

The WECF Plastic Tool

A hands-on tool
for environmental
education in
schools, youth work,
and more



Let's stop the
**PLASTIC
FLOOD:
JOIN
IN!**





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WECF e.V. (Women Engage for a Common Future e.V.) is a network of women's and environmental organisations in 70 countries working for a healthy environment. We aim to strengthen feminist leadership and gender equality in the field of sustainability. Our focus areas are sustainable development, climate and environmental protection, and a toxic-free future. With our activities in capacity building, policy advocacy, and awareness raising, we strengthen the position of women worldwide and protect the environment and health.

WECF is a member of Exit Plastic and #BreakFreeFromPlastic



#BreakFreeFromPlastic

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PREFACE

It cannot be overlooked: We are suffocating in plastic. Packaging, containers for take-away food, clothing and cosmetics are just few of the everyday items through which we encounter plastic. Over 450 million tonnes of plastic are produced worldwide every year. In 1950, it was 1.5 tonnes. The highly increased and still increasing production, application, and use of plastic contribute to climate change, as the production of plastic requires a lot of energy and has high CO₂ emissions. We are littering our beautiful planet with rubbish and jeopardising our health. This is because plastic contains many chemicals that are harmful to the environment and our health.

A good overview of facts and figures on a world full of plastics is provided, for example, by the Plastic Atlas¹, which we have also used here in our tool as a source of information. It shows that consumers are not the main contributors to the plastic crisis: The profit motive of many companies results in the constant expansion of areas in which plastic is used, thereby producing more plastic and increasing sales. So far, politicians have hardly set any limits on the mass production of plastic. Even though some types of plastic bags and the distribution of single-use plastic, such as drinking straws, have been banned in Germany since 2022, these steps in the right direction are still insufficient.

The only solution is drastically reducing plastic production. Consumers must, therefore, use their behaviour to call on politicians and companies to dramatically reduce the mass production and use of plastic. The production is expected to double by 2040, and the concentration of plastic in the oceans could quadruple by 2050². To counteract this, education on the topic of plastic is urgently needed. An important target group is young people.

Our Plastic Tool draws attention to plastic and shows the various aspects of plastic madness from production to landfill. The Plastic Tool can be used to pass on knowledge about harmful substances in plastic products and how to avoid plastic to protect our environment and health.

Around 20 million tonnes of plastics are produced and used/wasted annually in Germany. The majority of this is packaging waste³. There are many starting points and ideas for saving ourselves and the world from the (further) flood of plastic. Ultimately, the scale of the crisis also shows that we need to set out to make a change. This is why we want to start with the plastic tool in schools and work with young people; knowledge and understanding are the prerequisites for being able to act.

THIS IS HOW TO USE THE PLASTIC TOOL

WECF's 'Plastic Tool' can be used by teachers and people working with children and young people in general to sensitise young people to the topic of plastic. It is geared towards the learning levels of children and young people between the ages of 10 and 16, corresponding to grades 5-6, 7-8 and 9-10. The interactive activities are easily adaptable and can also be used for younger children and lower grades. Even though the texts and speeches are aimed at pupils and teachers, the Plastic Tool can be used in other contexts, such as youth work.

The tool is divided into eight different teaching units.

Each lesson consists of a theoretical part and a part with interactive and playful tasks to consolidate background knowledge. The activities last between five and 30 minutes and can be carried out individually, as a complete unit or in any combination. They are each labelled with an age recommendation and estimated duration so teachers can appropriately combine the activities/games for lessons or substitute lessons.

Materials and learning objectives

This tool contains valuable information on the topic of plastics as well as exercise materials. The pages in Appendix 10 are intended as copy templates. After 'knowledge blocks' are read and the activity is done, educators and teachers are encouraged to continue the discussion.

ACTIVITY 1: Life cycle of plastic – production, use, and recycling

- **Age recommendation:** 11-16 years
 - **Task:** Arrange pictures showing the different stages of the life cycle of a plastic cup in the right order.
 - **Material:** Pictures to print out (once or per group; Appendix 10.1)
- **Learning objective:** To understand the life cycle of plastic using the example of a cup;
Think about the life cycle of plastic and illustrate it.

ACTIVITY 2: The use

- **Age recommendation:** 11-16 years
 - **Task:** Explain different terms without using specific keywords (Cf. 'Taboo' game)
 - **Material:** 'Taboo' cards to print out (per group; Appendix 10.2)
- **Learning objective:** Recognise plastic in everyday use

ACTIVITY 3: Plastic and its effects

- **Age recommendation:** 14-16 years
 - **Task:** Find the correct answers to the quiz questions
 - **Material:** Printed quiz cards, pens (per group) / digital quiz cards on the projector (Appendix 10.3)
- **Learning objective:** To become aware of the chemicals in plastic; to think about the effects of plastic on our health

ACTIVITY 4: Plastic and environmental pollution

- **Age recommendation:** 11-16 years
 - **Task:** Create posters that can be hung up at school
 - **Material:** 2-6 large sheets of paper, crayons in different colours, craft supplies, and photos to print out (Appendix 10.4)
- **Learning objective:** Take a critical look at plastic in everyday life; discuss the environmental dangers of plastic

MATERIALS AND LEARNING OBJECTIVES

ACTIVITY 5: Avoiding plastic- alternatives and sustainable solutions

- **Age recommendation:** 11-13 years
- **Task:** Write down the plastic products you have recently thrown away on the 'Hunt for Plastic' lists.
- **Material:** 1-2 'Hunt for plastic' sheets (per group; appendix 10.5)
- **Learning objective:** Take a critical look at your plastic behaviour; integrate the findings into everyday behaviour

ACTIVITY 6: Plastic-free bingo

- **Age recommendation:** 11-16 years
- **Task:** The pupils receive bingo cards with everyday plastic items and are asked to actively look for sustainable alternatives that avoid the use of plastic.
- **Material:** Bingo cards (Appendix 10.6)
- **Learning objective:** Knowledge about the connection between environmental and health problems and plastic; find ways of avoiding plastic

ACTIVITY 7: Plastic-free reusable packaging

- **Age recommendation:** 11-13 years
- **Task:** Find the correct pairs of disposable and reusable products in the memory game
- **Material:** Memory cards to print out (per group; Appendix 10.6)
- **Learning objective:** To become aware of the sustainable alternatives; to raise awareness of plastic avoidance

ACTIVITY 8: Gender-based effects of plastic

- **Altersempfehlung:** 13-16 years
- **Task:** Do you agree with the different statements about plastic and gender?
- **Material:** none
- **Learning objective:** Recognise the connections between plastic and gender

ACTIVITY 9: My 'super person'

- **Age recommendation:** 13-16 years
- **Task:** Create a poster of your politically engaged 'super-person'
- **Material:** Paper and coloured pencils
- **Learning objective:** Recognise opportunities for political engagement; form your own opinion

ACTIVITY 10: My 'environmental debate'

- **Age recommendation:** 13-16 years
- **Task:** Create a poster of your politically engaged 'super-person'
- **Material:** Paper and coloured pencils
- **Learning objective:** Recognise opportunities for political engagement; form your own opinion



WHAT IS
PLASTIC?

1 WHAT IS PLASTIC?

1.1 ICEBREAKER: What does the word 'plastic' remind me of?

The word 'plastic' is the colloquial term for plastics of all kinds and refers to a wide variety of synthetic or chemical substances that can be moulded or shaped into different forms. With many products that we use every day, we don't even think about the fact that they are made of plastic. We often have plastic bags, plastic containers, etc. in mind. However, we are often unaware that plastic includes textiles made from synthetic fibres, such as polyester, or is found in our cosmetics. Plastic can be found almost everywhere. Question to the group: What do I think of when I hear the word 'plastic'?

Online	In class
Each student sends an emoji in the chat	Each student says a word / writes a word on a piece of paper, which is then read aloud

Then start an exchange, e.g. using the following questions:

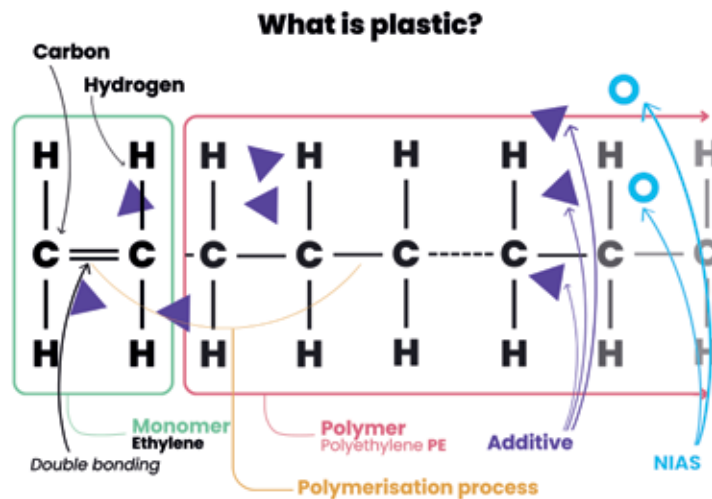
- Was a word/group/emoji mentioned more than once?
- Are there differences and/or similarities?

What is plastic?

→ Plastic is a material and a product.

1.2 Production of plastic

The plastic used to make our bottles, clothes, packaging and mobile phones is made from fossil fuels such as gas or oil. It consists mainly of two chemical elements: carbon, which is found in natural gas and crude oil, and hydrogen, the most common element in the universe. Both elements are linked together in plastic to form a long chain. This is what makes plastic so stable. Additional chemicals can give plastic certain properties.⁴



Source: Heinrich-Böll-Stiftung, Plastik, Müll & ich (adapted)

A brief history of plastic

The first plastic was introduced in 1862. It was called 'Parkesine' - after its inventor Alexander Parkes, who derived it from cellulose. Forty years later, in 1907, Leo Hendrik Baekeland invented 'Bakelite', the first plastic that was produced purely synthetically. It was both durable and heat-resistant. Five years later, in 1912, Fritz Klatte patented a plastic called 'Polyvinyl Chloride', better known as PVC or vinyl. The discovery that chlorine, a waste product from the production of caustic soda, could be used as a cheap raw material for PVC led to the mass production of PVC, which continues to this day. Although it has become increasingly recognised that PVC production is harmful to the environment and health, the petrochemical industry continues to make a huge profit from PVC. PVC has become the most important plastic in a wide range of household and industrial products.

Polyethylene was invented in the 1930s and used to make drinks bottles, shopping bags and food containers. Another plastic with the properties of polyethylene was invented in 1954 by the chemist Giulio Natta.

