

# PRINTABLE SPEAKER'S NOTES for THINK OUTSIDE THE BUS MINI-LESSON!

***Italics = suggested speaking script***    **Standard text = notes to educator**

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<b>Event Pack</b>	<b>Think Outside the Bus – School Buses in the Circular Economy</b>
<b>Suggested length</b>	60 minutes+
<b>Suggested age group</b>	7+
<b>Summary</b>	This workshop aims to get children thinking about the circular economy and ways things can be designed differently to better benefit both the planet AND people. Specifically, children will be hearing from the World Resources Institute's Electric School Bus Initiative and will be handed the steering wheel to reimagine how old diesel buses might be repurposed, as school districts adopt electric models instead.
<b>Content</b>	<p>The workshop is split into four distinct parts:</p> <p><b>Introduction</b></p> <ul style="list-style-type: none"> <li>• Build the Change</li> <li>• Poll questions</li> </ul> <p><b>Immerse</b></p> <ul style="list-style-type: none"> <li>• Dive deeper into the main topic, the circular economy and electric school buses</li> <li>• Take the children through a series of poll questions and discussion points</li> <li>• Hear some case studies</li> <li>• Learn some awesome new words</li> </ul> <p><b>Create</b></p> <ul style="list-style-type: none"> <li>• Give children the main creative task – As school districts switch to electric school buses, how can they reuse old diesel school buses (i.e. the product) or their components for a new purpose?</li> </ul> <p><b>Share</b></p> <ul style="list-style-type: none"> <li>• Give the children an opportunity to share what they have created</li> </ul>
<p><b>NOTES FOR EVENT FACILITATOR:</b></p> <ul style="list-style-type: none"> <li>• Please refer to speaker's notes on each slide for tips, info, and to ensure tone of presentation style is BtC-aligned.</li> <li>• Videos are embedded in presentation and play automatically when clicking on the previous slide. (does not apply to PDFs)</li> <li>• All images are ©The LEGO Group, licenced from Shutterstock or provided by WRI with permission for use in this workshop</li> <li>• Enjoy!</li> </ul> <p style="text-align: right;"><small>LEGO, the LEGO logo, the Minifigure, and the Brick and Knob configuration are trademarks and copyrights of the LEGO Group. ©2023 The LEGO Group. All rights reserved</small></p>	



In partnership with

Electric  
School Bus  
INITIATIVE



WORLD  
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# Build THE Change

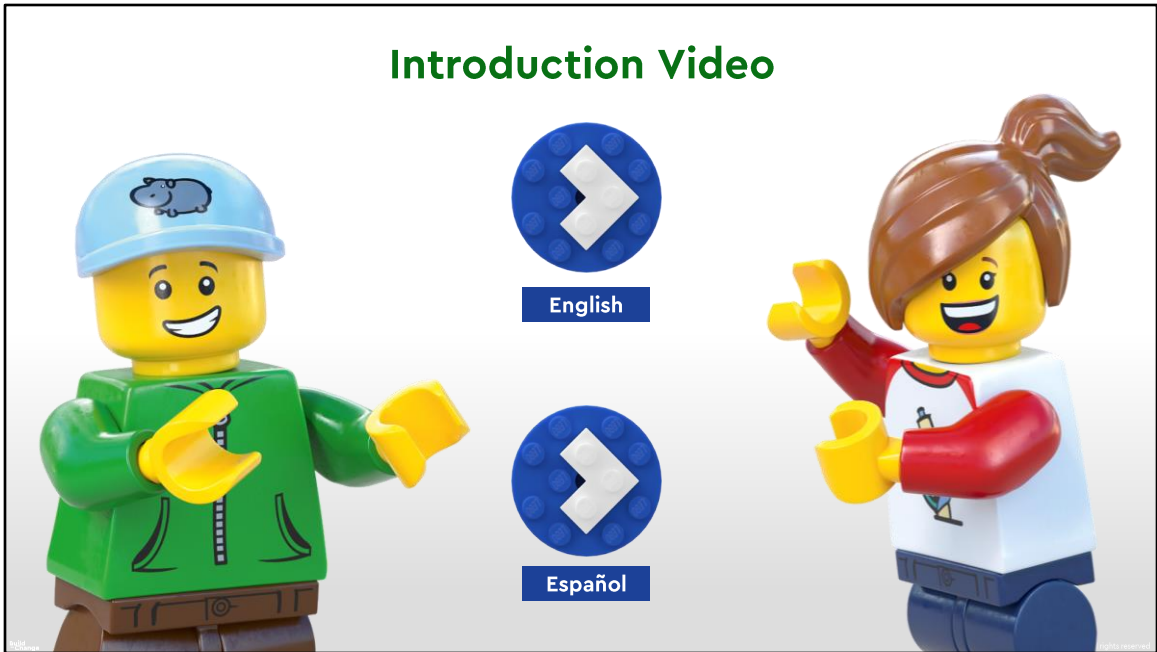
**Think Outside the Bus**  
**School Buses in the Circular Economy**

