

2023

How can informal education settings be best used to influence engagement with environmental issues?

Hill, H.L.

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The Plymouth Student Scientist

University of Plymouth

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Appendices

1. Environmental education conferences and summits timeline

Table 4. Further information about environmental education conferences and summits from Figure 1 (UNESCO, 1997b; UNESCO, 2007; UNESCO, 2015; Leicht et al., 2018; United Nations, no date (a); United Nations, no date (b)).

| Year | Conference/Programme | Description |
|----------------|--|--|
| 1975 - 1995 | International Environmental Education Programme | Two decades advising how best to use environmental education internationally to increase awareness of environmental issues. |
| 1977 | First Intergovernmental Conference on Environmental Education – Tbilisi, Georgia | Highlighted importance of education for promoting awareness of environmental issues at an international level. |
| 1987 | International Strategy for Action in the Field of Environmental Education and Training in the 1990's – Moscow, Russia | Continued to highlight the importance of education in promoting awareness of environmental issues at an international level. |
| 1992 | Earth Summit - Rio de Janeiro, Brazil | Creation of Agenda 21, in which education at all levels was cited as being linked to all areas within the report. |
| 1997 | Third International Conference "Environment and Society: Education and Public Awareness for Sustainability" – Thessaloniki, Greece | Suggested reorientation of formal and informal education towards sustainability, not just environment. |
| 2007 | Fourth International Conference on Environmental Education towards a Sustainable Future – Ahmedabad, India | Acknowledged work of previous conferences and placed urgent need on incorporation of sustainable development into environmental education. |
| 2012 | Earth Summit 2012, or Rio+20 – Rio de Janeiro, Brazil | Follow up to original Earth Summit, recognised need for changing how humanity thinks and acts to address environmental and sustainable development issues through education at all levels. |
| May 2015 | World Education Forum – Incheon, Republic of Korea | Adoption of Incheon Declaration, commitment of UN member states to renewed education agenda to reaffirm the goal of sustainable development education for all. |
| September 2015 | UN Sustainable Development Summit – New York, USA | Adoption of the 2030 Agenda for Sustainable Development, outlining Sustainable Development Goals, with one specifying the importance of education for sustainable development (SDG 4, Target 4.7). |
| 2022 | UN Transforming Education Summit – New York, USA | Renewed UN's commitment to inclusive, relevant education; place it at the top of the global political agenda; and aid its transformation to align with a rapidly changing world. |

2. Conversations with eco club lead teacher

Session 1 interview transcript - Mrs Cunningham

Why did you set up eco club?

I've been doing eco club for a number of years now, I think it was about 10 years ago we went for our green flag eco school status and that was something I just found the children were so passionate about a lot of the issues it just seemed that it would be quite nice to do something in the school grounds or involving a wider range of children that we could run as a club.

Did you have to set up the eco committee as a result of being a green flag school or did eco club count?

The eco committee is one of the stipulations of being a green flag school, you have to have that eco committee who are the driving force behind the green flag status. The idea is that it comes from the children and eco club is just an add-on to that, enriching in a different way.

Session 5 interview transcript – Mrs Cunningham

Has eco club always been so popular?

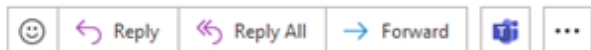
Yes it has, I have been doing it for 10 to 12 years, often at the beginning of the year we have that interest and then it sometimes wanes a little bit, but actually we've had numbers into the 20s and 30s. Overall it's generally a popular club to come to.

Follow up email to Mrs Cunningham re usual activities at eco club

Re: Another question about eco club



Becky Cunningham
To Hayley Hill



Tue 06/12/2022 15:44

Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.

Hi Hayley,

All good here thanks - just crawling towards the finish line! 😊

We usually do recycled Christmas crafts, bug hunts, make homes for nature, natural art, signs of seasonal change, plant/tree identification, use of the farm, planting, litter picks on school grounds and in the local community..

Hope this helps!

Becky

3. Project information sheets and consent forms

SAMPLE INFORMATION SHEET FOR ECO CLUB MEMBERS AND THEIR PARENTS/LEGAL GUARDIANS

UNIVERSITY OF PLYMOUTH

FACULTY OF SCIENCE AND ENGINEERING

RESEARCH INFORMATION SHEET

Name of principal investigator and email address:

Hayley Hill, hayley.hill@students.plymouth.ac.uk

Research Project Title:

In an informal education setting, does type of learning activity influence engagement with environmental issues?

Invitation to participate in research

You/your child are invited to be a participant in this research project. Before we go any further, please read this information sheet carefully to make sure you understand what you/your child might expect to do and how the research protects your/your child's anonymity, confidentiality, and well-being. You/your child may discuss the research process with others if you wish. Feel free to ask if you need more information. Please consider if you/your child want to take part or not in this study. You/your child are free to withdraw from this research at any time.

What is the project's purpose?

This project aims to identify whether enjoyment of different types of learning activity inspire engagement with, or future investigation of, environmental issues. The data collected will determine existing knowledge of environmental issues; which activities children enjoyed most and why; whether any activities inspired interest in learning more about a particular topic and whether the topic influenced the choice of favourite activity.

The session plans are as follows:

- Session 1: Introduction to study, find out what environmental issues children are aware of through an activity of the child's choosing (e.g., drawing/writing/model making).
- Session 2: topic: looking after animals and nature. Activity: board game designed by Hayley Hill
- Session 3: topic: far reaching consequences of litter. Activity: written (stories/poems/comics/songs/diary entries/newspaper reports)
- Session 4: topic: climate change and carbon dioxide emissions. Activity: art/drawing/posters/pictures/comics/collage.
- Session 5: final session. Short survey to determine most enjoyed activity and most enjoyed topic. Activity: child's choice based on one of the three topics covered.

Why have I been chosen?

Participants will be selected based on their attendance at Sir Robert Geffery's School after-school eco club.

Do I have to take part?

You/your child's participation is voluntary. If you/your child wish to take part, you and your child will need to sign consent forms (attached). You may withdraw from the research at any time during or after the research period by speaking to Hayley Hill or Mrs Cunningham.

