



Workbook for participants #10

Interactive worksheets for distance learning



What's old is new

Reducing waste with upcycling, recycling and circular economies



Full name Group/class

Email address

Phone number Date



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Dear teachers and parents,

The following **workbook for participants** is part of the learning pack “What’s old is new – Reducing waste with upcycling, recycling and circular economies.” It is aimed at **students and project participants** working through this learning pack in online classes.

Instructions on using the learning pack should be issued by a **teacher**. Teachers can find further information on this as well as other learning packs at [➤ dw.com/learning-environment](https://www.dw.com/learning-environment)

Most worksheets require a program compatible with PDF files, such as [➤ Adobe PDF-Reader](#) or similar. These are free of charge and enable participants to fill out forms. You will need a stable internet connection to watch the films.

i Help

Dear student,
Dear participant,

This **workbook** relates to the issue of “What’s old is new – Reducing waste with upcycling, recycling and circular economies.”

You can fill out the worksheets on the computer or laptop and save them. There are some helpful tips below.

How do I fill out the worksheets?

1. Go to the worksheet you wish to use.
2. Read the task thoroughly. Add your answers to the text field on the worksheet. Keep your answers as short as possible. You can only write in the text field.
3. Once you have filled out all the text fields, rename the PDF document and save it. If no file name has been agreed upon, it should include your last name (the file name should not be too long and should not contain any special characters).
4. You can now send your teacher your work in the saved PDF file, for example, as an attachment.

Before you begin, write your name and contact information on the **› title page**.

How do I find films and articles?

Watching films

On some worksheets, you will be asked to watch a **film**.

By clicking on a film title, you will be taken to the web page where you can watch the film. If that doesn’t work, you can copy the link in brackets into the search box of your browser.

Reading articles

Other worksheets relate to articles you will need to read in order to complete certain tasks. Each article is included with the corresponding worksheet.

By clicking on the title of an article, you will be taken directly to the article without having to scroll.

Tip

At the top of each page, you will find a navigation menu.

By clicking ↶, you will return to the page you last looked at.

The ? will take you to this help page.

Click → [table of contents](#) to go back to that page.

You can use the arrows ← and → at the bottom right of the page to move between pages.

Something isn’t working?

If there is anything you don’t understand or if you are having technical problems (such as with the internet or the PDF file), please ask an adult for help!



Worksheet 1

My waste journal

We all generate waste every day, including packaging, food leftovers and much more. But what exactly is in our daily trash?

1. Investigate your own garbage. Make a note of everything you throw away over the course of one day in the **waste journal** below. You can also take a photo of what you collect.
2. Talk about your experience with the rest of the group.

Waste from (Name) (Date)

Waste type (examples)	List of the actual waste
Plastics (yogurt pot, styrofoam packaging)	
Glass (milk bottle, jar)	
Paper (newspaper, wrapping paper)	
Tin / metal (food cans, aluminum foil)	
Composite materials* (drink cartons, shampoo sachets)	
Organic waste (leftover food, potato peel)	
Other waste (clothes, batteries)	

*Packaging made from layers of different materials which are usually glued together



Worksheet 2

Diagram: Increasing waste

The global population is growing, as is consumption, which means ever more waste. That implies problems and dangers.

1. Create a **diagram** depicting the global waste problem.

Instructions:

- Watch the [film "Trash – A problem to be avoided!"](https://www.dw.com/p/40IXr) ([dw.com/p/40IXr](https://www.dw.com/p/40IXr)).
 - Write the words below on cards or small pieces of paper.
 - Put the words down on a piece of paper in an order that reflects the relationships explained in the film. You can add additional words.
 - Connect neighboring terms with arrows and words that describe the relationships between the terms. Stick the cards down.
2. Present your diagram and explain why you placed it in that order.
-

Packaging

Consumption

Waste export

Toxic waste

Recycling

Global population

Single-use items

Electronic waste



Worksheet 3

Solutions to the waste problem

Sprawling mountains of trash and illegal waste dumps reveal how, in many places across the world, refuse disposal is a problem. But there are people who are working to solve the problem.

