



Build THE Change

supported by The LEGO Foundation



Human Impact: Saving Today's Dinosaurs Course Pack for Educators

In partnership with



Introduction

Hi there,

In this document you'll find everything you need to run **Human Impact: Saving Today's Dinosaurs**, a [Build the Change](#) course from the LEGO Group and the Natural History Museum, London and at Tring. There are materials for five 45-minute Learning Through Play sessions plus a "Showcase Day" show-and-tell event to share the creations and ideas from your young learners.

In this course, your students will explore how humans impact the planet, using the example of our impact on birds, "today's dinosaurs." They will learn that humans can have both negative and positive effects on nature and create their own positive impact by coming up with imaginative solutions to related real-world challenges.

At the LEGO Group, we are committed to becoming global leaders in Learning through Play. This means equipping the builders of tomorrow with the knowledge and skills they need to become engaged and successful 21st century citizens — skills including creativity, design thinking, communication + collaboration, and the confidence to know that their voices and opinions matter.

The course is organized around the latest scientific understanding of human impact and threats to biodiversity and is informed by our expert content partner the Natural History Museum in London and Tring, UK. Sessions focus on three key areas of negative human impact, and the solutions humans are working on to address these challenges:

1. Habitat Loss
2. Water Pollution
3. Light and Noise Pollution.

Note that the course directly impacts several areas identified in the UN's [Sustainable Development Goals](#) — the framework being used by schools around the world.

Learning through Play is at the heart of every session, with playful hands-on activities exploring the course's topics. They are designed to work with any creative materials you have available. LEGO® bricks are not required but can be used if you have some lying around 😊.

Thank you,

The LEGO Group
In partnership with
the Natural History Museum, London and at Tring



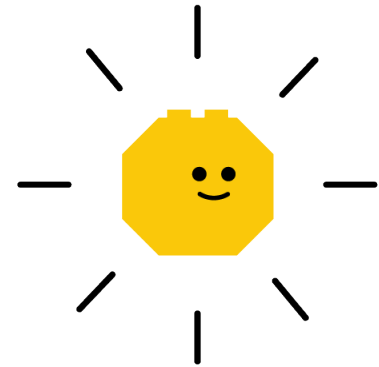
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Human Impact: Saving Today's Dinosaurs

What's in the Course Pack?

1. Lesson plans

and classroom presentations for five 45-minute sessions, plus a special "Showcase Day" event to let learners share the ideas they've created during the course.

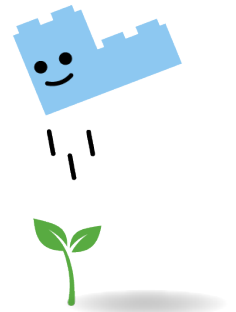


2. Printable materials

A **course journal** for learners to record their thoughts and learnings across the sessions, and **description cards** to display alongside their awesome creations.

3. Uploading your learners' ideas

Photos and descriptions of the creative ideas from the sessions can be uploaded to public galleries on LEGO.com for the whole world to see.



4. More materials for educators

- [Background information on birds, today's dinosaurs](#) from the Natural History Museum at London and Tring.
- Tips for tailoring the sessions for [curricula](#) (and alignment with the UN's sustainable development goals) or [age / ability](#).
- [Facilitation tips and tricks](#) for getting the best ideas out of kids.

5. More about us

- [The Natural History Museum, London and at Tring](#) on past, present, and dedication to a future with better human impact.
- [The LEGO Group and the LEGO Foundation](#) on our commitment to Learning through Play and sustainability.
- More about the LEGO Group's global [Build the Change](#) program.

Build the Change lesson plans

In the following section, you'll find suggested plans for a number of Build the Change sessions, each of which is about **45 minutes long**. Together these sessions add up to the *Human Impact: Saving Today's Dinosaurs* classroom course.

Click on the bricks or the links for each session's lesson plan.

KEY SKILLS
Creative problem solving & design thinking
Speaking & listening
Teamwork & collaboration
Project-based learning
STEM/STEAM
Citizenship

1. Introductory Session



[Introduction to Human Impact: Meet Today's Dinosaurs](#)

2. Stories of Change / Case Study Sessions



[2A: Tackling Habitat Loss](#)



[2B: Tackling Water Pollution](#)



[2C: Tackling Light and Noise Pollution](#)

3. 'The Big Challenge' Session



[Welcoming Migrating Birds](#)

4. Sharing your class's ideas



[Showcase Day](#)

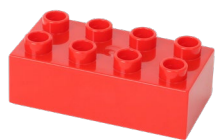


[Uploading ideas to our online gallery](#)



Feel free to extend, combine, and space out these sessions to produce the timings + course length that fits your learning environment and course needs.

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Introduction to Human Impact

Meet Today's Dinosaurs (45min)

A session to kick off the Build the Change course, with an accessible introduction to the concept of birds as today's dinosaurs, positive and negative human impacts on nature and the need for creative solutions, as learners participate in some fun hands-on, minds-on activities.