What will happen to me if I take part?

You/your child will be asked to take part in a variety of learning activities during five sessions of eco club and complete a short survey in the final session. Each session will be one hour long. The survey in the final session will take no more than ten minutes to complete. The principal investigator will also record informal conversations with you/your child as learning activities are completed each week. Mrs Cunningham will be present at all sessions.

What are the possible benefits of taking part?

Whilst there are no immediate benefits for those people participating in this project, it is hoped that this participation will contribute to my data collection for my final year dissertation and that the findings will help to improve engagement with environmental issues for primary school age children, by determining which learning activities are most enjoyed and inspire engagement.

Will my taking part in this project be kept confidential?

All the information that is collected during the research will be kept confidential and data will be anonymised to remove any personal information and stored securely. You will not be able to be identified in any reports or publications.

Will I be recorded, and how will the recorded media be used?

Informal conversations with you/your child during each eco club session will be recorded and analysed. The audio recording will be securely stored and then destroyed after transcription. There will be no images of you/your child taken at any time during the research.

Who is organising and funding the research?

The University of Plymouth, Faculty of Science and Engineering.

Who has ethically reviewed the project?

This research was approved by Faculty of Science and Engineering Research Ethics and Integrity Committee, University of Plymouth.

Contact for further information:

Dissertation advisor:

Dr Alison Stokes

School of Geography, Earth and Environmental Sciences

Plymouth University

Drake Circus,

Plymouth PL48AA

Email: alison.stokes@plymouth.ac.uk

If you are dissatisfied with the way the research is conducted, please contact the principal investigator in the first instance via hayley.hill@students.plymouth.ac.uk. If you feel the problem has not been resolved, please contact the secretary to the Faculty of Science and Engineering Research Ethics and Integrity Committee on scienghumanethics@plymouth.ac.uk

SAMPLE CONSENT FORM FOR PARENTS/GUARDIANS

UNIVERSITY OF PLYMOUTH

FACULTY OF SCIENCE AND ENGINEERING

CONSENT TO PARTICIPATE IN RESEARCH PROJECT

Name of Principal Investigator:

Hayley Hill

Title of Research:

In an informal education setting, does type of learning activity influence engagement with environmental issues?

Brief statement of purpose of work:

This study will investigate which types of learning activities work best to engage primary school age children with environmental issues in a non-formal education setting (Sir Robert Geffery's after school eco club). Over five weeks, sessions using games, written activities, and art/drawing activities will be delivered to teach the children about conservation issues, the far-reaching issues with litter and climate change. As the children complete activities, they will be engaged in informal conversation to find out whether they are enjoying the activity and if it has inspired them to find out more. In the last session children will be asked to complete a short survey to find out which activity they enjoyed the most and find out which topic they would prepare an assembly to see if there is an overlap between activity enjoyment and the topic they were most interested in.

I am the parent/legal guardian* of

(*delete as appropriate)

The objectives of this research have been explained to me.

I understand that my child is free to withdraw from the research at any stage and ask for their data to be destroyed by contacting the principal researcher at any time.

I understand that my child's anonymity is guaranteed unless I expressly state otherwise. All material from the survey will be anonymised, stored securely, and treated confidentially by the investigator.

I understand that informal discussions with Mrs Hill will be recorded, and all audio files deleted upon completion of the project.

I understand that Mrs Hill as Principal Investigator of this work will have attempted, as far as possible, to avoid any risks, and that safety and health risks will have been separately assessed by appropriate authorities. I understand that Mrs Cunningham will be present during eco-club sessions to ensure school rules and procedures are adhered to.

Under these circumstances, I agree for my child to participate in the research.

Name:

Signature:

Date:

If you are dissatisfied with the way the research is conducted, please contact the principal investigator in the first instance. If you feel the problem has not been resolved please contact the secretary to the Faculty of Science and Engineering Research Ethics and Integrity Committee on scienghumanethics@plymouth.ac.uk

Please return this consent form to Sir Robert Geffery's School reception office by Friday 16th September if you are happy for your child to take part in this research project.

If you would like further information about the project, please contact Hayley Hill by email at hayley.hill@students.plymouth.ac.uk

SAMPLE CONSENT FORM FOR PARTICIPANTS

UNIVERSITY OF PLYMOUTH

FACULTY OF SCIENCE AND ENGINEERING

CONSENT TO PARTICIPATE IN RESEARCH PROJECT

Name of Principal Investigator:

Mrs Hayley Hill

Title of Project:

In an informal education setting, does type of learning activity influence engagement with environmental issues?

My project is about comparing different activities to find out which one you enjoy most when talking or learning about environmental issues. I, Mrs Hill, will be joining five sessions of eco-club and together we will learn about looking after animals and nature, litter, and how our weather is changing. Each week we will look at a different topic and take part in different activities. During each session I would like to walk around and chat to you to find out:

Are you enjoying the activity? Why?

Do you think you would like to find out more about the topic we have been talking about in eco-club that week? Why is that?

In the fifth session I will give you a short form to find out which activity you enjoyed the most and ask whether there was a particular topic you enjoyed learning about. I will use this information to compare whether your favourite activity and favourite topic were the same.

I understand why this project is being done.

I understand that I do not have to take part in the project if I don't want to, and I can tell Mrs Cunningham if I no longer want to take part even after the sessions with Mrs Hill have started.

I understand that my name will not be used in the project and Mrs Hill will make sure my personal information is kept away from others and stored properly.

I am happy for Mrs Hill to record us when we talk about our activities, and I understand that she will delete all recordings when the project is finished.

I understand that Mrs Hill will do her best to avoid any risks to my health and safety, and Mrs Cunningham will be present during all sessions to ensure school rules are followed.

Under these circumstances, I agree to participate in Mrs Hill's project.

Name:

Signature:

Date:

If you are not happy with the way the project is conducted, please talk to Mrs Hill or Mrs Cunningham. If you are still unhappy, please contact the secretary to the Faculty of Science and Engineering Research Ethics and Integrity Committee on scienghumanethics@plymouth.ac.uk

Please return this consent form to Sir Robert Geffery's School reception office by Friday 16th September if you are happy to take part in this project.