Watch the following **films**, which will introduce you to people trying to solve the waste problem.

- **"Finding creative solutions to India's waste problem"** (dw.com/p/3WXMb)
- **"The tiny startup bringing recycling to Cape Town"** (dw.com/p/3u7Uz)
- **"Building walls with waste"** (dw.com/p/163Dm)

Decide on a project you most like and then fill out the **profile** for that one.

Project profile

1. Name of the person who initiated the project:
2. Name of the project: Place, country:
3. Project idea:

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4. Reason for the project:

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5. Participation incentives:

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6. Possible further development of the project:

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Worksheet 5

Linear economy versus circular economy

We buy, consume and discard. But all of that is not a sustainable system and it damages the environment. An alternative could be to design products in such a way that they are easy to repair and can be made into new things.

1. Watch ► **film** “**What does circular economy really mean?**” (dw.com/p/3u4Ib).
2. Fill out the **table** below. What aspects of a linear economy are mentioned in the film? What aspects of a circular economy?

Linear economy

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Circular economy

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Worksheet 6

Circular economy: How does it work?

A circular economy is sustainable and good for the environment – in theory at least. In reality, however, it can be hard to implement. How can a circular economy work?

Read the [▶ article “Circular economy: Could rethinking design transform the world?”](#) and then answer the **questions** below.

1. What is a circular economy?

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2. What are the advantages of a circular economy?

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3. What new problems could arise in a circular economy system?

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4. Give examples of functioning and nonfunctioning circular economies and explain them briefly.

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i Article

Circular economy: Could rethinking design transform the world?

Some argue that switching to a “circular economy” is crucial when it comes to climate protection and sustainability. But what would it entail? And can it work on a global scale?



Turning old into new: Shredded PET can be used in a variety of ways

Whether it's islands of trash in the ocean or the 40 million used tires in the Kuwait desert visible from space, signs that the world is choking on trash are not hard to find. And this has devastating consequences for the climate, ecosystems and human health.

We currently live in a linear economic system “designed to extract raw materials, process them into usable goods, and then ultimately either dump them in a landfill or incinerator, recycle them, or dispose of them in nature,” said Leyla Acaroglu, a designer and sustainability expert.

A circular economy aims instead to create a system that avoids waste as much as possible and reuse resources for new products.

The life cycle of a product

Achieving this requires a complete rethink in how design can extend the life cycle of a product. Take disposable coffee cups: Although made from cardboard, they are often covered with a layer of plastic, which makes recycling challenging, and sometimes impossible.

And, when it comes to electronic devices, it is often more straightforward and affordable to buy an

entirely new product than repair or replace parts in an old one. A circular economy makes sure these considerations are embedded into the entire design and production process.

Circular economy means more than recycling

At least 1 billion used tires are thrown away every year. Because the rubber is made from crude oil that is very difficult to recycle, tires are usually burned, or processed into low-quality rubber mats. However, the goal of a circular economy is to preserve the value of the product and avoid so-called downcycling.

The German company Pyrum Innovations has spent the past few years developing a technology that almost completely recovers the oil from used tires. They say the demand for this process is now increasing. “I can think of almost no country in the world from which we haven't had an inquiry,” said Pascal Klein, co-founder of Pyrum. By 2025, the company plans to build 50 plants in Europe and supply 100,000 tons of oil to chemical giant BASF.



The end of the linear economic chain: a huge car tire graveyard in Kuwait

The role of technology

Ninety-two million tons of old textiles end up in the trash every year, only 1% of which is recycled. Furthermore, products in the fashion industry that are recycled often lose their value.

A key missing aspect of textile recycling is detailed information about the materials involved. That is why the Berlin-based startup circular.fashion is working on technology that automatically recognizes and sorts textile fibers and gives them a “circular ID.” “This allows us to quickly calculate whether reuse or recycling is best for this product,” said Mario Malzacher, co-founder of the company.

i Article

The concept of the circular ID, known at the European level as a “product passport.” is an essential aspect of the European Union’s Circular Economy Action Plan for a resource-saving economy. The identification label contains information on the origin, composition, repair instructions and end-of-life options for a product.

