

Scientific Disseminator

Use one of your two actions to decrease by 1 the number of plastic or microplastic cards that will enter your next turn.

Scientist

It can remove 3 microplastics instead of 1 from an ocean adjacent to the continent it is present in.

Chemist

It transforms 5 plastics present on the continent that are present into biodegradable plastics, instead of 3.

Public Representative

Discard two solution cards from the same profession to decrease the plastic production level by 1 and the microplastic production level by 1.

Garbage Collector

You can recycle 3 plastics instead of 1, on the continent you are present on.

Doctor

Moves living beings up 3 spaces on their health track instead of 1.

<div><div>Resume: Actions</div><div>On your turn, you can do two of the five choices (i.e. you cannot repeat them)</div><div><ul style="list-style-type: none">TRAVEL FROM ONE CONTINENT TO ANOTHER.DONATE A CARD FROM YOUR HAND TO ANOTHER PLAYER WHO IS ON THE SAME CONTINENT AS YOU.MOVE UP 1 ON THE HEALTH TRACK OF LIVING BEINGS.SOLUTION: DISCARD 2 CARDS FROM YOUR HAND OF THE SAME PROFESSION (COLOR) TO MOVE UP 1 ON THE RECYCLING TRACK OR THE MICROPLASTIC TRACK.CHOOSE ONE OF THE FOLLOWING ACTIONS:<ul style="list-style-type: none">1. REMOVE 1 MICROPLASTIC FROM AN OCEAN ADJACENT TO THE CONTINENT YOU ARE ON.2. RECYCLE 1 PLASTIC FROM THE CONTINENT YOU ARE ON.3. TURN 3 PLASTICS INTO BIOPLASTIC FROM THE CONTINENT YOU ARE ON.</div></div>	<div><div>Resume: Actions</div><div>On your turn, you can do two of the five choices (i.e. you cannot repeat them)</div><div><ul style="list-style-type: none">TRAVEL FROM ONE CONTINENT TO ANOTHER.DONATE A CARD FROM YOUR HAND TO ANOTHER PLAYER WHO IS ON THE SAME CONTINENT AS YOU.MOVE UP 1 ON THE HEALTH TRACK OF LIVING BEINGS.SOLUTION: DISCARD 2 CARDS FROM YOUR HAND OF THE SAME PROFESSION (COLOR) TO MOVE UP 1 ON THE RECYCLING TRACK OR THE MICROPLASTIC TRACK.CHOOSE ONE OF THE FOLLOWING ACTIONS:<ul style="list-style-type: none">1. REMOVE 1 MICROPLASTIC FROM AN OCEAN ADJACENT TO THE CONTINENT YOU ARE ON.2. RECYCLE 1 PLASTIC FROM THE CONTINENT YOU ARE ON.3. TURN 3 PLASTICS INTO BIOPLASTIC FROM THE CONTINENT YOU ARE ON.</div></div>	<div><div>Resume: Actions</div><div>On your turn, you can do two of the five choices (i.e. you cannot repeat them)</div><div><ul style="list-style-type: none">TRAVEL FROM ONE CONTINENT TO ANOTHER.DONATE A CARD FROM YOUR HAND TO ANOTHER PLAYER WHO IS ON THE SAME CONTINENT AS YOU.MOVE UP 1 ON THE HEALTH TRACK OF LIVING BEINGS.SOLUTION: DISCARD 2 CARDS FROM YOUR HAND OF THE SAME PROFESSION (COLOR) TO MOVE UP 1 ON THE RECYCLING TRACK OR THE MICROPLASTIC TRACK.CHOOSE ONE OF THE FOLLOWING ACTIONS:<ul style="list-style-type: none">1. REMOVE 1 MICROPLASTIC FROM AN OCEAN ADJACENT TO THE CONTINENT YOU ARE ON.2. RECYCLE 1 PLASTIC FROM THE CONTINENT YOU ARE ON.3. TURN 3 PLASTICS INTO BIOPLASTIC FROM THE CONTINENT YOU ARE ON.</div></div>	<div><div>Resume: Actions</div><div>On your turn, you can do two of the five choices (i.e. you cannot repeat them)</div><div><ul style="list-style-type: none">TRAVEL FROM ONE CONTINENT TO ANOTHER.DONATE A CARD FROM YOUR HAND TO ANOTHER PLAYER WHO IS ON THE SAME CONTINENT AS YOU.MOVE UP 1 ON THE HEALTH TRACK OF LIVING BEINGS.SOLUTION: DISCARD 2 CARDS FROM YOUR HAND OF THE SAME PROFESSION (COLOR) TO MOVE UP 1 ON THE RECYCLING TRACK OR THE MICROPLASTIC TRACK.CHOOSE ONE OF THE FOLLOWING ACTIONS:<ul style="list-style-type: none">1. REMOVE 1 MICROPLASTIC FROM AN OCEAN ADJACENT TO THE CONTINENT YOU ARE ON.2. RECYCLE 1 PLASTIC FROM THE CONTINENT YOU ARE ON.3. TURN 3 PLASTICS INTO BIOPLASTIC FROM THE CONTINENT YOU ARE ON.</div></div>