If you would like further information about the project, please contact Hayley Hill by email at hayley.hill@students.plymouth.ac.uk

4. Ethical approval and consent from school



09 September 2022

CONFIDENTIAL

Hayley Hill
School of Geography, Earth and Environmental Science

Dear Hayley

Ethical Approval Application

Thank you for submitting the ethical approval form and details concerning your project:

In an informal education setting, does type of learning activity influence engagement with environmental issues?

I am pleased to inform you that this has been approved subject to the following conditions:

- Rewrite the child consent in age and context relevant style.
- Complete a risk assessment for travel and off site work.

Consider the following points:

- Consider adapting consent to keep only necessary detail and remove distracting information.
- Who is in charge of the sessions? Is there a club host / teacher present all time during activities?
- Is student at Plymouth employed at the school or have a formal role at running the club?
- What is the role of the researcher on the delivery of the activities.
- When recording and storing files, consider using the university secure online drive
- What features of the sessions are being compared?
- Has bias by researcher influence being considered as a possibility / how is that managed?

You do not need to resubmit any documentation but please ensure that any required changes are undertaken and points to consider are discussed with your supervisor.

If you have any queries please let me know

Kind regards

Rebecca Waghome
Secretary to Faculty Research Ethics Committee

CC: Dr Alison Stokes

Mrs Jayne Breen, Head of Faculty Operations, Faculty of Science and Engineering, University of Plymouth, Drake Circus, Plymouth, Devon PL4 8AA T +44 (0)1752 584584 F +44 (0)1752 584543 W www.plymouth.ac.uk

Permission for dissertation project



Becky Cunningham
To: Hayley Hill



Thu 30/06/2022 15:20

You replied to this message on 09/09/2022 14:04.
If there are problems with how this message is displayed, click here to view it in a web browser.

Hi Hayley,

It is with great pleasure that we welcome you to Sir Robert Geffery's to carry out your dissertation project in September. The club usually encompasses y1-6. Permission forms will be given to the children within eco club prior to starting the programme of activities.

Many thanks,

Mrs Becky Cunningham

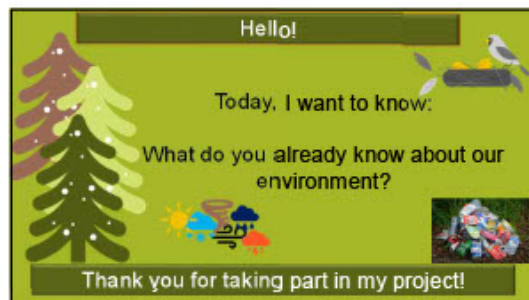
Assistant Headteacher and Eco Co-ordinator

5. Session resources

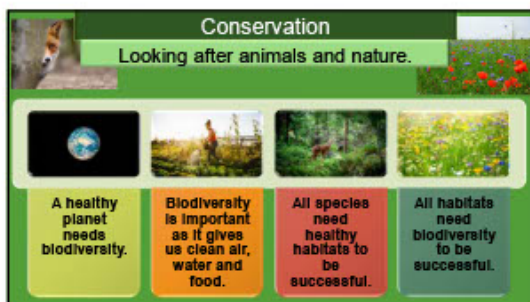
i) PowerPoint slides



1



2



3



4



5



6

The problem with plastic

What is the problem?




| | | | |
|---|---|---|---|
| <p>Plastic, especially single use plastic, has created a big environmental problem.</p> | <p>Plastic litter can travel a long way from where it is dropped.</p> | <p>Big pieces of plastic can trap and injure wildlife. Sometimes animals try to eat it.</p> | <p>Plastic is the environment is broken down into smaller pieces. Animals that have never seen plastic can end up eating these through the foodchain.</p> |
|---|---|---|---|

7

The problem with plastic

Litter heroes



Ella and Caitlin McEwan

In 2019, two sisters aged 10 and 9 created a petition asking fast food restaurants to stop giving away plastic toys in kids meals to reduce plastic pollution – and it worked! Over 400,000 people signed their petition. Burger King stopped giving away plastic toys because of the petition and McDonalds now gives a soft toy or a book.

8

The problem with plastic

What can we do?




| | | | |
|--|--|--|--|
| <p>Say no to single use plastics!</p> <p>Talk to your family about the damage single-use plastics have on our environment.</p> | <p>Look at food packaging when you go shopping.</p> <p>Pick products with little or no plastic packaging if you can.</p> | <p>Take part in a litter pick (with your adults permission).</p> <p>Every piece of litter you pick up helps keeps wildlife safe.</p> | <p>Make party bags plastic free and fill with eco-friendly gifts like paper notebooks, wildflower seeds or sweets (in a paper bag, of course!)</p> |
|--|--|--|--|

9

The problem with plastic

Your task

Create a written piece of work about plastic litter.



It can be about stopping the problem, or giving information about why it is a problem.

10

Climate change

What is the problem?



| | | | | |
|--|---|---|---|--|
| <p>Climate is the word used to describe weather and temperature conditions over a long period of time.</p> | <p>Our weather is changing very quickly to be hotter with more storms. This is climate change, and it is damaging to all life on Earth.</p> | <p>People do lots of things that cause climate change, like burn fossil fuels and cutting down trees.</p> | <p>Doing these things releases lots of greenhouse gases into the environment. These gases keep heat close to Earth's surface.</p> | <p>Extra heat causes many problems for animals, plants, their habitats and people. It also changes the weather all over the world.</p> |
|--|---|---|---|--|

11

Climate change

What makes greenhouse gases?



Farming

Deforestation

Making electricity

Factories

Transport

Rubbish dumps

12

Climate change
Climate hero

Lesein Mutunkei

"It does not matter how small you are, everything you do for the environment counts."

Since he was 11 years old, Lesein has been concerned about how deforestation and climate change will affect where he lives in Kenya, so he decided to plant a tree every time he scored a goal when playing football. Now aged 15, he has started 'Trees for Goals', a group of local schools and communities who do the same thing. Thousands of trees have been planted because of Lesein's great idea.