Polypropylene became popular in the 1950s and is still used today for a range of everyday products such as packaging, child seats, and pipes. Plastic became central to the lifestyle of that era. It was considered chic, clean, and modern. It displaced conventional products and penetrated all areas of life. Today, PVC, polyethylene and polypropylene are among the most widely used plastics in the world.⁵

How is plastic made? A little bit of chemistry for understanding

To convert crude oil into plastic, it is heated to very high temperatures using a lot of energy and then cooled quickly to crack the hydrocarbon molecules in the crude oil. The result is small particles known as monomers. In Greek, 'mono' means 'one', and méros means part, (i.e. one part). Monomers include ethylene, propylene, vinyl chloride and bisphenol. The monomer ethylene (ethene), for example, consists of two carbons connected via a double bond and four hydrogen atoms. Two hydrogen atoms are attached to each of the carbon atoms. Again, with a lot of energy, the carbon double bonds are opened, and the monomers attach themselves to each other in a chain reaction to form a very long molecular chain, a polymer. This process is known as polymerisation - 'poly' means 'a lot'.

What are additives in plastic?

During further processing, other chemicals, known as additives, are added to the polymer. These give the end product, (e.g. a plastic air mattress), specific properties such as flexibility, colour, stability against UV rays or make it flame-retardant. When plastic is exposed to the sun or high temperatures, for example, it becomes brittle and fragile. To protect it, UV protection substances are added. Light-coloured plastic base materials can be coloured by adding dyes or pigments to make colourful bottles, building blocks, figures, etc. Some pigments are harmless, but many are dangerous or too little is known about their properties. Plasticisers, (e.g. from the phthalate group), are used to make plastic flexible.

Additives such as plasticisers, UV stabilisers and flame retardants can easily be released from the plastic because they are not firmly bound. This allows them to enter the environment and the human body. Many additives are harmful to the environment and human health. Plasticisers, for example, can have hormonal effects. If they enter the body, they can disrupt its hormonal balance, which is important for physical development processes.

This can lead to the development of diseases. In other words, plastic not only accumulates as trash, but it also makes us ill.

1 WHAT IS PLASTIC?

Every plastic also contains many other chemical substances that are either contained in the base material as impurities or are incorporated during polymerisation. The process was briefly discussed previously. These are known as non-intentional added substances, or NIAS for short.

1.3 Recycling

The life cycle of plastic ranges from production and use (next chapter) to disposal and recycling.

Recycling is presented to us as the solution for dealing with plastic waste. We are taught to separate waste at school, work and our homes. Recycling is presented as the primary strategy, often even a priority, over avoiding plastic. However, avoiding plastic and the associated reduction in production is the only solution that can free us from the flood of plastic in the long term. Unfortunately, as already mentioned, recycling is generally seen as the way to help solve the plastic crisis, even though much of the material has yet to be reused. For example, only 17.4% of the plastic waste collected in Germany in 2023 became recyclable plastic material. The turnover is so low, partly due to the challenging requirements of the recycling process. There is a misconception that all plastics are the same and can be recycled in the same place. However, a prerequisite for recycling is that plastics of different compositions are separated in advance.

Why plastic recycling is not a solution

There are many different types of plastic. In Germany, symbols on the packaging indicate what type of plastic it is. Each type of plastic requires its own recycling method. Some plastic objects consist of several types of plastic that are bonded together and are, therefore, difficult or impossible to recycle. This is the case, for example, with toothpaste tubes (nine different layers of plastic!) or chip bags⁶.

Recycling is expensive, energy-intensive, and requires a certain infrastructure (lorries, factories, machines, etc.). Until now, a lot of plastic waste has been exported to other countries for recycling. These countries often lack the necessary safe disposal structures, leading to thousands of tonnes of German plastic waste ending up in huge landfill sites, bodies of water, or improperly incinerated. All of these can have serious health, environmental, and social consequences.

Plastic waste is also not infinitely recyclable. If plastic is recycled once, twice or three times, the quality deteriorates. Polymer chains break apart every time they are heated. For example, the plastic that makes up our water bottles can be recycled a maximum of 7 times. After that, it cannot be reused because it is badly damaged. In addition, the added chemicals can be released when plastic is recycled. **The solution is, therefore, to avoid plastic wherever possible.**

1.4 ACTIVITY 1: Life cycle of plastic – production, use and recycling

We take plastic so much for granted in our lives that we sometimes forget that we used to be able to do without it. How is it that so many products today are made of plastic? How is it produced? What happens to plastic when we no longer need it?

In the following exercise, the life cycle of a plastic cup is illustrated in various pictures, which need to be put in the right order.

Life cycle of plastic products: Arrange the pictures in the right order

Duration: 15–20 min (+ 5–10 min further discussion)

Participants: Groups of 4–8 pupils; alternatively: whole class; recommended age: 11–16 years

Objectives: To understand and illustrate the life cycle of plastic using the example of a cup

Material: Pictures (Appendix 10.1) for each group

Preparation: For different groups: Each group receives all the pictures and should put them in the correct order; alternatively with the whole class: write numbers from 1 to 10 on the board as a timeline; hang the different pictures loosely on the board with magnets

How to proceed

- 1) The pictures represent different stages of the production, use, and disposal of a plastic cup. The aim is to understand the pictures and put them in the right order.
- 2) Group work: Have the students discuss in groups what the different pictures represent, and in which order they should be arranged. Whole class: Take any picture and ask the pupils what it represents. When the correct answer has been found, ask which number in the life of the cup the picture corresponds to; as soon as a picture is correctly assigned, move on to the next one.
- 3) Group work: After a certain time, a group can present their result and the correct solution is shown and discussed (e.g. on the board).

DISCUSSION

- What objects do you see in the classroom that are made of plastic?
- Which plastic products do you use frequently but only for a short time?
- Can you name alternatives to plastic?
- What is plastic made of?
- Where can we find plastic?
- In which century was plastic invented?

1 WHAT IS PLASTIC?

Can plastics be recycled?



Polyethylen terephthalat (PET)

Recyclable, but harmful substances!

Examples: Beverage bottles (primarily disposable); food packaging

Tip: Avoid!

Alternatives: Unpackaged, glass bottles



Polyethylen (PE-HD / PE-LD)

Recyclable, but can disrupt the endocrine system (PE-HD) and pollute the environment.

Examples: Detergent bottles, shampoo bottles, yoghurt pots, etc.

Tip: Questionable; therefore, avoid!

Alternatives: Many without plastic



Polyvinyl chlorid (PVC)

Recyclable but highly toxic!

Examples: Floor coverings, shower curtains, packaging, cable insulation, swimming tyres

Tip: Avoid at all costs!



Polypropylene (PP)

Recyclable, but pollutes the environment.

Examples: Plastic bags, transparent packaging films and containers (e.g for sweet wrappers, protein bars, etc.)

Tip: Avoid if possible!

Alternatives: Numerous without plastic



Polystyrene (PS)

Difficult or impossible to recycle. Pollutes the environment.

Examples: Styrofoam, yoghurt pots, clothes hangers, plastic cutlery

Tip: Avoid!

Alternatives: Numerous without plastic



Other (O)

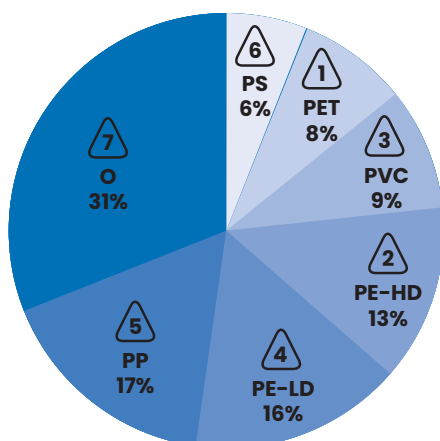
Other (O), Polycarbonate (PC)

Difficult to recycle.

Examples: Sausage and cheese packaging, fruit and vegetable peelings, toothpaste tubes, mobile phones

Tip: Very questionable; therefore, avoid!

Which types of plastic are most common?



2 THE USE

2.1 Where is plastic hiding?

Plastic can be found everywhere today; it is used in toys, cards, clothing, skin creams, etc. It is the third most common manufactured material after cement and steel. Since its invention, more than eight billion tonnes of it have been produced.⁷

Everyday products - plastic everywhere

Plastics or synthetic materials are found in almost all everyday products, even where we don't necessarily see them at first glance: textiles, cosmetics, mobile phones, toys, rainproof clothing, takeaway food containers and much more. We often don't even notice when plastics replace former non-plastic materials - such as tea bags or drinking bottles. Although tea bags are traditionally made from paper, manufacturers are increasingly switching to plastics or mixtures of plastic and paper, resulting in billions of micro- and nano-plastics being released in a cup of tea. In the case of drinking bottles, glass bottles have often been replaced by plastic bottles, which can also release plastic chemicals into drinks. Two product groups that contain a lot of plastic, including harmful chemicals, are explained in more detail below.

Cosmetics

More than a hundred ingredients in cosmetics are made of plastic! It's not about cans or lids but about what's inside. Anti-caking agents make powder more airy and easier to spread; glitter shines and reflects light thanks to microplastics; plastic exfoliating particles help to cleanse the skin mechanically, etc.

Plastic substances that are also listed on the packaging include PVP, Styrene, VP/VA, Acrylates, Co-polymer, Cross polymer, Nylon, Butylene, Carbomer, Dimethicone, Methacrylate, Ethylene, Methyl, Methacrylate, Copolymer, Polyacrylamide, Polyacrylate, Polypropylene, Polyurethane, Polyvinyl, Propylene, Tetrafluoroethylene, Vinyl Acetate, etc. Try to avoid products containing these substances.

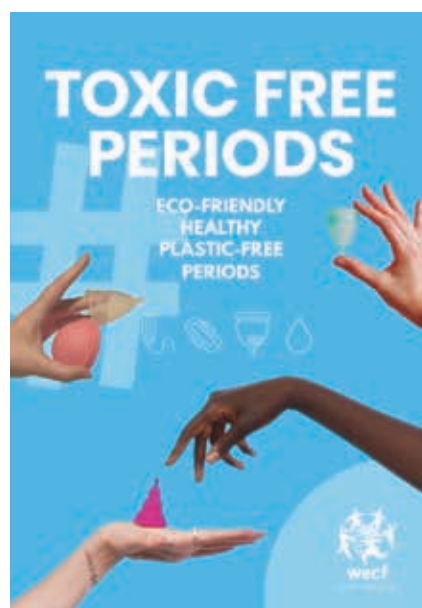
If you are in the drugstore, watch out! The ingredients are often written in a tiny print on the label. Some shopping trolleys have a magnifying glass that you can use.

Menstrual products

On average, menstruating women consume 180 kilograms of menstrual products during their lifetime. This amount of waste is a significant problem for the environment. Less obvious, but just as important: menstrual products are also a problem for our health. Some are made of up to 90% petroleum-based plastics and can contain dangerous chemicals such as bisphenols, phthalates, parabens, dioxins, etc., which have been linked to the development of numerous diseases.

