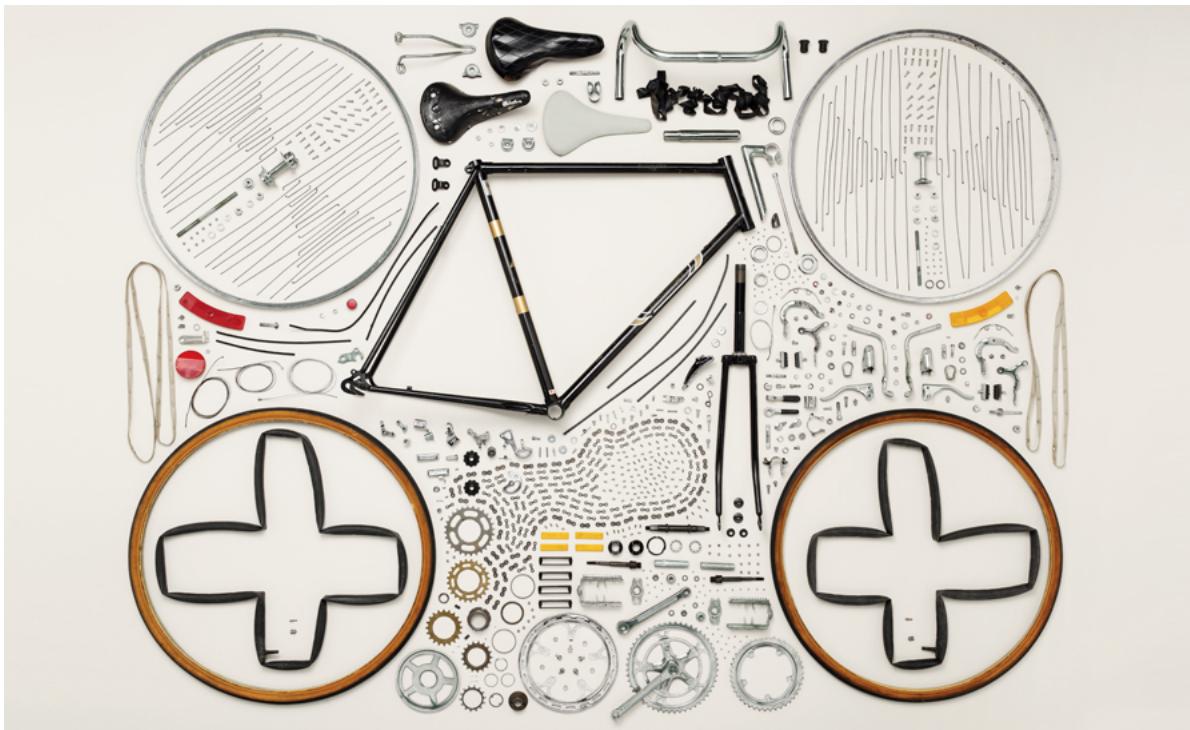


# LESSON 4

## Designing for a circular economy



## LESSON FOUR: Designing for a circular economy



Photograph by Todd McLellan ([www.toddmcellan.com](http://www.toddmcellan.com))

This lesson is part of a series that introduces students to a different way of thinking about how our economy could work: a circular economy. The series builds up exactly how a circular economy is different from the status quo, and looks at the economic, environmental and social advantages of a new approach.

### The series looks like this:

- (1/5) Challenging common conceptions
- (2/5) Exploring the circular economy
- (3/5) Understanding the challenge of 'finite' resources
- **(4/5) Designing for a circular economy**
- (5/5) The circular economy and modern agriculture

**Subjects:** Economics, Sociology, Business, Citizenship, Design Technology

**Age range:** 12-19 years

**Total time:** 120 minutes

## Learning outcomes:

- To learn about companies that have adopted the circular economy framework
- To design a product or service based on the circular economy

## Preparation:

- Load up the PowerPoint, Designing for a circular economy
- Preload the YouTube videos, Rethinking Progress and From Consumer to User (both created by the Ellen MacArthur Foundation)
- Print the case studies in Appendix 1 or have the links ready to share with your class

## Teacher's Introduction:

The previous lessons introduced the students to the circular economy. In this activity, students will be asked to design their own product or service fit for a circular economy.