13

Climate change
What can we do?



| | | | |
|---|--|--|--|
| Walk short journeys or take public transport like buses and trains instead of driving to reduce greenhouse gases emissions from cars. | Choose one day a week to not eat meat or dairy. Meat and dairy farming is a big source of greenhouse gases, especially when cows burp! | Turn off lights and devices at home when you aren't using them. Unplug devices when they are fully charged! | Talk to people about it! You could write a letter to the prime minister to ask what they are doing about climate change. |
|---|--|--|--|

14

Climate change
What can we do?



We really need the people in charge all around the world to make laws to stop big companies digging up and using fossil fuels to make the biggest difference, but making small changes to the way we live is really important to help stop climate change.

15

Climate change
Your task

Create an arty piece of work about climate change.

What can I do?

- A poster
- A picture
- A collage
- A comic
- A cartoon

It can be about:

- what we can do to stop the problem, or
- give information about why it is a problem.

16

THANK YOU ECO CLUB!



| | | |
|----------------------------------|------------------------------------|----------------|
| Looking after animals and nature | The problem with plastic pollution | Climate change |
|----------------------------------|------------------------------------|----------------|

Activity – whatever you want!

Design a board game! Write a song! Draw a cartoon!

17

THANK YOU ECO CLUB!

This is your future! Dream big!



Remember you have the power to make positive changes!


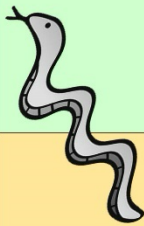








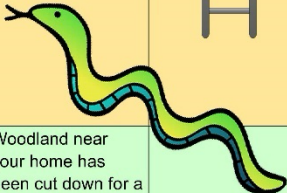




You can make a difference, no matter how old you are!



18

ii) Board game for session 2

| | | | | | | | |
|---|--|--|--|--|--|--|---|
|  | A camera trap you installed near a river films a beaver! Roll again. |  | You find a hedgehog with it's foot caught in some litter. Miss a turn to take it to the vet. | |  | A storm has washed up lots of litter on your local beach. Miss a turn to help clean it up. | FINISH! WELL DONE FOR DOING YOUR BIT FOR NATURE |
|  | Oh no! A wildfire has started in a nature reserve near your home. Move back one space to call 999. | | A bug hotel you made is full of insects. Move forward one space. | |  | There is frogspawn in your pond! Move forward one space. | You created a mini-pond in your school grounds to encourage wildlife. Roll again. |
|  | You have helped plant new trees to create a woodland habitat. Move forward one space. |  | A family of otters have moved into the river you helped to clean up! Roll again. | |  | The fish in a nearby river have disappeared due to pollution. Miss a turn to help clean it up. |  |
|  | The wildflower meadow you helped plant is full of butterflies and bees! Roll again. |  | You ask to go in a car for a journey you could have walked. Move back one space. | |  | Nest boxes you put in your garden have attracted a pair of endangered starlings. Move forward one space. |  |
| START | Woodland near your home has been cut down for a new road. Miss a turn to protest. | | You climb a tree and accidentally disturb a nest of endangered hazel dormice. Move back one space. | Land near your home has been turned into a nature reserve to protect wildlife! Roll again. | | You do a sponsored walk to raise money for a wildflower meadow. Move forward one space. | You take part in a litter pick to protect local wildlife. Move forward one space. |

iii) Ideas sheets for sessions 3 and 4

The problem with plastic

Your task

Some ideas:

- Write a story or poem from the viewpoint of an animal affected by plastic pollution.
- Write a story or poem about the journey a piece of plastic litter has taken and where it ends up.
- A newspaper article telling people why plastic pollution is harmful and what they can do to help stop it.
- A diary or blog entry from your point of view. Maybe you have decided to try and stop using plastic like Hope Jones?
- A diary entry by a fisherman who has found a floating island of plastic litter.
- A letter to a local community group asking them to organise a litter pick.
- A letter to your classmates asking them to talk to their parents about reducing use of single use plastics at home.

Or anything else you want to do...as long as it is written!

Climate change

Your task

Some ideas:

- Make a poster telling people about what is causing climate change.
- Draw a picture of how wildlife around the world might be affected by climate change.
- Create a cartoon about a school child who makes it their mission to do as much as they can to stop greenhouse gas emissions at home or school.
- Make a comic about how your choices can help reduce greenhouse gas emissions.
- Make a collage about an animal whose home has been damaged by climate change.
- Create a comic to tell people about how greenhouse gases are produced.
- Make a poster telling people how they can reduce their greenhouse gas emissions.

Or anything else you want to do...as long as it is arty!

A short survey for children in eco club who have completed all the learning activities set to find out which activity was their favourite, which topic they would choose to do for an assembly and why.

Thank you for taking part in my research over the last 5 weeks at Eco Club! You have been superstars and I am so grateful for your help. I hope you have enjoyed learning about environmental issues and completing the activities we have done as much as I have enjoyed telling you all about them. Please speak to me or Mrs Cunningham if you need any help completing this form.

Question 1

What year are you in?

- Year 3
- Year 4
- Year 6

Question 2

Which sessions did you attend?

- All of them!
- Session 1 – what environmental problems do you know about?
- Session 2 – looking after animals and nature (conservation).
- Session 3 – the problem with plastic.
- Session 4 – climate change.

Question 3

Which activity did you enjoy the most?

- Board game.
- Writing.
- Drawing/art.

Question 4

Can you tell me why?

- Looking after animals and nature (conservation).
- The problem with plastic.
- Climate change.

Question 6

Can you tell me why?