Used conventional tampons and menstrual pads are not recyclable and must be disposed of in residual waste. There is plastic in every pad or tampon, in the product itself and/or in the packaging. The plastic components in a menstrual pad or tampon applicator take more than a hundred years to decompose.

→ Further information on toxic-free menstruation:
WECF menstruation brochure (<https://www.wecf.org/wp-content/uploads/2020/10/ToxicFreePeriods-low-res.pdf>)



2.2 ACTIVITY 2: The use

It is often not immediately recognisable that a product contains plastic, as it can take many forms. Various playing cards include the names of objects that contain plastic. Similar to the game 'Taboo', the pupils have to explain the terms they are looking for without using certain words that are also on the card and are taboo. The other pupils have to guess the term.

Taboo: Explain the requested terms without mentioning specific keywords

Duration: 20 min (+ 5-10 min further discussion)

Participants: Several groups of approx. 4 people each; recommended age: 11-16 years

Objectives: To show through the 'taboo' game that many objects around us contain plastic

Material: 'Taboo' cards to print out (appendix 10.2); stopwatch, if necessary

Preparation: One pupil in each group starts with the first term, the other pupils in the group from the group guess; alternatively: two teams play against each other; each team has 5 cards

How to proceed

- 1) Each team chooses a person to explain the first term.
- 2) The terms are written on cards, which also contain words that must not be used when explaining the target term.
- 3) If a pupil guesses the term they are looking for, they receive the card and may explain the next term. Alternatively: the teacher can use a stopwatch. As soon as the stopwatch starts running, the person who is supposed to explain the word must take a card from the draw pile. Once the term has been guessed, the game moves on to the next one until the time is up (30 seconds).

QUESTION: What do all the terms in the taboo game have in common? → They all refer to products that contain plastic.

DISCUSSION

- How much plastic is in our clothes?
Look at the label on your item of clothing. What material is it made of?
→ Polyester, polyamide, polyacrylic, nylon, etc. = all plastic!
→ 60% of our clothing contains polyester, and 15% of global plastic production is textiles.
- How often do you buy a new item of clothing? Do you pay attention to the material?
- Were there any surprises regarding plastic in the game?
- What would be alternatives to the products in the game?
- Would you choose a plastic alternative? Yes/No - Why?
- Is anyone already consciously avoiding plastic?
- Is the paper bag a plastic alternative?
- What is your opinion on the use of glitter? Yes/No - Why?

3



Plastic
as a health
HAZARD



3 PLASTIC AS A HEALTH HAZARD

3.1 Additives in plastic

There is a problem: plastic lasts for a long time – too long. Today, scientists find traces of plastic everywhere: in the soil we cultivate, in the air we breathe, in the water we drink, in the rain and even in the human body. Plastic remains and spreads everywhere. What makes it useful is precisely what makes it harmful: plastic is a very resistant material. It lasts a long time and, therefore, takes hundreds or even thousands of years to degrade in nature.

As mentioned above, chemicals that manufacturers add are called 'additives'. They give plastic its various properties. Our everyday objects are interspersed with many additives, several harmful to health. Some examples are listed here:

- **Phthalates** are synthetic compounds that are used as additives in a huge number of everyday products. Phthalates are used to make plastics flexible, e.g. in shower curtains, flip-flops and PVC flooring.
Potential health effects: Reproductive disorders, obesity, insulin resistance, asthma, attention deficit disorder and hyperactivity disorders.
- Many plastics contain **flame retardants** to reduce the flammability of products. This is used in computers, textiles, etc. Brominated flame retardants are particularly dangerous.
Potential health effects: Reduced IQ and hyperactivity in children, cancer, hormone damage and reduced fertility.
- Polyfluorinated and perfluorinated compounds – **PFAS** – consist of a group of more than 9,000 chemical substances that are used for their oil, adhesive, or dirt-repellent properties in a variety of products such as outdoor clothing, takeaway containers, and coated cookware. The problem is that they are durable and can hardly be removed from the environment. The longevity is why they are also known as 'eternal chemicals.'
Potential health effects: kidney and testicular cancer, increased cholesterol, reduced fertility, low birth weight, thyroid problems and reduced immune response to vaccines in children.

3.2 Microplastic

Microplastics are plastic particles between five millimetres and one-thousandth of a millimetre in size. Particles or fibres that are smaller than 0.001 millimetres are called nano-plastics. Primary microplastics are produced deliberately, for example, as beads for skin exfoliants. Secondary microplastics are decomposition products, such as abrasions from car tyres.

Microplastics also find their way into the human body: they have already been detected in the lungs and placenta.

3.3 Why is plastic dangerous to health?

During production:

- Because of the additives = often harmful substances are added to plastics that can harm our health or the environment.
- Because of the polymers = very long molecular chains and the basic building block for plastic.
- Because of NIAS = unintentional chemical substances contained in plastics. Most of them are unknown and can, therefore, have unpredictable effects on humans and the environment. They are particularly dangerous if they are toxic and persistent, therefore remaining in the environment for a very long time.

3 PLASTIC AS A HEALTH HAZARD

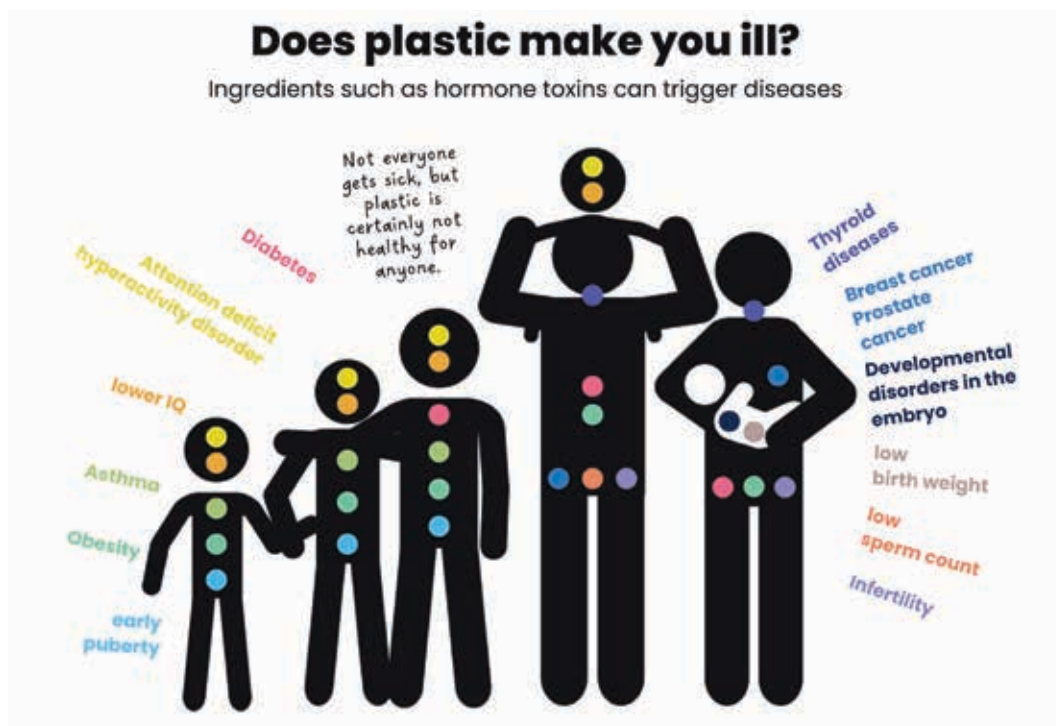
During use:

- Due to evaporation = small particles are released from the plastic, enter the air and become gaseous. For example, chemical particles escape from carpets, textiles and plastic objects. These end up in the indoor air and dust, entering the body when inhaled.
- Due to migration = small particles dissolve in liquids. Small amounts of unwanted chemical particles can enter the body when drinking from a plastic bottle or other plastic objects.

During decay:

- Because of the attraction = in the sea, plastic particles can attract harmful chemicals like magnets, which then attach themselves to the plastic.
- Microplastic = plastic breaks down into smaller and smaller plastic particles, which in turn can get everywhere.

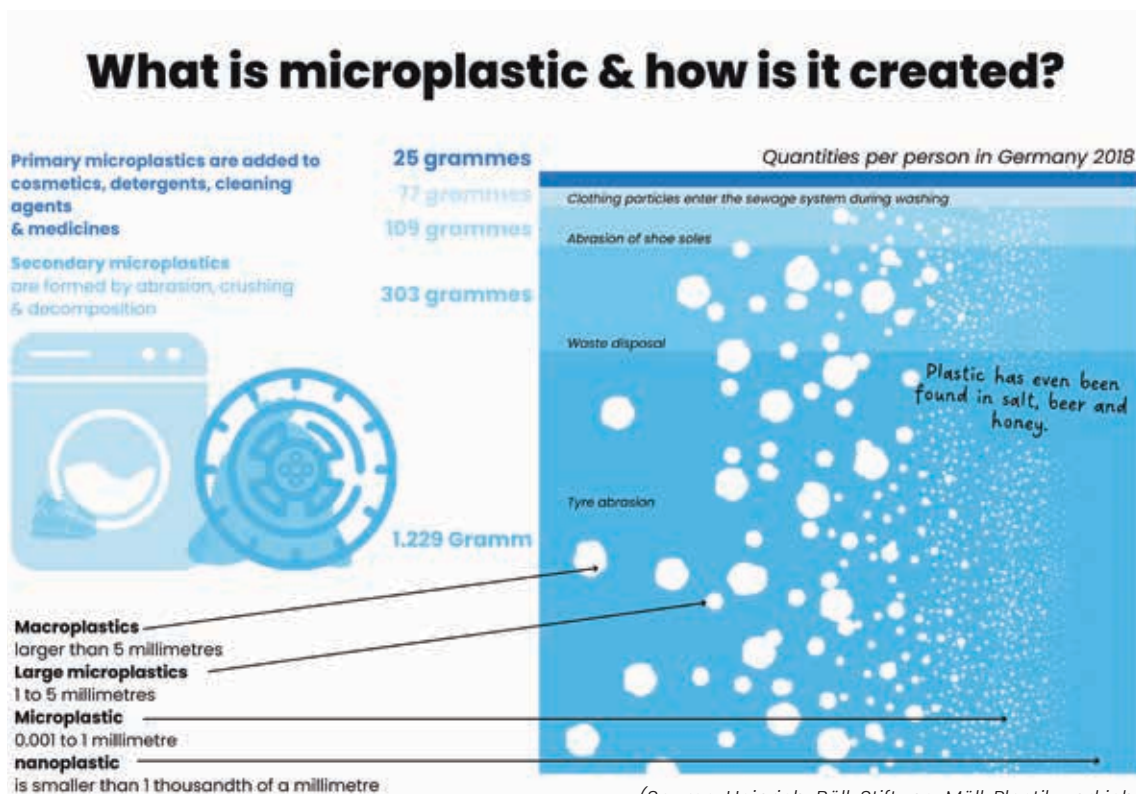
A study of around 2,700 children and adolescents between the ages of three and 17 found that all those tested had plastic-related chemicals in their bodies, some in concentrations at which health risks cannot be ruled out.⁸



(Source: Heinrich-Böll-Stiftung, Müll, Plastik und ich)

QUIZ AND DISCUSSION

- How much plastic do we consume per week through our food? (Slightly less than 1 gram / 3 grams / 5 grams)
→ Solution: about 5 grams per week = weight of a credit card⁹
- Do you think that's a lot or a little? Is it surprising for you?
- What do you think? How does plastic get into our food?
- What is the problem if plastic gets into your body?



