Co-funded by the
Erasmus+ Programme
of the European Union

CLAY Closing the Loop Along with the Youth

GUIDE FOR LEARNERS

Content

Introducing CLAY

Project CLAY – Closing the Loop Along with the Youth – is an Erasmus+ co-funded international project. All information related to the project can be found on the project website[1].

Sustainability and circular economy are THE topics of the upcoming years. The transition to a circular economy is a vital prerequisite for achieving several of the Sustainable Development Goals (SDGs). With CLAY, we want to show you what circular economy is about, why it is absolutely necessary for achieving sustainability and how it affects your daily life and choices.

Digital training materials

The CLAY training program consists of digital training modules – each in a distinct colour scheme – on 5 selected core topics:

The Problem: Linear vs. Circular Economy
3 units cover the differences between our current "linear economy" and a circular economy, highlights the necessity to go circular and the needed transition to a new economic system.

The Vision: Exploring circular economy and its potential benefits
4 units address the circulation of materials, the differences and overlaps between sustainability and circular economy, the importance of measuring circularity and "make it visible", and the benefits offered by a circular economy.

The Goals: Starting to zoom in on circular economy from a global/international perspective
4 units zoom in from the SDGs to the EU's Circular Economy Action Plan, financial initiatives aimed at financing circular economy on an international level, and other programs and initiatives committed to supporting circular economy.

The Strategies: Circular economy offers a set of strategies for companies as well as for you as a consumer
3 units provide an overview of the most common circular economy strategies: narrowing (by refuse, reduce, rethink), slowing (by reusing, repairing, refurbishing or remanufacturing) and closing (by repurposing, recycling and recovering) material and resource flows.

Implementation: Circular design
4 units finish to zoom in on concrete applications of circular economy through circular design: examples and best practices are presented to show how circular design can eliminate waste and other related negative effects for e-waste, plastics and packaging and the food industry.

[1] Link: www.clay-project.eu

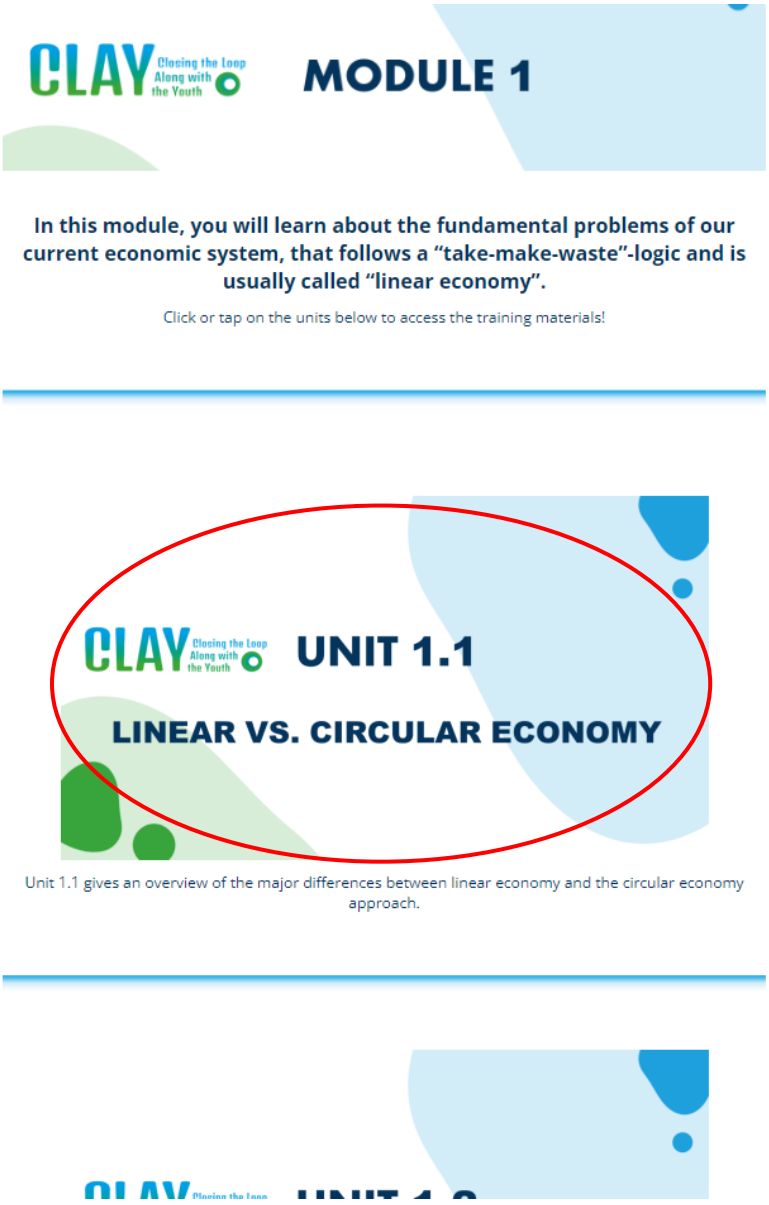
Each Module also includes a quiz to check your knowledge on the content of the units. We have also developed a “CLAY Score Calculator”! Check it out and find out how circular you are!

