

Climate Adaptation Requires Youth Action:

Creating the C.A.R.Y.A. Program Framework

An Interactive Qualifying Project of Worcester Polytechnic Institute in
partial fulfilment of the requirements for the degree of Bachelor of Science

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Abstract

Banksia Gardens Community Services is creating a two-part program called Climate Adaptation Requires Youth Action (C.A.R.Y.A.) in Broadmeadows, Australia. First, participants go through a training program to learn about climate change and adaptation practices. Second, participants help their community adapt to climate change. We created the C.A.R.Y.A. framework to give Banksia a strong program foundation in empowering youth (ages 18-29). Using community input, we created an instructor manual that sets up and details the training program. We established and documented a network of local organizations to support C.A.R.Y.A. and its participants. Anyone interested in training youth in climate change adaptation can reference and adapt the C.A.R.Y.A. program framework to help their community.

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Melinda Bowen, representative from Dept of Land Water and Planning

All of our youth interviewees

All of our focus group members

The Community Climate Change Adaptation Grants Program

Executive Summary

Marginalized populations are at a higher risk when it comes to climate change repercussions. In urban communities, climate change can lead to increased inequality due to resource shortages and inadequate infrastructure (Fields et al., 2014). The Broadmeadows neighborhood in Melbourne, Australia, has a dry climate that is being exacerbated due to climate change. The dry climate has resulted in food insecurity and water shortages around the neighborhood (Hume City Council, 2019). In addition, unpredictable rainfall has negatively impacted agriculture productivity (Hume City Council, 2015). With a growing population, the demand for limited resources increases along with prices (Fields et al., 2014).

The Broadmeadows community is having difficulty adapting to climate change because they lack knowledge and understanding of climate change, adaptation capacity (the scope of the community's ability to adapt), and adaptation practices (specific actions taken to adapt) (Caballero Aspe, 2019). Banksia Gardens Community Services (Banksia) is an organization addressing these shortcomings through various programming. Inspired by recent youth movements, Banksia is creating a program called Climate Adaptation Requires Youth Action (C.A.R.Y.A.). This program will build participants' knowledge through activities, increase capacity through local partnerships, and inspire community action. Banksia will recruit a cohort of culturally diverse youth (ages 18 to 29) and empower them to adapt to climate change with their community.

C.A.R.Y.A. is a two-part program where participants will first go through a training program and second create their adaptation initiatives. The training program educates youth about climate change and adaptation practices through meaningful experiences. After the training

program, participants develop and implement climate change adaptation initiatives in their community with mentorship from local organizations.

The cohort builds their understanding of adaptation against climate change in their community throughout a ten-week training program. Each weekly meeting covers a climate change topic and takes the form of either a workshop or a field trip. Held at Banksia, a workshop is a two-hour meeting where the cohort will deepen their understanding of climate change through activities and a mini-project. The mini-project is completed as a cohort and across the ten-week training program. A field trip is an off-site meeting to give the cohort contextual experiences. Timing for field trips vary from 2 hours to a full day.

C.A.R.Y.A. was conceptualized by our sponsor, Edgar Caballero Aspe, and made possible through the Community Climate Change Adaptation grant he received from the Victorian State Government's Department of Environment, Land, Water, and Planning. We developed the C.A.R.Y.A. framework to give Banksia a strong program foundation that would empower the Broadmeadows youth in combating climate change. We had three objectives when developing the C.A.R.Y.A. program framework: 1) compile a literature review, 2) create a training program framework, and 3) establish an adaptation initiative network. To achieve these objectives, we created three deliverables: 1) a background literature review, 2) an instructor manual, and 3) an organization directory.

Deliverable 1: Background Literature Review

The literature review is background information regarding climate change, climate change adaptation, and youth action against climate change. Our sponsor requested that we compile the literature review to help us develop a strong and engaging climate adaptation

program for youth. The background section of this report serves as this literature review. Background research in our literature review contextualizes and justifies our framework.

Deliverable 2: Instructor Manual

The training program framework sets up and details the ten-week training program. Because we will not be implementing the training program, we created an instructor manual to serve as the training program framework. Designed to be flexible, reproducible, and with an action competence approach, the instructor manual details training program set-up, climate change topics (with activities and field trips), and mini-projects (for adaptation initiative practice). Instructors will have the ability to tailor the program according to participants' interests. Additionally, C.A.R.Y.A. content was generalized for implementation by any instructor regardless of location. Specific details for the Banksia instructor were included separately.

The instructor manual was created using information obtained from various methods. Interviews with youth confirmed that activities, field trips, and mini-projects would be engaging. Interviews with organizations formed partnerships to support our activities, field trips, and mini-projects. Our interviews and research resulted in 14 climate change topics, 24 activities, 9 field trips, and 6 mini-project options. A focus group tested components of the training program, confirmed our manual's strengths, and identified points for improvement. Using the focus group's feedback, we were able to further refine the instructor manual to be relevant and engaging to future participants.

Deliverable 3: Organization Directory

The adaptation initiative network supports the participants in developing and implementing their adaptation initiative after the training program. We established the network through interviews with eight local organizations. Organizations were willing to mentor

participants in creating their adaptation initiatives. Participants could also support organizations in their programming as part of their adaptation initiative. To document the network, we created an organization directory, which lists local organizations, their contact information, and details for partnerships with C.A.R.Y.A.

The C.A.R.Y.A. framework lays the foundation for a program that strengthens participants and their community. Because of its flexibility and reproducibility, the instructor manual exists as a resource for any instructor worldwide. Anyone interested in climate change adaptation can reference and adapt the program framework to help their own community. C.A.R.Y.A. has the potential to cause a ripple effect and inspire more youth to act against climate change.

Contributions

Our final report, including literature review, has gone through multiple changes and reviews. These changes were made as a group and each team member edited most parts multiple times. We created a process for writing drafts of the report. This process included each person individually writing their sections, followed by a group read-through where major edits were suggested. Each member would then incorporate edits into their sections. This cycle would continue until the team felt comfortable with the writing. With each draft of the report, the team changed which parts they would write. Due to this process, it is impossible to credit one person for any specific section.

We all contributed equally when conducting the focus group and interviewing youth and organizations. We all rotated leading meetings and writing minutes.

Meha led the organization of the instructor manual, including formatting it on Publisher. She created the templates for the instructor manual. She was our point of contact for the professors by emailing them drafts and updating the professors.

Minh-Chau led the paper organization and editing. She created outlines for the paper and rearranged the order based on the professors' feedback. She also ensured that the paper was cohesive. Minh-Chau contacted youth for interviews and the focus group.