3.4 Activity 3: Plastic and its impact

Plastic products can affect our environment and health in many different ways. A quiz can be used to determine what the pupils know and what they have memorised from the previous lessons.

QUIZ: What impact does plastic have on the environment and health?

Note: Some quiz questions relate to content covered in the following chapter.

Duration: 20 min (+ 5-10 min further discussion)

Participants: Groups of approx. 4 people each; alternatively with the whole class; recommended age: 14-16 years

Aims: To find out which chemicals can be found in plastic and how they affect the environment and health

Material: Printed quiz cards (Appendix 10.3) for each group or digital quiz cards

Preparation: All groups play against each other

How to proceed. Execution:

1. Each group appoints a 'quiz master' who receives the printed cards.
Alternatively: The teacher shows the quiz cards to the whole class using a projector.
2. The quiz questions are read out one after the other by the 'quiz master' or the teacher and discussed together.
- 3.a. Group work: The group agrees on a solution and marks the answer.
When all the quiz cards have been answered, the teacher indicates the correct solutions.
- 3.b. Whole class: The pupils come forward and suggest a solution; the teacher then indicates the correct answer.

3 PLASTICS AS A HEALTH HAZARD

Solutions:

- How much plastic do we consume per week through our food?
→ 5 grams
- What does NIAS stand for?
→ Chemical substances unintentionally contained in plastics
- Which of the following diseases has a possible link to plastic?
→ All of them
- Why is plastic dangerous for our health? (2 correct answers)
→ Because of the polymers = a very long molecular chain and the basic building block for plastic; because of the additives = substances that are added to the plastics. Both can have harmful properties.
- How much plastic ends up in the world's oceans every minute?
→ 1 full rubbish lorry/trash truck
- How big is the Great Pacific Garbage Patch?
→ 4 1/2 times the size of Germany
- Where have scientists already found traces of plastic?
→ everywhere
- When plastic breaks down, small plastic particles remain. What do you call them?
→ Microplastics
- PFAS (polyfluorinated and perfluorinated compounds) are chemicals that are harmful to health. What properties do PFAS not have?
→ Elastic properties
- Please name 1-3 products in which phthalates can be found.
→ Shampoo, shower gel, toothpaste, sun cream, hair spray/gel, perfume, deodorant, nail polish, eyelash and eyebrow paint, tubes, wallpaper, plastic mats, toys, PVC floor coverings, vinyl wallpaper, furnishings, plastic shoes, rainwear, food packaging, paints, etc.



**PLASTIC
AND ENVIRONMENTAL
POLLUTION**

4 PLASTIC AND ENVIRONMENTAL POLLUTION

4.1 The environmental impact of plastic

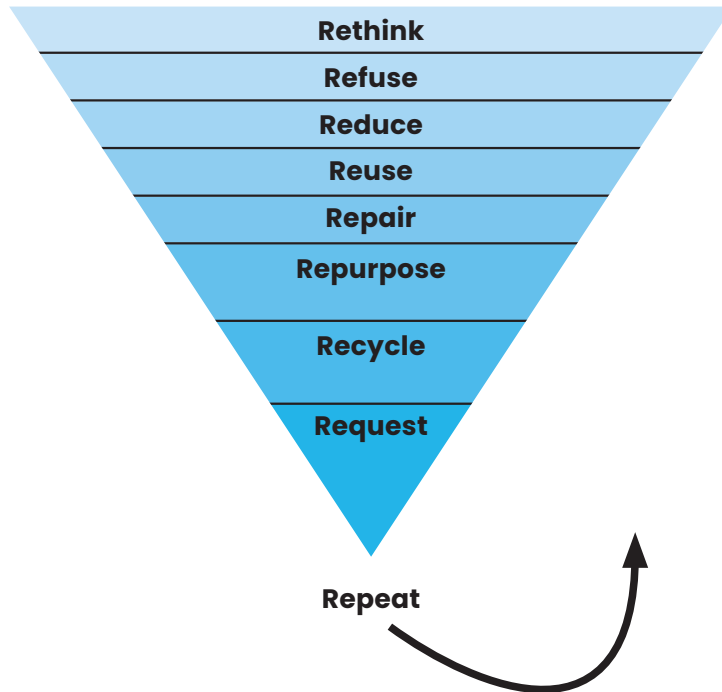
What is the Great Pacific Garbage Patch?

The Great Pacific Garbage Patch is the largest of the oceanic rubbish patches. It is located in the North Pacific and covers an area four times the size of Germany. Much of the 'plastic soup' floats below the sea's surface, so its actual dimensions are even larger.¹⁰

In Germany, around 40 kg of plastic packaging per inhabitant ends up in the rubbish every year. Each person consumes an average of 81 kilograms of plastic per year.¹¹ Multiplied by the size of Germany's population, this huge amount of plastic needs to be disposed of, recycled and handled. The total annual amount of plastic waste in Germany is over six million tonnes¹² – that is equivalent to the weight of 600 Eiffel Towers. Hence, there is an urgent need to find other solutions.



The 9R-Principle



- 1. Rethink:** Critically rethink your (consumption) behavior and try to consume and use fewer and fewer plastic products.
- 2. Refuse:** Avoid plastic that is unnecessary. Say no to a plastic bag in the store, bring your own bag or your straw to the restaurant, etc. Avoid food take-away. The packaging is usually made of plastic, and paper packaging is often treated with harmful chemicals to make the packaging water and grease repellent.
- 3. Reduce:** Reduce your plastic consumption (use a reusable drinking bottle, if possible not made of plastic, instead of a disposable bottle, etc.).
- 4. Reuse:** Reuse containers instead of throwing them away.
- 5. Repair:** Repair broken items instead of buying new ones.
- 6. Repurpose:** Find new uses for items. Rinse out a glass container from the supermarket that was used for pickled vegetables, for example, and then fill it with cereal to take to school, for example.
- 7. Recycling** is at the bottom of the pyramid if none of the previous steps are possible or applicable.
- 8. Request:** Ask that political decision-makers better regulate plastic production.
- 9. Repeat:** Repeat this thought process regularly, and for as many products and objects as possible. You will see that it becomes easier and easier for you to implement different steps. It just takes a little practice and habit.

4 PLASTIC AND ENVIRONMENTAL POLLUTION

4.2 ACTIVITY 4: Plastic and environmental pollution

The answer to the following question reveals a particularly alarming fact: How much plastic ends up in the world's oceans every minute? (one dustbin / six dustbins / one full lorry)

→ One full lorry/garbage truck.

It is estimated that plastic production will triple by 2050. Without drastic political measures to reduce plastic consumption, six rubbish lorries worth of plastic waste could end up in the sea every minute by 2050.¹³ It is therefore important to motivate as many people as possible to act on the issue. In the following exercise, the pupils can get creative and design posters on the topic of plastic to hang up in school. This will provide food for thought for other peers.

Illustrate the environmental pollution caused by plastic on various posters.

Duration: 30–60 min

Participants: Divide the class into 2–3 groups; recommended age: 11–16 years

Objectives: To illustrate the impact of plastic use on the environment and health; create 2–4 posters that can be hung up in the school

Materials:

- 2–6 large sheets of paper
- Coloured pencils in different colours, various craft supplies
- Photos to print out (Appendix 10.4)

Preparation:

- Divide the class into groups
- Distribute sheets of paper and printed pictures to the groups, then decide on different themes for the individual posters (in discussion with the pupils or determined by the teacher, e.g. 'Plastics are uncool because ...', 'Plastics are cool, but ...')

How to proceed:

1. Creativity is required: the pupils can write, draw, stick things on the sheets of paper, etc. The aim is to create a poster with which the pupils can draw attention to the use of plastic throughout the school.
2. Some rules: write short, precise texts; write large so that the poster can be seen from a distance; use images that are available; give free rein to your creativity.
3. The groups then present their posters to the class.

AVOIDING 5



PLASTIC

5 AVOIDING PLASTIC

5.1 Alternatives and sustainable solutions. Plastic myths

Myth 1: What is packaged in plastic is more hygienic and cleaner

That's true - in part. At least with food that is transported over long distances, the plastic packaging prevents mould spores from forming and contamination that could cause illness. That sounds great at first, but in reality, many types of fruit and vegetables, for example, already have their own protective layer (bananas, cucumbers, kohlrabi, apples, pears, etc.). They don't need the extra protection of plastic. If you buy loose fruit, you can rinse it with hot water to remove anything on the skin.

It is also claimed that plastic chopping boards contain less bacteria than wooden boards, but this is only sometimes the case. There are types of wood that inhibit bacterial growth. These include pine and oak, in particular. Poplar, on the other hand, is not recommended.

What this myth completely ignores: Packaging can introduce chemical ingredients into our food that can be hazardous to our health. So, does packaging protect against contamination?

Myth 2: Plastic is recyclable

As already mentioned in Chapter 2.1, this is not really true.

QUESTION: Think of all the plastic that has ever been produced worldwide. How much of it has been recycled? Just give the percentage.

→ Answer: 9 %

In Germany, of the 5.2 million tonnes of plastic waste generated in 2017, just 810,000 tonnes were recycled. This corresponds to a rate of 15.6%.¹⁴

There is also the effect of downcycling. This is a process in which plastic waste is converted into a new product of lower quality or value. For example, a plastic bottle is not recycled into another bottle but processed into a plastic item of lower value or quality. The material has not been returned to its original purpose.