At the end of this guide, you will find individual tasks and research questions for each unit, that you can use for further diving into circular economy and as a basis for homework, presentations, case-studies or related tasks.

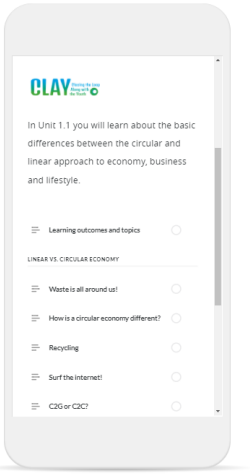
Access and navigation

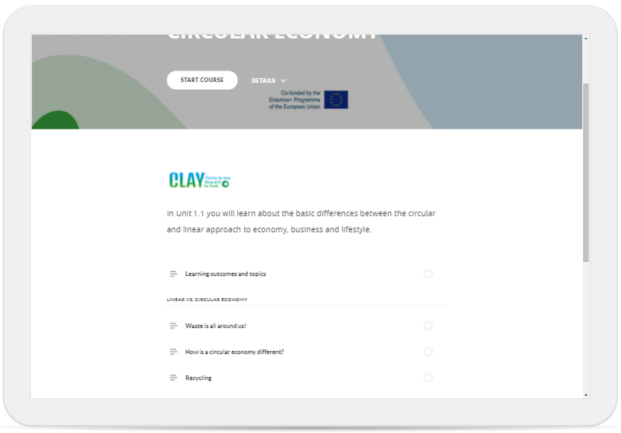
The digital training materials can be accessed via the project website under “OPEN EDUCATIONAL RESOURCES”.

You can access the units directly on the website.

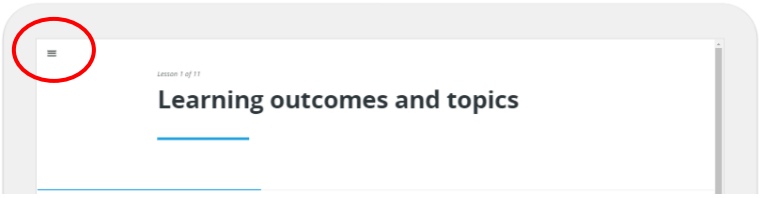


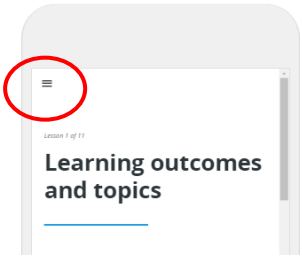
The units will play on your computer, but also on tablets and smartphones:





When clicking/tapping on “START COURSE”, the overview will collapse. You can always reopen the overview by clicking/tapping on the three bar icon on top of each page, to revisit previous pages or assess your progress.