7. Open coding information

7.1 Coding for Results and Discussion – what motivated children to join eco club?

i) Coding for Figure 4

Table 5. Raw data from interviews during session 1 used to compile themes for Figure 4.

| Child and year | Why did you join eco club? | Theme |
|----------------|---|---|
| Anna Year 3 | No consent at this point | |
| Becky Year 3 | Not present | |
| Carly Year 3 | Not present | |
| Daisy Year 4 | Because I wanted to try something new because I love trying new things and I also wanted to find out what eco was all about. | Learning opportunity |
| Ellie Year 4 | Because I like saving the world and picking up litter. | Protect planet Action opportunity |
| Fiona Year 4 | Because I have known that I wanted to do eco committee but I know there was a chance that I wasn't going to be able to join and a few days ago I found a lot of cigarettes and plastic stuff on the floor and I thought I would like to solve this in eco club. Also it's really helpful and I like eco-club anyway but what I see on the board and what I am doing right now I seen it on a YouTube short. | Action opportunity Learning opportunity Enjoyment |
| George Year 4 | Because I think it is important to protect our planet and reduce our carbon footprint. | Protect planet Action opportunity |
| Harry Year 4 | Because then I can save the habitats. <i>The habitats? Any particular animals?</i> Monkeys, crocodiles. People are catching crocodiles and killing them for their meat and killing other animals and so I wanted to join eco club to clean up stuff and save the habitats. | Protect animals Action opportunity |
| Jack Year 4 | Because I liked it. <i>What do you like about it?</i> We do some things in it. | Enjoyment Action opportunity |
| Kyle Year 4 | I like to help animals, save the world and try and stop pollution and pick up plastic. | Protect animals Protect planet Action opportunity |
| Laura Year 6 | Because I love learning about the planet and all sorts of different stuff. | Learning opportunity |
| Maria Year 6 | Because it's fun and you get to do all sorts of stuff. You get to do colouring, you get to do making. | Enjoyment |

7.2 Coding for Results and Discussion - To what extent did activity type promote engagement with topics? Individual sessions

i) Coding for Session 2 (Figures 7 and 8)

Table 6. Raw data from interviews during session 2 used to compile data shown in Figure 7 to ascertain enjoyment of activity, and open coding themes shown in Figure 8 to ascertain reasons for enjoyment.

| Child and year | Are you enjoying this activity? | Why? | Theme |
|----------------|---------------------------------|---|--|
| Anna Year 3 | Yes | Because it's not about winning, it's about having fun and I really like it. | Fun |
| Becky Year 3 | Nodded | <i>Can you tell me why? Is it because you are winning? Is it teaching you anything? No, not teaching you anything? What about the forfeits, do you like reading about these bits? Yeah?</i> | Unclear reason |
| Carly Year 3 | Yes | I like these bits (indicates forfeits) <i>You like the forfeits? Are they teaching you new things or did you already know them? They're teaching me new things.</i> | Learning opportunity |
| Daisy Year 4 | Yes | Because we are getting the chance to play a game that we haven't played in a long time. <i>Do you think it's teaching you very much about looking after animals and nature? Yes.</i> | Fun Learning opportunity |
| Ellie Year 4 | Yes I am | Because I love animals and I love helping the world. | Topic preference Protect planet |
| Fiona Year 4 | Yes | Because I love animals. | Topic preference |
| George Year 4 | Yes | One, because I am winning and two, because it is really fun. <i>Is the game teaching you anything you didn't already know?</i> I'm finding what they say interesting because it is saying what you really would do in real life if you had to help, so if you do that you have to miss a go, so if something happened bad you'd miss something (???) so it shows to help wildlife you sometimes have to sacrifice things. | Fun Learning opportunity Protect animals |
| Harry Year 4 | Yeah | It's very fun and it's much easier than regular snakes and ladders because you have got different kinds of roll again, and move forward a space and you only get that on Monopoly. <i>What do you think about the forfeits? Are you learning anything from them? Yes, very much!</i> | Fun Learning opportunity |
| Jack Year 4 | Yeah | Because you either have to move back a space or you move forward a space. <i>Why do you have to move backwards or forwards?</i> Because if you are not planting then that's not good for the environment and you go down, or back, and if you are doing something good you go forwards or upwards. | Protect planet |
| Kyle Year 4 | Yes | Because it's quite fun and you get to learn lots about wildlife and how to save them. | Fun Learning opportunity Protect animals |
| Laura Year 6 | Yeah I think it's really good | Because you get to know what's endangered animals, other species | Learning opportunity |
| Maria Year 6 | Yes, I'm really enjoying it | it's really fun and we're all engaging into the game and you learn about what you can do and have fun ...you roll over one place and you get something good. | Fun Learning opportunity |

ii) Coding for Session 2 (Figures 7 and 10)

Table 7. Raw data from interviews during session 2 used to compile data shown in Figure 7 to ascertain interest in topic, and open coding themes shown in Figure 10 to ascertain reasons for interest. Children in this session were not specifically asked why it interested them due to researcher error, but two volunteered the information.

| Child and year | Does looking after animals and nature interest you? | Theme |
|----------------|---|------------------------------|
| Anna Year 3 | Yes, because I like making stuff at home and stuff. | Creative at home |
| Becky Year 3 | <i>Does looking after animals and nature interest you? Nods Yeah?</i> | Interested Unclear reason |
| Carly Year 3 | <i>Does looking after animals and nature interest you? Nods. Yeah?</i> | Interested Unclear reason |
| Daisy Year 4 | Yes | Interested Unclear reason |
| Ellie Year 4 | Yes | Interested Unclear reason |
| Fiona Year 4 | <i>Does looking after animals and nature interest you? Nods Yeah?</i> | Interested Unclear reason |
| George Year 4 | Yes | Interested Unclear reason |
| Harry Year 4 | No answer – distracted by game | |
| Jack Year 4 | <i>Does looking after animals and nature interest you? Nods Yeah?</i> | Interested Unclear reason |
| Kyle Year 4 | Definitely | Interested Unclear reason |
| Laura Year 6 | Yes | Interested Unclear reason |
| Maria Year 6 | Yes, I had a rabbit called Felix, he was a wild rabbit, and we got him from the wild on a campsite and he was blind so he was very special to us and he sadly just passed away. | Pet experience |

iii) Coding for Session 3 (Figures 7 and 8)

Table 8. Raw data from interviews during session 3 used to compile data shown in Figure 7 to ascertain enjoyment of activity, and open coding themes shown in Figure 8 to ascertain reasons for enjoyment.