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- *Welcome class!*
- *In this Build the Change course, we are going to learn about steps others have taken – and steps we can take – to move toward a world without waste by keeping products and materials in use.*
- *We'll be taking a close look at school buses. Did you know that school districts across the country are starting to add electric school buses to their fleets? This is great news for addressing climate change and local air pollution. But, what happens to the old, mostly diesel buses, they replace? How can we reduce waste?*
- *That's what we'll explore today!*
- *To start, let's hear from Leo and Linda about Build the Change and the role you will play!*

The video is on the next slide.

## Introduction Video



- *Here's a quick video to get us started*

Play the video, "Welcome to Build the Change," at

### **ENGLISH**

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### **ESPAÑOL**

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# Poll

[Link to online poll](#)

1



I don't have a role at all in protecting the planet.

2



I don't think I have much of a role.

3



I'm not sure.

4



I play a role in keeping the planet healthy.

5



I have a really important role in protecting the planet.

**Do you think you have an important role in protecting the planet?**

- *Before we get started, let's ask ourselves a few poll questions...*

Ask the class to put their hands up for the number they most connect with.

Recognise there are no wrong answers.

If answering as a class, click on the poll link and enter the answer which had the most hands up.

[http://www.lego.com/sustainability/buildthechange/polls/poll-bus\\_start?CMP=EMC-LCE](http://www.lego.com/sustainability/buildthechange/polls/poll-bus_start?CMP=EMC-LCE)

# Poll

[Link to online poll](#)



Disagree.



I'm not sure.



Agree.

I am already making a change.

Ask the class to put their hands up for the number they most connect with.

Recognise there are no wrong answers.

If answering as a class, click on the poll link and enter the answer which had the most hands up.

<http://www.LEGO.com/sustainability/buildthechange/polls/mch?CMP=EMC-LCE>

## **Educator prompt:**

- *What are ways that you are already helping to build the change?* Students may suggest answers such as: walking or riding my bike places, recycling, reusable water bottle, turning off lights, etc

# Our Topic



## Think Outside the Bus School Buses in the Circular Economy

- *Today we are going to start exploring a really cool topic – one that is really important in helping people and the planet. The session is called Think Outside the Bus – School Buses in the Circular Economy!*
- *The big idea here is to start designing things differently to change the ways we take, make, use, and waste things right now.*
- *One way to do this is by applying the principles of something called the circular economy.*
- *Don't worry if you've never heard of it – by the end of this, you will know what these two words mean together and you will be able to tell others what it means too!*
- *It's something that can help the environment, help communities around the world and also help businesses be more environmentally and socially responsible.*

## Most U.S. school buses use harmful diesel fuel



Source: [School Bus Fleet](#), [WRI Analysis](#), [Atlas EV Hub](#)