Circular economy: No silver bullet

A study into the circular economy concept by Yale University warns of the possibility of a “rebound” effect, in which more efficiently designed and cheaper products could lead to more, rather than less, consumption.

Key to recycling is that it uses fewer resources than extraction and disposal – otherwise, it adds to, rather than reduces, the carbon footprint. To prevent that from happening, they argue research needs to continue and circular approaches need to be carefully implemented.

Yet the transition to a circular economy is still in its early stages. Today less than 9% of the global economy reflects circular principles, according to the Circular Economy Gap Report. Resources are being depleted with increasing intensity, consumption is

rising, and little progress has been made in dealing with products at the end of their life cycle.

Research suggests that the benefits of overcoming these challenges could be significant.

According to the World Economic Forum, the switch to a circular economy could have an annual global financial benefit of \$4.5 trillion (€3.8 trillion). Research from the Ellen MacArthur Foundation states that it could also reduce global greenhouse gas emissions by one-fifth, making it a crucial tool in tackling the climate crisis.



Enormous quantities of textiles are thrown away, but recycling possibilities are limited

22.11.2021 | Author Tim Schauenberg | [dw.com/p/42uyN](https://www.dw.com/p/42uyN)



Worksheet 7

Circular economy for electronic goods

Demand for smartphones, tablets, laptops and other electronics is growing. But the lifespan of most devices is getting shorter. They are often complicated and expensive to repair, although that would be much more sustainable than buying a new device.

1. Watch the > film **“Circular economy: Sustainable and profitable”** (dw.com/p/3tmnr).
2. Fill in the blanks in the **text**. Cross out the words you have already used.

Electronic trash is the fastest growing waste stream in the world, with (1) tons generated annually. And according to the United Nations, that volume could (2) within the next 30 years.

Currently, only (3) of global electronic waste is (4). The rest often ends up in landfill sites in (5) or (6) where it pollutes the (7), (8) and (9).

The (10) of new smartphones uses vast amounts of resources. That is why it has to become easier to repair and recycle electronic appliances.

The German company AfB (11) old computers, smartphones and laptops. Around (12) of devices they receive can be recycled. That saves some 25,000 tons of (13) and 300 million liters of water compared to the production of new goods.

It also saves a lot of CO2. But repairs are not always that easy. The (14) in some smartphones has to be (15) with a hairdryer in order to dissolve so as to swap out the display.

Components that cannot be repaired are sorted and (16). Among other things, a recycling specialist for precious metals extracts (17), (18) and (19). Each smartphone contains metals with a value of €1.50. With an estimated (20) unused cell phones lying around in German households alone, that implies a million-dollar business.

- 200 million 20% 53 million 70%
- Africa Asia softened soil shredded gold
- manufacture adhesive air metals platinum recycled
- repairs silver double water



Worksheet 8

Mealworms: Unsung heroes?

Reporter Christian Caurla is happy when he receives a batch of worms in the post. It means he won't have to use the trash can as often.

Can you imagine what the story behind this statement might be?

Watch the > **film "Plastic recycling with mealworms"** (dw.com/p/3lENm).

Answer the following **questions**.

1. What is the difference between plastic and natural materials?

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2. What are the advantages of plastic?

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3. How did people used to regard plastic? And how do we see it today?

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4. How can mealworms digest plastic?

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5. What does Susan Freinkel see as the main problem with plastic?

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6. Which plastic products are shown in the film?

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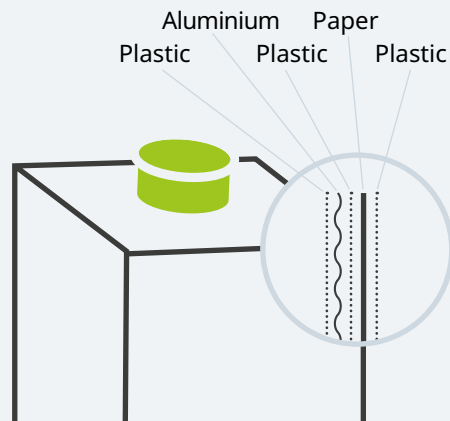
Worksheet 10.1

Turn it into something new: Flower pots from drink cartons

Drink cartons - hard to recycle

Milk, juice and in some places, even yogurt, are sold in drink cartons made from card coated in plastic and often also a layer of aluminium.