Download for offline usage

All modules and units can also be downloaded for offline usage. Go to the “DOWNLOAD” sub-site of “OPEN EDUCATIOANL RESOURCES”, here you can download the modules as zip files.

- Each module-zip-file contains separate zip-files for all units and the quiz.
- Extract these zip files to separate folders on your computer.
- Go to the folder of the unit you want to open and double-click the “index”-file.
- The unit will play in the internet browser – but also without internet connection.

Unit structure

Each unit is following the same structure:

FOCUS
Sections marked with a pink dot set the focus for a specific topic in the unit.

DELVE INTO
Sections marked with a blue dot zoom-in on specific topics, examples and best practices for circular economy.

SURF TO FIND OUT MORE
In sections marked with this symbol, you will find links to related materials online, where you can find out more about circular economy on your own.

PRACTICE AND REVIEW
Each unit also contains short practice and review interactions, marked with a yellow dot.

Guide for learners

In this guide, you will find useful tips and information on how to learn most effectively, how to apply critical thinking and how to stay focused.

Important tips for learning

Use multiple learning modes!

Learning is a pretty personal thing – different techniques tend to work for different people. Most people learn best if they combine different techniques, or modes of learning. If you can, combine different learning approaches that tap into all your senses. There are four main learning styles:

- **V**isual: Learn by looking at pictures, such as graphs, diagrams, and charts or explainer videos.
- **A**uditory: Learn by listening to information or by reading out loud.
- **R**eading/writing: Learn with texts, reports, handouts etc. and write short summaries/ learning cards.
- **K**inesthetic: Learn by actively trying out theoretic knowledge in practical experiments.

You don't have to choose one – try to mix them and find out which combination works best for you! To identify your primary learning style, try taking the VARK questionnaire[2].

Break down the learning materials into manageable chunks!

If you try to absorb everything about a topic all at once, you'll soon find yourself overwhelmed. Whether you're doing an e-learning, reading a chapter in a history textbook or trying to learn how to play the piano, focus on one piece of information at a time before moving on to the next. Once you've mastered each piece, you can work on putting them together into a coherent whole.

For example, if you're reading a Unit of the training program, you might start by doing a quick skim of the whole chapter or even just scanning the Unit headings to get a sense of the content. Then, do a close reading of each paragraph and try to identify the key concepts.

Take notes while you learn!

Taking notes can help you engage more fully with the material you are learning, making it easier for your brain to understand and absorb it. If you are listening to a lecture or an explanation of a topic, note the key points as you listen. If you're reading, write down key words, summarize important concepts, and make notes of any questions you have about the material.

[2] Link: http://vark-learn.com/the-vark-questionnaire/?p=questionnaire

Studies show that taking handwritten notes is more effective for most people than typing your notes on a computer. When you write your notes by hand, you're more likely to focus on the important points rather than trying to write down everything you hear or see.

Summarize information you have just learned!

Summarizing is a good way to test your knowledge and help clarify your understanding of a subject. After learning something new, whether you heard it in a lecture or read about it in a book, take a moment to write a brief paragraph or a few bullet points summing up the key points.

You can also try summarizing the information verbally. If you're working with a teacher, they can give you direct feedback based on your summary to help you determine whether you understand the concept correctly.

Keep your learning sessions brief and frequent!

Instead of spending hours of your time studying a single subject each day, spread it out into multiple sessions of 30-60 minutes each day over the course of a few days or weeks. This can help prevent you from overdoing it and will also ultimately help you retain the information better.

Spacing out your study sessions can also help you overcome procrastination. If you devote a little time to a particular task or subject each day, it will feel less overwhelming in the long run, so you'll be less tempted to put it off.

Discuss what you are learning with other people!

