Build THE Change

A Future Without Waste

Course Pack for Educators

In partnership with ELLEN MACARTHUR FOUNDATION

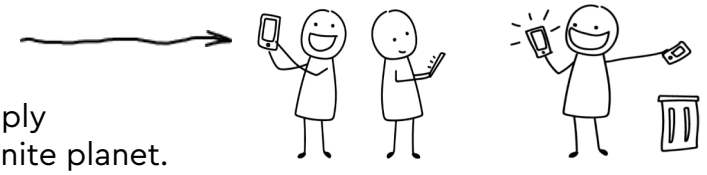
Let's go! →

Background for educators: Getting to grips with the circular economy

This resource is a collection of helpful content for educators who wish to begin teaching the circular economy. It is designed to give a quick and accessible overview of the circular economy concept and its core principles. Having established this base-line knowledge, educators should feel equipped to use other circular economy resources from the Ellen MacArthur Foundation and beyond.

Where are we now?
To understand what the circular economy is, it's helpful to start with where we are now. In our current economy, we **take** resources from the Earth to **make** products, which we use for a short time before we throw them away and they become **waste**.

Take-make-waste



We call this a linear economy. It simply cannot work in the long-term on a finite planet.

Where are we heading?
Nature never does things in straight lines. It has arrived at a far more efficient and effective way of doing things — it works in cycles. Things grow, they die, and then nutrients return to the Earth so that new life can grow. Again and again. The energy needed to make all of this happen comes from the sun.

The aim of the circular economy is to mimic nature's cycles as much as possible in our economy. So instead of working in straight lines, we work in cycles; and instead of losing valuable materials and nutrients to landfill or incineration (leading to high levels of waste and pollution), it keeps them in the economy for as long as possible. This can help us tackle pressing concerns like climate change and biodiversity loss.

The three principles of the circular economy are:

1- Eliminate waste and pollution
2- Keep products and materials (resources) in use
3- Regenerate nature

What separates this from other sustainability initiatives like recycling? The answer is **Design.** The circular economy addresses the root causes of problems like waste and pollution instead of the symptoms. By fundamentally redesigning the things around us we can stop them from ever becoming waste in the first place.

For example, we might design things to be more durable, to be shared or reused in various ways, to be repaired, or to be easily taken apart at end of life so that materials can be recovered and used again. What if we viewed waste as a design flaw? After all, there is no waste in nature.

WATCH: Humans Changed the Face of the Earth, Now we Rethink our Future

← Back to table of contents

Circular economy background (continued)

Now let's take a closer look at how materials can cycle in a circular economy. Here, Ellen MacArthur explains how the different 'loops' of the circular economy work to create a system that is regenerative by design: The Butterfly Diagram with Ellen MacArthur

How we talk about the circular economy

Since the Ellen MacArthur Foundation was founded in 2010, we have described the circular economy as an economic opportunity with multiple environmental and societal benefits. This is where the concept distinguishes itself from most sustainability narratives and paradigms, which often leave out the role of the economy when it comes to considering environmental concerns.

Increasing pressures from things like climate change, resource scarcity, supply chain disruptions, increasing consumer demands, and policy changes, mean that businesses will need to transition to more circular ways of operating in order to increase efficiencies, lower costs, minimise negative externalities such as waste, and generally future-proof their operations. Our reports have helped highlight the benefits of a circular transition and there are now companies, cities, governments and educational institutions the world over, reaping the rewards of going circular (for people, profit, and planet).
View our case study library to explore some of the most innovative examples.

The circular economy in education

The transition from a linear to a circular economy is a huge undertaking that will require new skills, knowledge, and mindsets. There is a role for artists, designers, architects, engineers, educators, entrepreneurs, policy-makers, scientists, farmers and just about everyone in between. By its very nature, it is an interdisciplinary topic, excellent for project-based and problem-based learning approaches with an emphasis on creativity, collaboration, critical thinking and systems thinking.