<div><div>Resume: Actions</div><div>On your turn, you can do two of the five choices (i.e. you cannot repeat them)</div><div><ul style="list-style-type: none">TRAVEL FROM ONE CONTINENT TO ANOTHER.DONATE A CARD FROM YOUR HAND TO ANOTHER PLAYER WHO IS ON THE SAME CONTINENT AS YOU.MOVE UP 1 ON THE HEALTH TRACK OF LIVING BEINGS.SOLUTION: DISCARD 2 CARDS FROM YOUR HAND OF THE SAME PROFESSION (COLOR) TO MOVE UP 1 ON THE RECYCLING TRACK OR THE MICROPLASTIC TRACK.CHOOSE ONE OF THE FOLLOWING ACTIONS:<ul style="list-style-type: none">1. REMOVE 1 MICROPLASTIC FROM AN OCEAN ADJACENT TO THE CONTINENT YOU ARE ON.2. RECYCLE 1 PLASTIC FROM THE CONTINENT YOU ARE ON.3. TURN 3 PLASTICS INTO BIOPLASTIC FROM THE CONTINENT YOU ARE ON.</div></div>	<div><div>Resume: Actions</div><div>On your turn, you can do two of the five choices (i.e. you cannot repeat them)</div><div><ul style="list-style-type: none">TRAVEL FROM ONE CONTINENT TO ANOTHER.DONATE A CARD FROM YOUR HAND TO ANOTHER PLAYER WHO IS ON THE SAME CONTINENT AS YOU.MOVE UP 1 ON THE HEALTH TRACK OF LIVING BEINGS.SOLUTION: DISCARD 2 CARDS FROM YOUR HAND OF THE SAME PROFESSION (COLOR) TO MOVE UP 1 ON THE RECYCLING TRACK OR THE MICROPLASTIC TRACK.CHOOSE ONE OF THE FOLLOWING ACTIONS:<ul style="list-style-type: none">1. REMOVE 1 MICROPLASTIC FROM AN OCEAN ADJACENT TO THE CONTINENT YOU ARE ON.2. RECYCLE 1 PLASTIC FROM THE CONTINENT YOU ARE ON.3. TURN 3 PLASTICS INTO BIOPLASTIC FROM THE CONTINENT YOU ARE ON.</div></div>	<div><div>Effect Contamination</div><div>3</div><div></div><div>Microplastics act as potential vectors for the transport of microorganisms, including pathogens, through the formation of a biofilm on the surface of the microplastic. Invasive species are also transported by microplastics and their effects on ecosystem biodiversity are still unknown, as are the losses related to the migration of exotic species to other habitats.</div></div>	<div><div>Effect Contamination</div><div>1</div><div></div><div>Microplastics can now be found in remote areas. This presence of microplastics therefore reflects the ease with which these particles can be transported over long distances by the action of the wind, increasing plastic pollution.</div></div>
<div><div>Effect Contamination</div><div>1</div><div></div><div>In outdoor environments, airborne microplastics can be transported to other environmental compartments via erosion, which are ways of carrying sediments such as microplastics.</div></div>	<div><div>Effect Contamination</div><div>3</div><div></div><div>Microplastics are already present in human bodies. One route of human exposure to microplastics is through the inhalation of particles in the air during breathing.</div></div>	<div><div>Effect Contamination</div><div>1</div><div></div><div>The inadequate disposal of solid waste is a practice that culminates in plastic pollution in terrestrial and aquatic environments, with the possible formation of microplastic in these compartments.</div></div>	<div><div>Effect Contamination</div><div>3</div><div></div><div>In countries where a large part of the population does not have a sewage collection and/or treatment network, the contribution of microplastics to the environment is aggravated, as sewage is released directly into bodies of water.</div></div>