Sadie led the creation of the final presentation, made most of the figures, and contacted organizations for interviews. Additionally, Sadie filled in all the gaps in our project. When dividing work, they were willing to work on any topic and help as needed.

Contributions for the instructor manual were as follows:

- As a group we worked on the following topic pages: Health Impact and Wildfires.

- Meha created: Greenhouse Gasses, Air Pollution, Waste Management, and Extreme Weather.
- Minh-Chau created: Heatwaves, Oceans, Agricultural Impact, and Biodiversity.
- Sadie created: Impact on Vulnerable Communities, Renewable Energy, Water Quality, and Infrastructure Impact.
- Meha and Minh-Chau wrote the introduction page.
- Meha created various schedules and wrote the Culmination Event page.
- Minh-Chau wrote all explanations and examples.
- Sadie created the Evaluation Techniques page, the physical and online registration forms, as well as the Adaptation Initiative page. The adaptation initiative deliverable took the form of the Organization Directory. Sadie took the lead on this document.
- Everyone contributed to editing the instructor manual, with Meha as the main editor.

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1 Introduction

Marginalized populations are at a higher risk when it comes to climate change repercussions. In urban communities, climate change can lead to increased inequality due to resource shortages and inadequate infrastructure (Fields et al., 2014). The Broadmeadows neighborhood in Melbourne, Australia, has a dry climate that is being exacerbated due to climate change. This dry climate has resulted in food insecurity and water shortages around the neighborhood (Hume City Council, 2019). In addition, unpredictable rainfall has negatively impacted agriculture productivity (Hume City Council, 2015). With a growing population, the demand for limited resources increases along with prices (Fields et al., 2014).

The Broadmeadows community is having difficulty adapting to climate change because they lack knowledge and understanding of climate change, adaptation capacity (the scope of the community's ability to adapt), and adaptation practices (specific action taken to adapt) (Caballero Aspe, 2019). Banksia Gardens Community Services (Banksia) is an organization addressing these shortcomings through various programming. Inspired by recent youth movements, Banksia is creating a program called Climate Adaptation Requires Youth Action (C.A.R.Y.A.). This program will build participants' knowledge through activities, increase capacity through local partnerships, and inspire community action. Banksia will recruit a cohort of culturally diverse youth (ages 18 to 29) and empower them to adapt to climate change with their community.

C.A.R.Y.A. is a two-part program (see Figure 1) where participants will first go through a training program, and second, create their adaptation initiatives. The training program educates youth about climate change and adaptation practices through meaningful experiences. After the

training program, participants will develop and implement climate change adaptation initiatives in their community with mentorship from local organizations.

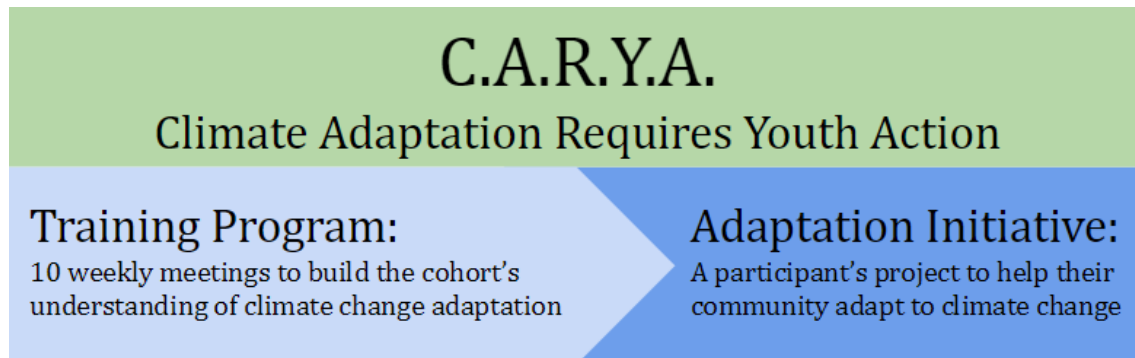


Figure 1. The two parts of the C.A.R.Y.A. program

C.A.R.Y.A. was conceptualized by our sponsor, Edgar Caballero Aspe, and made possible through the Community Climate Change Adaptation grant he received from the Victorian State Government's Department of Environment, Land, Water, and Planning. We developed the C.A.R.Y.A. framework to give Banksia a strong program foundation that would empower the Broadmeadows youth in combating climate change. We had three objectives when developing the C.A.R.Y.A. program framework:

- 1) Compile a literature review.
- 2) Create a training program framework.
- 3) Establish an adaptation initiative network.

2 Background

2.1 Climate Change

Climate change is one of the biggest issues impacting our lives today (Richardson et al., 2009). Just within ten years, global warming has contributed to the increased frequency of 500-year natural disasters and species extinctions (CBS News, 2017). As the human population increases, the rate which the climate changes is also increasing (CSIRO, 2019).

Humans have been heavily relying on plastics and processes that emit greenhouse gasses (Jones, Pittock, & Whetton, 2000). Chlorinated plastics release harmful chemicals into the surrounding soil and water sources (UN Environment Programme, 2018). Burning fossil fuels increases the concentration of greenhouse gasses which absorbs heat and causes global warming (Australian Government, 2020). These instances are just a few ways that humans have harmed the environment and contributed to climate change.

2.1.1 Climate Change Impact on Australia

Australia's environment and biodiversity are deteriorating due to ocean acidification, rising temperatures, and other climate changes (The State of Victoria, 2019). Rising temperatures have caused longer river droughts and more forest fires. From 2006 to 2011, the Murray-Darling River dried out due to insufficient rainfall (Hughes et al., 2019). Figure 2 shows the effect of climate change on the river. In early 2016, the Tasmanian Wilderness World Heritage Area lost 20,000 hectares due to bushfires caused by lightning (Hughes et al., 2019). Had the Murray-Darling River and the Tasmanian Wilderness World Heritage Area received sufficient rainfall, these ecosystems may have still been healthy to this day. The 2019-2020 Australian bushfires devastated the environment and its surrounding communities. The country lost almost one third of its koala population (Center for Disaster Philanthropy, 2020). While bushfires are naturally

occurring, climate change effects, such as heatwaves and droughts, gas made bushfires more harmful and deadly (BBC News, 2020).



Figure 2. Murray-Darling River before and during the 2006-2011 drought (Hughes et. al., 2019)

2.2 Climate Change Adaptation

Climate change mitigation and climate change adaptation are two methods to address climate change and its effects. Figure 3 explains the difference between the methods and emphasizes the need to use both concurrently.