These layers can be separated from each other in special factories, but the process is energy and water intensive. Often, the paper component is the only one to be recycled.

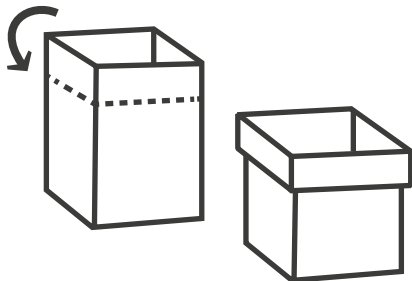


What you need for the flower pot:

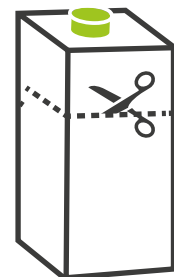
- several used and cleaned **drink cartons**
- a large pair of **scissors** as well as **paint, paint brushes** and **pens**

Instructions

1. Cut off the top of the carton.
2. Wet the outer, printed layer with a little water and carefully try to peel it off. You can also crumple up the drink carton. Just make sure the bottom remains stable.

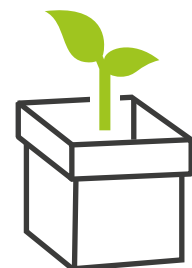


3. When you have peeled off the outer printed layer, fold over the edge of the carton two or three times to create a silver rim.
4. Your planter is now ready for you to decorate as you like.



Tip

If you want to fill your new pot with soil and plant something in it, add a layer of small stones or shells at the bottom, and don't water too much.





Worksheet 10.2

Turn it into something new: Greetings cards from drink cartons

Although drink cartons contain paper, they are not paper waste. This single-use packaging also contains aluminum and plastic. Separate the layers and use the paper from your drink carton to make a birthday card or invitation. This saves money and resources.

For the cards, you need:

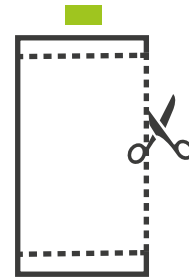
- at least one cleaned **drink carton**
- a large pair of **scissors**
- **pens, stamps** or **stickers** to design the card

Instructions

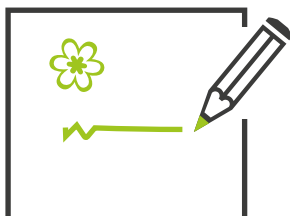
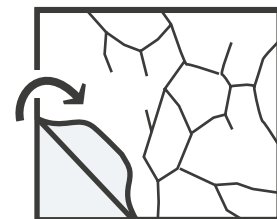
1. Cut off the top and bottom of the drink carton.
2. Separate the card along one of the four folds.



3. Scrunch up the carton and knead it roughly until the different layers of material separate from each other.



4. Spread the cardboard out flat in front of you and carefully separate the paper from the other layers. If it still doesn't separate, knead again.



5. Smooth your paper and cut it to the size you want.
6. Use stamps, stickers and pens to design a creative card.



Worksheet 10.3

Turn it into something new: A zipper case from a plastic bottle

Does a water or lemonade bottle have to be thrown away when it's empty? We have another idea! You could transform it into something else.

For a case, you will need:

- the bottom part of **two identical plastic bottles**
- a large sharp pair of **scissors** or a **box cutter**
- a **zip** (long enough to go right around the bottle)
- a **strong needle**, thick **thread** and a thimble

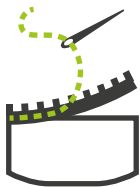
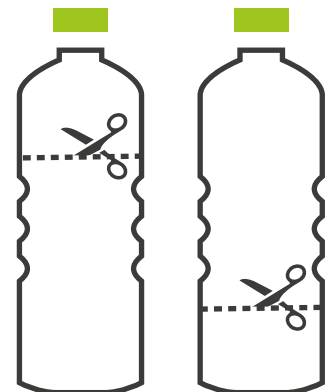
Instructions

1. Clean both bottles thoroughly and remove the labels.
2. Cut one of the bottles to make the long part of the case. Cut the second bottle relatively close to the base. This shorter part of the case will be the lid.