We believe that the circular economy should be at the heart of the education system, helping to empower students with a positive vision for the future based on solutions to real-world problems.

← Back to table of contents

To find out more, check out the online resources on the next page.

Additional online resources from the Ellen MacArthur Foundation:

What is a circular economy?

Rethinking progress a broad overview of the concept of the circular economy.

From consumer to user explores the possibility of favouring access to goods and services over ownership

EMF's suite of learning resources for schools

How it all Started: Ellen's Journey to the Circular Economy

Dame Ellen MacArthur's TED TALK

Dame Ellen's vision of a circular economy for a better planet

Circular Economy: Stories of Change Case Studies

Eliminating Waste and Pollution

DeClique: Turning food waste into new products

Food Shift: Getting food destined for waste to hungry people.

#WearNext: Reusing clothing waste.

Keeping Products and Resources in Use

LEGO Replay: Keeping pre-loved LEGO® bricks in play.

Belo Horizonte: Repurposing electronics.

Library of Things: Lending things instead of selling them.

Regenerating Nature

M62 Biodiversity Tower, Paris: Redesigning a building to help nature.

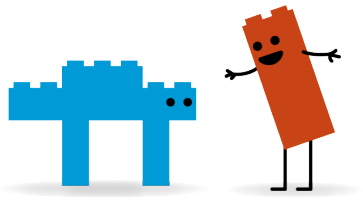
#FreetownTheTreetown: Bringing trees back to an urban center.

The High Line: Restoring biodiversity to an urban wasteland.

← Back to table of contents

Fitting into Curricula

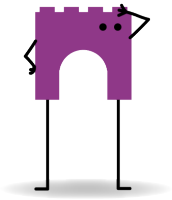
The Build the Change team recognize fully that you, the educator, are the expert on what is relevant for your class in the context of your local curriculum. We also know how important it is that activities you choose have an outcome that builds towards your national curriculum objectives.



While curricula vary from country to country and state to state, this Build the Change course offers a number of **cross-cutting skills and knowledge areas** that form part of many national and regional curricula for the **7-12 year old age range**:

SKILLS	Knowledge
Creative problem solving & design thinking	Social studies
Speaking, literacy & comprehension	Economics
Teamwork & collaboration	Environmental science/earth science
Project-based learning	Design and technology
STEM/STEAM	Spoken language/vocabulary
Citizenship	Human geography

SKILL AREAS



CREATIVE PROBLEM SOLVING & DESIGN THINKING

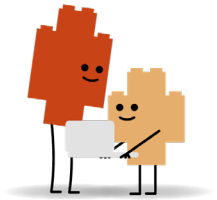
The LEGO Group see creativity as one of the core skills needed to start children on a journey of lifelong learning, and Build the Change sessions are designed to develop this – each session begins with a brief initial immersion in a real-world topic followed quickly by hands-on creation and sharing of original ideas.

Examining the world around them through a range of lenses and perspectives, children are tasked with generating ideas that will make a positive impact on the environment and their society. They are encouraged to take their ideas and make them a reality, connecting the dots between great ideas and impact using creativity. The aim is to build confidence and understanding that their voices matter as part of their global and local society.

The sessions encourage children to explore the world around them and the causes and effects of the issues the planet faces, thinking critically on how we might address them. Using a Learning through Play approach, and by setting up a space where children feel safe to test and iterate, problem solving as a skill is nurtured and has a heavy presence throughout.

The courses give students a platform on which to experiment with and prototype their ideas, helping them build an understanding of how real-world problems can be addressed. The design thinking flow also helps students draw the links between multiple disciplines and creativity. Technological aspects of the course also nurture the ability to move seamlessly between analogue and digital tools.

SPEAKING, LITERACY & COMPREHENSION



The lessons are designed to give children opportunities to develop their speaking, literacy & comprehension skills as they create, present, and discuss ideas. Chances to present and share well-structured reflections and narratives on their creations to the broader group are built into the "Time to Reflect" moments within the sessions.