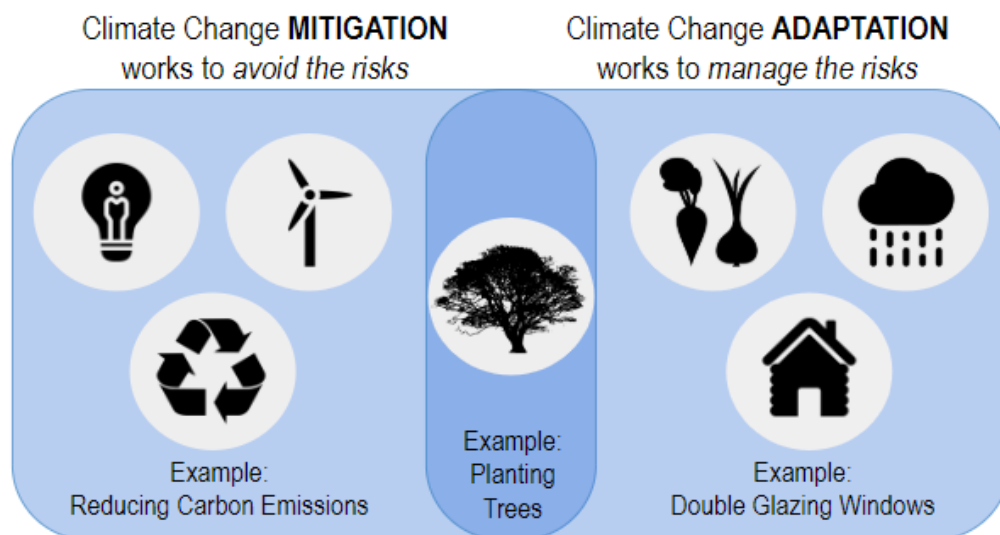


Figure 3. Climate change mitigation vs adaptation

Many current climate change initiatives focus on climate change mitigation. Some examples of mitigation legislation include Massachusetts' one-time-use plastic bags ban (Duffy, 2018) and Sweden's recycling system (Hinde, 2019). Education on living sustainably can lead to mitigation. For example, the world-wide movement against plastic straws and eating utensils aims to prevent plastics from entering the oceans and harming marine life (Gibbens, 2019). More people are living sustainably and inspiring others to do the same, after knowing about plastics' detrimental effects. The efforts listed above focus on preventing further climate change.

Climate change adaptation acknowledges climate change and its current detrimental effects. It is common for actions to fit both mitigation and adaptation methods. One example is tree planting. By consuming carbon dioxide, the tree reduces carbon emissions, i.e. mitigation. By emitting oxygen, the tree improves air quality for many organisms, i.e. adaptation (Ajia, 2017). Unfortunately, some climate change risks cannot be avoided. In the context of extreme weather events, which are increasing due to climate change, adaptation becomes extremely valuable. Adaptation measures protect communities and build resilience.

2.2.1 Adaptation Principles and Practices Worldwide

Adaptation practices for climate change have been developed throughout the world. For example, the 2013-2016 California drought affected many residents, but hit the agricultural industry the hardest. A study from the Society of Range Management reports 80% of plant-based food for livestock was lost (Macon et al, 2016). To survive, farmers were forced to make adaptations to their practices: 70% permanently reduced their herd size and 26% bought more land for their cattle to feed on during drought periods (Macon et al, 2016).

In the Netherlands, students created the "Plant Bag," a backpack which filtered outside air for the user to breathe (Phys, 2016). Air was filtered by a plant root inside the backpack.

Users could now breathe pollutant-free air (Phys, 2016). The Plant Bag is an ideal adaptation device for areas with low air quality. In a world of increasing air pollution, it is wise to protect against pollutants that could cause permanent lung and health issues, while also striving to reduce air pollution.

In Morocco, a youth group named El Mouddaa Adaptation Initiative used various adaptation strategies to improve their community. The group strategically built rock dams to reduce floods and damages (UNCC, 2020). Additionally, El Mouddaa implemented an early flash flood warning system to help their community prepare for floods. This solution enabled the community to actively protect themselves (UNCC, 2020). By engaging the entire community, adaptation practices become more feasible.

2.2.2 Adaptation in Australia

The Australian Government has been taking adaptation actions through government programs. In Sydney, the Coastal Adaptation Decision Pathways program established a framework for evaluating seawalls. This framework is helping Sydney maintain and improve their seawalls against coastal climate change risks such as storms and erosion (Australian Government, 2015). The Tasmanian state government is providing Enterprise Suitability Maps to help farmers adapt their farming to the changing climate. Maps have been made for various crops such as wheat, potatoes, wine grapes, and barley (Tasmanian Government, 2019). When the climate changes, farmers now know when to plant certain crops and increase their overall agricultural productivity.

Indigenous Australians have been adapting to the local environment for millennia. Current Indigenous groups are combining traditional knowledge with modern science to address urgent climate change effects. The West Arnhem Land Fire Abatement Project (WALFA) is a

partnership in the Northern Territory between Indigenous rangers and a liquefied natural gas plant. WALFA carries out early season grassland burns which reduces wild bushfires and lowers greenhouse gas emissions (ConocoPhillips, 2020). Many Indigenous groups carry out controlled burnings to prevent uncontrollable and dangerous wildfires.

2.3 Inspiring Youth Action Against Climate Change

Youth are inspired and motivated to be environmental stewards when climate change affects them personally or they encounter meaningful experiences in nature. Today's youth recognize that present decisions will greatly affect their future (O'Brien, Selboe, & Hayward, 2018). By participating in activism and eco-friendly youth programs, many have already begun making a difference in their community despite their age (O'Brien et al., 2018).

2.3.1 Youth Activism

Youth are drawn to activism because it is a chance for them to take action against climate change and address their concerns (Thew, 2019). Jean Hinchliffe became one of the biggest climate change youth activists in Australia at the age of fifteen. As the master of ceremonies for Sydney climate strikes, Hinchliffe knows climate change affects all aspects of life. She has stated that "Climate change often isn't seen as an intersectional problem. But as climate change gets worse, you can see more and more natural disasters and that creates communities being poorer and more desperate, which leads to more rape and more crime" (Kenny, 2019). By helping others recognize that climate change affects everyone, she has inspired youth to join the climate strikes.