Link to Session Presentation PDF

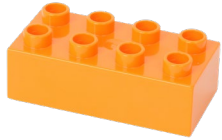
http://www.LEGO.com/cdn/cs/sustainability/assets/bltd84f548919a93c12/HI_BtC_1_Introduction.pdf



Link to Printable Speaker's Notes for the presentation

http://www.LEGO.com/cdn/cs/sustainability/assets/blt4c18f6328a44f6be/HI_BtC_1_Introduction_notes.pdf

SECTION	CONTENT	MATERIALS	TIMING (~45 min)
Opening	Welcome to this Build the Change course, part of the LEGO Group's program for children all around the world to create and share their ideas for the future. In this course learners will use creativity to tackle negative human impacts on "today's dinosaurs," birds, and come up with ideas for how to make our impact positive.	Session presentation PDF (used throughout the session)	1 min
Video: Build the Change Introduction	Leo and Linda welcome the children to Build the Change.	Online video (link on slide in presentation)	5 min
Stage-setting	A slide introducing the Natural History Museum in London.		2min
Awesome Words	Three "Awesome" vocabulary words – <i>Environment, Impact and Habitat</i> - that will be used in the session.		3 min
Group poll	A "show of hands" group poll with questions about the class's feelings and sense of agency around sustainability – online poll lets the class see how their result compares with other classrooms around the world and reflect on any similarities/differences.	Online poll (link on slide in presentation)	3 min
Awesome Words	Three more "Awesome" vocabulary words – <i>Extinction, Endangered, Adaptation</i> - that will be used in the session.		3 min
Video: Meet today's dinosaurs	A 4-minute explainer video introducing how birds are affected by negative human impacts – habitat destruction, water pollution, and light and noise pollution - and how using our creative human brains could help turn those impacts positive.	Online video (link on slide in presentation)	5 min
Warm Up activities	The class comes up with 10 bird examples, thinks about the similarities and differences between birds who live in different environments, and how birds compare to dinosaurs.		5 min
Time to create	Introductory activity to get learners thinking about designing solutions to real-world challenges: children build their own bird while thinking in terms of adaptations to the bird's environment.	Creative materials	10 min
Time to share	A chance for the class to share their thoughts, ideas and creations.		5 min
Time to quiz	A few quiz questions to check understanding of the session's content.	Quiz on slides	3 min
Sum up & next steps	"Over to you" suggestions for how children can do to help birds + tease of the next session.		2 min



Stories of Change A

Tackling Habitat Loss (45min)

One of 3 case study sessions where children explore three forms of negative human impact on birds and how creative humans are trying to turn them positive, before devising their own solutions to address these real-world challenges.

Link to Session Presentation PDF

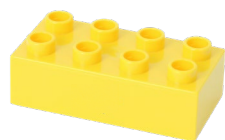
http://www.LEGO.com/cdn/cs/sustainability/assets/blta89a80a703ddc570/HI_BtC_2A_SoC_Habitat_Loss.pdf



Link to Printable Speaker's Notes for the presentation

http://www.LEGO.com/cdn/cs/sustainability/assets/blt2e04e7e356322015/HI_BtC_2A_SoC_Habitat_Loss_notes.pdf

SECTION	CONTENT	MATERIALS	TIMING (~45 min)
Opening	This is one of three "Stories of Change" sessions exploring case studies around human impacts on bird species. This one looks at the challenge of habitat loss linked to human impact, and ways humans are fixing this by creating positive impact around the world.	Stories of Change A PDF (used throughout the session)	1 min
Group poll	Follow a link to poll questions where children can immediately see how their opinions compare to other classes around the world.	Online poll (link on slide in presentation)	2 min
Awesome words	Opportunity to run through a few of the trickier vocabulary words about to pop up in the Stories of Change video: <i>Indigenous, Nocturnal, Predator, Migrate</i> .		2 min
Warm up activities	Class compares nests from the Natural History Museum's collection and play the "Hoopoe habitat game" demonstrating the impact of habitat loss on birds.		5 min
Video: Tackling Habitat Loss	Play the <i>Tackling Habitat Loss</i> video highlighting birds impacted by habitat loss – Swifts and Kiwis – and the solutions humans are using to try to reverse that negative impact.	Online video (link on slide in presentation)	3 min
Follow up case studies	Slides highlight two more birds impacted by water pollution: the Turtle Dove and Kirtland's Warbler.		2 min
Time to reflect	A chance for children to reflect as a group on what they've seen so far.		1 min
Time to create	Ask the children to create something to protect birds from water pollution, in one of 3 categories: <ul style="list-style-type: none"> - A nest box for a local green space. - Something to transform a home or school into a bird-friendly building. - A way of rewilding an unused local space. 	Creative materials Printable idea description cards PDF (optional)	20 min
Time to share	Ask the class to share what they have created.	Writing materials (optional)	5 min
End of session quiz	Quiz questions to check the class's understanding of the session's content. Can be done as a group vote or individually in children's class journals.	Quiz on slides Printable course journal (optional)	3 min
Sum up and next steps	Recap on what they have learned today and a quick focus what we can all do to help protect birds from water pollution.		1 min



Stories of Change B

Tackling Water Pollution (45min)

One of 3 case study sessions where children explore three forms of negative human impact on birds and how creative humans are trying to turn them positive, before devising their own solutions to address these real-world challenges.