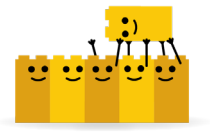
We also take a novel engineering approach in some of the sessions, giving the children the opportunity to find the challenges they wish to address within scenarios that we present to them.

Much of the content is scenario- and situation-based, giving opportunities to communicate big, visionary and future-facing ideas, and allowing space to develop articulation skills.

← Back to table of contents

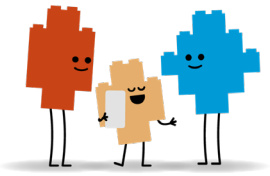
Fitting into Curricula

TEAMWORK & COLLABORATION



Build the Change is designed to give the educator freedom on whether children work individually or as groups, or both at different points in the sessions. The activities encourage children to work together, to listen to others' ideas, to find solutions and work together to present them to others. There are opportunities to delegate specific roles to members of each group or to open it up to a team discussion and empower the children to decide.

CITIZENSHIP



A key objective of Build the Change is to build advocacy, civic engagement and self-efficacy in the children who take part. Children should leave the sessions feeling their ideas are valued and have the power to inspire, influence and impact the planet and everything on it.

The discussion session specifically gives students the opportunity to think and speak critically on environmental and social issues and to look at facts and evidence when forming their opinions.

KNOWLEDGE AREAS

SCIENCE

This course gives the students an introduction to how nature, community and business can all work together in unison. To do this, the course touches on aspects of the natural world and its systems to illustrate: i) key interdependencies between different organisms and different stages of cycles and ii) ways in which nature can benefit multiple parts of society in addition to the environment.

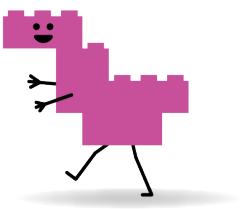
This course investigates the concept of waste both as a negative and a positive. For example, the concept of there being nothing wasted in natural cycles is highlighted as inspiration for the way in which we, as humans, design services and products in the future. What can we learn from nature?

There is also focus given to the concept of regenerating nature in order to benefit both the environment and society. How can bringing back biodiversity to a space impact how we feel, how we behave, how society operates and what kinds of businesses can flourish?

The Big Challenge gives the children the opportunity to integrate science knowledge into a more holistic approach on designing a town, working with interdependencies for example:

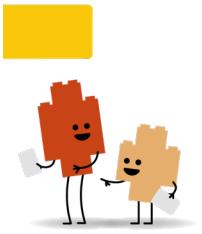
- pollination; food chains, food for communities to eat, food for businesses
- Waste, turn it into something useful, use to grow plants, provide business with resources
- More biodiversity, better environment for everything, better mental health

GEOGRAPHY



The course content focuses especially on human geography: town planning, impact of spaces on communities, the interlinking of business, community and nature.

LANGUAGE



In addition to outcomes described under the speaking and listening skills sections above, language skills are developed through the acquisition of new vocabulary, adapting language to different contexts, and imaginative writing.

The materials are available in English, Spanish, and Danish (with more to come) so also have the potential for use as part of foreign language practice.

← Back to table of contents

Fitting into Curricula

THE SUSTAINABLE DEVELOPMENT GOALS

The United Nation's Sustainable Development Goals (SDGs) are used by an increasing numbers of schools as a recognized framework to address and speak about real-world people and planet challenges. The SDGs help create a common language across not only governments and policy makers but also education authorities and the broader public. We have listed the main touchpoints that the course has across the 17 goals firstly focusing on the three core goals followed by those which are discussed in the course but not necessarily impacted directly.