- *Before we get into the circular economy, let's start with how school buses fit into this lesson.*
- *Did you know?*
  - *In 2018-19, more than 20 million students rode the bus to school each day in the United States?*
  - *There are approximately 480,000 school buses in the U.S., and about 90% of them are diesel-powered.*
  - *Diesel exhaust pollution presents health and development dangers to students, drivers and communities. It has links to asthma and other respiratory conditions.*
  - *Diesel is also a fossil fuel, which means it releases greenhouse gas emissions and contributes to climate change.*
  - *And, climate change is impacting our planet in a variety of ways – creating heat waves, droughts, extreme storms, sea level rise, and more.*

## While diesel exhaust pollution is dangerous for everyone, its impacts are not felt equally



Source: [Union of Concerned Scientists](#)

- *While diesel exhaust pollution is dangerous for everyone, its impacts are not felt equally*
- *For example, today, communities of color face higher levels of pollution including on-road pollution*
- *One source of this on-road pollution is diesel school buses.*
- *So, what can be done?*



## Electric School buses offer a cleaner, healthier ride



Source: [WRI Analysis](#) & [WRI Analysis](#)

Main photo: Gilbert Rosas & Twin Rivers Unified School District

- *One solution is electric school buses.*
- *Have you ever noticed a tailpipe on a car or bus? Electric school buses don't have one! They have no tailpipe and no tailpipe emissions. This means students and drivers are protected from dangerous air pollutants.*
- *They also produce fewer greenhouse gas emissions – which cause climate change – than any other school bus type.*
- *Unfortunately, electric school buses still make up a small percentage of those 480,000 buses across the country.*
- *But, there is a lot of excitement and momentum around making the switch to electric school buses. The federal government, as well as many states, are beginning to put more money into making this happen in more communities across the country.*
- *And, remember what we just learned about how some communities – especially low-income communities and communities of color – have more exposure to diesel exhaust from school buses than others?*
- *The transition away from diesel school buses to electric school buses must address that. It's critical we make sure that the communities most impacted by diesel exhaust pollution have access to the benefits of electric school buses first – and that they're involved in the decisions and processes to make electric school buses a reality.*



- *OK, let's hear more about electric school buses.*

Play the video

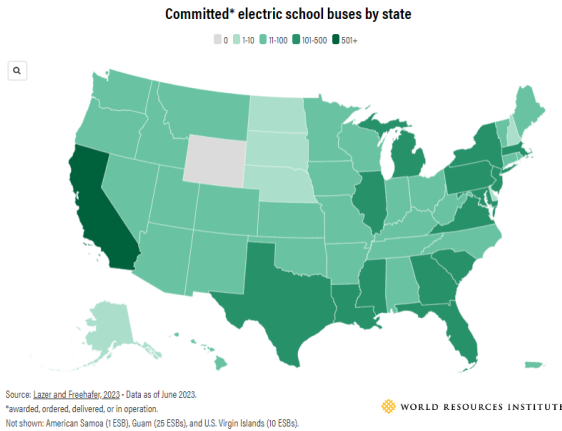
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## **ESPAÑOL**

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# Electric school buses are on their way to schools across the country!



**[Click here](#) to find out which districts in your state have electric school buses – or will be getting them soon!**

Source: [WRI analysis, August 2023](#)

- *Electric school buses are operating in all types of communities*
- *Thanks to funding from the Environmental Protection Agency's Clean School Bus Program and other programs, electric school buses are on their way to almost every state in the US, as well as American Samoa, Washington, DC, Guam, Puerto Rico, and the Virgin Islands.*
- *Today, school districts in California, Maryland and Florida are leading the way with hundreds of electric school buses committed in each state.*

# Awesome Words



**Reuse**



**Recycle**



**Repair**



**Repurpose**

Now it's time to introduce the class to some of the key words from the session. To start with, ask the children if they know any of these words and ask them to describe what they think they mean.