Chemist



It transforms 5 plastics present on the continent that are present into biodegradable plastics, instead of 3.

Scientist



It can remove 3 microplastics instead of 1 from an ocean adjacent to the continent it is present in.

Scientific Disseminator



Use one of your two actions to decrease by 1 the number of plastic or microplastic cards that will enter your next turn.

Doctor



Moves living beings up 3 spaces on their health track instead of 1.

Garbage Collector


















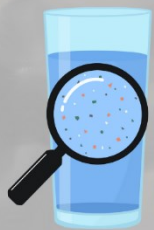
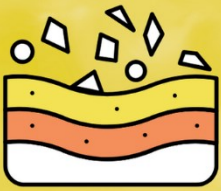


You can recycle 3 plastics instead of 1, on the continent you are present on.

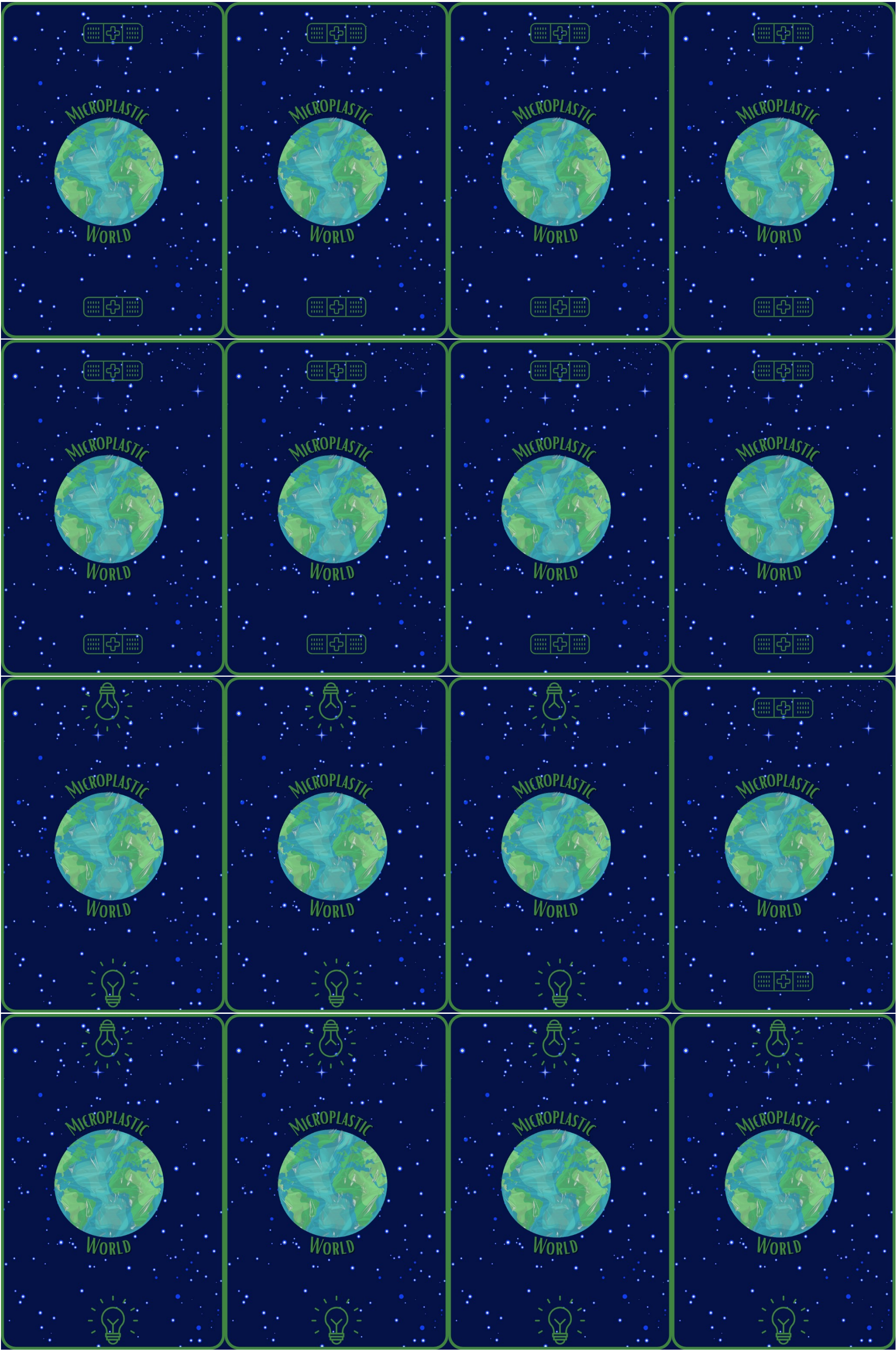
Public Representative



Discard two solution cards from the same profession to decrease the plastic production level by 1 and the microplastic production level by 1.


			
			
			

<p>Effect Contamination</p> <p>3</p>  <p>In the terrestrial environment, plastic waste present in landfills and dumps is responsible for the formation of secondary microplastics, which are determined in leachate samples from urban landfills.</p>	<p>Effect High Disposal</p> <p>3</p>  <p>The lack of knowledge about the negative effects of microplastics on the environment and living beings can affect the high consumption of plastics, as they are materials that are very present in our daily lives and that make our routine more practical.</p>	<p>Effect High Disposal</p> <p>1</p>  <p>Due to the lack of knowledge about the effects that plastic has on the environment, a lot of waste is created instead of being reused or sent for recycling.</p>	<p>Effect Impaired Health</p> <p>3</p>  <p>Researchers have found microplastics in soil used in agriculture. This contamination threatens food security by damaging soil health, reducing crop yields and decreasing agricultural productivity.</p>
<p>Effect Impaired Health</p> <p>3</p>  <p>Microplastics contain intentionally added additives that, when combined, act as endocrine disruptors (EDCs), disrupting the natural hormone system and can cause cancer, diabetes and neurological impairment in a developing fetus.</p>	<p>Effect Impaired Health</p> <p>3</p>  <p>Plastic waste impairs the growth and oxygen production of <i>Prochlorococcus</i>, the most abundant photosynthetic bacteria in the ocean. In other words, microplastics are decreasing global oxygen production.</p>	<p>Effect Impaired Health</p> <p>3</p>  <p>Microplastics are easily ingested when present in the environment, directly by organisms or indirectly through the consumption of species at a lower trophic level, that is, humans are constantly exposed to microplastics through their diet.</p>	<p>Effect Harmful Effects</p> <p>3</p>  <p>Primary microplastics present in household products are directly carried by water into sewage systems where, due to their small size, they are retained and pass through the filters of wastewater treatment plants, continuing on their way even after the filtration stage.</p>
