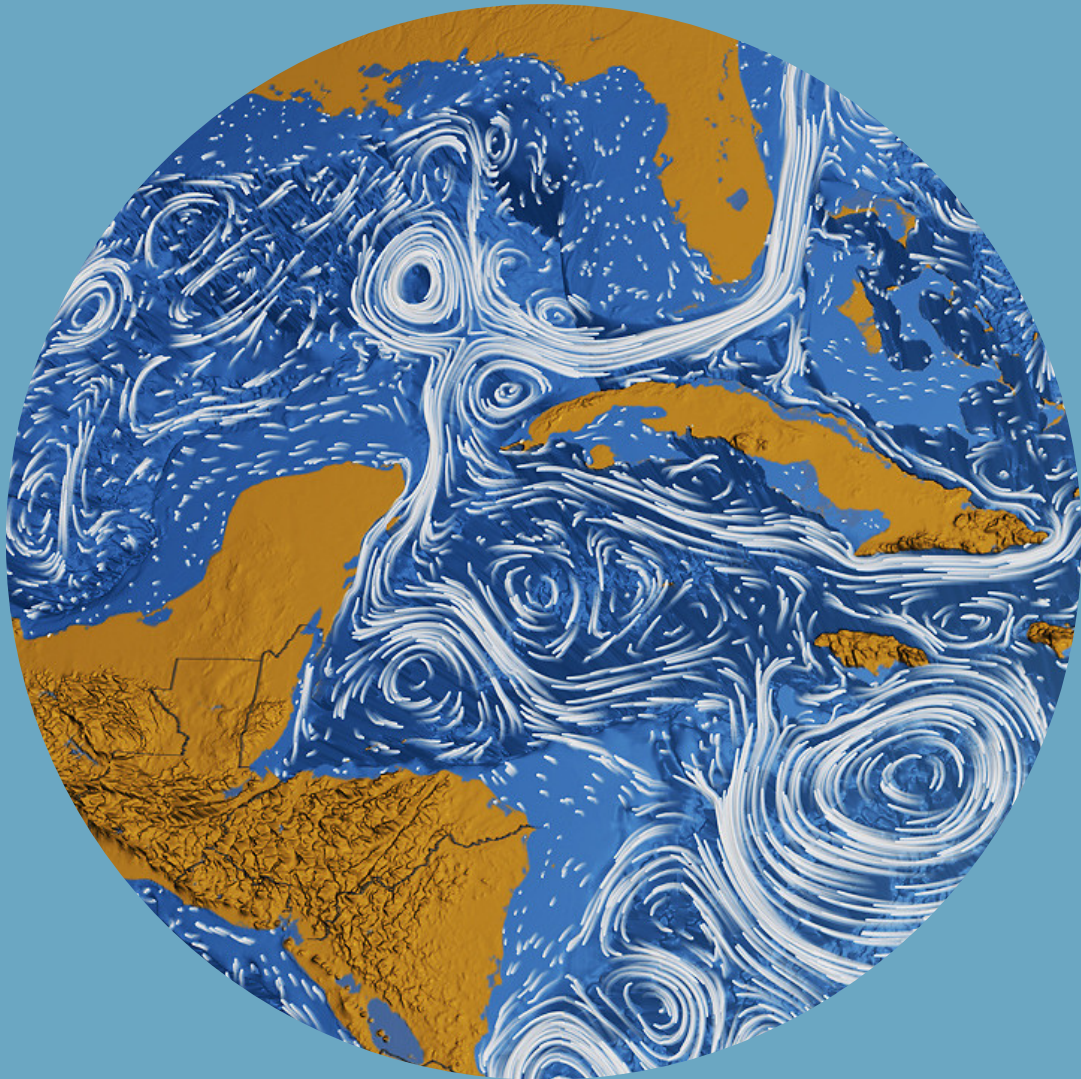


# LESSON 1

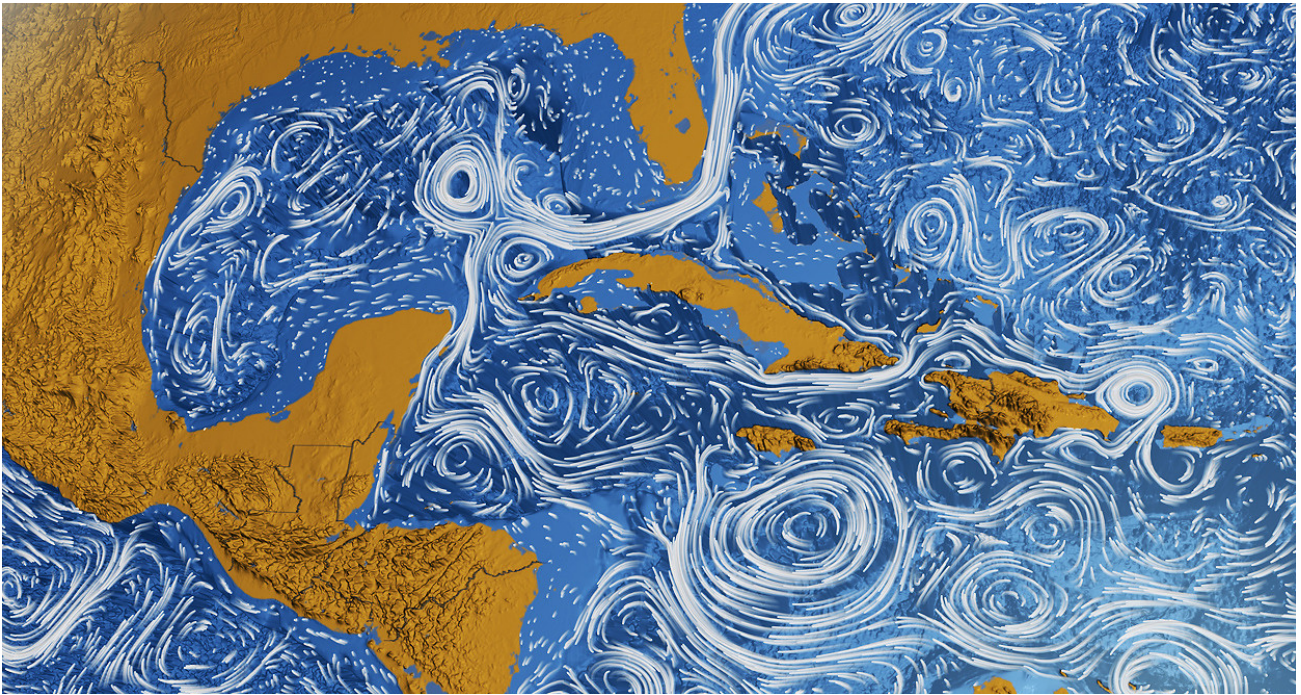
Challenging common conceptions



ELLEN  
MACARTHUR  
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## LESSON ONE:

### Challenging common conceptions



*(Image courtesy of NASA Scientific Visualization Studio)*

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, Geography, Environmental Systems, Sociology, Business, Citizenship

**Age range:** 12-19

**Total time:** 60 minutes



### **Learning outcomes:**

- To understand that environmental issues can be intrinsically linked to economic issues
- To critique the flaws inherent in some common approaches to environmental education
- To begin to investigate a different way of approaching environmental, social and economic issues

### **Preparation:**

- Pre-load the videos from YouTube
- Read the notes that accompany each video
- Sit the students in small discussion groups

### **Introduction for the teacher:**

Education about improving the environment can often come to familiar conclusions such as ‘reduce, reuse, recycle’, but what if some of those conclusions have detrimental effects in other areas, such as employment, standards of living and the economy? In other words, what if these conclusions fail to see the bigger picture? In this activity, a series of videos is used as a stimulus for classroom discussion about how environmental goals could be aligned with economic goals.