## Recommended classroom set-up:

In this activity, student can work alone or in groups.

## CASE STUDIES (10-30 minutes)

Using the slides as a visual aid, read the case studies in appendix 1 to the class, or ask the class to investigate the case studies section of the Ellen MacArthur Foundation website - [www.ellenmacarthurfoundation.org/case-studies](http://www.ellenmacarthurfoundation.org/case-studies)

## LEARNING ACTIVITY - Video, from Consumer to User (around 5 minutes)

This video ([https://www.youtube.com/watch?v=Cd\\_isKtGaf8](https://www.youtube.com/watch?v=Cd_isKtGaf8) - 3.11 minutes) investigates the move away from ownership of goods to access to goods. Might the students use this idea as inspiration for their business model?

## LEARNING ACTIVITY - Designing a product or service (40+ minutes)

The remaining slides, from “a challenge for you” onwards, set the scene for the students to design a product or service fit for a circular economy. Note each example in the PowerPoint comes with a question for the students to answer.

An idea...

You might want to ask your students to pitch their business ideas to a panel of peers or teachers.

## REFLECTION (10 minutes)

Ask your students to reflect on what they have learned in this process. Use a 'think, pair, share' approach to help collect responses from everyone in the room.

This lesson was produced by the Ellen MacArthur Foundation. The Ellen MacArthur Foundation works with business, government and academia to build a framework for an economy that is restorative and regenerative by design.

We have produced a number of educational resources which are free to download from [www.ellenmacarthurfoundation.org](http://www.ellenmacarthurfoundation.org).

## APPENDIX 1

Case studies – (to help teachers unable to reliably access the internet - useful to include these as a printable appendix)

<http://www.ellenmacarthurfoundation.org/case-studies/philips-and-turntoo>

<http://www.ellenmacarthurfoundation.org/case-studies/floow2-1>

<http://www.letote.com/>

# Designing for a circular economy

## NOTES FROM THE POWERPOINT PRESENTATION

SLIDE NUMBER	NOTES
1	<p>This PowerPoint was produced to support ACTIVITY THREE: Designing for a circular economy. It has been produced by the Ellen MacArthur Foundation for the World's Biggest Lesson.</p> <p>See <a href="http://www.ellenmacarthurfoundation.org">www.ellenmacarthurfoundation.org</a></p>
2	<p>We recommend you start with a recap about the circular economy, by watching this video.</p> <p>URL: <a href="https://www.youtube.com/watch?v=zCRKvDyyHmI">https://www.youtube.com/watch?v=zCRKvDyyHmI</a></p>
3	<p>Here is a reminder of a useful quote to help students think about a circular economy</p>
4	<p>This image is a simplified graphic demonstrating the circular economy: an industrial system which is restorative by design or intention.</p> <p>Ask the audience what they see.</p> <p>Note two cycles of materials:</p> <p><b>Biological materials</b> are made from things that grow and which ultimately can go back into the soils (perhaps by composting, or through anaerobic digestion) and improve it. They are natural materials that can be safely disposed of in a manner which allows the soil to regenerate; thus they must not contain any toxins.</p> <p><b>Technical materials</b> are metals, polymers, etc. They are materials designed to continually flow at high quality in closed industrial cycles.</p>