Link to Session Presentation PDF

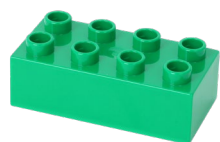
http://www.LEGO.com/cdn/cs/sustainability/assets/bltee4f5595f407a3383/Hi_BtC_2B_SoC_Water_Pollution.pdf

Link to Printable Speaker's Notes for the presentation

http://www.LEGO.com/cdn/cs/sustainability/assets/bltee4a617f166bdb00/Hi_BtC_2B_SoC_Water_Pollution_notes.pdf



SECTION	CONTENT	MATERIALS	TIMING (~45 min)
Opening	This is one of three "Stories of Change" sessions exploring case studies around human impacts on bird species. This one looks at the challenge of water pollution linked to human impact, and ways humans are fixing this by creating positive impact around the world.	Stories of Change A PDF (used throughout the session)	1 min
Group poll	Follow a link to poll questions where children can immediately see how their opinions compare to other classes around the world.	Online poll (link on slide in presentation)	2 min
Awesome words	Opportunity to run through a few of the trickier vocabulary words about to pop up in the Stories of Change video: <i>Single-use plastic, Pollution, Industrial.</i>		2 min
Warm up activities	Class compares beaks from the Natural History Museum's collection and considers how different substances mix with water to help understand how pollution enters waterways.		5 min
Video: Tackling Water Pollution	Play the <i>Tackling Water Pollution</i> video highlighting birds impacted by water pollution – penguins and other water birds – and the solutions humans are using to try to reverse that negative impact.	Online video (link on slide in presentation)	3 min
Follow up case studies	Slides highlight two more birds impacted by water pollution: Andean Flamingos and Scaly-sided Mergansers.		2 min
Time to reflect	A chance for children to reflect as a group on what they've seen so far.		1 min
Time to create	Ask the children to create something to protect birds from water pollution, in one of 2 categories: <ul style="list-style-type: none"> - Something that removes pollution from water - Something that stops pollution from getting into water. 	Creative materials Printable idea description cards PDF (optional)	20 min
Time to share	Ask the class to share what they have created.	Writing materials (optional)	5 min
End of session quiz	Quiz questions to check the class's understanding of the session's content. Can be done as a group vote or individually in children's class journals.	Quiz on slides Printable course journal (optional)	3 min
Sum up and next steps	Recap on what they have learned today and a quick focus what we can all do to help protect birds from water pollution.		1 min



Stories of Change C

Tackling Light and Noise Pollution (45min)

One of 3 case study sessions where children explore three forms of negative human impact on birds and how creative humans are trying to turn them positive, before devising their own solutions to address these real-world challenges.

Link to Session Presentation PDF

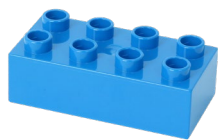
http://www.LEGO.com/cdn/cs/sustainability/assets/bltdb9d461321fa3647/Hi_BtC_2C_SoC_Noise_and_Light_Pollution.pdf



Link to Printable Speaker's Notes for the presentation

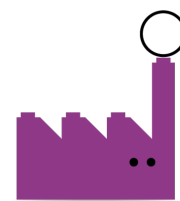
http://www.LEGO.com/cdn/cs/sustainability/assets/bltb543e5dcf90bdb09/Hi_BtC_2C_SoC_Noise_and_Light_Pollution_notes.pdf

SECTION	CONTENT	MATERIALS	TIMING (~45 min)
Opening	This is one of three "Stories of Change" sessions exploring case studies around human impacts on bird species. This one looks at the challenge of light and noise pollution linked to human impact, and ways humans are fixing this by creating positive impact around the world.	Stories of Change A PDF (used throughout the session)	1 min
Group poll	Follow a link to poll questions where children can immediately see how their opinions compare to other classes around the world.	Online poll (link on slide in presentation)	2 min
Awesome words	Opportunity to run through a few of the trickier vocabulary words about to pop up in the Stories of Change video: <i>Light pollution, Noise pollution, Communication.</i>		2 min
Warm up activities	Class compares birdsongs from the Natural History Museum's collection from during and after the pandemic and considers what that means about the impact of human activity on birds.		5 min
Video: Tackling Light & Noise Pollution	Play the <i>Tackling Light & Noise Pollution</i> video highlighting birds impacted by these two types of pollution – European robins and puffins – and the solutions humans are using to try to reverse that negative impact.	Online video (link on slide in presentation)	3 min
Follow up case studies	Slides highlight two types of birds impacted by light and noise pollution: Western Bluebird & migrating songbirds		2 min
Time to reflect	A chance for children to reflect as a group on what they've seen so far.		1 min
Time to create	Ask the children to create something to protect birds from water pollution, in one of 2 categories: - Something on your street to reduce light pollution. - Something in your town/city to help reduce noise pollution.	Creative materials Printable idea description cards PDF (optional)	20 min
Time to share	Ask the class to share what they have created.	Writing materials (optional)	5 min
End of session quiz	Quiz questions to check the class's understanding of the session's content. Can be done as a group vote or individually in children's class journals.	Quiz on slides Printable course journal (optional)	3 min
Sum up and next steps	Recap on what they have learned today and a quick focus what we can all do to help protect birds from water pollution.		1 min



The Big Challenge

Welcoming Migrating Birds (~45 min)



In this session all previous skills and learnings are put together to create something to create a positive impact on migrating birds stopping off in their local area. The objective is for children to create something to showcase to their community, including other children and decision makers. At the end, you can also [upload](#) what they've made to the LEGO Group - we'd love to see them!