There are nine videos and each is no longer than 1 minute. The videos each end with a challenge for the viewer. We suggest you watch them in advance and read the notes below so you are prepared for the discussion.

You can access all of the videos on YouTube from this address:  
<http://tinyurl.com/seeingthebiggerpicture>

### **Basic run-through:**

Each video ends with a question, so watch one video, then ask the groups to discuss their response to the question posed. Students should take notes on individual or group sheets of paper.

The videos lead the students to conclude that some familiar environmental ‘solutions’ can cause damaging effects on jobs and the economy overall. The activity then goes on to investigate a different sort of economy: a circular economy, which is regenerative by design.

This activity could be completed in one hour, but we recommend you take longer so your class has time to digest the information and properly tackle each question raised.

## NOTES FOR EACH VIDEO

### Video one: The Linear Economy

Link: <https://www.youtube.com/watch?v=PU-hevOX0Qo>

This video ends with the question: ***We can't sustain this 'take-make-dispose' model - what's the solution?***

Invite students to share their answers to this question, writing up their responses at the front of the class where everyone can see them

Some key points about the way the economy operates:

1. We do live in a modern, sophisticated, global economy that does bring benefits for many people.
2. The Industrial Revolution raised living standards for many people around the world through mass production and consumption.
3. There are clear downsides, as referenced in the film, including increased waste and pressure on finite resources, despite technological advances.

The following videos look at some familiar 'solutions' to the problems of the linear economy, but each has shortcomings if considered with the bigger picture in mind. We suggest you watch them in turn and allow your students to critique the ideas within.

### Video two: Recycling?

Link: <https://www.youtube.com/watch?v=RX14rA-tylo>

This video ends with the question: ***What would have to change to make recycling work better?***

**RECAP:** Ask your students to recap the key points of the video to check their understanding.

Evidently recycling is useful, but it is less effective with short-cycle products, such as aluminium cans and other packaging. The problem is that small losses multiply rapidly over time. If you want to understand the mathematics behind the 90% figure, here is a link: [en.wikipedia.org/wiki/rule\\_of\\_72](https://en.wikipedia.org/wiki/rule_of_72). In practice, though, all you have to do is divide 70 by the percentage loss per year (if the loss is, for example 50% use 50 rather than 0.5) to give you the number of cycles before half the quantity is lost. In the video, we learned that today's stock of aluminium cans would last for approximately 14 cycles until the whole stock is in landfill, and bear in mind that's with a vastly increased recycling rate – we don't recycle anywhere near 90%. And note this: nobody reasonably expects 100% recycling to be possible, so it's always going to mean some losses.

**DISCUSS:** Encourage students to think beyond the example – why might aluminium cans be easier to recycle than other products? Are most of the products that students use this simple, or are they more complex? What about packaging, even?

### Video three: Use Less?

Link: [https://www.youtube.com/watch?v=mJFdW\\_Y4JDY](https://www.youtube.com/watch?v=mJFdW_Y4JDY)

This video ends with the question: ***What would have to change to allow for using less to be ok?***

It's an attractive moral position to suggest we can all change our lifestyles and use a little less. But one person's income results from another person's expenditure, so, as the video suggests, using less can ultimately lead to recession.

As with the last video, when we look at the bigger picture, beyond the individual, you get a different result. Moderation by one person is fine, moderation by everybody leads to problems...

**DISCUSS:** Return to the question: 'What would have to change to allow for using less to be okay?' Suggest we need to consider the way businesses operate. Is there a way of keeping money flowing around the system whilst not depleting more resources? Perhaps the idea is to not sell products, but to sell the services which come from them, e.g. subscribing to a car-sharing service rather than buying a car. And perhaps we need to design those cars in a way that allows us to use the materials again...