Talking about what you're learning can help you gain new perspectives or make connections that might not be obvious just from reading or studying on your own. In addition to asking your teacher or fellow students questions, share your own perspective and understanding of what you've learned.

Teaching other people is a great way to solidify your understanding of a subject. It can also help you identify areas where you can improve your knowledge. Try explaining something you've learned to a friend, relative, or classmate.

Evaluate what you do and do not know!

Metacognition, or the ability to recognize what you do and do not know, is an important part of learning. Reflect on the subject or skill you are trying to learn about and ask yourself: "What do I know about this topic? What do I not know or fully understand yet?"
Once you've identified areas where you still need to improve your knowledge or understanding, you can focus your attention on those areas.

One good way to evaluate your knowledge is to quiz yourself on the material. If you are using a textbook or taking a course that includes self-administered quizzes or knowledge checks, take advantage of them. You could also try writing a brief explanation of the subject.

How to apply critical thinking

Ask questions about what you are learning!

To really engage with what you're learning, it's important to do more than just absorb and remember information. As you're learning, stop and ask yourself questions. Explore these questions and look for answers yourself and you will gain a deeper understanding of the material. For example, if you're reading about a historical event, you might ask questions like "Why did this happen? How do we know what happened—what kinds of sources do we have? How might things be different today if this event hadn't taken place?"

Look for connections between concepts!

When you're learning about a topic, try not to view it as a series of unconnected pieces of information. Instead, look for ways that ideas and information relate to each other and to your own knowledge and experiences. This will help you put the things you learn in context.

Examine sources of information critically!

Don't accept everything you hear, see, or read at face value. When you're learning, consider where the information comes from, how reliable it is, and whether it is current or outdated. Some questions you can use for examining information are:

- "What evidence does this author provide to back up their major arguments?"
- "Is this information up-to-date?"
- "What are the sources for this information?"
- "What are the qualifications of the person presenting this information? Do they have any agendas or biases?"
- "Are there alternative interpretations of this issue that might also be valid?"

Try to identify key concepts in the material you are studying!

Whether you're looking at a full course on a particular topic or just focusing on an individual lesson, try to pull out a few key themes and concepts. Doing this can help you organize your thoughts and define your focus as you learn and study.

How to stay focused while you learn

Take frequent breaks while you study!

If you find your focus wandering, try breaking your study time up into 25-minute sessions with 5-minute breaks in between. This is called the Pomodoro Technique. Using the Pomodoro method (even available as app "Pomodoro Time") will keep your brain sharp and help you focus more deeply.

Get 7-9 hours of high-quality sleep each night!

Being well-rested can help you stay focused and energized while you study. However, sleep also plays a key role in learning and remembering information. Go to bed early enough that you can sleep for 7-9 hours. You can also get better sleep by:

Eat brain-boosting foods!

Eating nutritious, energizing – and circular – foods can help you stay focused and absorb information more effectively. Start the day with a nutritious breakfast, and while you're studying, snack on brain-friendly foods like fruits or nuts. Make sure to stay hydrated too: your brain largely consists of water!

Find a quiet and comfortable study environment!

Studying in a noisy, uncomfortable, or poorly lit area can make it harder to concentrate and absorb what you're learning. Different people learn best in different environments, so experiment with studying in various settings and find out what works best for you.

Put away your phone and other distractions!

It's easy to get sucked into social media apps and games or to keep checking your email when you should be studying. If your phone or another device is distracting you, try switching it off or putting it somewhere out of reach (like inside your bag or a desk drawer).

Set of individual tasks

You can use the following tasks for diving deeper into circular economy, or as a starting point for your homework, presentation, report, etc.