2.3.2 Youth Programs

Another way of motivating youth to participate in climate change initiatives is by creating personal interest. Basing projects on personal and community importance will gather interest and commitment. In Salinas, California, Youth Community Council members took

photos of their community's environmental health. Through discussing these photos, youth were able to identify and address concerns important to them and their community. The discussions culminated with two action plans: a 5k run to raise awareness about safer exercise places, and a high school recycling program (Madrigal et al., 2014). Policy changes are slow, but interest and momentum in youth should be maintained (Madrigal et al., 2014). These action plans allowed for continuous youth engagement after the program.

People are motivated to be environmental stewards through meaningful experiences in nature. According to research at Cornell University, childhood nature experiences correlate to environmental stewardship as an adult (Wells & Lekies, 2006). Students at the University of Idaho Extension were taught about sustainability and the environment through forest camping trips. Student feedback of the trip indicated a strong preference for active experiences (Warren, 2015). Additionally, the Youth Environmental Leadership Expedition connects youth to nature by exploring the Frontenac Arch in Ontario, Canada (Biosphere Environmental Education Inc, 2019). At the end of this program, the participants advocate for the environment by creating an inspiring educational video. Through the video assignment, the participants were further engaged in the program's content and developed a personal connection with the environment.

2.3.3 Action Competence Framework

The action competence framework emphasizes eight aspects for effective environmental education: emotion, embodiment, reflection, knowledge, vision for a sustainable future, action-taking for sustainability, connectedness, and social network (Caballero Aspe, 2013). Table 1 summarizes each aspect and its importance towards environmental education.

In environmental education, traditional methods that prioritize passive listening have not been enough to inspire behavioral changes (Mogensen & Schnack, 2010). With an action

competence framework, students learn about the problem by taking action and creating a personal connection with the material. The framework creates a cycle between learning and solving the problem. Thus, this framework builds the competence for action within students.

Table 1. Aspects of action competence (Caballero Aspe, 2013)

	Definition	Importance
Emotion	Using knowledge and experiences to inform choices and guide your lifestyle.	Embodying the ability to take power is a necessary step before taking action. This component develops the “heart/feel” aspect.
Embodiment	Using knowledge and experiences to inform choices and guide your lifestyle.	Embodying the ability to take power is a necessary step before taking action.
Reflection	Critically thinking about one’s experiences.	Reflection is essential to make the connections between thinking, feeling & acting.
Knowledge	Knowledge is conceptual & practical understanding of sustainability & the processes through which knowledge is gained & used.	Developing an ability to use information & findings will inform decisions & actions that lead to a more sustainable future.
Vision for a Sustainable Future	The vision includes how we might like our future to be & what changes need to be made now for that future.	A vision for a sustainable future involves understanding sustainability & exploring alternatives for change.
Action-taking for Sustainability	Intentional & carefully considered behavior promotes sustainability.	Develops an ability to plan & a willingness to take effective action for sustainability.
Connectedness	Interconnectedness is between people & all aspects of the environment. Includes connections between thinking, feeling & acting (head, hearts, & hands).	Connectedness leads to relevance, enthusiasm & interest because learning is participative.
Social Network	Connecting with other people through sharing information and experiences between individuals.	Social network allows individuals to reflect on their liberty and responsibility to communicate.

Field trips exemplify the action competence approach by addressing all eight aspects.

Students get to experience, reflect on, learn about, and connect to nature. Field trips can also help

students develop a vision for a sustainable future and involve them in taking sustainable actions. According to Science Education, if students get new experiences, their interest and engagement will increase, regardless of their prior interest or knowledge in the subject (Dohn, 2011).

Project-based learning also exemplifies all eight aspects of the action competence approach. This learning style allows students to learn about, reflect on, and connect to different subjects through meaningful experiences. Instead of being taught subjects in a typical lecture style, project-based learning forces students to think as a group to develop a solution through action. According to Kevin Gary, a professor from Arizona State University, knowing how to solve a specific issue is not as important as understanding the context of the problem and the possible routes to solve it (Gary, 2015). Project-based learning teaches students how to problem-solve, rather than solving a specific problem. According to Kristin Wobbe, Co-Director of Project Based Learning at Worcester Polytechnic Institute, this type of learning is complex for students but more engaging than traditional lessons (personal communication, 2019).

2.4 Project C.A.R.Y.A.

2.4.1 Broadmeadows Community

Broadmeadows is a diverse neighborhood of people from different cultures, races, and backgrounds that is affected by poverty, poor health, crime and low educational attainment. A large number of non-English speaking immigrants and refugees have been settling in the area. Statistics from the 2016 Census indicate that 70.2% of the Broadmeadows neighborhood spoke a language other than English at home (Australia Bureau of Statistics, 2017).

The Broadmeadows community is facing negative repercussions from climate change. Hume City Council notes that climate change is worsening Broadmeadows' dry climate and straining water resources. Food insecurity is also rising concern due to unpredictable rainfall

(Hume City Council, 2015, 2019). Marginalized populations, like Broadmeadows, are disproportionately affected by climate change (Fields et al., 2014). Food and water shortages inflate prices for necessities. Hardships increase for disadvantaged groups, such as the poor, elderly, and migrants, who already have limited resources. Therefore, communities like Broadmeadows will be greatly affected and recover slowly from climate change-related disasters (Fields et al., 2014).

Economic insecurity along with rising temperatures from climate change can exacerbate problems in the community. Broadmeadows is affected by trauma, violence, and crime. Research has shown a correlation between extreme heat and aggression (DeWall, Anderson, & Bushman, 2011). Climate change is already negatively affecting the community and conditions will only worsen. Therefore, the Broadmeadows community must acknowledge and adapt to climate change.

2.4.2 Banksia Gardens Community Services

Banksia serves the local Broadmeadows community in Melbourne, Australia, through their mission of “Transforming Lives, Strengthening Communities, [and] Reducing Disadvantage” (Banksia Gardens Community Services, 2013). The organization empowers its youth through various methods. Educational support exists in the form of study groups and the Aiming High VCE Support Program for year 11 and 12 students. The Good People Act Now project teaches youth to take the initiative in educating about and preventing violence against women in their community.

In 2009, Banksia adopted environmental sustainability as one of its core values. Their biggest initiative, the Eco-Warriors Project, educated the community on sustainable practices. The project’s programs included bicycle distribution, maintenance workshops, and a community

garden (Banksia Gardens Community Centre, 2013). Since the conclusion of their Eco-Warriors Project in 2011, Banksia has been looking for more ways to engage and educate their community in environmental stewardship.