<p>Effect Harmful Effects</p> <p>3</p>  <p>The degradation of polymers favors the release of chemical additives, such as stabilizers, dyes, plasticizers, flame retardants, among others, which are used in the polymer formulation to achieve the characteristics necessary for the intended use in the final product.</p>	<p>Solution Science</p>  <p>One of the methods for collecting microplastics present in the atmosphere is passive samplers, which provide a specific indication of the location collected and the amount of microplastic suspended in the atmosphere. In addition, these are samplers placed at strategic points that rely on the gravitational deposition of particles on the samplers.</p>	<p>Solution Science</p>  <p>Magnetic force has enabled different solutions to microplastics. One solution is to improve the PET recycling process by adding magnetic nanoparticles to the plastic during recycling. Another solution is to use a compound called ferrofluid to attract microplastics present in a liquid and then use a magnet to manipulate the ferrofluid and remove the microplastics from the liquid.</p>	<p>Solution Science</p>  <p>The bacterium <i>Ideonella sakaiensis</i> is able to feed on PET polymer to survive. This bacterium decomposes plastic in just a few days, because the enzyme it produces, PETase, decomposes this type of plastic. A new genetically modified version of this enzyme, called FAST-PETase, has been discovered, which is very advantageous for large-scale production and recycling of plastic, which is cheap, fast and environmentally friendly.</p>
<p>Solution Garbage Collection</p>  <p>In addition to being aware of the effects of microplastics on the environment, it is necessary to put into practice the act of reducing the consumption of products considered necessary.</p>	<p>Solution Garbage Collection</p>  <p>In addition to being aware of the effects of microplastics on the environment, it is necessary to put into practice the act of reusing packaging and other products, renewing their uses as much as possible, increasing their useful life and delaying their disposal.</p>	<p>Solution Garbage Collection</p>  <p>In addition to being aware of the effects of microplastics on the environment, it is necessary to put into practice the act of refusing to consume unnecessary or superfluous products.</p>	<p>Solution Scientific Disclosure</p>  <p>Working with scientific texts and news involving the use and effects of plastic at school can encourage new research and actions in local communities by students, in addition to raising awareness in the citizenship education of students.</p>