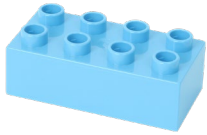
Link to Session Presentation PDF

http://www.LEGO.com/cdn/cs/sustainability/assets/blt37b77174a8913290/HI_BtC_3_Big_Challenge_Migrating_Birds.pdf

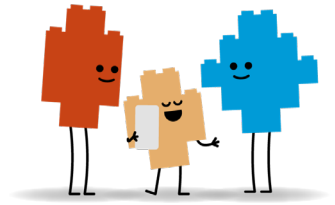
Link to Printable Speaker's Notes for the presentation

http://www.LEGO.com/cdn/cs/sustainability/assets/blt6343d4126116f794/HI_BtC_3_Big_Challenge_Migrating_Birds_notes.pdf

SECTION	CONTENT	MATERIALS	TIMING (~45 min)
Opening	In this final session children take everything they've learned in the previous sessions and apply it to help migrating birds stopping off in their local area. The ideas they create can be sent to the LEGO Group, who will share them with influential people such as policy makers, politicians and global leaders as much as they can to help inspire change. Consider also sharing the ideas with local decision makers, experts, etc. More on that later.	Big Challenge presentation PDF (used throughout)	3 min
Warm up activities	Class compares eggs from the Natural History Museum's collection and play the "migratory bird race" game to help visualise the challenges facing birds migrating over long distances.		5 min
Video: <i>Welcoming Migrating Birds</i>	Play the video which introduces the main challenge: to create somewhere safe for migrating birds to stop during their long journeys: somewhere where migrating birds and humans can live together.	Online video (link on slide in presentation)	3 min
Time to reflect	A chance for children to reflect as a group on what they've seen so far.		1 min
Time to create	Ask the children to create something to protect migrating birds: A welcoming neighborhood which migratory birds and humans can share..	Creative materials Printable idea description cards PDF (optional)	30 min
Time to share	Ask the class to share what they have created.		5 min
Group poll	Students revisit the question they were asked at the beginning of the course in light of everything they've learned: Do they think they can help nature in the future?		2 min
Sum up and next steps	Let the class know what the next step is... showing their ideas to others during the final 90-minute session, Showcase Day.		2 min
After the session	Educator takes photos of each build and its description and uploads it to the LEGO Group via the upload tool link provided. Can be done when convenient after the session. Put the builds and descriptions to one side so they can be shared at the final Showcase Day show-and-tell event. We have also provided a template letter to local decision makers if you'd like to contact them to share the children's ideas after the session.	Online photo/idea upload tool (link on slide in presentation + later in this pack)	Post-session



Showcase Day (~90 min+)



We would highly encourage every class that takes part in the Build the Change Educator program to carve out time after the core course to celebrate and showcase the children's awesome ideas. As one of the key aims of Build the Change is to amplify children's voices, the session has maximum impact especially when guests are invited from the local community, in person or online, who are in some way involved with making decisions at any scale that impact people and planet.

Link to Session Presentation PDF

http://www.LEGO.com/cdn/cs/sustainability/assets/blt62a502003b0bb778/Hi_BtC_4_Showcase_Day.pdf

Link to Printable Speaker's Notes for the presentation

http://www.LEGO.com/cdn/cs/sustainability/assets/blt601eb5c1a67d2bad/Hi_BtC_4_Showcase_Day_notes.pdf

SECTION	CONTENT	MATERIALS	TIMING (~75 min+)
Opening	Introduce the children to what is happening for the session and that you have a very special guest here to hear about their ideas (if you've invited one).	Showcase Day PDF presentation	5 min
Guest introduction	Give time to the guest(s) to introduce themselves and take questions from the children.		15 min
Showcase time	Time for the children to showcase their ideas in whichever format best suits your class. It might be a presentation per group. It might be an expo/exhibition style walk around with the guest.		45 min+
Sum up and next steps	Recap on what you have covered and achieved over the course. Massive high fives!!!!		5 min



LOCAL GUEST FOR SHOWCASE DAY

Feel free to use our [letter/email template](#) to send to local decision makers, inviting them to Showcase Day to hear the students' ideas.