2.4.3 Climate Adaptation Requires Youth Action

Banksia seeks to address the climate change crisis through youth action in environmental sustainability. Our sponsor, Edgar Caballero Aspe, created the C.A.R.Y.A. program and received funding through applying to the Community Climate Change Adaptation grant from the Victorian State Government. The C.A.R.Y.A. program aims to inspire youth groups in creating climate change adaptations with their community. As more people move into Broadmeadows, the community grows and diversifies. To ensure that youth action benefits everyone in Broadmeadows, C.A.R.Y.A. is a purposefully inclusive program. The following chapters will discuss our development of C.A.R.Y.A.'s framework.

3 Deliverables

We developed the C.A.R.Y.A. framework through three objectives: 1) compile a literature review, 2) create a training program framework, and 3) establish an adaptation initiative network. To achieve these objectives, we created three deliverables: 1) a background literature review, 2) an instructor manual, and 3) an organization directory.

3.1 Background Literature Review

The literature review is background information regarding climate change, climate change adaptation, and youth action against climate change. Our sponsor requested that we compile the literature review to learn about best practices in climate change adaptation. The background section of our report serves as this literature review.

3.2 Instructor Manual

Documented through an instructor manual, the training program framework sets up the ten-week training program. The cohort builds their understanding of adaptation against climate change in their community throughout the ten weeks. Each weekly meeting covers a climate change topic and takes the form of either a workshop or a field trip. Held at Banksia, a workshop is a two-hour meeting where the cohort deepens their understanding of climate change through activities and a mini-project. The mini-project is completed as a cohort and across the ten-week training program. A field trip is an off-site meeting to give the cohort contextual experiences. Timing for field trips vary from 2 hours to a full day. Figure 4 maps key components of the training program.

Discussions with our sponsor emphasized the need for a flexible and reproducible training program. Flexibility would allow the program to be tailored to the participants and their interests. Reproducibility would allow the program to be implemented at locations outside of

Broadmeadows by any instructor. Our sponsor wanted C.A.R.Y.A. to be a resource for anyone interested in climate change adaptation. Thus, we created the instructor manual to allow for flexibility and reproducibility in the training program’s framework. The instructor manual details training program set-up, prototype program schedules, climate change topics (with activities and field trips), and mini-projects (for adaptation initiative practice).

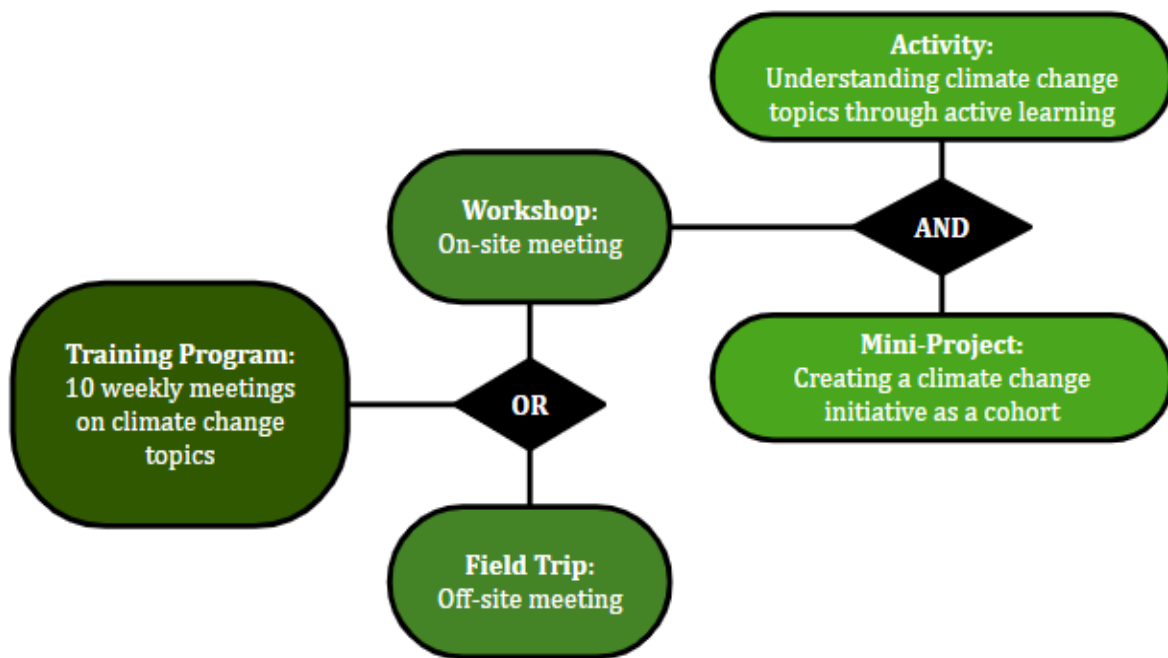


Figure 4. Training program consists of workshops and field trips

3.3 Organization Directory

After the training program, each participant is encouraged to develop and implement an adaptation initiative in their community. In this second part of the program, C.A.R.Y.A. provides resources and connects the cohort to a network of local organizations. This adaptation initiative network mentors the participants and provides expert knowledge. Participants have the responsibility to lead their own initiatives. We created an organization directory to document the network and centralize its information. Organizations in this directory expressed an interest in

partnering with C.A.R.Y.A. for the adaptation initiative and supporting the training program through field trips, activities, and mini-projects. The organization directory lists local organizations, their contact information, and details for partnerships with C.A.R.Y.A.

4 Methodology

To create the instructor manual and organization directory, we gathered additional information and resources and tailored the program to the Broadmeadows community. Various methods were used to ensure that the C.A.R.Y.A. program framework was engaging and effective. This chapter details why each method was chosen and how they were executed.

4.1 Assembly

To make the instructor manual and organization directory easy to read, we compiled both documents in Microsoft Publisher. Everyone on our team had access to the program which made developing and editing content easier. Additionally, we believed that Publisher would give us more flexibility in formatting than Microsoft Word. After finalizing the manual on Publisher, we transferred the manual to Microsoft Word so that the manual can more easily exist as a living document and be edited by the sponsor (who did not have access to Microsoft Publisher).

To make the instructor manual easy to follow, we standardized content on climate change topics through a template. This template (see Figure 5) compiled all the information we gathered across the methods and guided our documentation of resources, activities, and field trips for the climate change topics.