**Advanced question:** Why might it be hard for a politician to campaign for us to 'use less'?

### Video four: Last Longer?

Link: <https://www.youtube.com/watch?v=a4dbNnlfcbc>

This video ends with the question: ***Could longer lasting products work? How?***

**DISCUSS:** What are the challenges of making longer lasting products successful?

We want new products, but we also want the materials and components within those products to have another use. To keep up with technology, products that are likely to be obsolete very rapidly – like a mobile phone – need to be designed in such a way that they can be upgraded and the materials can be recovered. Perhaps products should have a **defined use period**. In other words, it is expected that they will be moved on and the materials be reutilised. Longer lasting products could work but there is a danger that a drop in consumption will result in a drop in spending in the economy as a whole (which affects jobs and, ultimately, standards of living).

**Advanced question:** What would be the effect on businesses, employees and the government if products were designed to last longer?

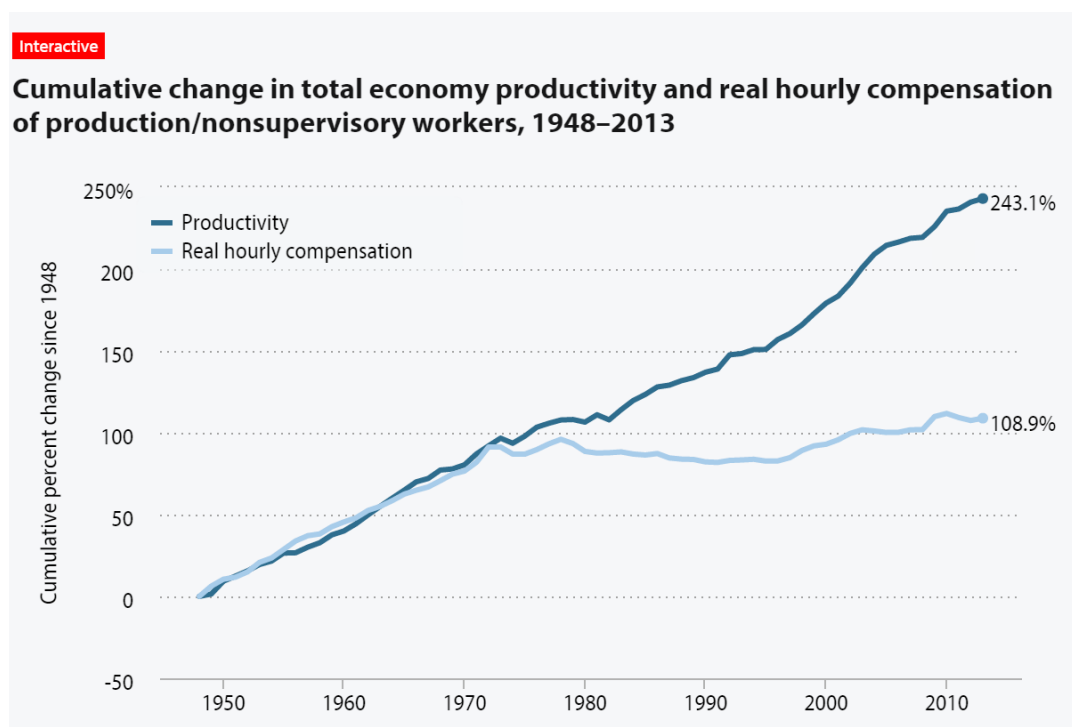
## Video five: More Efficient?

Link: <https://www.youtube.com/watch?v=u-qCn2tRp0w>

This video ends with the question: ***What would we have to change to make efficiency really helpful?***

Introduce the idea that this puzzle is called the 'paradox of efficiency'. From an **environmental** perspective, more spending on more stuff – aided by efficiencies – is a bad thing if the stuff still uses the linear, take, make and dispose system. After all, in this scenario the 'stuff' is still wasteful of finite resources, and has related negative externalities, such as environmental spoiling. So, the impact per unit may be going down, but the overall negative effect still increases.

But if the system was effective – i.e. it worked well – then our stuff would be made in a way that considered how to use resources again and again, using non-toxic materials and substances, and is powered by renewable energy. Efficiencies within that system would be a good thing.