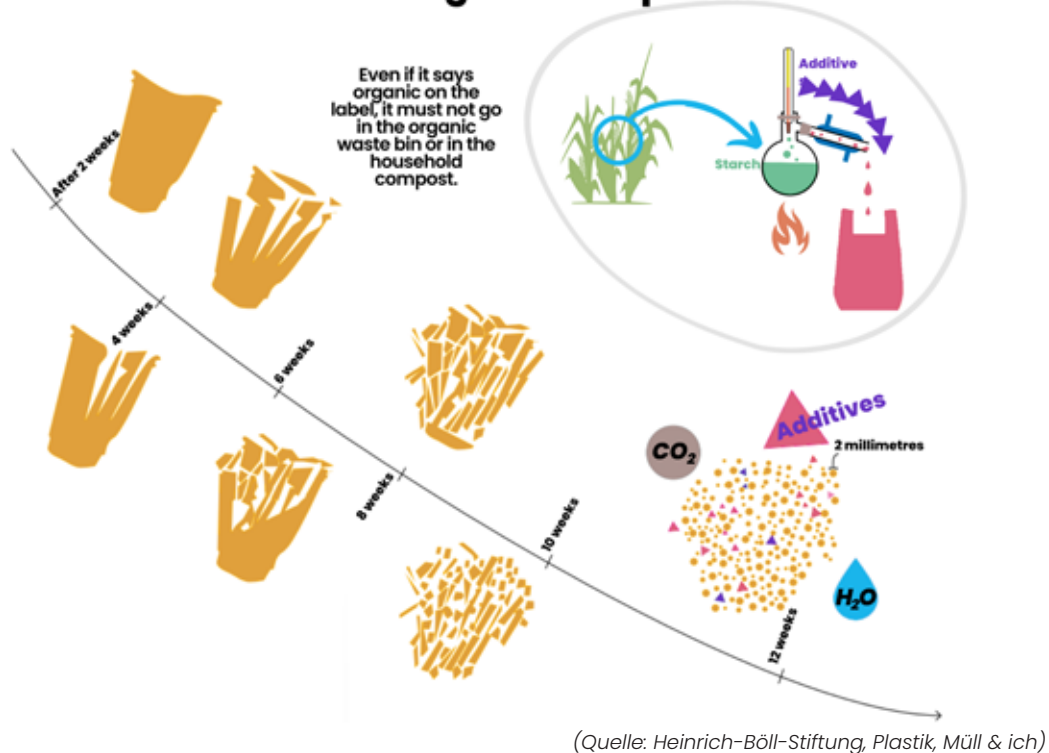
Is bioplastic really a solution?

Biodegradable plastics leave behind residues.

'Biodegradable' is an EU-wide certification. This means that in industrial composting plants, only 10% of the residue may be larger than two millimetres after twelve weeks. Whether these residues are then degraded over a certain period or under certain conditions remains unclear. In an industrial composting plant, 'biodegradable' plastic is broken down into CO₂ and water under the influence of oxygen. This plastic can contain harmful additives, which are also found in compost.

Plants such as maize can also be used to produce plastic. The agricultural land used to grow maize is then unavailable for food production. There are not enough fields in the world to grow the raw materials required for all the plastics currently being produced and food.

Is there "biodegradable" plastic?



5.2 ACTIVITY 5: Avoiding plastic – alternatives and sustainable solutions

Plastic is used everywhere and for everything. It is often only used for a short time, for example, as packaging. Do we need so much plastic?

Answer the questions on a slip of paper: How much plastic do I use? Was any of the plastic I used unnecessary?

Duration: 15-20 min

Participants: Groups of 4-8 people each; recommended age: 11-13 years

Objectives: To deal with one's own plastic behaviour; to reduce plastic waste at school and at home

Material: 'Hunt for plastic' sheets (Appendix 10.5), either 1-2 times per group or for each student

Preparation: Give each group 1-2 sheets

How to proceed:

1. Each student or group receives the printed sheet 'Hunting for plastic'.
2. The groups can limit themselves to specific areas, e.g. list of my plastic waste at school/ at home/in my free time/etc.
3. The students make a list of all the plastic they throw in the trash and assess whether the purchase or use was necessary, and whether it could be dispensed with or reused.
4. The students discuss the completed lists and what they could do to avoid plastic in the schoolyard, in the canteen, in the classroom, at home, etc. What can be dispensed with? Is there a plastic-free alternative?

5 AVOIDING PLASTIC

DISCUSSION

- What type of plastic should be avoided the most?
- What would be an alternative?
- What have the students already done to reduce plastic waste?
- Can this activity be continued in any way?

5.3 ACTIVITY 6: Plastic-free bingo

Plastic-Free Bingo is an interactive and educational activity that makes pupils aware of the environmental and health problems caused by using plastic. It enables them to recognise more sustainable alternatives and take action to protect the environment and their health. In this game, pupils are given bingo cards with common plastic items, and their task is to actively search for plastic-free alternatives.

Duration: One day, one week or any period you prefer

Participants: Students by themselves; recommended age: 11-16 years

Objectives: To educate pupils about the environmental and health problems associated with plastics and encourage them to find alternatives to common plastic products.

Material: Bingo cards to print out (Appendix 10.6)

Preparation: Print out one bingo card per pupil.

How to proceed:

1. Give each pupil a bingo card at the beginning of the activity.
2. Set a time limit (e.g. one day, one week or any period of time), within which the game is played. The aim is to complete as many tasks on the bingo card squares as possible.
3. If the pupils successfully do without a plastic item or choose a more sustainable alternative, they should mark the corresponding field on their bingo card and write the date in the corresponding fields.
4. After the game, bring all the students together to discuss their experiences. Talk about the challenges they faced, the alternatives they discovered, and how their choices can contribute to reducing plastic use and waste and its impact on the environment and health.

DISCUSSION

- What types of plastic waste can, and should, we avoid?
- What are alternatives to the products in the game?
- Is there anyone who is consciously avoiding plastic?
- Were there any surprises? Were the pupils aware of where plastic is found?
- Is a paper bag an alternative to plastic? What does it take to make a paper bag?
- Why is it important to save on packaging, etc.? (Consumption of raw materials, energy costs, chemical exposure, overburdening the planet...)
- What have the pupils already done to reduce plastic waste?
- How can this campaign be continued?

6

Pollutant-free
REUSABLE
instead of single-
use plastic



6 POLLUTANT-FREE, REUSABLE INSTEAD OF SINGLE-USE PLASTIC

6.1 Reusables to avoid plastic waste

What exactly is behind reusable packaging? Why is it useful?

Reusable containers, preferably not made of plastic, are practical because they can be filled with anything, rinsed, and reused. Very often, reusable containers don't have to be bought separately but are automatically provided when you purchase products like pesto, jam, or pickles in a jar. Of course, other reusable products exist, such as cloth bags, water bottles, wax cloths, or towels.

One well-known reusable system is the deposit-return system in Germany. When a bottle of lemonade is bought in the supermarket, a deposit must be paid at the time of purchase, which is refunded when the empty bottle is returned. The drink containers are collected, cleaned and refilled, and glass bottles can be used up to 50 times. Of course, plastic and aluminium products can also be returned to the system, but they are not always easy to rinse. The softer plastic, in particular, is shredded and recycled elsewhere. Firmer plastic bottles can be reused, but not as often as glass bottles. Therefore, even with the official deposit system, it is better to choose materials without plastic and to prefer reusable products.

Good to know: Since 1 January 2023, takeaway food may no longer be served in disposable plastic packaging alone. Anyone offering it must have a reusable alternative ready. However, this can also be made of plastic. Please ask! The ban on single-use bags with a wall thickness of 15 to 50 micrometres has been in place since 2022. Shirt bags (e.g. for fruit) are still permitted, though we think this is unnecessary.

Many single-use plastic products have been banned in the EU since 3 July 2021. These include drinking straws, stirrers, balloon sticks and disposable tableware made from conventional plastic and 'bioplastics'. To-go cups and disposable polystyrene containers may also no longer be produced and sold in the EU.

Social injustice around plastic

A major problem with using reusable options such as refill stations, and packaging-free shopping options (such as markets, unpackaged shops, or even direct delivery services) is that the goods are often relatively expensive and, therefore, not affordable to everyone. A policy change could help here. For example, by subsidising plastic-free and unpackaged goods or, conversely, taxing goods containing plastic and packaged goods, especially disposable products. Fruits and vegetables without plastic, especially if they are 'organic', are often much more expensive than those packaged in plastic. Even items such as hairbrushes, wooden spoons or toys made from plastic are often much cheaper than alternatives made from natural materials such as wood. However, buying seasonal and/or unpackaged food or second-hand items can make finding good, plastic-free products at more affordable prices possible.

Injustice is not only present in product selection but also in production and disposal. Factories for producing products such as plastic are often not located in Germany but in countries such as China or Indonesia. Therefore, the people there have to live with the hazards associated with production, such as air pollution or dirty wastewater.

Countries in the Global North export their waste to countries in the Global South. This has given rise to the term 'waste colonialism', against which affected countries are beginning to defend themselves. Germany does not 'recycle' a large portion of its plastic waste but exports it to third countries, mainly in Asia. There, the waste is often not recycled but incinerated or it ends up in

POLLUTANT-FREE REUSABLE INSTEAD OF SINGLE-USE PLASTIC

landfills or even the sea. Since China imposed an import ban on plastic waste in 2018, waste is increasingly being disposed of in Malaysia. Germany is the third largest exporter of plastic waste to Asia, after the USA and Japan. The Mediterranean and North Sea figures show that Germany is a major contributor to marine littering. Plastic does not stop at national borders or waterways. Once in the water, microplastics can also accumulate in groundwater and drinking water.

Exporting waste is not a sustainable or fair solution; just because the waste is no longer in Germany does not mean that it no longer exists. In recent decades, the trade in plastic waste has led to vast amounts of waste accumulation in countries in the Global South. And, of course, the waste also contains hazardous substances in landfill sites.

Good to know: The export of unsorted plastic waste from the European Union to non-OECD countries has been banned since January 2021, as agreed by the 187 signatory states to the UN Basel Convention.

The industry is currently proclaiming chemical recycling as a solution to reduce plastic waste. However, this costs a lot of energy, and little is known about its environmental and health impact.

6.2 ACTIVITY 7: Plastic-free reusable packaging

After completing the previous exercises, it is more apparent that recycling is not the solution to the plastic problem and can even be dangerous with some added chemicals. Therefore, the real solution is to use no plastic or at least as little plastic as possible (e.g. you don't need a plastic bag when buying bananas) or to use alternatives that can be used several times. The sustainable alternative to plastic straws is not paper straws. The most sustainable alternative is to avoid some products altogether. However, if necessary, you should use products not made of plastic, such as glass, metal or wood.

The following memory game matches pairs of plastic products and alternatives made from sustainable materials.

