprite move using drag-and-drop blocks.
 - Task 2: Add interactions (e.g., sprite changes color when clicked).
 - Task 3: Create a simple animation (e.g., a walking robot).
- 3. Create a Simple Program (1.5 hours)**
 - Task: Build a virtual robot that moves and detects objects.
 - Use motion blocks to move the robot.
 - Add a "detection" feature (e.g., robot stops when it "sees" an object).
 - Participants present their programs to the class.

Building a Trash Detection Tool

AI in PictoBlox

Duration: 2 hours

Objective: Introduce AI features in PictoBlox and teach participants how to use image recognition.

Agenda:

- 1. Introduction to AI in PictoBlox (30 minutes)**
 - Overview of AI blocks:
 - Image recognition, object detection, and text-to-speech.
 - How to use pre-trained models:
 - Example: Recognizing objects like bottles, cans, and straws.
- 2. Hands-on Activity: Teach the AI (1.5 hours)**
 - Task: Train the AI to recognize different types of beach trash.
 - Use a pre-trained model in PictoBlox.
 - Add custom labels (e.g., plastic bottles, cans, straws).
 - Test the model with sample images.

Group Work – Trash Detection Tool

Duration: 3 hours

Objective: Develop a prototype AI tool for trash detection and classification.

Agenda:

1. Group Work: Develop the Tool (1.5 hours)

- Task: Build a prototype AI tool that detects and classifies trash.
 - Use PictoBlox to create a program that identifies trash types.
 - Add features like sound alerts or data logging.

2. Testing the Tool (1 hour)

- Test the tool with images of beach trash collected during the field trip.
- Evaluate accuracy and discuss limitations.

3. Discussion and Improvements (30 minutes)

- Groups present their tools.
- Discuss potential improvements (e.g., better training data, adding more trash types).
- Reflect on how AI can be used for real-world environmental solutions.

Workshop Report: Land Art Workshop in Bodrum, September 2024

Introduction

In September 2024, a transformative **Land Art Workshop** was held in the picturesque coastal town of Bodrum, Turkey. This workshop brought together students and educators to explore the intersection of art, nature, and creativity. The event aimed to challenge traditional perceptions of art and inspire participants to see the world through a more expansive and integrated lens. Below is a detailed report of the workshop, including its objectives, activities, and outcomes.

Workshop Objectives

The primary goal of the workshop was to dismantle the conventional notion that art is confined to specific rules, tools, or settings. By integrating the principles of **STEM (Science, Technology, Engineering, and Mathematics)** with **Art**, the workshop sought to demonstrate how these disciplines can harmoniously coexist and enhance one another. Specifically, the workshop aimed to:

1. Broaden students' perspectives on art by introducing them to the concept of **Land Art**.
2. Encourage creativity and self-expression using natural materials.
3. Foster a deeper connection between participants and the natural environment.
4. Highlight the importance of sustainability and environmental awareness through artistic expression.

Motivating the Students

To prepare students for the workshop, a **didactic oral conversation** was conducted to introduce the roots and philosophy of Land Art. This session aimed to familiarize participants with the concept and its significance. Key points discussed included:

- The origins of Land Art as a movement that emerged in the 1960s and 1970s.
- The use of natural materials such as rocks, soil, and vegetation to create art.
- The environmental and social messages often conveyed through Land Art.

To further inspire the students, a **presentation** showcasing examples of iconic Land Art installations was shared. These images included works by renowned artists such as **Robert Smithson** (Spiral Jetty) and **Andy Goldsworthy**. Accompanying the visuals was a motivational note:

"This workshop can be interpreted as an invasion on large natural areas. It is made with the use of rock, soil, and a lot of other natural components. Our aim is to draw attention to the beauties that Mother Earth offers us and leave a mark with the materials that exist in nature. ART, EVERYWHERE."

This note served as a guiding principle for the workshop, encouraging students to think beyond traditional art forms and embrace the natural world as their canvas.