Graph from Forbes\*. Note the disconnect between productivity and wages, which began in the 1970s.

From an **economic** perspective, there is no problem with efficiency unless wages don't keep up. Recently they have not: wages have been stagnating in many countries for several decades, and increasing levels of credit (loaned money) are required to bridge the gap between what people earn and what they spend...so what happens when credit is no longer available?

What people need is income, not just lowered prices. If we designed a system that cycled and cascaded resources (products and materials) then people and businesses could make use of them, add value to them, and sell them to each other to create income.

Efficiency has to be balanced by opportunities for income generation. Material flows have to be effective to close the loop – this keeps materials in circulation and creates new economic opportunities.

#### Advanced questions:

(1) Why might the overall negative effect on the environment increase, even if the process of production becomes more efficient, and prices drop?

(2) What is the difference between an efficient system and an effective system? Which is most sensible to aim for?

#### Video six – Green?

Link: <https://www.youtube.com/watch?v=LS7d2ZHEpQM>

This video ends with the question: ***Although many green products are moving in the right direction, what does the destination look like?***

**DISCUSS:** If this question is too tricky for your class, you might want to use the following questions instead:

- What is the purpose of 'green' products?
- Do 'green' products always help us meet that purpose?
- Is it easy to make the 'right' choices as a consumer?
- Does the 'green' label help us choose, or do we need to become experts in every product to understand their environmental and social impact?
- Is it really fair that unless you can afford to pay a premium you have to choose unhealthy food, damaging products and polluted skies?
- What if we changed the system instead, so that all products had a positive impact?

And how can we change the system? Well, that's what we're going to get onto soon...

#### Advanced questions:

(1) Are 'green' products always good for the planet? Or are they often 'less bad'?

(2) Are companies acting hypocritically when they produce a 'green' range alongside their regular products?

## Video seven – Fewer People?

Link: <https://www.youtube.com/watch?v=1fzj2ZLYLzQ>

This video ends with the question: ***How can we change things to make our newest members of the human race welcome on our planet?***

The question of population control is a difficult issue to handle and a big debate. Given projected population growth, here we concentrate on how we could welcome these new people onto the planet considering they will increase demand, potentially leading to rising prices and, ultimately, fewer resources.

Encourage students to think hypothetically: If we had a system where production and consumption were benign, at worst, why would we be concerned about the number of people?

**Recap and reflect:** What links all of the ‘eco-friendly’ concepts explored in this lesson? They tend to only consider the short-term, they can have negative economic impacts and they all rely on isolated actions, rather than considering the whole system.

We’ve got to bring the bigger picture and a longer-term perspective to the table, in a way that still makes economic sense and spins off social and environmental benefits. And we can do this by learning from living systems, especially since we know living systems have an impressive 3.8 billion year-old track record.

The next video explores this point...

## Video eight – How Do Other Species Live?

Link: <https://www.youtube.com/watch?v=N6GNbOzTc2s>

This video ends with the question: ***What are the rules [for benign production]?***

The different elements of the lesson all point to the idea that there is a different way of seeing production and consumption. Support your class to reach conclusions from the lesson, by applying what they have learnt to consider why ants might be a good model for production and consumption. How is this different to the way our system currently operates?

Key points include:

- Their biomass is greater than that of humans, yet their impact on the environment is **positive**.
- They are adapted to the system, i.e. all their waste is food for something else, they live off renewable energy, they are diverse in their functions, and they restore natural capital by, for example, rebuilding soils.
- They are an effective species (not just efficient) – they make the whole system thrive, as well as guaranteeing their own survival.



## Conclusion

One possible response to the challenges we face is a circular economy. The next lesson in this series – **Exploring the circular economy** - explores that concept.

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.

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

*\*You can access the graph from Forbes here:*

<http://www.forbes.com/sites/scottwinship/2014/10/20/has-inequality-driven-a-wedge-between-productivity-and-compensation-growth/#187d40556078>