Topic Title

Background Information on the topic and its relationship to climate change

Learning Outcomes

- What students are expected to leave the meeting with
- Learning Outcome 2
- Learning Outcome 3

Activities

Activity Title

Prep Time: X hr Xmin Activity Duration: X hr X min

Activity Purpose

Materials:

- Material 1
- Material 2

Instructor Preparation:

- Task 1
- Task 2

Activity Instructions:

1. Instruction 1 (X min)
 - a. Sub- Instruction a
 - b. Sub- Instruction b

Additional Resources

Hyperlinked Resource 1

Hyperlinked Resource 2

Hyperlinked Resource 3

Field Trips

Field Trip

Purpose of Field Trip

Example Locations/Organizations:

Location Name: Background. Purpose.

Logistics: How and when to contact. Transportation arrangements.

Organization Name: Background. Purpose.

Logistics: How and when to contact. Transportation arrangements.

Figure 5. Topic template

4.2 Additional Research

When creating the instructor manual, we conducted more research to come up with specific climate change topics, activities, field trips, and mini projects relevant to the participants. Research was fundamental in giving credibility to our work on the instructor manual. We researched meticulously to ensure that we did not misinform the instructor or future participants. Additional resources provided to the instructor for the climate change topics (see Figure 5) were picked purposefully from reliable resources. Because the instructor manual is an online-accessible PDF, these resources are external links the instructor can click on to navigate to the resources.

4.3 Semi-Structured Interviews with Youth

To create an instructor manual that would empower youth, we needed to understand how youth perceive climate change, what issues matter to them, and what resources they need. We conducted semi-structured interviews with four Broadmeadows youth to gather in-depth responses. The semi-structured interview allows for open-ended questions while still maintaining organization (Adams, 2010). A list of questions (see Appendix A) were prepared but the conversations flowed according to the interviewee, rather than to a script. Each individual interview lasted from 1 to 2.5 hours.

We interviewed a diverse group of youth interested in climate change adaptation. Talking to the target audience allowed us to design the program according to youths' interest. The four youth interviewees varied in age, gender, ethnicity, and nationality (see Table 2). All four interviewees have been involved in acting against climate change. By learning what helped these youth act, we were able to create material that assists others in doing the same. Interviewees helped us develop activities, field trips, and mini-projects by expressing their interests and

brainstorming with us. Additionally, these interviews provided insight on what resources youth still need.

Table 2. Youth interviewee demographics

	Distribution
Ages	19, 20, 23, 26
Genders	3 Female, 1 Male
Ethnicities	East African, Mixed European, Irish, Sri Lankan
Nationalities	Sri Lankan, Somalian, 2 Australian

4.4 Focus Group

To refine our instructor manual, we tested parts of a workshop on a focus group. Focus groups allow participant interaction and discussion that would not be possible in a one-on-one interview (Lavrakas, 2019). Additionally, a focus group simulated the workshop environment. The participants in the focus group were diverse in age, gender, ethnicity, and nationality (see Table 3) to reflect the Broadmeadows community.

Table 3. Focus group participant demographics

	Distribution
Ages	18, 19, 21, 29
Genders	3 Female, 1 Male
Ethnicities	Palestinian, 2 Sri Lankan, Thai
Nationalities	Palestinian, 2 Sri Lankan, Thai

We used the focus group to determine if our climate change topics and activities were engaging. Participants were asked to rate our topics and run through one activity. The full two-hour focus group schedule is shown in Table 4 (for the full script, see Appendix C). Feedback

from the focus group allowed us to identify our program’s strengths and points for improvement. We then modified the instructor manual accordingly.

Table 4. Focus group schedule

Duration	Event	Description
5 min	Collect Information	Sign consent forms and collect demographics information.
5 min	Introduction of Focus Group	Introduce team, C.A.R.Y.A. program, purpose and schedule of focus group.
5 min	Rating Topics	Rate interest level in climate change topics.
5 min	Acknowledge of Country + Opening Ritual	Test the start of every meeting in the training program.
60 min	Activity	Test run the activity from Air Pollution topic: Identifying Air Pollution Items/Systems.
40 min	Feedback + Discussion	Discuss strengths and points for improvements for the workshop.

4.5 Semi-Structured Interviews with Organizations

Connecting with organizations helped us establish a stronger C.A.R.Y.A. framework when developing both the instructor manual and the organization directory. We conducted semi-structured interviews to develop partnerships with local organizations involved in environmental sustainability. Youth action is more effective when partnered with local organizations that provide their expertise (Monroe et al., 2016).

We were able to inquire about partnerships in greater detail through the semi-structured interview (see Appendix B for the full interview template). Organizations were asked for help in the following areas: 1) aiding activities and mini-projects, 2) hosting field trips, or 3) mentoring adaptation initiatives. When interviewing organizations, our team considered three factors: 1) the mentorship and network options available, 2) the environmental issues that the organization works on in relation to interests expressed by the Broadmeadows youth, and 3) what industry

their expertise lies in. We determined the partnership based on these three factors and how organizations would help in the three prior areas. With these criteria, we established a network of strong organizations to ensure that the cohort received effective guidance and knowledge throughout C.A.R.Y.A.

5 Results

5.1 C.A.R.Y.A. Framework

The C.A.R.Y.A. program has a flexible timeline. The training program consists of ten weekly meetings, is prefaced by registration, and is followed by the adaptation initiative.

However, the instructor can change content within the training program based on the cohort's interests and the program's timing. Figure 6 shows one example timeline for the C.A.R.Y.A. program. Some timeline variations involve:

- 1) Balance between workshops and field trips (e.g., 6 workshops and 2 field trips)
- 2) Duration of registration
- 3) Duration of the adaptation initiative