Examples of the kinds of people and groups you might reach out to include:

- Local town officials or community leaders
- Local mayor
- Environmental groups
- Sustainability-focused businesses
- School directors/principals/heads
- Heads of relevant topics at the school
- Environmental scientists, engineers, designers, and other experts

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PRINTABLE MATERIALS

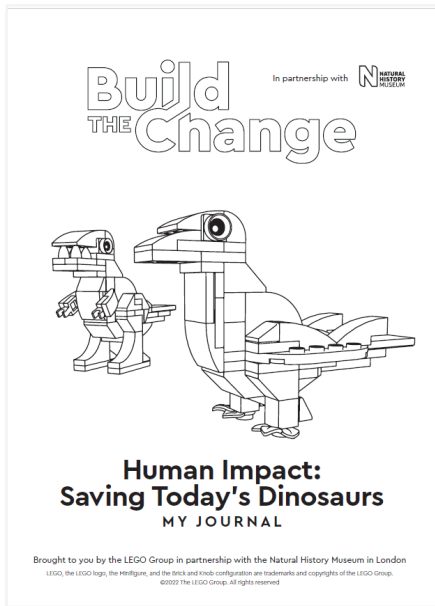
COURSE JOURNAL

Download PDF:

http://www.LEGO.com/cdn/cs/sustainability/assets/blt46c9f2b09eb3a32f/course_journal_HI.pdf

Download PDF: 2-SIDED PRINT AND FOLD VERSION

http://www.LEGO.com/cdn/cs/sustainability/assets/blt9afabb8a32461e9f/course_journal_HI-printandfold.pdf



Encourage your learners to print this blank book for recording their reflections and learnings throughout the course.

Children can also use it to write down their answers to the quizzes at the end of each session.

IDEA CARDS

Download Printable PDF

http://www.LEGO.com/cdn/cs/sustainability/assets/blt05a1a38185a2557e/BtC_Idea_description_card.pdf

These can be printed and placed next to learners' creations for when they are being displayed, for example during [Showcase Day](#).



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Uploading the Ideas

Human Impact: Saving Today's Dinosaurs

The link / QR code below will let you upload images to the LEGO Group's online galleries on LEGO.com – note that it works best on a phone!

Each hands-on "Time to Create" challenge in the course has its own gallery. Scanning the "Uploader" QR code with your phone camera will bring up a website where you can photograph your learners' builds, add a short description, and upload them.

Session 2A

Ideas to protect birds from habitat loss.



Uploader [\(link\)](#)
Gallery [\(link\)](#)

Session 2B

Ideas to protect birds from water pollution.



Uploader [\(link\)](#)
Gallery [\(link\)](#)

Session 2C

Ideas to protect birds from noise and light pollution.



Uploader [\(link\)](#)
Gallery [\(link\)](#)

Session 3: Big Challenge

A welcoming neighborhood for migratory birds.



Uploader [\(link\)](#)
Gallery [\(link\)](#)



NOTE: You'll need to create and/or sign in with a [LEGO ID Account](#) so we can contact you with any queries about your submission.

While we can't wait to see what your learners come up with, please be aware that images may be rejected by our moderation system, especially if they contain personally identifying information, e.g.

- Faces and/or people in the image
- Information about the creator beyond first name and age – e.g. last names, names of schools or geographic areas, etc.
- Email addresses, phone numbers, etc.

Images may also be rejected if they are rotated, very blurry, or contain inappropriate content.

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Background for educators: Human impact on today's dinosaurs (1/4)

About this course

In this course, your students will explore how humans impact the planet. We will focus on birds, "today's dinosaurs," to reveal how we humans can have both a negative and a positive effect on nature. Students will create imaginative solutions to these real-world challenges and share their ideas with others.

The course is organised around the latest scientific understanding of human impact and threats to biodiversity and is informed by our expert content partner, the Natural History Museum. The sessions focus on **three key areas of negative human impact** with examples from the real world of challenges and the solutions humans are working on to address them:

- A. Habitat Loss
- B. Water Pollution
- C. Light and Noise Pollution.

Human impact

Humans have been around for a very short period of time when we look at the history of the planet – but despite this, we have managed to cause a lot of negative impact. Yes, we have had positive impacts too but there is no doubt that our negative actions have disrupted the balance of life on Earth. This course looks at how humans impact the natural world – and how that impact can be negative or positive.

Historically, much our impact on the natural world has been negative, through deforestation, intensive farming, exploiting natural resources, man-made climate change, introducing invasive species plus pollution and pesticides.

Every ecosystem around the world is affected by extinction, from coral reefs to tropical jungles, and the problem is accelerating with each passing day.

It is estimated that around one million animals and plants are now threatened with extinction - more than ever before in human history. More than 40% of amphibian species, about 33% of reef-forming corals and more than a third of all marine mammals are threatened.

In fact, 75% of environments on land have been significantly altered by human actions, plus roughly 66% of the marine environment.

Not only that, but our human impact on the natural world is also starting to affect our economies and food security.

However, we have the tools to understand what is happening, and what needs to be done. If we act together we can make a positive difference.

More on this topic:

- Extinction <https://www.nhm.ac.uk/discover/news/2019/may/one-million-animals-and-plants-face-extinction.html>
- What you can do to help the planet <https://www.nhm.ac.uk/discover/what-you-can-do-to-help-the-planet.html>

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Background for educators: Human impact on today's dinosaurs (2/4)

Birds are dinosaurs!

In this course your students will learn that birds are dinosaurs! Scientists call birds 'avian dinosaurs'.

Birds evolved from a group of meat-eating dinosaurs called theropods. That's the same group that Tyrannosaurus rex belonged to, although birds evolved from small theropods, not huge ones like T. rex. The oldest bird fossils are about 150 million years old. These ancient birds looked quite a lot like small, feathered dinosaurs and they had much in common. Their mouths still contained sharp teeth. But over time, birds lost their teeth and evolved beaks.