Workshop Activities

The workshop was divided into several engaging and hands-on activities designed to immerse students in the world of Land Art. Below is an overview of the key activities:

1. Introduction to Land Art

- Students were introduced to the history and philosophy of Land Art through an interactive presentation.
- They explored how Land Art challenges traditional art forms by using natural materials and outdoor spaces.

2. Nature Walk and Material Collection

- Participants embarked on a guided nature walk along the Bodrum coastline to collect natural materials such as rocks, driftwood, seashells, and leaves.
- This activity encouraged students to observe and appreciate the beauty of their surroundings while gathering resources for their art projects.

3. Collaborative Land Art Creation

- Working in small groups, students used the collected materials to create large-scale Land Art installations on the beach.
- Each group was encouraged to convey a specific message or theme through their artwork, such as environmental conservation, the beauty of nature, or the passage of time.

4. Documentation and Reflection

- Students documented their creations through photographs and videos, capturing the transient nature of Land Art.
- A group reflection session allowed participants to share their experiences, challenges, and insights gained during the workshop.

Outcomes and Impact

The Land Art Workshop in Bodrum was a resounding success, achieving its objectives and leaving a lasting impact on all participants. Key outcomes included:

1. **Expanded Perspectives on Art:** Students gained a deeper understanding of art as a dynamic and inclusive discipline that transcends traditional boundaries.
2. **Environmental Awareness:** The workshop fostered a greater appreciation for nature and highlighted the importance of sustainability.
3. **Creativity and Collaboration:** Participants developed their creative skills and learned the value of teamwork through collaborative art projects.
4. **Personal Growth:** Many students reported feeling more connected to nature and inspired to explore new forms of artistic expression.

Visual Documentation

The workshop was documented through a series of photographs capturing the students' creative process and final installations. These images showcase the beauty of the natural landscape, the materials used, and the collaborative spirit of the participants. Below are some highlights:

- **Photo 1:** Students collecting natural materials along the Bodrum coastline.
- **Photo 2:** A group working together to create a large-scale Land Art installation.

- **Photo 3:** A close-up of a finished artwork featuring intricate patterns made from rocks and seashells.
- **Photo 4:** Participants reflecting on their creations during the group discussion.



Conclusion

The Land Art Workshop in Bodrum was a powerful reminder of the transformative potential of art and nature. By breaking down traditional barriers and encouraging students to think creatively, the workshop not only expanded their artistic horizons but also deepened their connection to the environment. As one participant aptly put it, *“Art is everywhere—we just need to open our eyes and see it.”*

This workshop serves as a model for future initiatives that integrate art, nature, and education, inspiring the next generation of artists, thinkers, and environmental stewards.

Workshop Report: PictoBlox AI and Coding Workshop in Bodrum, September 2024

Introduction

As part of the broader "**STEM+Art**" initiative held in Bodrum in September 2024, a **PictoBlox AI and Coding Workshop** was conducted to introduce students to the exciting world of artificial intelligence (AI) and programming. This workshop aimed to demystify AI and coding, making it accessible and engaging for students aged 14–18. Through hands-on activities and creative projects, participants explored how AI can be used to solve real-world problems, particularly in the context of environmental conservation.

Workshop Objectives

The PictoBlox workshop was designed with the following goals in mind:

1. **Introduce AI and Coding:** Provide students with a foundational understanding of AI and coding using PictoBlox, a beginner-friendly platform.
2. **Foster Problem-Solving Skills:** Encourage students to apply AI and coding to address environmental challenges, such as trash detection and classification.
3. **Promote Creativity and Innovation:** Inspire students to think creatively and develop their own AI-based projects.
4. **Build Technical Confidence:** Equip students with the skills and confidence to explore AI and coding further in their academic and personal lives.

Workshop Structure

The PictoBlox workshop was divided into two main sessions: an **Introduction to AI and PictoBlox** and a **Hands-On AI Programming Workshop**. Below is a detailed breakdown of each session.

Session 1: Introduction to AI and PictoBlox

Objectives:

- Familiarize students with the basics of AI and its applications.
- Introduce the PictoBlox interface and its features.
- Build a simple program to demonstrate the capabilities of PictoBlox.