| Child and year | Are you enjoying this activity? | Why? | Theme |
|----------------|--|---|-------------------------------------|
| Anna Year 3 | Yes | Because I really like writing songs and I normally write songs with my sister. | Activity preference |
| Becky Year 3 | Yeah | <i>Can you tell me why?</i> Pause. | Unclear reason |
| Carly Year 3 | Not present | | |
| Daisy Year 4 | Yes | Because it gets me a chance to actually write something like a poster to put on my window and tell people actually the sea, what is happening now is bad and I love creatures like dogs and turtles and hammerhead sharks and I don't want them to get hurt. | Protect animals Public awareness |
| Ellie Year 4 | Yes | Because I write a lot at home about pollution. | Activity preference |
| Fiona Year 4 | Yes | Because I can draw something and I can write something and draw something and write something. | Unclear reason |
| George Year 4 | Um, at first I wasn't because I had nothing to put but then I saw that one (referencing ideas list), put one down and then I had an idea so... | <i>So you're enjoying it now you have an idea?</i> Yeah, a lot more. | Unclear reason |
| Harry Year 4 | Ummmm, in the middle. It's ok. It's getting there. | <i>Are you enjoying writing it?</i> Um all I really do is think of all the lines and details because at the bottom, right there, I am going to draw a little picture of a wave and the plastic getting hit by the rock and then I'm going to turn over and do some more writing. <i>Is there something you would rather be doing than writing a story?</i> I would rather go home and sleep! | Unclear reason |
| Jack Year 4 | Yes | <i>What are you doing?</i> I am doing like a poster. <i>A written poster?</i> Yeah. <i>Do you enjoy making posters with writing on them?</i> I'd rather do it with colouring but yeah. | Unclear reason |
| Kyle Year 4 | Not present | | |
| Laura Year 6 | Yes | I love writing stories and I love writing different stuff. | Activity preference |
| Maria Year 6 | Not present | | |

iv) Coding for Session 3 (Figures 7 and 10)

Table 9. Raw data from interviews during session 3 used to compile data shown in Figure 7 to ascertain interest in topic, and open coding themes shown in Figure 10 to ascertain reasons for interest.

| Child and year | Does topic of plastic pollution interest you? | Why? | Theme |
|----------------|--|---|-----------------------------------|
| Anna Year 3 | Yes | Because I really like animals and I like make little hotels and stuff for them so I really want to save the world for them this time. | Protect animals Protect planet |
| Becky Year 3 | Yes | I like animals. | Protect animals |
| Carly Year 3 | Not present | | |
| Daisy Year 4 | Yes | Because it means I get a chance to tell people that yes I would like them to help with plastic cos if we could get the whole world stopping and reusing things so when they get something plastic they turn it into something that would be helpful and don't throw it away so the creatures are safe. | Protect animals Desire to help |
| Ellie Year 4 | Yes | Because I want plastic to stop hurting the earth. | Protect planet Desire to help |
| Fiona Year 4 | It interests me | Because I want to stop it really bad and I just thought I could stop it by asking the nearest McDonalds to see if they sell plastic toys I'll ask them to stop. When the employees come up and I realise that I've got a plastic toy I will ask them do you mind if next time maybe you could give me something that's not plastic? | Desire to help |
| George Year 4 | Yes | Because my mum has always had a really good idea about something I heard, and it goes like this. It goes, so you put a plastic bottle in the ocean with a tracker in it and that will show you how far it goes. | Unclear reason |
| Harry Year 4 | Yeah | It interested me because I really want to save the planet from plastic and I don't want any animals to go to waste. And you know, there is some good plastic and bad plastic, like plastic that you use for like, um, like, that, that's plastic and you reuse it (Pointing at a water bottle). | Protect animals Protect planet |
| Jack Year 4 | <i>(After a long pause, encouraged to be honest)</i> Sort of. | Because I don't really like doing inside things. <i>You like doing outside things?</i> Yes. <i>I see. So you prefer eco club when it's outside?</i> Yes. | Sort of interested |
| Kyle Year 4 | Not present | | |
| Laura Year 6 | Yes | Because I love animals and I don't like the thought of them getting hurt. | Protect animals |
| Maria Year 6 | Not present | | |

v) Coding for Session 4 (Figures 7 and 8)

Table 10. Raw data from interviews during session 4 used to compile data shown in Figure 7 to ascertain enjoyment of activity, and open coding themes shown in Figure 8 to ascertain reasons for enjoyment.

| Child and year | Are you enjoying this activity? | Why? | Theme |
|----------------|---------------------------------------|--|---|
| Anna Year 3 | Yeah | Because I always like doing arty stuff and helping the world and climate change and all of that stuff. | Activity preference Protect planet Topic preference |
| Becky Year 3 | Yes | Hmmmm <i>Do you like art and drawing?</i> Nodded immediately. | Activity preference |
| Carly Year 3 | Nodded immediately | Because.... <i>Do you like drawing?</i> Nodded immediately. | Activity preference |
| Daisy Year 4 | Yes | Because it gets a chance, so people can see my creation and it shows affecting the world and how we need to make things different | Public awareness Protect planet |
| Ellie Year 4 | Not interviewed | | |
| Fiona Year 4 | Yeah | I don't know why! | Unclear reason |
| George Year 4 | Yes | Because I like making things to help climate change and reduce our carbon. Help stop climate change and reduce our carbon footprint. | Protect planet Topic preference |
| Harry Year 4 | Yeah | I really like my things and making the sun shining onto the monkeys so then it's a happy place. | Unclear reason |
| Jack Year 4 | Nodded immediately | Because it's drawing. | Activity preference |
| Kyle Year 4 | Not interviewed | | |
| Laura Year 6 | I love this activity | Because I love drawing. | Activity preference |
| Maria Year 6 | Yes I'm really enjoying this activity | I really like it because we're sticking, gluing and ripping things, you can get messy with it and stuff. | Activity preference |

vi) Coding for Session 4 (Figures 7 and 10)