Memory: Find the matching pairs

Duration: 20 min

Participants: Groups of 4 people; recommended age: 11-13 years

Objectives: By finding the matching pairs of disposable and reusable products, the pupils learn about alternatives to plastic

Material: Memory cards to print out for each group (Appendix 10.7)

Preparation: Each group receives a copy of the memory cards

How to proceed:

1. The memory cards are placed upside down on the table or floor. One pupil starts and chooses two cards to turn over. If the pairs match, the pupil may take and keep the cards and turn over two more cards, and so on. If the two cards do not match, it is the next pupil's turn.
2. Whoever has the most cards at the end wins; afterwards, there is a discussion about whether the reusable products are already known and have been used before.

7 & GENDER PLASTIC



7.1 The different gender-based effects of plastic

Women are often more affected by the negative effects of plastic than men. This is partly due to biological differences: Their bodies react differently to toxins. In general, women have more fatty tissue than men. This is relevant because toxic chemicals from plastic are more easily stored in fatty tissue. In addition, women are more affected by hormonal changes than men due to their cyclical biorhythm - from the day of their first period to menopause. Women are, therefore, more affected by chemical exposure to plastic chemicals that have hormonal effects. But that's not all: in reality, women come into contact with these plastic components more frequently than men in their everyday lives.¹⁵

Housework, caring for children, and looking after people are tasks that still fall on the shoulders of women in most societies worldwide, including ours. Women are often exposed to products with high plastic content and, therefore, also to a large amount of chemicals typical of plastics, such as plasticisers, PFAS or flame retardants. Socially transmitted images of a certain ideal of female beauty, which is still widespread in advertising, mean that women and girls use more personal care and cosmetic products than men. As a result, they come into more contact with chemical substances from the plastic packaging or the product itself, such as BPA or phthalates.

A very good example of women's particular exposure to plastic products is menstrual health. As mentioned, tampons and disposable sanitary towels often have high plastic content.

Note on gender categories

In our tool, 'women' and 'men' are biologically categorised as binary in terms of organs, hormones and other physical characteristics (i.e. cisgender-specific). We are aware that the findings listed here may also affect other genders or gender identities. However, there is virtually no scientific evidence available on the specific effects of harmful substances on intersex people and transgender people.

7 GENDER AND PLASTIC

7.2 ACTIVITY 8: Gender-based effects of plastic

After you have given a brief input on the connection between gender and plastic, you can repeat various pieces of information in the statements below. The pupils position themselves in the room depending on whether they agree or disagree with the statement. The statements are then discussed in the group.

Position yourselves in the room: Do you agree with the statements on gender and plastic?

Duration: 20 min

Participants: Entire class; recommended age: 13-16 years

Objectives: To recognise the connections between plastic and gender.

Material: None

Preparation: Organise the room so that the group has enough space to move around.

How to proceed:

1. Stand in the centre of the room and read the statements below out loud.
2. Ask the students to position themselves on one side or the other side of the room, depending on whether they agree or disagree with the statement (e.g. window side = 'I agree', door side = 'I disagree').
3. After the statement has been read out and the students have positioned themselves, ask one person from each side to give an argument in favour of their position.
4. Each participant can switch sides as often as they like during the debate. They can then explain what justified their new position.

Statements:

- Men and women are not affected differently by plastics.
- Women are generally more affected by chemical pollution from plastic components.
- Men come into contact with plastic components more frequently than women.
- Housework and caring for other people are tasks that in most societies around the world fall on the shoulders of women.
- Gender-specific social expectations can lead one group to consume more personal care products.

8

POLITICAL ENGAGEMENT



8 POLITICAL ENGAGEMENT

8.1 How can I take action?

Plastics and Policy

The plastic problem has gradually become part of political debates. Laws such as the ban on some single-use plastic products, the export ban on plastic waste and the obligation to offer reusable food to go are steps in the right direction. However, they are probably still far from enough to stop the flood of plastic and pollution of plastic chemicals. The United Nations Environment Programme (UNEP) sees pollution, including plastic and chemical pollution, as the third major environmental crisis of our time alongside climate change and the loss of biodiversity. This is why UNEP has given states the mandate to negotiate a global agreement in 2022 to end plastic pollution.

Political commitment is important, because ultimately it is up to politicians to set the limits so that we and our communities do not drown in plastics.

Elections are important

Most students may not yet be of voting age, but it's never too early to take an interest in political and social issues. Elections are probably the best-known instrument for making a difference in politics: In many cities, officials and their parties make their stance on environmental protection clear. All citizens have the right to vote and stand for election. This means that every pupil can stand for election and cast their vote. Pupils can also enter into dialogue with politicians: at demonstrations or by email, anyone can communicate their demands for less plastic.

Start a petition

You can start a petition. A petition brings people's concerns to politicians. At the federal and state level, there is a Petitions Committee that discusses all petitions received. If at least 50,000 people support the petition, it is examined by the Petitions Committee. If it is declared valid by the Committee, it is forwarded to the state or federal government. At the municipal level, petitions can be addressed to the city's Environmental Department or the mayor. Forms for petitions at the state level can be found on the websites of the state parliaments. Once you have started a petition, you need to arouse the interest of many people. There are also petition platforms such as Change.org and OpenPetition.de in Germany. This is how it works in Germany, but other countries are likely to have similar systems. Nevertheless, we encourage you to check which sites are available in your country.

Demonstrations and boycott

In most cities and municipalities, there are groups that campaign for better climate protection, for example, through demonstrations. The 'Fridays for Future' demonstrations are known for being organised by young people. Boycotts are also an effective way of making a difference. Consumers have a lot of power and can influence product policy: if people stop buying certain products, these products gradually disappear from the range. In the best-case scenario, companies start to rethink their products and the composition of their production.

You don't understand why a product is excessively or unnecessarily packaged? Stop buying it and explain to those around you why you have made this decision. If others also stop buying the product, manufacturers and retailers may have to react.

Join an environmental organisation

Clubs, associations and non-governmental organizations (NGOs) campaign for specific interests such as environmental and climate protection. WECF, Greenpeace, WWF, BUND, NABU and many other organizations are committed to reducing plastic and have their own chapters in many cities. WECF, for example, campaigns for political measures to regulate harmful chemicals in plastic and thus for better health and environmental protection.

8.2 ACTIVITY 9: My 'super person'

If you want to make a difference on the issues of plastic, it is important to get involved politically. Although consumers can influence the market through sustainable purchasing behaviour, politicians need to take action to make fundamental changes to our plastic use. They must ask themselves: Why don't we curb plastic production, which is so harmful to the environment and health? From citizens' initiatives to association work, there are specific tips for gaining political commitment. There are simple ways to get involved in favour of less plastic and more environmental, health and climate protection.

Duration: 20 min

Participants: Groups of 4 people; recommended age: 13-16 years

Objectives: To recognise the possibilities for (own) political engagement

Material: Papers and coloured pencils for drawing

Preparation: Hand out one A4 or A3 sheet of paper per group.

How to proceed:

1. Each group is given a sheet of paper and various coloured pencils.
2. The groups are given 10-15 minutes to draw an imaginary person. The person does a lot to get politically involved and this should be recognisable in the drawing. For example, the person leads a sustainable life, is politically or socially active, etc. There are no limits to creativity here (e.g. the person can also have superpowers).
3. After completing the drawing, each group is given time to introduce their 'super person'.

Subsequent question: Is my fictional person a role model for me? Can I adopt any attributes from this person?

DISCUSSION

- Has anyone ever taken part in a political debate? What was argued for or against?
- Has anyone ever considered getting involved in politics? If so, on which topics?

8 POLITICAL ENGAGEMENT

8.3 ACTIVITY 10: Environmental debate

Organising environmental debates is an effective way to engage students in discussions about the problems of plastic consumption, its impact on the environment and health, as well as gender aspects and possible solutions.

Duration: 30–40 minutes

Participants: Groups of 2 to 3 students for one topic/debate

Objectives: To encourage students to critically analyse and discuss different aspects of the use of plastics, and to enable them to exchange arguments and discuss them constructively.

Material: List of discussion topics on the subject of plastics, timer or stopwatch, research material (which can also be found online)

Preparation:

- Choose discussion topics that revolve around questions about plastic. Some example topics could be: 'Should all plastic bags be banned?', 'Is recycling a real solution to the plastic problem?', 'To what extent are gender aspects important in the discussion about plastic?' 'How could the use of plastic products and packaging be reduced?', 'Is it acceptable for plastic waste to be shipped to other countries in Africa or Asia?' 'What is so practical about plastic and what is the danger? What are the alternatives to plastic?'
- Set some guidelines and rules for the debate format (e.g. do not interrupt others, raise your hand to comment or ask a question and respect the order of raised hands, ensure equal speaking time - especially between different genders, respect each other's opinions)

How to proceed:

1. Choose the topic: Assign each discussion team a specific plastics-related topic to research and prepare arguments on. Make sure that the topics are balanced so that the teams can argue for and against the topic.
2. Research and preparation: Give the teams sufficient time to research the topic assigned to them, gather relevant information and prepare their arguments. This step may include creating a structured case with supporting evidence.
3. Format guidelines: Explain to the students the format of the debates, including the speaking time limit, the order of speakers and the rebuttal. You can also assign different roles to the students so that they represent a political party, a company, a non-governmental organisation, a civil person, etc.
4. Discussion and reflection: After each debate, have a discussion with the students about the main points raised by the teams. Discuss the merits of each argument and encourage students to think about the problems associated with plastic and possible solutions.

DISKUSSION

- Has anyone ever taken part in a political debate? What was discussed?
- Has anyone ever thought about getting involved in politics? If so, in what form and on what topics?



OUTLOOK

9

9 OUTLOOK

9.1 And now: The Plastic Challenge!

In our plastic tool, we looked at many aspects of the topic of plastic. What happens now?

We have come up with a little challenge for you:
a plastic-free day!

Try not to buy or use plastic for a day and invite your family, friends and others to join in. Which of you will succeed in this challenge?

Everyday life has many plastic pitfalls in store. We have compiled them in a booklet so that you can watch out for them.

A day without plastic - is that possible?



(<http://www.wecf.org/de/ein-tag-plastikfrei/>)

9.2 Conclusion

To raise awareness, asking the students what they have discovered and learnt while working with the Plastic Tool is essential. On the one hand, it is related to the plastic problem in general and on the other hand, it is related to their plastic consumption. It's not about scaring the children and young people. Instead, it is about educating and showing them how to deal with plastic and its ingredients.