MODULE 1: LINEAR VS. CIRCULAR ECONOMY

UNIT 1.1 LINEAR VS. CIRCULAR ECONOMY

- Online research – Check if you can find answers and information on the following questions:
    - How much textiles end up as waste in landfills per person in your country?
    - What metals can be recovered from cell phones and e-waste through recycling?
    - How long does it take for conventional plastics to decompose?
    - How much energy can be saved by recycling a single plastic bottle?
- Watch this video on "Re-Thinking Progress", that explores how we can re-design the way our economy works through a change in perspective. It explores the question whether we can build a restorative economy through creativity and innovation. What do you think, can we?
- Pick a company/organization from your country and check if they are following a "take-make-waste" approach or circular economy principles. Do they address circular economy on their website?
- Research companies engaging in circular economy practices online. Are they truly working circular, or is it "green-washing" (pretend to be circular, but instead try to maximize sales and profits) in a different colour?
- The Ellen MacArthur Foundation develops and promotes the idea of a circular economy. Find out more about the Foundation and about their Mission and Vision. What do you think about their approach towards accelerating the transition to a circular economy?
- Check out the C2C certificate and find out what it takes to get a product C2C certified. Can you find a product that you own, which is C2C certified?

UNIT 1.2 NECESSITY TO GO CIRCULAR

- In this whiteboard explainer video you will learn what is needed for a successful transition towards a circular economy. What part did you like the most (or has been most inspiring for you) and why?
- In this report from 2015 by the consulting company McKinsey, you can find information and data on economic benefits of circular economy for Europe. Check out the benefits for your country and see what has happened since 2015 in your country.
- The Ecological Footprint is the only metric that compares the resource demand of individuals, governments, and businesses against Earth's capacity for biological regeneration. Check your own footprint and personal Overshoot Day – what could be ways to reduce it?
- The paper The Circular Economy: What, Why, How and Where was prepared for an OECD/EC high-level expert workshop on "Managing the transition to a circular economy in regions and cities" in 2019. Use it as a basis for reflection, discussion and further research.

UNIT 1.3 THE TRANSITION TOWARDS CIRCULAR ECONOMY

- Cities play a major role on the circular economy agenda, to unlock economic, environmental, and social benefits. How can cities support the transition to a circular economy in line with their

priorities, which include housing, mobility, and economic development? Watch this video to find out more on the role of cities and use it as a starting point for further online research.

- Read some of these success stories of companies that successfully implement circular principles in their processes. Choose one story to study in detail and then try to re-tell the story stressing out the most important point of the story: the innovative moment and the benefits for the society and nature.

MODULE 2: EXPLORING CIRCULAR ECONOMY

UNIT 2.1 CIRCULATION OF MATERIALS

- Within the biological cycle, orange peels are a good example. The company PeelPioneers collects orange peels from catering establishments and extracts essential oils from them. Check out these two videos here and here to find out more about this project. What similar projects and initiatives are there in your country/region?
- Pick a biological product/material and describe it's potential circles of reuse, repair, and other elements from the butterfly diagram.
- Pick a technological product/material and describe it's potential circles of reuse, repair, and other elements from the butterfly diagram.

UNIT 2.2 CIRCULARITY AND SUSTAINABILITY

- Packaging and single-use plastic bags are a major source of waste. If you want to reduce your impact on the planet, you can switch to inexpensive, re-useable bags. Check out the example of Jutebag, used by several famous brands – what needs to be considered to make them truly circular/sustainable?
- Research your city's engagement for sustainability: What initiatives and organizations (public and private) are engaged for sustainability and circular economy in your home-town/city?
- Research companies in your country that circularly design products, imitating natural processes. What are the key differences to conventional products?
- Research 2-3 different approaches to circular economy (other related theories from Unit 2.2) and analyse: where do they overlap, where are the differences?
- Read about the sustainable business strategy of Coca-Cola. Reflect on the content in a critical way: How is sustainability defined? What shortcomings can you identify (also by additional research)?