- *OK class, which of these words do you recognize? Would anyone like to try telling us what they mean?*

*Reuse -----*

- *This describes when we take something that has already been used once and use it again, hopefully many more times. Reuse means less waste because fewer things are thrown away. It might be using the thing again in the same way OR using it again in a different way. For example, the juice carton was perfect for holding my juice. Then I **reused** it as a plant holder for planting seeds.*

*Recycle -----*

- *Recycling is the action or process of breaking waste down into reusable materials. Does anyone know something that is recycled? One thing to know about recycling is that it does use some energy and creates some waste. Therefore, reducing and reusing have less of an impact on the environment.*

*Repair -----*

- *This is where something that is broken is fixed so it can be used again. Have you ever repaired something?*

*Repurpose -----*

- *To repurpose something is to give an object a new use, or purpose that is not what it was originally created to do. If, for example, we took a ladder and made it into a bookshelf, that's an example of repurposing*

# Awesome Words



**Product**



**Component**



**Material**

- *OK class, we have three more awesome words to cover, which of these words do you recognize? Would anyone like to try telling us what they mean?*

*Product -----*

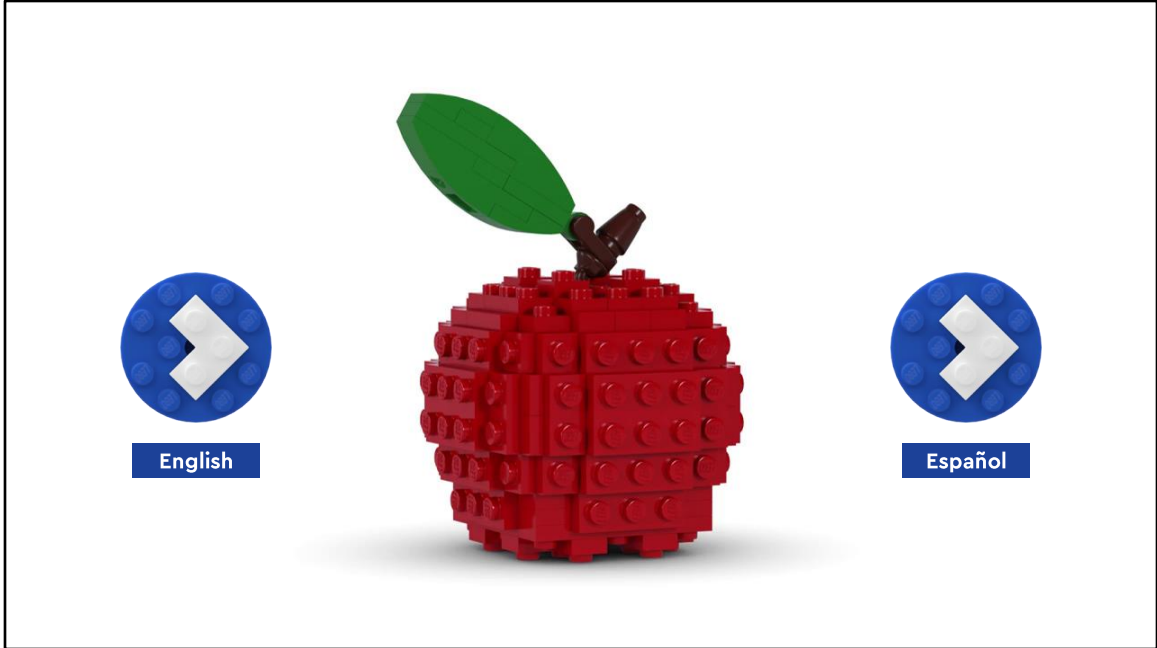
- *A product is anything that people need or want to buy.*

*Component -----*

- *A part of something bigger, especially a part of a machine or vehicle. For example, the handlebars on a bike are a component of the whole bicycle.*