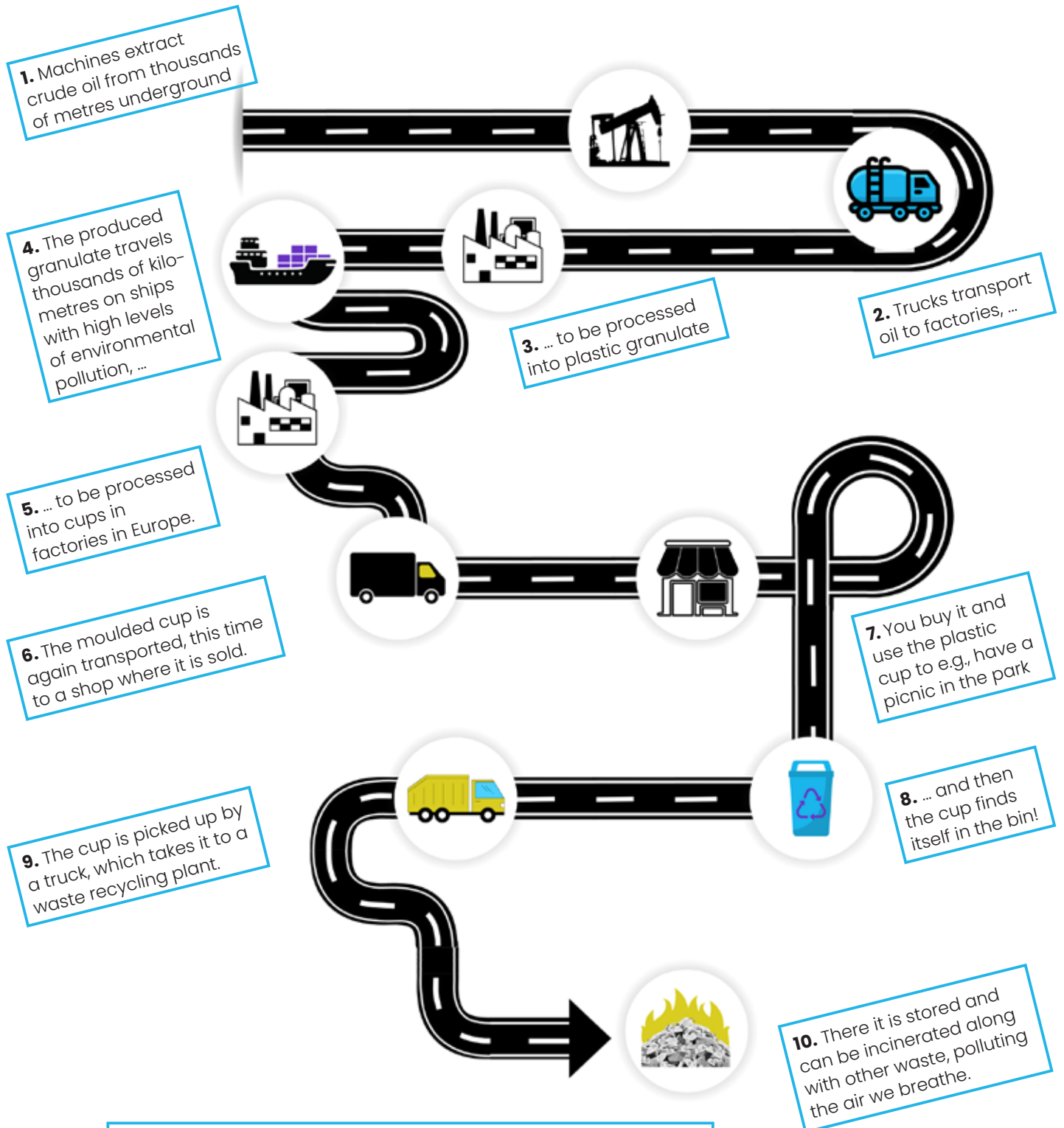
We hope that addressing the topic of plastic and its ingredients will inspire people to think about it and take action. Plastic is a problem on a global scale with many impacts on our own lives. To stop pollution, politicians and industries must find sustainable solutions. However, to protect yourself from hazardous ingredients and produce less waste, there are ideas that each person can use for themselves or approaches that make a difference in places where people come together, such as schools.

Suggestions on how your school and your life can become more plastic-free may have already been collected during the 'Hunt for Plastic' activity. Now, it's about implementing these at school and in everyday life, such as water dispensers or less plastic packaging at school kiosks or cafeterias.

10 APPENDIX



You have to do a lot to produce plastic!














All that for a picnic?

Every second, 126 plastic cups are thrown away worldwide after being used once. A bit fast for an object that took months to make, travelled thousands of kilometres and takes thousands of years to disappear from the earth's surface,, don't you think?



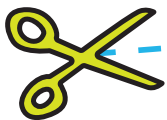
10.7 Activity 1

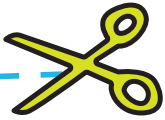
		
		
		
		

10.1 Activity 2



WET WIPES	TAMPONS	FLEECE
<p>Cleaning Bath Make-up</p> 	<p>Period Blood</p> 	<p>Cold Clothes Soft</p> 
SWIMSUIT	SKIN CREAM	TYRES
<p>Swimming Water Bikini</p> 	<p>Face Moisturising Dry</p> 	<p>Car Round</p> 
FACE MASKS	ADHESIVE TAPES	CHEWING GUM
<p>COVID-19 Hospital Mouth</p> 	<p>Transparent Crafting Package</p> 	<p>Candy Mint Mouth</p> 

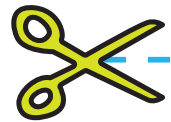




TEA BAG	PAPER CUP	NAIL POLISH
<p>Drinking Hot</p> 	<p>Container Beverage Disposable</p> 	<p>Colour Hands Beautiful</p> 
GIFT WRAPPING PAPER	SUN CREAM	GARBAGE
<p>Christmas Birthday Friends</p> 	<p>Summer Warm Beach</p> 	<p>Large Throw Waste</p> 
COAT HANGER	BUCKETS	LAUNDRY DETERGENT
<p>Clothes Wardrobe</p> 	<p>Cleaning Garden Water</p> 	<p>Clothing Clean Machine</p> 



10.1 Activity 2



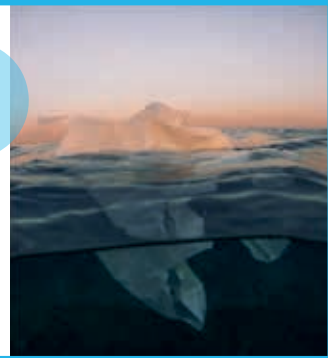


Quiz

How does plastic affect the environment and health?

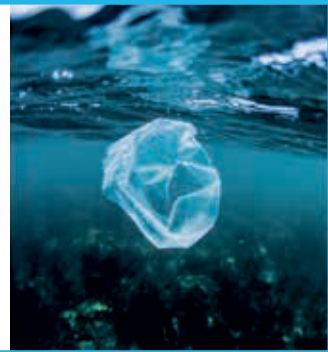
How much plastic do we consume per week through our food?

- a) Slightly less than 1 gram
- b) 3 grammes
- c) 5 grammes



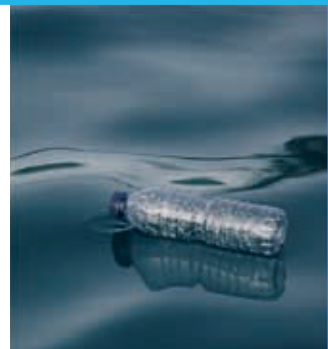
What does NIAS stand for?

- a) Chemical substances unintentionally contained in plastics
- b) Chemical substances intentionally contained in plastics
- c) Other substances unintentionally contained in plastics



Which of the following diseases may be linked to plastic?

- a) Diabetes
- b) Asthma
- c) Early puberty
- d) All of the above



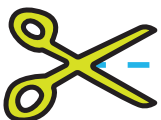
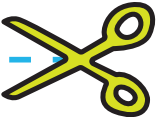
Why is plastic dangerous for our health?
(Two correct answers)

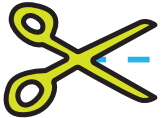
- a) About polymers = a very long molecular chain and the basic building block of plastics
- b) Antioxidants = substances found in plastics
- c) Additives = substances added to plastics



How much plastic enters the world's oceans every minute?

- a) 1 rubbish bin
- b) 6 rubbish bins
- c) 1 full lorry





How big is the Great Pacific Garbage Patch?

- a) As big as Germany
- b) Twice the size of Germany
- c) Four and a half times the size of Germany



Where have scientists already found traces of plastics?

- a) Soil
- b) Water
- c) Rain
- d) Air
- e) Human body
- f) All of the above



When plastic decomposes, small particles of plastic are left behind, what do you call them?

- a) Microplastics
- b) Minioplastics
- c) Monoplastics



What properties do PFAS not have?

- a) Oil repellent properties
- b) Dirt repellent properties
- c) Elastic properties

PFAS (polyfluorinated and perfluorinated compounds) are chemicals that are harmful to health.



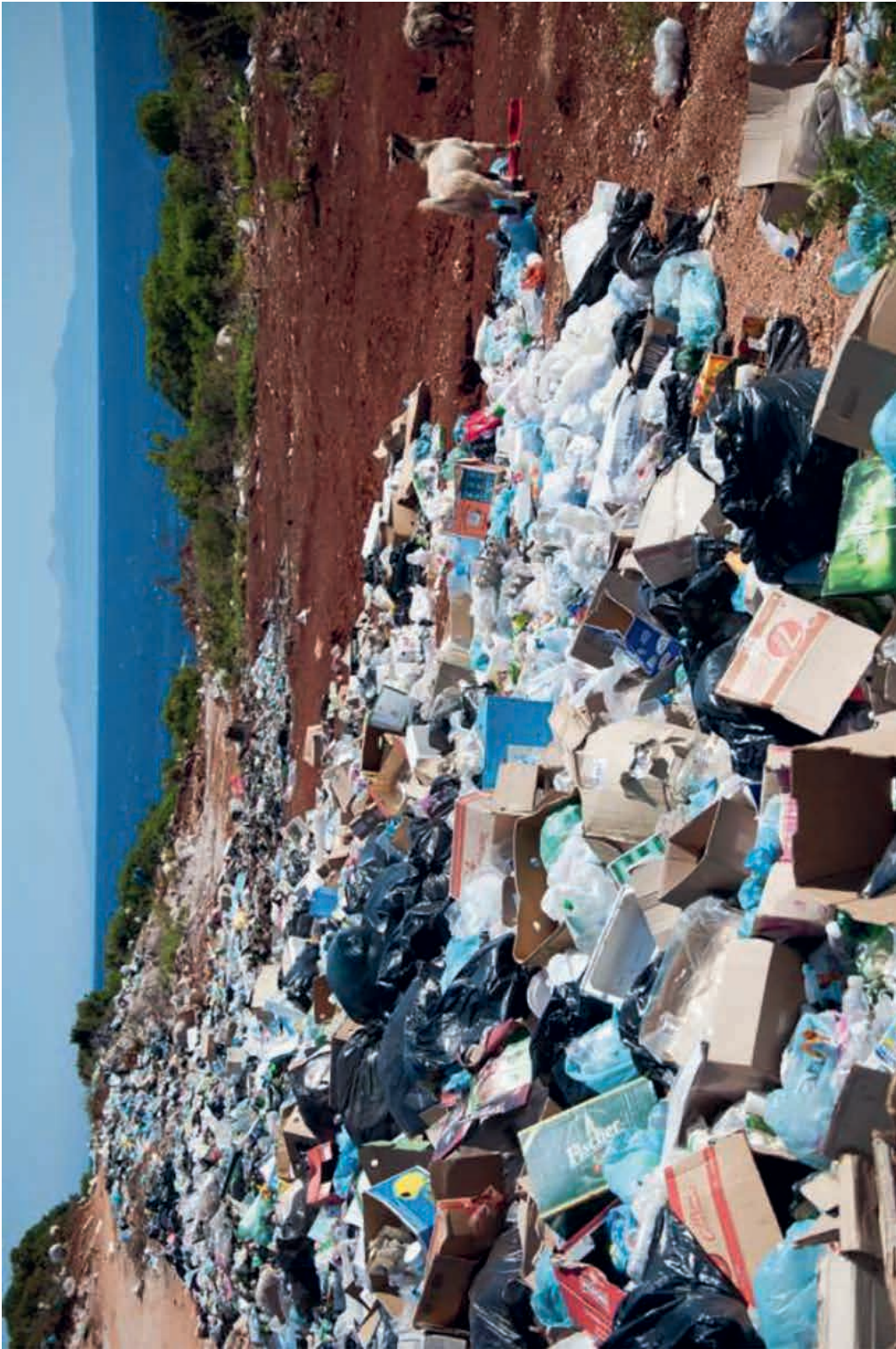
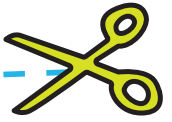
Phthalates are synthetic compounds that make plastics flexible.