UNIT 2.3 CIRCULARITY MEASUREMENT

- Research 2-3 circularity metrics form Unit 2.3, lesson "Measuring Circularity". Analyse their differences regarding approach and report what these metrics have found/are used for.
- What do different metrics measure in your country? Research the different approaches and find out, whether they are applied to/in your country.
- Here you can find a more scientific approach describing possible indicators for the various measurement strategies: What are the key findings of the article?

UNIT 2.4 BENEFITS OF CIRCULAR ECONOMY

- Research on the various disadvantages of the linear economic model.
- Research studies and information highlighting economic, ecological and social benefits of circular economy in your country.

MODULE 3: GLOBAL AND INTERNATIONAL CIRCULAR ECONOMY

UNIT 3.1 SUSTAINABLE DEVELOPMENT GOALS (SDGs)

- Pick one of the "Circular SDGs" and research the connections to the others.
- Check out the SDGs in your country – how are they part of political programs and strategies?
- Research the conferences in "The origins of the SDGs" and analyse how the goals and targets have changed over time. Which targets have been met?

UNIT 3.2 CIRCULAR ECONOMY ACTION PLAN

- Research which implications the European Green Deal offers for your country. Is it influencing national policies?
- Review the Circular Economy Action Plan (latest version 2020). What key activities and policies are included?
- Check out circular economy in your country. Eurostat offers a very useful tool, the Monitoring Framework, to measure progress concerning circular economy. This online interactive tool allows to display both the EU level or the national levels according to the following 4 specific indicators:
    - Production and consumption: EU self-efficiency for raw materials, green public procurement, waste generation, food waste
    - Waste management: recycling rates, recycling / recovery for specific waste streams
    - Secondary raw materials: contribution of recycled materials to raw materials demand, trade in recyclable raw materials
    - Competitiveness and innovation: private investments, jobs and gross value added related to circular economy sectors, number of patents related to recycling and secondary raw materials

  Click here to explore the Eurostat online tool or check out this interactive tool on voluntary national reviews provided by each country concerning the SDGs.

UNIT 3.3 FINANCIAL TOOLS AND SUPPORT

- Focus on the "Just transition mechanism" – is it relevant for your country? What programs and activities are linked to it in your country?
- Analyse and compare the objectives and priorities of the different European financing programs for circular economy.
- Research the circular economy package. How does it apply to your country? Are there projects and initiatives that were submitted for funding/circular awards in your country?

UNIT 3.4 CIRCULAR ECONOMY INITIATIVES AND STRATEGIES

Based on what you have learned in Unit 3.4, research and critically compare the following initiatives regarding objective/mission, field of action, target group, size and impact:

- EU Circular Economy Stakeholder Platform (EUCESP)
- World Circular Economy Forum (WCEF)
- Fridays for Future (FFF)
- Be the change initiative
- ecopreneur.eu

MODULE 4: STRATEGIES FOR CIRCULAR ECONOMY

UNIT 4.1 NARROW FLOWS: REFUSE, REDUCE, RETHINK

- Rethinking Plastic Packaging - Unilever declares that "There's a lot of plastic pollution in the environment, some with our name on it – and that's not okay with us. We're completely rethinking the role of plastic in our business." According to the CEO of Unilever "despite challenging conditions, we must not turn our backs on plastic pollution. It is vital for us, and for the rest of the industry, to stay the course, cut the amount of plastic we use and rapidly transition to a circular economy." Research Unilever's sustainability targets and strategies regarding plastic packaging and critically review their implementation.
- Check your trash! When looking through your "waste", try to answer the following questions:
    - How many of the items could be recycled? How much goes into the trash?
    - Is there anything that surprises you about what you collected?
    - What items could have been used longer or replaced with items that last longer?
    - What items are necessary and what could be replaced with another environmentally friendly option? Did you really need to buy/use that "thing"?
    - Besides recycling, what options do you have for disposal rather than it going in the trash can?
    - How much of your waste is from packaging? Are there alternatives?
    - What could be upcycled?