*Material -----*

- *The elements, substance, or parts which make up a component. This is what we think of when we ask, "What is something made of?" Examples are wood, plastic, steel, etc.*



- *OK, it's time to hear more about what circular economy is and the problems it can address!*

Play video >>>>

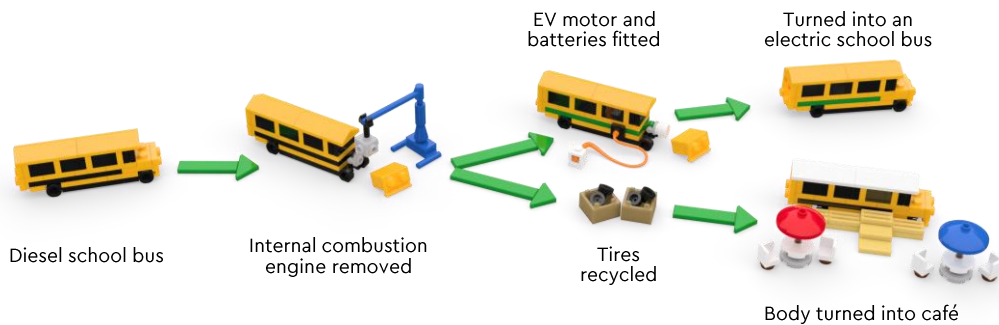
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## Being part of the circle helps the planet



**Diesel buses can be taken apart and reused or recycled**

- *Now, bringing this all back to circular economy: As schools transition to more electric school buses, we have to also think about what happens to the old and retiring diesel buses.*
- *As you can see in this diagram, there are at least a couple of paths that this can take. First, the internal combustion engine is removed. Then:*
  - *An EV motor and other EV components, including a battery, can be installed. This is a process called "repowering," and it turns the bus into an electric school bus.*
  - *Alternatively, components of the bus, such as the tires, can be recycled. Other components, such as the body, can be reused. The example in the diagram is a bus body that's turned into a café.*

# Discussion



What things have you observed that have been reused?

- *Before we get going, let's ask ourselves a few questions...*
- *What things have you observed that have been reused? Has anyone ever been on a tire swing? What else do you see on this slide that's being reused for another purpose?*

The instructor can collect responses on a white board, if desired.



# Discussion

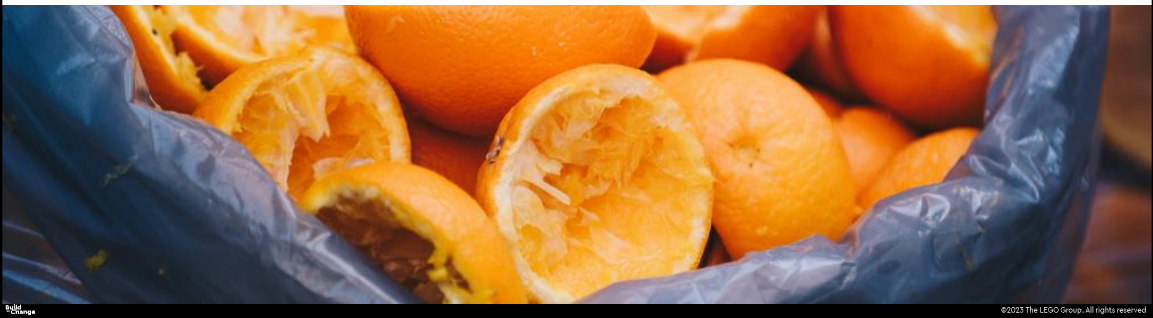


How do you get to school?  
What word comes to mind when you think of 'school bus'?

Open this question up to your class.