Activities:

1. **What is AI?**
 - A brief presentation explained the concept of AI, including machine learning, neural networks, and real-world applications (e.g., facial recognition, self-driving cars, and environmental monitoring).
 - Students learned how AI is being used to address environmental issues, such as detecting ocean trash and monitoring wildlife.
2. **Introduction to PictoBlox**
 - Participants were introduced to the PictoBlox platform, its drag-and-drop interface, and its AI capabilities.
 - A live demonstration showed how to create a simple program, such as making a virtual robot move and respond to user inputs.
3. **Hands-On Activity: Make a Sprite Move**

- Students created their first project by programming a sprite (e.g., a robot or animal) to move across the screen using motion blocks.
- They added interactivity by making the sprite change color or play a sound when clicked.

Session 2: Hands-On AI Programming Workshop

Objectives:

- Teach students how to use PictoBlox's AI features, such as image recognition and object detection.
- Guide students in building a functional AI tool for trash detection.
- Encourage collaboration and problem-solving through group projects.

Activities:

- 1. Introduction to AI in PictoBlox**
 - Students learned how to use PictoBlox's AI blocks for image recognition and object detection.
 - A pre-trained model was used to demonstrate how AI can recognize objects like plastic bottles, cans, and straws.
- 2. Building a Trash Detection Tool**
 - Participants worked in small groups to develop an AI tool that could detect and classify different types of beach trash.
 - Using PictoBlox, they trained the AI to recognize specific objects and added features like sound alerts and data logging.
- 3. Testing and Refining the Tool**
 - Students tested their AI tools with images of beach trash collected during the field trip.
 - They discussed the limitations of their tools and brainstormed potential improvements, such as adding more trash categories or improving accuracy.
- 4. Group Presentations**
 - Each group presented their AI tool to the class, explaining how it worked and its potential applications.
 - The presentations sparked lively discussions about the role of AI in environmental conservation and other fields.

Outcomes and Impact

The PictoBlox workshop was a resounding success, achieving its objectives and leaving a lasting impression on the students. Key outcomes included:

- 1. Increased Understanding of AI:** Students gained a foundational understanding of AI and its applications, particularly in environmental conservation.
- 2. Hands-On Coding Experience:** Participants developed practical coding skills using PictoBlox, building confidence in their ability to create AI-based projects.
- 3. Problem-Solving and Collaboration:** The group projects fostered teamwork and critical thinking, as students worked together to solve real-world problems.
- 4. Inspiration for Future Learning:** Many students expressed interest in continuing to explore AI and coding, with some even suggesting ideas for future projects.

Student Feedback

The workshop received overwhelmingly positive feedback from participants. Here are some highlights:

- *“I never thought I could create something like this. PictoBlox makes coding so easy and fun!”* – Participant A
- *“I loved how we used AI to solve a real problem. It made me realize how powerful technology can be.”* – Participant B
- *“Working in a group was really fun. We learned so much from each other.”* – Participant C

Visual Documentation

The workshop was documented through photographs and videos, capturing the students’ engagement and creativity. Below are some highlights:

- **Photo 1:** Students working in groups to build their AI tools using PictoBlox.
- **Photo 2:** A close-up of a student testing their trash detection tool.
- **Photo 3:** A group presenting their AI tool to the class.
- **Photo 4:** Participants celebrating their completed projects.



Conclusion

The PictoBlox AI and Coding Workshop in Bodrum was a transformative experience for all participants. By combining hands-on learning with real-world applications, the workshop not only introduced students to AI and coding but also inspired them to think creatively and critically about

the role of technology in addressing global challenges. As one student aptly put it, *“This workshop showed me that AI isn’t just for scientists—it’s for everyone.”*

This workshop serves as a model for future initiatives that aim to make AI and coding accessible and engaging for young learners, empowering them to become the innovators and problem-solvers of tomorrow.