Table 11. Raw data from interviews during session 4 used to compile data shown in Figure 7 to ascertain interest in topic, and open coding themes shown in Figure 10 to ascertain reasons for interest.

| Child and year | Does topic of climate change interest you? | Why? | Theme |
|----------------|--|---|-----------------------------------|
| Anna Year 3 | Yes | Because I always like do climate change back at home. | Interested Unclear reason |
| Becky Year 3 | Yeah | Shakes her head immediately when I ask if she can tell me why. | Interested Unclear reason |
| Carly Year 3 | Yes | I like being kind to animals. | Protect animals |
| Daisy Year 4 | Yes | Because it's tells you all about the world and how you have to, if you want our world not to be a big terrible dangerous place then you need to help it. | Protect planet Desire to help |
| Ellie Year 4 | Not interviewed | | |
| Fiona Year 4 | Yes | Um, it's because I love animals and I don't want this earth to die. | Protect animals Protect planet |
| George Year 4 | Um, it does | Because I like to help the planet make, have good choices instead of hurting the planet. | Desire to help Protect planet |
| Harry Year 4 | Yeah | I just want to help all the animals get better and stop going and stop getting existed, I mean extinct like the dinosaurs did. | Desire to help Protect animals |
| Jack Year 4 | Um, sort of | <i>Do you think you might want to learn more about it?</i> Yes. | Sort of interested |
| Kyle Year 4 | Not interviewed | | |
| Laura Year 6 | Nodded immediately | Because we have to do something about it before it all goes wrong. | Desire to help Protect planet |
| Maria Year 6 | Yes | Because it's actually pretty sad how the world is changing like this, but there are some good sides, um, my dad said half of the world, Britain, had been frozen over, but now we're warming up but we're all warming up and it's destroying other habitats homes so there is good sides and bad sides. | Protect planet Protect animals |

7.3 Coding information for Results and Discussion - To what extent did activity type promote engagement with topics? Survey responses.

i) Coding for Session 5 survey responses (Figures 11 and 12)

Table 12. Raw data from anonymous survey responses during session 5 used to compile data shown in Figure 11 to ascertain overall favourite activity, and open coding themes shown in Figure 12 to ascertain reasons for enjoyment.

| Year | Favourite activity | Why? | Theme |
|--------|---------------------------|--|---|
| Year 3 | Drawing/art | Because I love art | Activity preference |
| Year 3 | Drawing/art | Because I like drawing and doing art. I am a creative person. | Activity preference |
| Year 3 | Drawing/art | Because I love the nater | Topic preference |
| Year 4 | Drawing/art | Cus I love learning about it | Learning opportunity |
| Year 4 | Drawing/art | Because I love art | Activity preference |
| Year 4 | Board game | Because it was really fun | Fun |
| Year 4 | Board game | Because it was great fun learning what you have to give up to save the planet | Fun Learning opportunity Protect planet |
| Year 4 | Board game | It was so fun | Fun |
| Year 4 | Board game Drawing/art | Because I like the questions on the game and I like looking at different animals | Learning opportunity Topic preference |
| Year 4 | Writing Drawing/art | It was fun | Fun |
| Year 6 | Drawing/art | Because I love the creativity | Activity preference |
| Year 6 | Drawing/art | Because I love making storys and of course DRAWING | Activity preference |

ii) Coding for Session 5 interview responses (Figure 12)

Table 13. Raw data from interviews during session 5 used to compile open coding themes shown in Figure 12 to ascertain reasons for enjoyment.

| Child and year | Why did you enjoy your favourite activity so much? | Theme |
|----------------|--|--|
| Anna Year 3 | I don't know, I forgot. | Unclear |
| Becky Year 3 | I like looking after animals and nature. <i>Was your favourite activity last week when we did art?</i> Yes. <i>Why did you enjoy that so much?</i> I don't know, I just really like art. | Topic preference Activity preference |
| Carly Year 3 | Because I really like drawing for nature. | Activity preference Topic preference |
| Daisy Year 4 | I chose all of them because I enjoyed working and helping for the nature because I care about nature as much as I think others may do. | Topic preference |
| Ellie Year 4 | Because I like doing drawing and art. | Activity preference |
| Fiona Year 4 | Because it helps me learn about all the things that are going on. | Learning opportunity |
| George Year 4 | Because I thought that it was fun to learn, it was great fun learning what you had to give up to save the planet. | Fun Learning opportunity |
| Harry Year 4 | Because it was really, really fun and it tells us about what we could do. | Fun Learning opportunity |
| Jack Year 4 | Because it was like, you didn't really have to do anything, all you had to do was roll a dice. | Easy |
| Kyle Year 4 | Because the board game was really fun and I liked the questions, and I liked to stick the things in and look at the animals for the second one. | Fun Learning opportunity Activity preference |
| Laura Year 6 | Because I love drawing. | Activity preference |
| Maria Year 6 | Because I'm really creative and I quite like to do drawing, and if I say to connect it to climate change we could draw all sorts of stuff like making stone paper, that I think some people have actually done, and making other materials of paper because this paper here is made of wood and how much trees are being chopped down? | Activity preference |

iii) Coding for Session 5 survey responses (Figures 11 and 14)

Table 14. Raw data from anonymous survey responses during session 5 used to compile data shown in Figure 11 to ascertain overall topic of interest, and open coding themes shown in Figure 14 to ascertain reasons for choice.

| Year | Assembly topic | Why? | Theme |
|--------|--|---|--|
| Year 3 | Looking after animals and nature | Because I love animals | Interest in animals |
| Year 3 | Looking after animals and nature The problem with plastic | Because I love looking after animals and I have lots myself. | Interest in animals |
| Year 3 | Looking after animals and nature | Because I love animal | Interest in animals |
| Year 4 | Looking after animals and nature | I love animals | Interest in animals |
| Year 4 | Looking after animals and nature | Because my family loves animals | Interest in animals Family influence |
| Year 4 | The problem with plastic | Because it would be the interesting one | Learning opportunity |
| Year 4 | Looking after animals and nature | Because it is my favourite subject and I think it is important to look after the animals on our planet. | Interest in animals Protect animals Important |
| Year 4 | Looking after animals and nature | To save the animals | Protect animals |
| Year 4 | The problem with plastic Climate change | Because a lot of people litter and I don't like that people are cutting down trees | Action opportunity |
| Year 4 | Looking after animals and nature The problem with plastic Climate change | I love nature | Interest in nature |
| Year 6 | Looking after animals and nature | Because I think it important | Important |
| Year 6 | Looking after animals and nature | Because I love animals and nature and we need to save them | Interest in animals Interest in nature Protect animals |

iv) Coding for Session 5 interview responses (Figure 15)