# de CLIQUE

Netherlands



- *Let's take a look at a real-world example of **reuse** of a **component**. First, can someone quickly remind us what **reuse** means? And, what's a **component**?*
  - *Great. Here's the example. DeClique, located in the Netherlands, is a company that takes discarded food products – the food waste we throw away -- and reuses them in new products.*
  - *One example is oranges. DeClique takes discarded orange peels and uses them to make cleaning products, beverages and bread.*

Image courtesy of DeClique



Play video

## **ENGLISH**

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## **ESPAÑOL**

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# Bus Repurposed

## Knox, USA



- Here's another example of reusing. This time, it's a **product** that is being re-used. And, that product is a diesel school bus!
  - In 2020, Knox County School District, in Missouri, decided to make its next school bus an electric one.
  - They were attracted to the health benefits of electric buses, and they knew they would save money each year by not having to purchase diesel fuel for the bus.
  - So, after looking for and receiving grants (or money), the district purchased its first electric school bus. It's up and running already!
  - The drivers love how quiet and smooth the ride is.
  - And, kids no longer have to yell over a loud diesel engine. I'm sure you can appreciate that!
- A requirement of many electric school bus funding programs is that, when the new electric school bus arrives, the old diesel bus must be scrapped. Does anyone know what "scrapped" means?
- Scrapped means that the bus can no longer be used.
- Knox County School District did not want to simply scrap its bus. They wanted to find a way to reuse it for a new purpose. What could they do?
  - Instead of turning the bus over to a junkyard, Knox County School District repurposed the structure as a coffee shop!
  - Students were very involved in redesigning and reconstructing the bus as a coffee shop. They are the ones who run the shop, even!
  - You can see photos of the coffee shop bus [here](#).

# Bus café

## The Benefits



Waste reduction

Bus component parts do not end up in the landfill.



New purpose & value

The Knox County community has a new coffee shop!



Education

Students learn entrepreneurship and business development.

- *So, what are the benefits of this project, in which students reused their old diesel bus by turning it into a coffee shop?*
  - *Bus component parts do not end up in the landfill.*
  - *The Knox County community has a new coffee shop; students donate appreciation coffees to local businesses every Wednesday.*
  - *Students designed, built, and now operate the bus café. They've learned entrepreneurship and business development.*

# Time to reflect

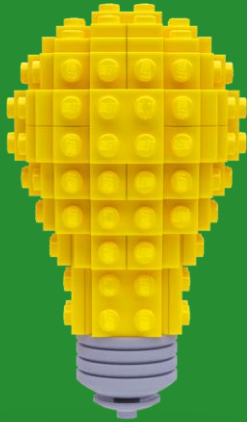
What stood out to you in those stories of change?



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The children have been through two case studies by this point. This slide is an opportunity to reflect and take in all of the information they have just heard.



# Time to create...

**a new use for old diesel buses (or their components) as they are replaced with electric buses?**

Students will explore the challenge question --

- *As school districts switch to electric school buses, how can they reuse old diesel school buses (i.e., the product) or their components for a new purpose?*
- *It may be something to help the community. It may be something that brings people together. It may be something that provides shelter.*

Remind the children of the examples of reuse discussed previously in the lesson.

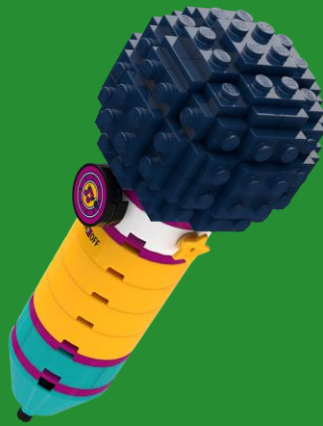
Materials needed: In line with the theme of repurposing and keeping things in use for longer, we encourage classes to reuse waste materials lying around in school or at home for these activities. This activity can also be done with pen and paper or LEGO bricks.



Bring this up once the 25 minutes of “time to create” is up. [time can be shorter or longer]



# Time to share



Show this slide while you give children a chance to share what they designed.

Once they're done with sharing, get them to gather for a wrap up quiz starting on the next slide...