Solution


Scientific Disclosure



Public Policies focused on Scientific Dissemination to society, associated with actions, are essential to communicate about the effects of plastic on the environment and what can be done to prevent pollution resulting from plastic.

Solution


Scientific Disclosure



Non-formal teaching spaces, such as museums, are essential for presenting in a didactic and interactive way the effects of microplastic pollution, the role of Science and the attitudes that we can implement in our daily lives to prevent this pollution from occurring.

Solution


Public Representation



Public Policies focused on Scientific Dissemination to society, associated with actions, are essential to communicate about the effects of plastic on the environment and what can be done to prevent pollution resulting from plastic.

Solution


Public Representation



Public Policies focused on investing in ecopoints in cities significantly help to reduce improper disposal and increase the recycling of materials.

Solution


Public Representation



Public policies focused on limiting plastic production and encouraging reuse and recycling are necessary to prevent improper disposal of plastic.

Solution

Medicine



People need to be monitored to better understand the effects of microplastics and their increasingly present presence in the body.

Solution


Medicine



People need to be monitored to better understand the effects of microplastics and their increasingly present presence in the body.

Solution


Medicine



People need to be monitored to better understand the effects of microplastics and their increasingly present presence in the body.

Solution

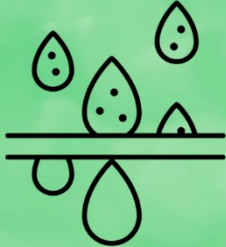
Chemistry



An alternative to plastics that come from petrochemical polymers is the production of bioplastics, which come from renewable raw materials such as biopolymers based on starch and cellulose, which are also biodegradable.

Solution


Chemistry



For efficient water treatment to remove microplastics, water treatment is required through coagulation, flocculation, sedimentation and filtration processes using the Jar Test and using the coagulants tannin and polyaluminium chloride (PAC).