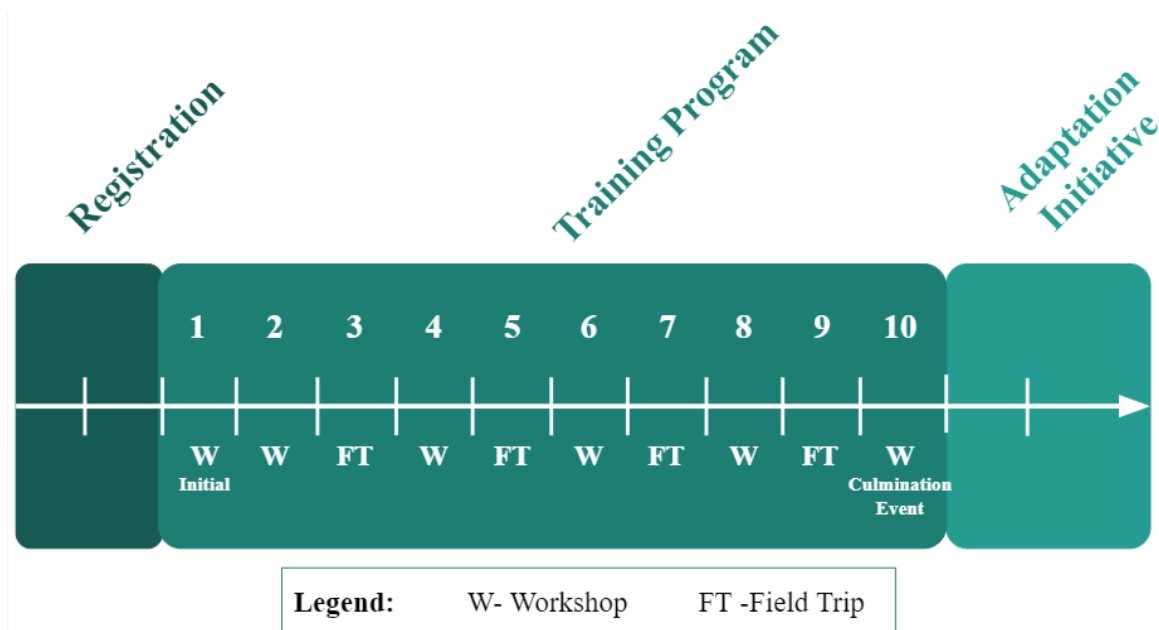


Figure 6. Example C.A.R.Y.A. program timeline

5.2 Instructor Manual

We created an instructor manual to ensure that Banksia and others can run the C.A.R.Y.A. program. In discussions with Banksia employees, youth, and local organizations,

there was a strong desire for the program to expand beyond Banksia. Therefore, the manual is descriptive enough to ensure that any instructor could run the program, while also providing specific details for the Banksia instructor.

The instructor manual is a compilation of schedules, climate change topic pages and other supplementary material. A generalized workshop schedule (see Table 5) was made for the instructor to reference when planning and leading workshop meetings. Each topic page is laid out so that instructors have enough details about the topic to perform their own research and prepare for meetings. In addition, they are given directions on how to set-up a meeting for either an activity or field trip. As an example, the Infrastructure Impact topic page can be seen in Figure 7.

Table 5. General workshop schedule from the instructor manual

Duration	Event Name	Description
2 min	Acknowledgement of Country	The instructor will deliver an Acknowledgement of Country.
3 min	Opening Ritual	The instructor will read a poem that connects the cohort to climate change. Simultaneously, an item of significance will be passed around the room.
70 min	Activity	The activity is based on the topic for that day.
5 min	Break	
35 min	Mini-Project	More details for mini projects are provided in the mini projects section.
5 min	Closing Ritual	To be developed by the instructor and/or cohort.

Infrastructure Impact

As the climate continues to worsen, our homes need to become more sustainable and be able to withstand the changes. Infrastructure impact takes two main forms, changes done to buildings (new and existing) and the impact climate change has on infrastructure. Changes done to buildings can include things like implementing renewable energy, composting, and naturally regulating the temperature of a building. In order to adapt to the changes affecting the world, the infrastructure must be adapted to fit the needs of the people that inhabit it. Adapting infrastructure to the changing climate will also decrease one's reliance on energy (ex. less air conditioning needed).

Learning Outcomes

- Understand the effects climate change has on infrastructures
- Gain knowledge on how to adapt already existing infrastructures
- Create a vision for a future where new structures are built with sustainability in mind

Activities

DIY: Sustainable Home

Activity Duration: 1 hr 10 min

Through this activity, the cohort will find ways to make their own home sustainable.

Materials:

- Renters Guide to Sustainable Living
- Paper
- Pencils
- Devices with Internet Access (e.g. tablets, phones)

Activity Instruction:

1. Individuals research ways to make their homes more sustainable. (20 min)
2. Discuss solutions as a cohort. (15 min)
3. Create DIY sustainable solutions. (30 min)
 - a. Ideally, most of these solutions will use items that would normally go in the trash.
 - b. If the materials are available, the participants will build a prototype of their ideas.
 - i. If the materials are not available, have them sketch out their ideas.
 - c. Ex: Create "double-glazed windows" by using take-away containers.
 - i. Tape the containers together in the shape of the windows.
 - ii. Instead of using heating or air conditioning, put the containers in the windows in the morning.
4. Present step 3 to each other and explain how this is adaptation. (10 min)

Additional Resources

Renters Guide to Sustainable Living by Renew

Climate Proofing Australia's Infrastructure by National Climate Change Adaptation Research Facility

How Climate Change Impacts Infrastructure by The University of Sydney

Field Trips

Sustainable House Tour

This field trip will show the cohort what a sustainable house actually looks like. Also, this field trip will show them the different types of adaptations that can be implemented in houses.

Example Locations/Organizations:

Renew: A company focused on improving their members' residences through sustainability.

Logistics: Email one month ahead of time. Either contact Hume City Council for transportation or use public transportation to get the house.

The cohort will tour some eco-friendly and sustainable houses.

Figure 7. Infrastructure impact topic page

5.2.1 Topics

We identified 14 climate change topics (see Figure 8), each relevant to the Broadmeadows community, for the training program. Thorough research ensured that the topics effectively covered climate change effects on Australia. There are only 8 meetings that the climate change topics will be discussed in since the first meeting is an introductory workshop and the final meeting is a community culmination event. During program registration, participants will rank the 14 topics. The instructor will tailor the training program to the cohort and only cover the 8 topics the cohort finds most interesting. If the participants express interest in a topic outside of the 14, the manual includes a template for the instructor to create a workshop for the new topic. This template also helps C.A.R.Y.A. be reproducible, as it allows other instructors to create new workshops based on their cohort's interest.

1. Air Pollution	8. Impact on Vulnerable Communities
2. Agriculture Impact	9. Infrastructure Impact
3. Biodiversity	10. Oceans
4. Extreme Weather	11. Renewable Energy
5. Greenhouse Gasses	12. Waste Management
6. Health Impact	13. Water Quality
7. Heatwaves	14. Wildfires

Figure 8. 14 Topics in the instructor manual listed by alphabetical order

The focus group confirmed that the 14 topics were interesting to Broadmeadows youth by rating each topic on a scale of 1 (not interesting) to 5 (very interesting). From this rating, we found the most interesting topic was Health Impact, rating 4.5 out of 5. Wildfires, Greenhouse Gasses, and Infrastructure Impact were the least interesting with a rating of 3.5 out of 5. With 3.5 as the lowest rating, we were confident that all our topics were interesting to the Broadmeadows community. Figure 9 shows the average rating for each topic.