UNIT 4.2 SLOW FLOWS: REUSE, REPAIR, REFURBISH, REMANUFACTURE

- Research companies and organizations offering reuse or reusable products in your city, region or country.
- Research companies and organizations offering repair services or products with extended warranty or repair services in your city, region or country.
- Research companies and organizations who have included refurbishing or remanufacturing in their operations and services in your city, region or country.

UNIT 4.3 CLOSE FLOWS: REPURPOSE, RECYCLE, RECOVER

- Check out Precious Plastic, an open source project that provides tools and guidance on creating local, small scale recycling shops for the processing and manufacturing of new products. Based on this information, try to develop a concept for a similar organization in your city/region.
- In 2007, Fiat and Microsoft announced their collaboration on a system that enables drivers to minimize their impact on the environment: EcoDrive. Research and check out the current state of the collaboration!
- Research companies and organizations in your country/region that offer repurpose, recycling or recovery activities.
- Check out the website of Recycling Counts and find out how they encourage recycling plastics.

MODULE 5: CIRCULAR DESIGN

UNIT 5.1 THE ROLE OF CIRCULAR DESIGN

- How could we create products and services that fit into our (eco)-systems, and become 'nutritions' rather than waste and pollution? Research best practices from your country/region!
- How can circular design be a force for positive change and address the big challenges of this century, such as climate change and the loss in biodiversity?
- Research on planned obsolescence, choose a product (e.g. a smartphone) and find out more!

UNIT 5.2 CIRCULAR DESIGN VS. E-WASTE

- Bundles is a dutch company that offers washing machines as product as a service. Check out their homepage and find out:
  - What possibilities does Bundles offer regarding product-oriented service systems?
  - Why would you/should a customer choose Bundles, what are the opportunities?
  - What is the difference to renting?
  - How does Bundles apply the C2C approach?
- Have a look at the Fairphone 2 recyclability study! What are they doing to prevent huge amounts of e-waste?
- Have a look at this paper which was published in 2021 "Modelling of different circular end of use scenarios for smartphones".
  - What have you learned about e-waste caused by smartphones and what do the authors say?
  - Reflect critically on the content! What questions would you have for the authors?
- A linear smartphone is designed in a way that it „gets old" quickly and it is hard to repair. Check out the design differences between these three smartphones and focus on their design regarding circular economy: iPhone, Fairphone, Samsung Galaxy S21

UNIT 5.3 PLASTICS AND PACKAGING: DESIGN FOR THE FUTURE

- Check out the Upstream Innovation Guide provided by the Ellen MacArthur Foundation. What exactly is an upstream innovation?
- Do a research on how much packaging waste is generated per person per year in your country. Compare it to other countries and check whether your country is above or below average and why?
- Which main problems will arise from the huge amount of packaging waste and which design concept is the most useful to fight these problems?
- Compare these three detergent companies: MyReplenish, Splosh, Everdrop. Which design technology would you choose and why? What problems do you see?
- Do a research on in the impacts of (single-use & reusable) bags made of paper, conventional plastic, recycled plastic and fabric such as cotton. Which would you choose and why?

UNIT 5.4 DESIGNING CIRCULAR FOOD

- Apply the DISRUPT framework from Circle Economy to the technology of aquaponics! What are possibilities and threats? What are possible future problems with Aqua- or Hydroponics? Can aquaponics replace conventional agriculture in the future?
- Do a research on in the impacts of conventional, regional and organic food production. What design differences can you identify and what is their impact?

- Find out information about the following companies and how they apply circular design principles: Toastale, Agriprotein, Ostara
- With soda machines you can carbonate tap water at home. Often more than 50 liters can be carbonated with one cartridge. This reduces CO2 emissions by drastically reducing transport weight of full water bottles and less packaging waste.
    - Do you think this is good concept regarding circular design? How much waste produces one cartridge, and can it be compared with single use plastic bottles?
    - Find out more about the company Sodastream and discuss its (circular?) design concept!