Tip

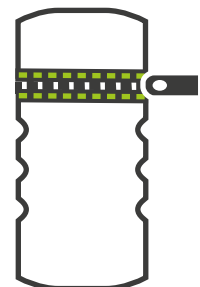
If you would prefer to make a small case, cut both bottles close to their base.

3. Put aside the necks of the bottles, which you no longer need.



4. Sew the zip onto one of the two parts of the case, taking care that the teeth of the zip poke out over the rim of the cut bottle.
5. Open the zip and sew the other half to the second part of the case in the same way.

Finished! Unless you want to paint your creation, or decorate it with stickers or something else, in which case, go for it!





Worksheet 10.4

Turn it into something new: Strings of flowers from plastic bottles

Do you have a lot of empty plastic bottles?
This upcycling idea could be just the thing for you!

What you need for a string of flowers:

- the cut-off, upper part of each **plastic bottle**
- sharp **scissors**, possibly a hand drill
- cut-resistant work surface
- **acrylic paint**, **paintbrush** for decorating
- **cord** or strong yarn



Instructions

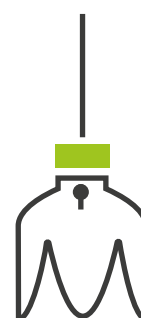
How to craft the flowers:

1. Cut a flower from the top part of the bottle. You can draw the outline of the flower before starting to cut. Be careful not to cut the petals all the way to the neck of the bottle.
2. Remove the cap and place it flat side down on a cut-resistant work surface. Use a hand drill or the tip of a pair of scissors to make a hole in the middle of the cap. (**Warning: injury risk!**) Make sure that the hole is big enough for you to thread your cord or yarn through.
3. Screw the cap onto the flower.
4. Paint the flower. It looks particularly pretty if you paint the edges in a different color.



How to assemble the string of flowers:

5. Choose a piece of cord or yarn longer than you wish your entire string of flowers to be.
6. Tie a knot at the end of your cord or yarn and pull the other end through the hole of the cap of a flower. Choose the position of the next flower, tie a knot where you want it to be and thread the cord or yarn through the next flower. Continue in the same way until the string of flowers is finished.



Tip

You can use several strings of flowers to make a **mobile**.

Imprint

Publisher

Deutsche Welle (DW)
Global Ideas
Voltastraße 6
13355 Berlin
Germany

Telephone: +49 30 4646-6401
Mail: globalideas@dw.com
Web: dw.com/globalideas
Twitter: [@dw_environment](https://twitter.com/dw_environment)
Facebook: facebook.com/dw.globalideas
Instagram: instagram.com/dw_globalideas

Department

DW Business, Science, Environment

Responsible

Manuela Kasper-Claridge

Didactic implementation

mct media consulting team Dortmund GmbH

Design

DW Design

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Global Ideas

The multimedia environment magazine

Around the world, imaginative people and innovative projects are working to protect our climate and biodiversity. Global Ideas tells their stories on TV and online every week.

Global Ideas is Deutsche Welle's multiple award-winning, multimedia environment magazine supported by the German Environment Ministry's International Climate Initiative. Established in 2009, it showcases TV reports, background articles, special feature projects and much more, as a means of informing people all over the world about best practice initiatives to protect the planet.

Global Ideas is more than just television. Think interactive specials such as a visit with Africa's wild animals or easy-to-understand explainers that answers complex questions about the environment and changing climate. The magazine also has an educational element in the form of carefully crafted "learning packs" on key environmental topics. Available free of charge in German, English and Spanish, these learning materials include videos, articles, worksheets and teacher handouts, as well as other educational materials such as posters, picture cards and practical experiments. The learning packs are available in booklet form with an accompanying DVD, as well as online for distance and in-person learning.

globalideas@dw.com
dw.com/globalideas

 @dw_environment
 facebook.com/dw.globalideas
 @dw_globalideas

dw.com