Solution

Chemistry



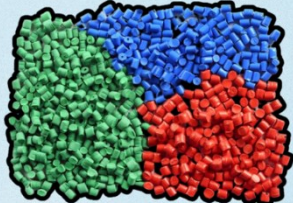
There is a huge need to eliminate microspheres from personal care and cosmetic products that contain them, such as exfoliants, for example, since when they are released into nature there is a huge dispersion of them.


PACIFIC OCEAN

2

Pellets

Polyethylene





ATLANTIC OCEAN

1

Pellets

Polypropylene





PACIFIC OCEAN

2

Synthetic Clothing

Polyethylene Terephthalate





ATLANTIC OCEAN

2

Synthetic Clothing

Polyethylene Terephthalate





INDIAN OCEAN

2

Synthetic Clothing

Polyethylene Terephthalate





ARCTIC OCEAN

2

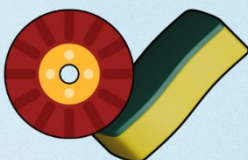





































Synthetic Clothing

Tereftalato de Polietileno







<div><div>ATLANTIC OCEAN</div><div>1</div></div> <div><div>Cleaning Abrasives</div><div>Polyurethane</div><div></div><div></div></div>	<div><div>ARCTIC OCEAN</div><div>1</div></div> <div><div>Personal Hygiene Products</div><div>Polyethylene</div><div></div><div></div></div>	<div><div>PACIFIC OCEAN</div><div>2</div></div> <div><div>Personal Hygiene Products</div><div>Polyethylene</div><div></div><div></div></div>	<div><div>INDIAN OCEAN</div><div>2</div></div> <div><div>Synthetic Clothing</div><div>Polyethylene Terephthalate</div><div></div><div></div></div>	<div><div>AMERICA</div><div>2</div></div> <div><div>Civil Construction</div><div>Polyethylene - High Density</div><div></div><div></div></div>
<div><div>EUROPE</div><div>1</div></div> <div><div>Civil Construction</div><div>Polyethylene - Low Density</div><div></div><div></div></div>	<div><div>ASIA</div><div>2</div></div> <div><div>Civil Construction</div><div>Polychloroethene</div><div></div><div></div></div>	<div><div>AMERICA</div><div>2</div></div> <div><div>Food Packaging</div><div>Polypropylene</div><div></div><div></div></div>	<div><div>ASIA</div><div>2</div></div> <div><div>Food Packaging</div><div>Poly(lactic Acid (PLA)</div><div></div><div></div></div>	<div><div>AFRICA</div><div>1</div></div> <div><div>Food Packaging</div><div>Polyethylene</div><div></div><div></div></div>
<div><div>EUROPE</div><div>2</div></div> <div><div>Food Packaging</div><div>Poly(lactic Acid (PLA)</div><div></div><div></div></div>	<div><div>AMERICA</div><div>2</div></div> <div><div>Food Packaging</div><div>Polyethylene Terephthalate</div><div></div><div></div></div>	<div><div>AFRICA</div><div>2</div></div> <div><div>Household Utensils</div><div>Polypropylene</div><div></div><div></div></div>	<div><div>OCEANIA</div><div>2</div></div> <div><div>Household Utensils</div><div>Polypropylene</div><div></div><div></div></div>	<div><div>ASIA</div><div>2</div></div> <div><div>Cars and Auto Parts</div><div>Polypropylene</div><div></div><div></div></div>
<div><div>OCEANIA</div><div>2</div></div> <div><div>Cars and Auto Parts</div><div>Polyethylene - High Density</div><div></div><div></div></div>	<div><div>AMERICA</div><div>2</div></div> <div><div>Agriculture</div><div>Polyethylene - Low Density</div><div></div><div></div></div>	<div><div>AMERICA</div><div>1</div></div> <div><div>Hygiene and Cleaning</div><div>Polyethylene - High Density</div><div></div><div></div></div>	<div><div>ASIA</div><div>2</div></div> <div><div>Disposables</div><div>Polyethylene - Low Density</div><div></div><div></div></div>	