After more than 140 million years in charge, the reign of the dinosaurs came to an abrupt end when a huge asteroid strike and massive volcanic eruptions caused disastrous changes to the environment. Most dinosaurs went extinct. Only birds remained.

Over the next 66 million years, birds evolved in many ways, which enabled them to survive in lots of different habitats. Today there are at least 11,000 bird species.

More on this topic:

- How dinosaurs evolved into birds <https://www.nhm.ac.uk/discover/how-dinosaurs-evolved-into-birds.html>
- Why are birds the only surviving dinosaurs? <https://www.nhm.ac.uk/discover/why-are-birds-the-only-surviving-dinosaurs.html>

Adaptations

Adaptations are features of a living thing that improves its chances of survival and reproduction. Basically, any feature that allows a living thing to live long enough to have offspring is an adaptation. Adaptations can be physical features, such as large eyes to see in the dark, or behavioural features such as hibernating during winter to survive tough environments.

This video shows Museum staff talking about their favourite specimen. Listen out for the different adaptations of each living thing that helps it to survive: <http://www.youtube.com/watch?v=EEtLdyd94Sg>

Migration

Few bird species stay in the same location their whole lives. Most move to find better food sources, a mate or areas better suited to raising chicks. Many different species of birds, migrate, or travel, from one area to another. Migrations can be short journeys, but some birds travel extremely long distances when migrating, crossing oceans and continents. Birds migrate for many reasons: to go somewhere warmer during cold months or somewhere with more daylight hours for finding food. Some birds use the stars and moon to help navigate and work out which way to go.

More on this topic: <https://www.rspb.org.uk/birds-and-wildlife/natures-home-magazine/birds-and-wildlife-articles/migration/>

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Background for educators: Human impact on today's dinosaurs (3/4)

Habitat Loss

As humans change the environment, from building roads to digging up fields, we chip away at the diversity of life, reducing the number of species that are found in any one place. This is causing species around the planet to decline at a concerning speed.

A study has assessed the potential different drivers of this decline and found that land use change is the number one cause. This land use change is often attributed to the destruction of natural forests and grasslands to make space for intensive farming and livestock. The other biggest causes are the direct exploitation of wildlife and pollution. What is perhaps most surprising is that climate change has been only the fourth largest driver of recent biodiversity loss on land.

Each species plays an important role in maintaining the complex systems that keep the Earth functioning, including the production of clean water, the food that we eat, the air we breathe, and even our mental and physical wellbeing.

Knowing what is causing this rapid decline in wildlife is essential in helping to direct how we will stop and eventually reverse it. There are many projects around the world to protect natural areas and reduce habitat loss.

More on this topic: <http://www.nhm.ac.uk/discover/news/2022/november/destruction-forests-and-grasslands-biggest-cause-of-biodiversity-loss.html>

Water Pollution

We all rely on the ocean, whether we know it or not. Earth's vast expanses of water are key to the success of all life on Earth. We eat fish from the ocean, we breathe the oxygen it gives off, we feel the warmth of its huge currents. Without a healthy ocean, humans cannot thrive.

But we haven't been treating the ocean well and as a result, it is now struggling. It is facing three huge threats: overfishing, pollution and climate change. Most of these are caused by human mismanagement. Nature is being stretched to breaking point. If we don't stop, the ocean could be drastically changed within our lifetimes.

Rivers of pollution flow into the ocean every day, with little sign of slowing down. Marine animals and birds now regularly eat single-use plastic, and so do humans. It is estimated that by 2050 there could be more plastic in the sea than fish. Chemicals, sewage and noise pollution all affect marine life too.

Knowing what is causing water pollution is essential in helping to direct how we will stop and eventually reverse it. There are many projects around the world to protect natural areas and reduce water pollution.

More on this topic: <http://www.nhm.ac.uk/discover/will-the-ocean-really-die.html>



Background for educators: Human impact on today's dinosaurs (4/4)

Light Pollution

Light pollution is the presence of artificial light in the night environment. It is caused by human activity which can be disruptive and harmful to both wildlife and humans.

In well-lit areas such as towns and cities, sky glow can be enough to entirely obscure our view of the stars. With growing light pollution around the world, species with nocturnal behaviours dependent on moonlight are having it obscured by other light sources, and they are in trouble. For many animals, particularly birds, the Moon is essential to migration and navigation. Others will time their reproduction to coincide with the specific phases of the lunar cycle.

It's not just about how much light there is but what type of light is being produced. In some cases, energy-efficient lighting such as blue-rich LEDs can be just as bad (or even worse) for wildlife as less energy efficient options.

Knowing what is causing light pollution is essential in helping to direct how we will stop and eventually reverse it. There are many projects around the world to protect natural areas and reduce light pollution. There are also many simple ways individuals can help reduce light pollution.

More on this topic:

- Light Pollution <http://www.nhm.ac.uk/discover/light-pollution.html>
- How does the moon affect life on Earth?
<http://www.nhm.ac.uk/discover/how-does-the-moon-affect-life-on-earth.html>

Noise Pollution

Noise pollution describes harmful or annoying levels of noise. It is caused by human activity which can be disruptive and harmful to both wildlife and humans.