Video Resources

How to Use These Videos

- **Day 1 Screening:** Show 1-2 short clips or a segment of a documentary during the interactive presentation.
- **Discussion:** After screening, facilitate a discussion about the videos. Ask questions like:
 - What surprised you the most?
 - How do you feel about the scale of the problem?
 - What solutions inspired you?
- **Homework:** Assign students to watch a full documentary or explore one of the YouTube channels for further learning.

These videos will engage students, deepen their understanding of marine pollution, and inspire them to take action during the workshop!

1. Documentaries on Marine Pollution and Cleanups

"A Plastic Ocean" (2016)

- **Description:** This documentary explores the impact of plastic pollution on marine ecosystems and highlights innovative solutions to tackle the problem.
- **Link:** [A Plastic Ocean on Netflix](#) (may require a subscription)
- **Free Clips:** [A Plastic Ocean Trailer](#)

"The Story of Plastic" (2019)

- **Description:** A comprehensive look at the global plastic pollution crisis, from production to disposal, and the efforts to clean up our planet.
- **Link:** [The Story of Plastic on Discovery+](#) (may require a subscription)
- **Free Clips:** [The Story of Plastic Trailer](#)

"Chasing Coral" (2017)

- **Description:** While primarily about coral reefs, this documentary also touches on the broader impacts of climate change and pollution on marine ecosystems.
- **Link:** [Chasing Coral on Netflix](#)
- **Free Clips:** [Chasing Coral Trailer](#)

2. Short Clips on Beach Cleanups and Innovations

The Ocean Cleanup Project

- **Description:** A nonprofit organization developing advanced technologies to remove plastic from the oceans.
- **Video:** [The Ocean Cleanup: How It Works](#)
- **Video:** [The Ocean Cleanup: First Plastic Catch](#)

4ocean: Cleaning Beaches and Oceans

- **Description:** A company dedicated to removing trash from oceans and coastlines while raising awareness about plastic pollution.
- **Video:** [4ocean: Our Mission](#)
- **Video:** [4ocean: Beach Cleanup in Bali](#)

Parley for the Oceans: AIR Strategy

- **Description:** Parley collaborates with brands, artists, and activists to reduce plastic waste and clean up oceans.
- **Video:** [Parley for the Oceans: AIR Strategy](#)
- **Video:** [Parley: Cleaning the Maldives](#)

Seabin Project: Cleaning Harbors and Marinas

- **Description:** The Seabin is a floating trash bin designed to collect debris from marinas and harbors.
- **Video:** [Seabin Project: How It Works](#)
- **Video:** [Seabin: Cleaning the Ocean](#)

3. Inspirational Short Films

"Plastic Tide" by Sky Ocean Rescue

- **Description:** A short film about the impact of plastic pollution and how individuals can make a difference.
- **Video:** [Plastic Tide on YouTube](#)

"The Majestic Plastic Bag" by Heal the Bay

- **Description:** A mockumentary that humorously follows the journey of a plastic bag from a grocery store to the ocean.
- **Video:** [The Majestic Plastic Bag on YouTube](#)

"Plastic Island" by UN Environment Programme

- **Description:** A short film about the impact of plastic pollution on remote islands and marine life.
- **Video:** [Plastic Island on YouTube](#)

4. Educational YouTube Channels

National Geographic: Planet or Plastic?

- **Description:** A series of videos exploring the global plastic pollution crisis and solutions.
- **Link:** [National Geographic YouTube Channel](#)

TED-Ed: Lessons on Ocean Pollution

- **Description:** Animated videos explaining the science behind ocean pollution and its solutions.
- **Video:** [What Really Happens to the Plastic You Throw Away?](#)
- **Video:** [The Hidden Dangers of Microplastics](#)

5. Local and Community-Led Cleanups

Take 3 for the Sea

- **Description:** A global movement encouraging people to take three pieces of trash with them when they leave the beach.
- **Video:** [Take 3 for the Sea: The Movement](#)

#2MinuteBeachClean

- **Description:** A campaign encouraging people to spend just two minutes picking up trash from beaches.
- **Video:** [#2MinuteBeachClean on YouTube](#)

Ressources - PictoBlox

PictoBlox Website

- **Link:** <https://thestempedia.com/product/pictoblox/>
- **What's Included:**
 - Download PictoBlox (available for Windows, macOS, and Linux).
 - Overview of features, including AI and machine learning capabilities.
 - Tutorials and project ideas for beginners.