Name 1-3 products that contain phthalates.









BINGO

Plastic-free

Let's take a step toward a more sustainable future.
Can you complete as many squares as possible by making
eco-friendly choices and reducing plastic use?
Write the date you completed a task in the white space.

Use a
reusable water
bottle

Bring your
own shopping
bag

Reuse
a plastic
straw

Pack a
plastic-free
lunch

Avoid plastic
packaging
when grocery
shopping

Use a
refillable coffee
or tea cup

Say no
to plastic
cutlery

Choose glass
or metal
containers
over plastic

Pick up litter
and dispose of it
properly

Recycle
plastic items
correctly

Use a cloth
or reusable
shopping bag

Switch to
a bamboo
or metal
toothbrush

Avoid
single-use
plastic
utensils

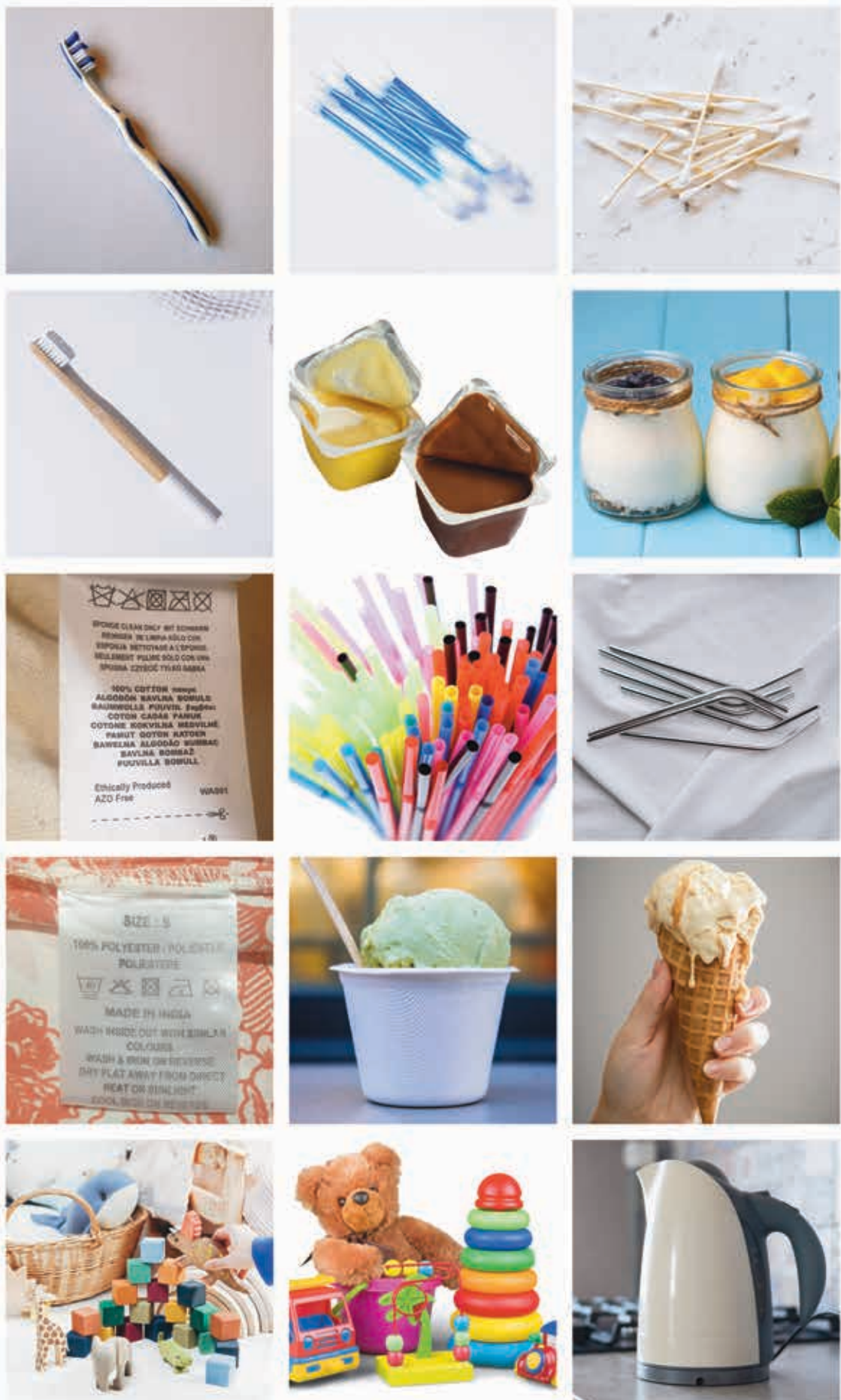
Choose
products with
minimal plastic
packaging

Refuse to
use plastic-
wrapped
produce

Upcycle or
repurpose a
plastic item into
something useful

Memory cards





10.1 Activity 7



Literature used (selection) and further information

- Gesund Trotz Klimawandel: Lebenswelt "Plastikfrei" (2023) <https://um-welt.org/project/plastikfrei/>
- Exit-Plastik: Wege aus der Plastikkrise (o.D.) www.exit-plastik.de
- HEAL, WECF: Die Plastikflut stoppen. Gesundheitsschädliche Chemikalien in Plastik, (2020) https://www.wecf.org/de/wp-content/uploads/2018/10/HEAL_Plastics_report_DE.pdf
- Heinrich-Böll-Stiftung: Plastik Atlas. Daten und Fakten für eine Welt ohne Kunststoff, (2019) <https://www.boell.de/de/plastikatlas>
- Heinrich-Böll-Stiftung: Plastik, Müll & ich, (2021) https://www.boell.de/sites/default/files/2021-08/210805_plastikbuch_download.pdf
- WECF: Gifffreie Menstruation, (2022) <https://www.wecf.org/de/wp-content/uploads/2022/02/Gifffreie-Menstruation-WECF-2022.pdf>
- WECF: Plastik, Umwelt und Gesundheit, (o. D.) <https://www.wecf.org/de/plastik-umwelt-und-gesundheit/>
- WECF: Nestbau, Plastik – hier, dort, überall! Leider mit Nebenwirkungen (2022) <https://nestbau.info/plastik/>

Footnotes (resources in original language of publication)

- 1 Heinrich-Böll-Stiftung: Plastic Atlas. Data and facts for a world without plastic (2019), Seite 10f. <https://www.boell.de/de/plastikatlas>
- 2 Alfred-Wegener-Institut, WWF: The impacts of plastic pollution in the oceans on marine species, biodiversity and ecosystems (2022) https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Plastik/WWF-Auswirkungen_von_Plastikverschmutzung_im_Ozean_auf_marine_Arten_Biodiversität_und_Ökosysteme.pdf
- 3 Statista: Plastic waste (2023) <https://de.statista.com/themen/4645/plastikmuell/#topicOverview>
- 4 Exit Plastic: Chemicals in Plastic (2021) https://exit-plastik.de/wp-content/uploads/2022/10/Positionspapier-Chemikalien-in-Plastik_Exit-Plastik.pdf
- 5 Heinrich-Böll-Stiftung: Plastic Atlas. Data and facts for a world without plastic (2019), Seite 10f.
- 6 Code Océan: Investigation into the heart of plastic pollution (o. D.) <https://codeocean.plasticodyssey.org>
- 7 Code Océan, op. cit.
- 8 Federal Environment Agency (ed.), Results report of the German Environmental Study on the Health of Children and Adolescents 2014–2017 (GerES V) (2023) https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/uug_02-2023_deutsche_umweltstudie_zur_gesundheit_von_kindern_und_jugendlichen_2014-2017.pdf
- 9 Heinrich-Böll-Stiftung: Plastic, Garbage & I (2021) <https://www.boell.de/de/pack-aus-plastikmuell-und-ich>
- 10 Heinrich-Böll-Stiftung: Plastic Atlas. Data and facts for a world without plastic (2019) <https://www.boell.de/de/plastikatlas>
- 11 Heinrich-Böll-Stiftung: Plastic, Garbage & I (2021) <https://www.boell.de/de/pack-aus-plastikmuell-und-ich>
- 12 Umweltbundesamt: Plastic Waste (2021) <https://www.umweltbundesamt.de/daten/ressourcen-abfall/verwertung-entsorgung-ausgewaehlter-abfallarten/kunststoffabfaelle#kunststoffe-produktion-verwendung-und-verwertung>
- 13 Alfred-Wegener-Institut, WWF, op. cit.
- 14 Heinrich-Böll-Stiftung: Plastic Atlas. Data and facts for a world without plastic (2019) <https://www.boell.de/de/plastikatlas>
- 15 WECF: Women and Chemicals. The impact of hazardous chemicals on women (2016) https://www.wecf.org/wp-content/uploads/2018/12/WomenAndChemicals_PublicationIWD2016.pdf