Table 15. Raw data from interviews during session 5 used to compile open coding themes shown in Figure 15 to ascertain whether activity encouraged thought on topic.

| Child and year | Did any activity help you think about the topic we were learning? | Theme |
|----------------|--|--|
| Anna Year 3 | I don't know. | Unsure |
| Becky Year 3 | Yes. <i>Which one?</i> Um, all of them. | Yes – art Yes – board game Yes - written |
| Carly Year 3 | Yes. <i>Do you remember which one?</i> The drawing. | Yes - art |
| Daisy Year 4 | I liked when we were doing about plastic and climate change and nature because they all got me writing big posters and I have put them up in my window. | Yes – art Yes – board game Yes - written |
| Ellie Year 4 | Yeah. <i>Do you remember which one?</i> Not really. | Unsure |
| Fiona Year 4 | Yeah. <i>Can you remember which ones?</i> Climate change. <i>Was it the activity that made you think about the topic?</i> <i>The drawing? Or making a collage?</i> I'm making a bigger collage. | Unsure |
| George Year 4 | I would say looking after animals and nature. <i>So was it the activity that helped you think about it?</i> No, because I think it is really important to look after the animals on the planet as well, not just us. It's not their fault that the world is being destroyed so we should look after them just as well as we look after ourselves. | No |
| Harry Year 4 | Yes. <i>Can you remember which one?</i> Um...um...I don't really know. | Unsure |
| Jack Year 4 | Um, collage. | Yes - art |
| Kyle Year 4 | Um, yes. <i>Which one?</i> Probably the climate change one. <i>When we did drawing?</i> Yeah. | Yes - art |
| Laura Year 6 | Um...Yeah. <i>Can you elaborate?</i> What, one of the lessons? <i>Yes, so if we were doing the board game did it make you think more about conservation?</i> Yes it did. <i>Or when we were doing the writing did it make you think more about plastic pollution?</i> Well, I think pollution is really bad for the planet and it's going to do something at one point and we're all going to regret it. | Unsure |
| Maria Year 6 | Um, yes and no. This one (collage) doesn't really explain anything but it's like a creative activity which I quite like, you've got a really good arty thing to it, but I don't know how a collage really shows anything that it needs to climate change or wildlife or anything like that. | Unsure |

7.4 Coding for Results and Discussion - Did attendance inspire further investigation into environmental issues?

i) Coding for Session 5 interview responses (Figure 16 and 17)

Table 16. Raw data from interviews during session 5 used to ascertain whether participation in eco club inspired self-directed learning, and in those that did, whether there was pre-existing interest mentioned in the session relating to the topic they studied.

| Child and year | Have you investigated any topics at home? If so, which and why? | Topic | Pre-existing knowledge from individual sessions |
|----------------|--|------------------------|---|
| Anna Year 3 | Yes. <i>Which ones have you looked at?</i> Climate change. <i>Why did you look that up at home?</i> Because I like helping the animals and stuff. | Climate change (S4) | Not very much but I did know a little bit. |
| Becky Year 3 | No | No | N/A |
| Carly Year 3 | Um...ummm | No | N/A |
| Daisy Year 4 | I have told my mum and my mum is trying to recycle as much plastic and I like to use any plastic to build things like Barbie clothes and cars, and I am going to reuse cardboard boxes and turn them into a big train for all my toys. | Plastic pollution (S3) | So when my mum told me about plastic and how it was affecting wildlife I really wanted to help but there was nothing we could do. <i>Ok. What about litter picking?</i> We started to do it but stopped for a while because of COIVD and we haven't done any yet but hopefully we will do some soon. |
| Ellie Year 4 | No | No | N/A |
| Fiona Year 4 | I haven't but I do know quite a bit about it. | No | N/A |
| George Year 4 | No | No | N/A |
| Harry Year 4 | No | No | N/A |
| Jack Year 4 | I have done litter picking. | Plastic pollution (S3) | No pre-existing knowledge indicated during S3 |
| Kyle Year 4 | Um, I think yes I have. <i>Which one?</i> The plastic one. <i>Why did you look at plastic at home?</i> Because lots of people around where I live sometimes litter a lot and I find lots of rubbish on the ground and I don't know what to do with it since it sometimes has insects and like dog wee and things on it, and I know I can't pick it up but if it didn't have that stuff on then I would pick it up and put it in the bin. | Plastic pollution (S3) | Was not present but chose plastic as favourite topic because it would be the most interesting. |
| Laura Year 6 | I have a little bit, I searched up on my computer about endangered species. I have actually seen an endangered species once, the Fennec Fox. They are so cute. | Conservation (S2) | Yes, because I have three cats and five guinea pigs and I also have this robin who comes to my garden a lot and he's really cute. |
| Maria Year 6 | Um, yes, with the wildlife and animals, we had a rabbit and we were wondering why it was going round and round and round in circles all the time so we googled it and it actually, the actual thing then was he was blind and he had a parasite in his eye, so he would run round in circles because that's how we knew, he sadly passed away so I can't do any more research about him. We have another rabbit that was a rescue rabbit but I don't want to go into detail because there's loads. | Conservation (S2) | Yes, um, since lockdown happened we have had loads of birds and animals at our house, so basically my sister Darcy she had some pigeons and the cat got our pigeons, very sadly, and one of the eggs was alive still so she took care of it and it's hatched now, it hatched out in her hand. The chick was called chickpea, I don't know why, it got passed away because of its leg, it couldn't walk properly so it wouldn't be able to expend much energy. |