PictoBlox Tutorials

- **Link:** <https://thestempedia.com/tutorials/>
- **What's Included:**
 - Step-by-step tutorials for beginners.
 - Guides on using AI blocks, robotics, and more.
 - Example projects like face detection, object recognition, and voice-controlled robots.

PictoBlox YouTube Channel

- **Link:** <https://www.youtube.com/c/STEMpedia>
- **What's Included:**
 - Video tutorials for beginners.
 - Demonstrations of AI and machine learning projects.
 - Tips and tricks for using PictoBlox effectively.

Getting Started with PictoBlox

- **Link:** <https://thestempedia.com/tutorials/getting-started-with-pictoblox/>
- **What's Included:**
 - A beginner's guide to installing and navigating PictoBlox.
 - Basic coding concepts using drag-and-drop blocks.
 - Simple projects like making a sprite move and interact.

Introduction to AI in PictoBlox

- **Link:** <https://thestempedia.com/tutorials/introduction-to-ai-in-pictoblox/>
- **What's Included:**
 - Explanation of AI blocks in PictoBlox.
 - How to use image recognition and object detection.
 - Example: Building a program to recognize objects like fruits or animals.

Code.org AI for Oceans

- **Link:** <https://code.org/oceans>
- **What's Included:**
 - A free, interactive tutorial that introduces AI concepts.
 - Students train an AI model to clean up the ocean by classifying fish and trash.
 - Great for introducing AI before diving into PictoBlox.

Google Teachable Machine

- **Link:** <https://teachablemachine.withgoogle.com/>
- **What's Included:**
 - A beginner-friendly tool for training machine learning models.
 - Students can create models for image, sound, or pose recognition.
 - Export the model and use it in PictoBlox for advanced projects.

With these resources, you'll have everything you need to introduce PictoBlox to your students and inspire them to explore the exciting world of AI and coding! Let me know if you need further assistance.

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References

References for Plastic Pollution

Jambeck, J. R., et al. (2015). *Plastic waste inputs from land into the ocean*. *Science*, 347(6223), 768-771. [Link](#) This study estimates that 8 million metric tons of plastic enter the oceans annually.

National Geographic: Planet or Plastic? [Link](#) A comprehensive resource on plastic pollution and its impacts.

The Ocean Cleanup Project [Link](#) Information on technologies and efforts to remove plastic from the oceans.

UN Environment Programme (UNEP): Marine Litter [Link](#) Reports and data on marine litter and its global impact.

References for Overfishing

Food and Agriculture Organization (FAO): The State of World Fisheries and Aquaculture (2022) [Link](#) Provides statistics on global fish stocks and overfishing.

World Wildlife Fund (WWF): Overfishing [Link](#) Information on the impacts of overfishing and sustainable solutions.

Marine Stewardship Council (MSC) [Link](#) Certification program for sustainable seafood.

National Oceanic and Atmospheric Administration (NOAA): Bycatch [Link](#) Explains the concept of bycatch and efforts to reduce it.

References for Climate Change

Intergovernmental Panel on Climate Change (IPCC): Special Report on the Ocean and Cryosphere (2019) [Link](#) Detailed report on the impacts of climate change on oceans and polar regions.

NOAA: Coral Reef Conservation Program [Link](#) Information on coral bleaching and conservation efforts.

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References for Biodiversity and Ecosystems

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References for Solutions and Actions

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References for Fun Facts and General Information

Smithsonian Ocean Portal [Link](#) Educational resources on marine science and conservation.

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MarineBio Conservation Society [Link](#) Information on marine life, ecosystems, and conservation.

BBC Earth: Ocean Stories [Link](#) Articles and videos on ocean ecosystems and wildlife.