5	<p>More details here: <a href="http://www.ellenmacarthurfoundation.org/case_studies/philips-and-turntoo">http://www.ellenmacarthurfoundation.org/case_studies/philips-and-turntoo</a></p> <p>Students could research the case studies, or you could talk through them. You may wish to use case studies more appropriate for your audience. There are many to be found on the Ellen MacArthur Foundation website (<a href="http://www.ellenmacarthurfoundation.org/case-studies">www.ellenmacarthurfoundation.org/case-studies</a>), or you may know of some yourself.</p> <p>In this model, Philips sell 'lumens' to Turntoo, instead of selling light fittings. Philips pay the electricity bill, which means they have an incentive to make the lights as efficient as possible. Turntoo pay a fee based on how many lumens they use.</p>
6	<p>More details here: <a href="http://www.ellenmacarthurfoundation.org/case_studies/floow2-1">http://www.ellenmacarthurfoundation.org/case_studies/floow2-1</a></p> <p>FLOOW2 facilitate the overcapacity of heavy machinery. Some heavy machinery is idle 50% of the time, wouldn't it make sense to make money from machinery not in use? FLOOW2 connects idle machines with willing users. It's sort of an eBay for customers who wish to use heavy machinery for a short period of time.</p>
7	<p>More details here: <a href="http://www.letote.com/">http://www.letote.com/</a></p> <p>Subscribe to Le Tote to receive up to \$200 of clothes every month. You don't own the clothes, but you do get the chance to have an ever-changing wardrobe.</p>
8	<p>This video is titled 'From Consumer to User'. It describes a future in which we perhaps don't own all of our goods. Instead we use and return goods, paying a subscription fee in the process.</p> <p><a href="https://www.youtube.com/watch?v=Cd_isKtGaf8">https://www.youtube.com/watch?v=Cd_isKtGaf8</a> (length 3:11)</p>

The next few slides provide some inspiration for students.

Some key points –

A PRODUCT will fit within a system, or business model, which allows the materials and energy to rejoin a flow. For example, a company will have the product returned to them in order to use the product/materials in the next cycle....OR the product will be safely returned to the biosphere, perhaps by composting.

Applications will need to show that system in operation.

9

A SERVICE can be something we use but don't own, like a taxi, or films on Netflix.

In this activity we suggest applicants can re-design anything. For some, an open book may prove a barrier. If you think that is the case, can we suggest you amend this PowerPoint and suggest students choose from one of a few themes. This may help focus the students creativity and class research. You might want to consider these themes (but you do not have to!):

Mobility Ecosystems / Communications & Entertainment / Living Cities / Clothing and apparel

10

'Mink' – a 3D Printer for make-up. The designer of Mink, Grace Choi, said: "It can take any image and instantly transform it into a wearable cosmetic"

Q: Why might this be of interest in a circular economy?

Likely answers:

Relocalises production – produce at home/in a nearby store, rather than produce in a far-off land. Saves transportation costs and saves time.

3D printing vastly reduces waste in its production method. The 'additive' process builds items up layer-by-layer rather than by subtracting material from a larger piece, as is standard in 'subtractive' processing.

3D printing allows us to customise our goods, and make them more durable.

11	<p>Playstation Network – download games to your Playstation, without actually receiving a physical disk.</p> <p>Q: why might this be of interest in a circular economy?</p> <p>A: It dematerialises computer games by making them downloadable (i.e. no wasted packaging, no transportation of games)</p> <p>A: It's a quick way to connect with the goods you want</p>
12	<p>Puma InCycle trainers – can be safely returned to the biosphere when no longer suitable to wear</p> <p>Q: why might this be of interest in a circular economy?</p> <p>A: The waste (unwanted trainers) becomes food for the next cycle. No materials are lost, post-production. Everything has value.</p>
13	<p>Car2Go- all the convenience of a car (?) without any of the associated costs.</p> <p>Q: why might this be of interest in a circular economy?</p> <p>A: No depreciation, no MOT, very little risk.</p> <p>A: Can be quick and convenient</p> <p>A: It's powered by electricity, which could be generated by renewable sources</p> <p>A: Use an app to find and book the cars in the city</p>
14	[no notes]
15	[no notes]
16	[no notes]

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*These notes were produced by the Ellen MacArthur Foundation to complement a lesson titled 'Designing for a circular economy'. The lesson was produced for The World's Largest Lesson.*

*For teaching resources, videos and articles about a different economy, visit [www.ellenmacarthurfoundation.org](http://www.ellenmacarthurfoundation.org)*