Core Goals and Targets Impacted

This course aims to provide free sustainability education resources for as many children as possible, directly addressing **target 4.7**

The circular economy topic promotes information and raises awareness on sustainable development and lifestyles in harmony with nature directly addressing **target 12.8**

The course aims to help improve education and raise awareness on climate change actions that need to take place for a move to a more sustainable future, directly addressing **target 13.3**

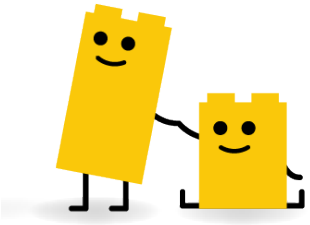
Other Goals Discussed

The course also touches on the sustainable development goals **6, 7, 8,11, 14 and 15**: from the importance of regenerating nature in improving all life both below water and on land to the importance of circular economy in driving economic growth decoupled from the environmental degradation.

For more information on the SDGs, please visit https://sdgs.un.org/goals

← Back to table of contents

Catering to ages and ability



The presentations included with this pack were designed primarily with **7-12 year olds** in mind.

TO ADAPT THESE, EDUCATORS MAY WISH TO...

- Alter spoken scripts to suit younger children.
- Create more in-depth presentations for older children using our background materials and resources.
- Spend longer on creations with older children, e.g. splitting design, building, and presentation of ideas into multiple sessions.

The core experience of creating one's own solution to a real-world problem, however, scales naturally to take account of age and ability – because learners are constructing their own learning experiences, most challenges work across all age groups.

A challenge like "**invent something to clean the air**" for example, will be interpreted and executed very differently depending on whether the learner is four (a flying broom) or forty (an autonomous fleet of modified multi-rotor drones fitted with the latest carbon-dioxide absorbing kit).

Most importantly, both learners will have had a highly joyful and personal experience of Learning through Play as they understand and respond to the problem at the level which they are able.

The next page looks at some examples of how tasks can be adapted for more support through to more challenge – scaling up and down.

← Back to table of contents

Examples of scaling up and down

We have tried to design the sessions to be low-entry but offering high ceilings, allowing the children to take their exploration wherever they want. The area where differences in ability will be most evident, and different styles of facilitation needed, is during the ***Time to Create*** section in most of the sessions. Children are encouraged to explore individually or as a small group, with the emphasis on a child-led experience. We realize that not every child works well with this level of open-endedness and have made a few suggestions on how more support might be provided as well as how more challenge might be added for those children who require it.

Let's look at the biggest questions or tasks first:

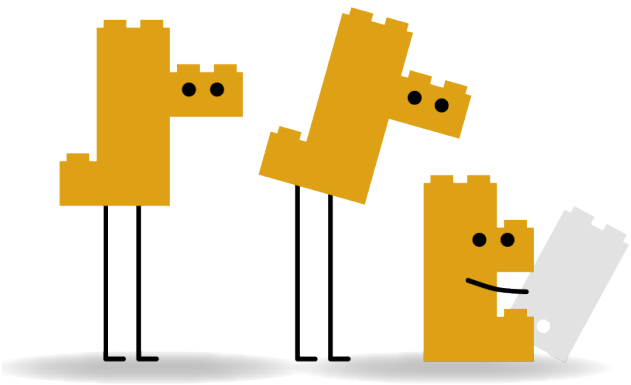
...design a school cafeteria that produces no waste

Support needed

- Work with the child to help them firstly picture the space we are focusing on – maybe make a quick visit to school dining hall to facilitate this. Discuss what needs to go into a school kitchen: vegetables, fruits, meats etc. Then ask them what comes out of a kitchen once everyone's been through at lunchtime: waste food, waste water etc. Now, ask them how we can use the waste food and water to help vegetables and fruit grow? What can they create to make this happen? A robot? A machine? A bucket on a cable car wire?

Challenge needed

- Ask the child to design something for a school kitchen in a part of the world where there are extreme temperatures involved, either hot or cold. How might the school cafeteria be different to theirs?



Redesign Grimsville to benefit nature, community and business

Support needed

- This is a big, multi-faceted question. For some, they might be intimidated and not know where to start. This is natural but hopefully by the second or third time they go through the process, they will be used to the approach.
- First, encourage them by letting them know anything is possible and there are no right or wrong answers – remove any concerns of failure.
- Secondly, get them into the mindset that they are a town planner, testing and trying things out. Or a designer making prototypes where nothing is perfect but the idea is there.
- Lastly, if they need a little more support, highlight a real-world example (from the case study videos for example) and ask them to adapt it to their area. For example, how might they redesign the buildings in Grimsville to bring back biodiversity or what kinds of businesses would they have to convert waste into products?