Many species are sensitive to noise pollution. It may affect their behavior, stress levels and even growth. Animals use sound for many different reasons, including navigation, finding food, attracting mates and avoiding predators. Noise pollution therefore makes it difficult for them to do hear the world around them, which can affect their ability survive.

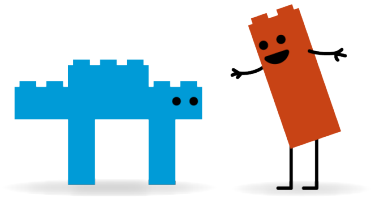
Knowing what is causing noise pollution is essential in helping to direct how we will stop and eventually reverse it. There are many projects around the world to protect natural areas and reduce noise pollution.

More on this topic: <https://www.nhm.ac.uk/discover/nature-liberated-by-lockdown.html>

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.

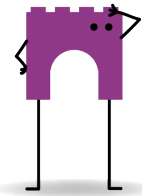
While curricula vary from country to country and state to state, this Build the Change course offers a number of **cross-cutting skills and knowledge areas** that form part of many national and regional curricula for the **7-12 year old age range**:



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



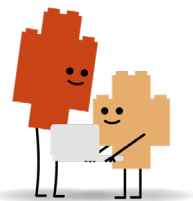
The LEGO Group see creativity as one of the core skills needed to start children on a journey of lifelong learning, and Build the Change sessions are designed to develop this – each session begins with a brief initial immersion in a real-world topic followed quickly by hands-on creation and sharing of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

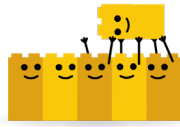
sessions, giving the children the opportunity to find the challenges they wish to address within scenarios that we present to them.

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.

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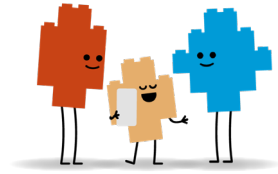
Fitting into Curricula

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

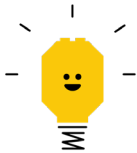


A key objective of Build the Change is to build advocacy, civic engagement and self-efficacy in the children who take part. Children should leave the sessions feeling their ideas are valued and have the power to inspire, influence and impact the planet and everything on it.

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 a number of key scientific concepts and encourages children to think in terms of systems when looking at the natural world and the impacts that humans can have.

The first big connect is that of dinosaurs to their evolutionary cousins, birds. Exploring the physical similarities of birds and dinosaurs, children are able to connect the dots between the two.

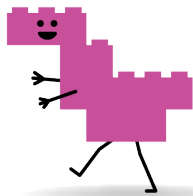
The course explores different habitats that birds live in and examine the adaptations species have to their environment. It also introduces the migratory behaviour of

birds – why they do it, how they do it etc.

The children are also introduced to the negative impacts that humans are having on birds and their habitats around the world, reinforcing the systems thinking approach – that one impact sets off another and so on.

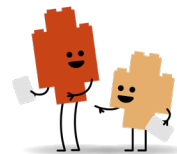
Equally this thinking is encouraged through positive stories of change, highlighting the efforts of humans in reversing many of these impacts and preventing them from happening again.

GEOGRAPHY



The course content focuses especially on the impact of human behaviours and error, of development and urbanization.

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.

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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**

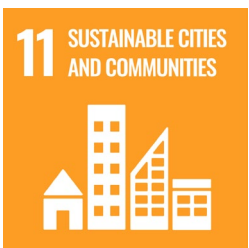


The course aims to educate children on the importance of conserving the oceans and seas for preserving biodiversity **target 14**



The course aims promote the protection, restoration and sustainable use of the planet’s terrestrial ecosystems, reversing land degradation and halting biodiversity loss **target 15**

Other Goals Discussed



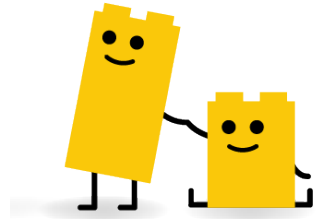
The course also touches on the sustainable development goals **6, 7, 11, 12 and 13**: from the importance of finding cleaner and smarter solutions to enable humans to live side by side with nature to ways human impact can positively affect not only bird species but also climate change.

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

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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.

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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:

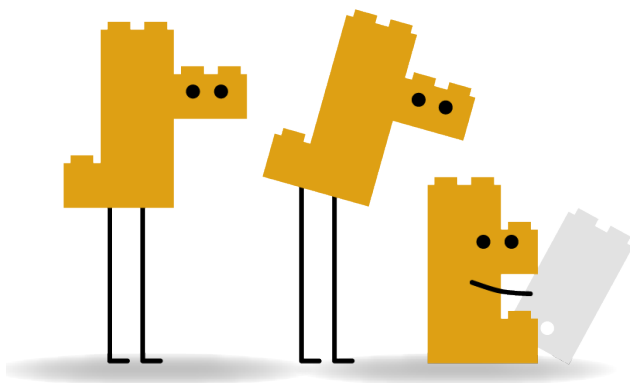
...Create something that can remove pollution from water

Support needed

- Work with the child to help them firstly picture either the water habitat or environment we are focusing on or the type of pollution. For example, they might start with "river" or "single-use plastic bottle." Perhaps ask them to sketch this first step to get the creativity going. Once they are comfortable with this, expand from there with questions like: "what can harm the river?" or "how easy is it to pick up a floating water bottle?" Aim to have the habitat and pollution type firm in the child's mind after a few questions. Then move on to encouraging them to create something that can stop that pollution entering the water in the first place or a machine that picks it out of the environment.