**Teachers: Don't forget to upload photos and descriptions of your kids' ideas to our public galleries on LEGO.com, using the QR code in the Course Pack or this URL:**

<https://www.lego.com/sustainability/buildthechange/challenges/bus/upload>



- *It is the end of the session! Yay!! Well done everyone!*
- *We'll be finishing up with a quick quiz on some of the things we learned today.*

# Quiz question 1

What is the circular economy?

- A** A new way to design, make and use things that's better for people and the planet.
- B** It describes a future where everything we make is circle-shaped (no more triangles or squares).
- C** It describes how we must continue to take things from the Earth.



Go to the next slide to see the correct answer.

# Quiz question 1

What is the circular economy?

- A A new way to design, make and use things that's better for people and the planet. ✓
- B It describes a future where everything we make is circle-shaped (no more triangles or squares).
- C It describes how we must continue to take things from the Earth.



Go to the next slide to see the next question.

## Quiz question 2

Which of these are examples of reusing something?

- A** Walking to school instead of driving.
- B** Putting a milk carton in the recycling bin.
- C** Mixing paint colors in old yogurt containers.



Go to the next slide to see the correct answer.

## Quiz question 2

Which of these are examples of reusing something?

- A Walking to school instead of driving.
- B Putting a milk carton in the recycling bin.
- C Mixing paint colors in old yogurt containers. ✓



Go to the next slide to see the next question.

# Quiz question 3

How do electric school buses help people and nature?

- A** They have no tailpipe emissions, so kids on board have less exposure to pollution.
- B** They produce fewer greenhouse gas emissions.
- C** They're quieter!



Go to the next slide to see the correct answer.

# Quiz question 3

How do electric school buses help people and nature?

- A** They have no tailpipe emissions, so kids on board have less exposure to pollution. ✓
- B** They produce fewer greenhouse gas emissions. ✓
- C** They're quieter! ✓





# Poll

[Link to online poll](#)



I don't have a role at all in protecting the planet.



I don't think I have much of a role.



I'm not sure.



I play a role in keeping the planet healthy.



I have a really important role in protecting the planet.

Do you think you have an important role in protecting the planet?

The direct link is here:

[http://www.LEGO.com/sustainability/buildthechange/polls/poll-bus\\_end?CMP=EMC-LCE](http://www.LEGO.com/sustainability/buildthechange/polls/poll-bus_end?CMP=EMC-LCE)

# Over to Us

## What can we do to help?

1. Recycle your milk carton and/or other containers at lunch.
2. Talk to your school cafeteria staff about how the school can reduce food waste.
3. Reduce your carbon footprint by asking your family if you can walk or bike to nearby locations.
4. Reuse things from home to make bird feeders and bird nest boxes.
5. Ask your school district if it has any electric school buses or is considering them.

- *Before we go, here are a few tips on how we can all help the circular economy.*
- *Do you do any of these already?*



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From the Planet Earth and  
everyone at the LEGO Group  
and the World Resources  
Institute, thank you for  
building the change

**See you next  
time!**

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- *That's it for this session! Well done to all.*

# Hey, Educators!

## Upload your kids' awesome ideas!

Don't forget to [upload](#) photos and descriptions of your class' creations to our [Thinking Outside the Bus gallery](#) on LEGO.com!

Scan the QR code with a phone camera to get started.



**Think Outside the Bus**  
School Buses in the Circular  
Economy

<https://www.lego.com/sustainability/buildthechange/challenges/bus/upload>



Don't forget to upload your kids' creations to our gallery on LEGO.com! Just take a photo, add a description of the idea, and fire away! **Note: you will need to be signed with your LEGOID username and password to upload.**

Just scan the QR code above with a phone camera to get started or use this URL:  
<https://www.lego.com/sustainability/buildthechange/challenges/bus/upload>

Images and descriptions will be moderated and put into this gallery:  
<https://www.lego.com/sustainability/buildthechange/challenges/bus/gallery>