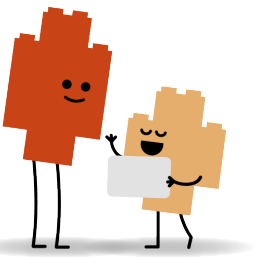
Challenge needed

- Given the high-ceiling nature of this task, there is a lot of room to make their designs as complex as they wish. If they finish their creations quickly, try for example tasking them with adding annotations to their creation with sticky notes, describing each component of their idea. Perhaps ask them to detail how nature, community or business benefit from that feature.
- Additionally, you could ask the child to think about how they might pitch this idea to world leaders. If time allows, get them to create a sketch pitch poster. Tell them to imagine they have space on a wall in the local town hall – what would they put there to "sell" their idea?

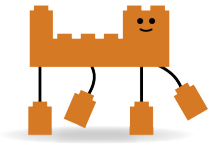
← Back to table of contents

General facilitation tips and tricks

Getting the best ideas out of young learners.



GENERAL

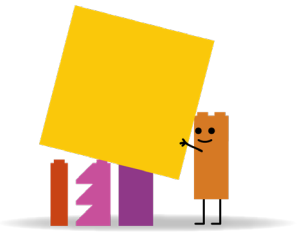


You are educators so we are super aware that you are likely to know this already, but in the spirit of sharing, here are a few workshop facilitation techniques we use in the LEGO Group:

- Keep questions open-ended whenever possible.
- Encourage reflection.
- Ensure that the tone is kept light, hopeful and fun (it is easy to go gloomy when talking about topics like climate change).
- If the question feels too big and general for them, try to bring it back to something they can relate to, something local perhaps.

We need your help in conveying the energy behind some of the statements that aim to empower and motivate children. Imagine it's the most important thing you've ever said to them. Then times it by a million.

In the immersion material, we have tried to give enough information about the topics without making it too prescriptive for the children. A novel engineering approach to some of the challenges, especially the Big Challenge, means that children can find their own issues to address from what we present to them. This gives them a sense of ownership and an increased motivation to come up with solutions.



CREATIVE SECTIONS

We all know what it is like to be stuck on first steps when given an open-ended creative exercise: frozen, no ideas in sight, panic starting to set in.

We also know that it is normal to feel this way but here are some tips to spark that first step into creativity overload!

- Go back over key points from earlier that session. Do any jump out to the student? Expand on those.
- Give your own wacky ideas (the sillier the better) on what you would do. This helps relax the student and reminds them that anything is possible. It's important that the students don't feel the constraints on creativity that we often do as adults.
- If there are creative materials in front of the student, tell them to let their hands do the thinking. Get them to start putting objects together randomly. Is anything appearing? Any shapes? Does it remind them of anything? This is a great way to break that idea freeze.

Once the students are creating their ideas, spend a moment with each group or individual to ensure they are giving thoughts to the following:

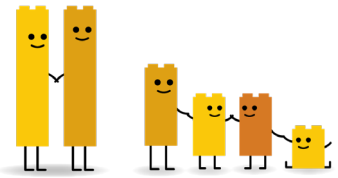
- Is it a new idea? If not, what can you add to make it even cooler and more unique?
- What are the causes and effects in their idea?
- Keep them on theme. Everyone loves to build a space rocket swimming pool dinosaur machine, but is it going to help the planet? Maybe... hold that thought ;)

When it comes to sharing their creation encourage them to use a simple structure:

- What is their creation?
- How does it help nature, community or business? (or all three)
- Encourage students to be big picture thinkers by asking them 'connecting' questions - how does this idea connect to that? What will happen to this if we do that? How does this business help that group of people? etc. This helps them to see how changes to one part of their build can affect the whole.