Challenge needed

- Ask the child to design something that changes the behaviour of the public so that pollution doesn't end up in the water to start with.



...Create a welcoming neighbourhood which migratory birds and humans can share.

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 space designer, testing and trying things out. That making prototypes where nothing is perfect but the idea is there is fine!
- 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 attract one of the species they heard about to their area?

Challenge needed

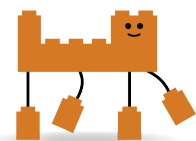
- Given the high-ceiling nature of this task, there is a lot of room to make their designs as complex as they wish. If they finish their creations quickly, try for example tasking them with adding annotations to their creation with sticky notes, describing each component of their idea. Perhaps ask them to detail how species will 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?

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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.

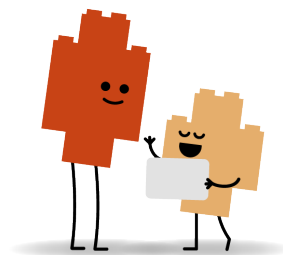
CREATIVE SECTIONS

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:



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.



- 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 ;)

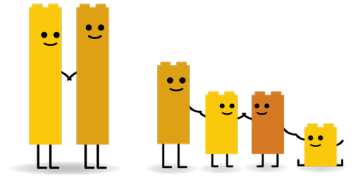
When it comes to sharing their creation encourage them to use a simple structure:

- 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.

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Facilitation tips and tricks

GROUP WORK

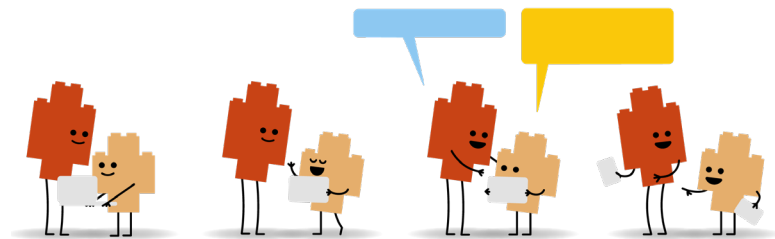


Build the Change is perfect for working in groups, but we would recommend no more than 4 children per group. This is simply to ensure everyone gets to input and play an important role.

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.

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About the Natural History Museum, London and at Tring

The Natural History Museum in London first opened to the public in 1881 and is a world-class visitor attraction and leading science research centre. We use our unique collections and unrivalled expertise to tackle the biggest challenges facing the world today. We care for more than 80 million objects spanning billions of years, including one of the largest and most comprehensive bird collections in the world.

Our mission is to create advocates for the planet, and one of our strategic priorities is to engage and involve the widest possible audience. Caring, understanding, and speaking up for the natural world has never been more important. We seek to empower people to make informed choices and act on behalf of nature to secure the best possible future for the planet. Through our learning programme we want to inspire, inform and empower the next generation of advocates for the planet, building identity, confidence and literacy in science as well as long lasting relationships with the natural world.

With over one million specimens representing 95% of all known bird species, housed mostly at our sister site in Tring, Hertfordshire, the Museum scientists study birds from across the entire planet, as well as across thousands of years, paying particular attention to topics like evolution, conservation and interactions between humans and birds.

Studying the genetic makeup and characteristics of these birds can help inform present and future research of what we can do to coexist with nature, allowing both people and planet to thrive. Inspiring future generations to be advocates for the planet through education is vital in tackling climate and biodiversity issues.

The LEGO Group and the Natural History Museum have been working in partnership for a number of years, reaching thousands of people through our co-created programmes. Our joint goal is to help the builders of tomorrow learn about the natural world through playful and creative experiences.

<https://www.nhm.ac.uk/>



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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](#).

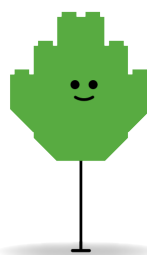


OUR COMMITMENT TO SUSTAINABILITY

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.



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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.

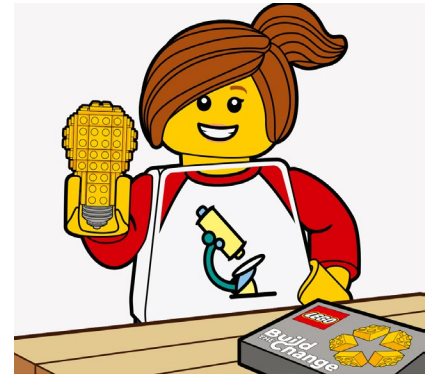
Immerse → Create → Share



Learn about a real-world planet and people challenge.



Devise your own brilliant solution.



Share it with others.



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