← Back to table of contents

Facilitation tips and tricks



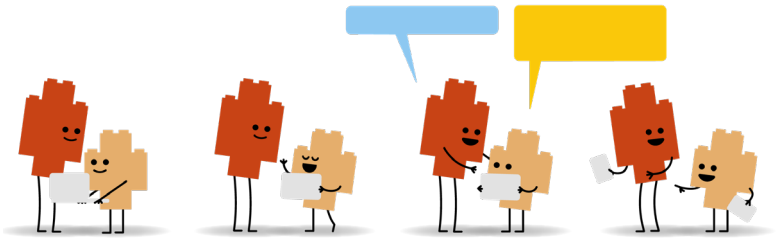
GROUP WORK

Build the Change is perfect for working in groups, but we would recommend no more than 4 children per group. This is simply to ensure everyone gets to input and play an important role.

Depending on the students, it might be worth delegating roles. For example, some of the roles that have worked in the past include:

- a project manager (to lead the group)
- a communicator
- a writer (to capture the story – almost like a journalist)
- a designer
- an architect/engineer

This list is far from exhaustive on the roles within a creative design project, so feel free to come up with completely different ones based on your students.



SPEAKING MOMENTS

At the LEGO Group, we love building microphones out of LEGO bricks and handing them to those whose turn it is to speak. It works wonders and adds a bit of fun.

← Back to table of contents

The Ellen MacArthur Foundation on the circular economy and designing a better world.

To solve big problems like climate change, waste, and pollution, we need a big idea.

It's time to rethink how we design, make, and use the things we need, from the food we eat to the clothes we wear. What if we looked to the natural world as a model for how to design products, services, and systems that never create waste?

At the Ellen MacArthur Foundation, we develop and promote the idea of a circular economy. We inspire and work with businesses, academia, policymakers, and institutions across the globe. Our vision is an economic system that's better for people and the environment.

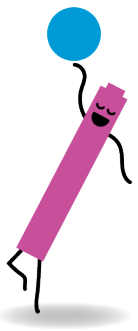
Together, we can create a better future for all of us.

Find out more at www.ellenmacarthurfoundation.org/

ELLEN MACARTHUR FOUNDATION

← Back to table of contents

The LEGO Group on Learning through Play and Sustainability

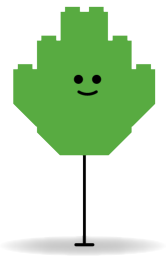


OUR COMMITMENT TO LEARNING THROUGH PLAY

The LEGO Group and the LEGO Foundation are committed to becoming a global force for learning through play. We aim to redefine play and reimagine learning with hands-on learning experiences like Build the Change, where children are actively engaged through a meaningful and enjoyable experience, testing and trying out things with others. Success for us is seeing more and more children around the world become creative, engaged, and life-long learners.

Educators can use Learning through Play to support students' depth of knowledge and understanding, with the application of this knowledge into practical skills and nurturing a lifelong motivation to learn new things.

On the LEGO Foundation website, you can find more information and access the LEGO Foundation knowledge base and in particular the white papers on What we mean by Learning through Play and Learning through Play at school.



OUR COMMITMENT TO SUSTAINABILITY

We're playing our part in building a sustainable future and creating a brighter world for our children to inherit. We're joining forces with children and parents, educators, our employees, partners, charities and experts to have a lasting impact and inspire the children of today to become the builders of tomorrow.

We are proud of the journey we are on and recognize that there is much more to do and learn. We will continue to do everything we can to achieve our ambitions.

On our sustainability website you can find more information about our initiatives, ambitions and progress.

← Back to table of contents

What is Build the Change?

Build the Change is the LEGO Group's flagship sustainability education program. Deceptively simple and effective, it has been tested with kids at events around the world for over a decade.

Immerse ➡ Create ➡ Share

Learn about a real-world planet and people challenge.

Devise your own brilliant solution.

Share it with others.

← Back to table of contents