Average Rating for Each Topic

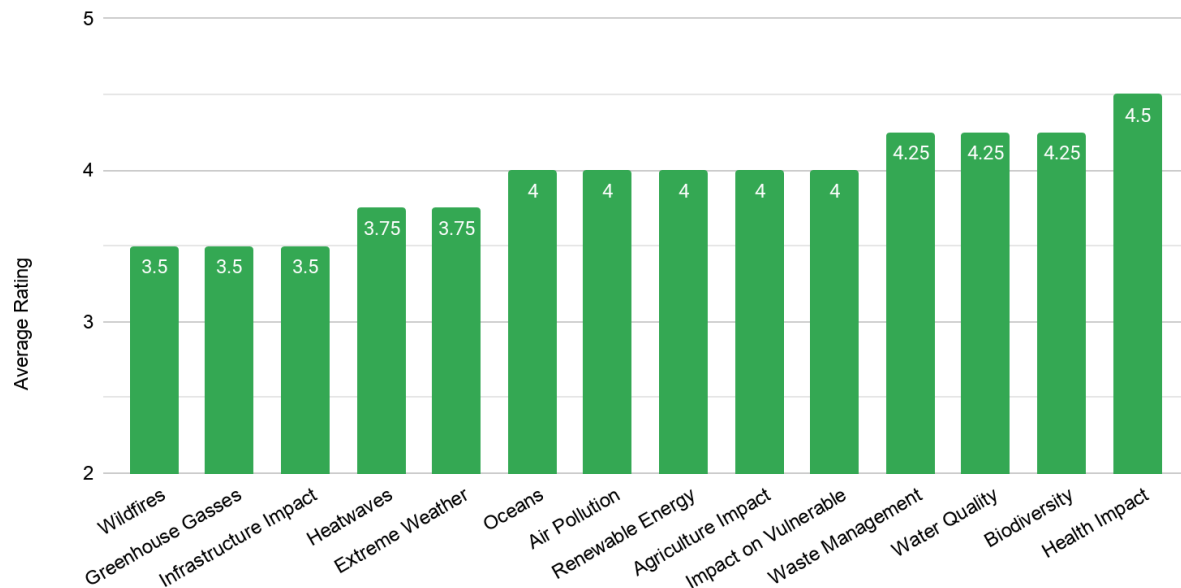


Figure 9. Average rating for each topic

5.2.2 Activities

Based on the action competence approach (Caballero Aspe, 2013) and our interviews, we determined that activities should be the main method to help participants understand the topics. Youth interviews confirmed that interactive content was preferred over traditional school lectures. One youth stated, “Students do not connect to schools when they are spoon fed.” When asked how to inspire action, youth interviewees advised us to “make it personal. Then it goes from expert to citizen driven.” Additionally, the interviewees thought it was important to show that “if everyone changes a little bit, we can make a difference ... small changes will not be inconvenient and [can] still make an impact.” Thus, activities were kept simple and focused on developing curiosity and supporting the ideas of the participants.

Activities for the workshops were varied and depended on the topic. We looked at youth interviews to guide the content. Some suggestions were “creating or watching films,” “tree planting,” “carbon footprint audits,” and “learning from Aboriginal perspectives.” In response,

we researched and created activities such as watching the film 2040, comparing transportation carbon footprints, and talking to Aboriginals about intentional burns. In total, we developed 24 activities, which are divided by topic in Table 6.

Table 6. Activities listed by topics

Topic	Activities
Initial Workshop (Mandatory)	<ul style="list-style-type: none"> - Climate Change Graphs - What's Your 2040?
Wildfires	<ul style="list-style-type: none"> - Famous Fires - Guest Lecturer: Intentional Burns
Waste Management	<ul style="list-style-type: none"> - Waste Audit
Heatwaves	<ul style="list-style-type: none"> - Heat Wave Escape Room - Hot Weather Fashion Show - Neighborhood Heatwave Walk
Water Quality	<ul style="list-style-type: none"> - Create a Water Filter
Oceans	<ul style="list-style-type: none"> - Seafood Audit - Ocean Acidification Impact Test
Air Pollution	<ul style="list-style-type: none"> - Identifying Air Pollution Items/Systems
Renewable Energy	<ul style="list-style-type: none"> - Energy Audit
Health Impact	<ul style="list-style-type: none"> - Healthy Sustainable Cooking - Interview a Psychologist
Agriculture Impact	<ul style="list-style-type: none"> - Community Garden - Native Food Recipe
Greenhouse Gasses	<ul style="list-style-type: none"> - Compare, Contrast and Change Commutes - Josh's House
Extreme Weather	<ul style="list-style-type: none"> - Compilation of Lesson Plans for various Extreme Weather
Infrastructure Impact	<ul style="list-style-type: none"> - DIY: Sustainable Home
Biodiversity	<ul style="list-style-type: none"> - Biodiversity Walk
Impact on Vulnerable Communities	<ul style="list-style-type: none"> - Impact Chat - Photovoice: Climate Change in the Community
Culmination Event (Mandatory)	<ul style="list-style-type: none"> - Trivia Night

Some activities involved partnering with organizations. Two local organizations expressed interest in facilitating activities (more details can be found in Appendix E). For example, DPV Health (a medical clinic), agreed to teach participants about climate change's health impact through a Healthy Sustainable Cooking activity. We included organizations in our activities to give participants access to experts in specific topics.

Interviews with youth guided our creation of the final meeting: participants will plan a culmination event to share their knowledge with their community. Youth noted that community-based ideas were ideal since “children are the best way to change home lifestyle.” By involving the community, “we can help them improve and they can help us learn.” We provided instructions for setting up a community trivia night as the culmination event. The trivia night will allow the cohort to invite their family and friends to learn about climate change and useful adaptation techniques.

Using a focus group to test the Identifying Air Pollution Items/Systems activity, we identified our activity's strengths. Participants liked that information given about air pollution was “straightforward,” “quick and simple,” since “less information on the board allowed for discussion, group thinking and brainstorming.” These comments confirmed that we did not need lectures to inform youth; thus, we kept the activities as interactive as possible. Another strength was the activity's open-environment. Throughout the focus group, participants felt “welcomed and connected” because of our “casual and friendly conversations.” Some reflected that even though it was “overwhelming [to see climate change] where you live,” the activity “helped because it gives hope that you're doing something and [gives you] courage to keep going.” These comments and observations verify that the activities will empower youth. Additionally, we observed that throughout the activity, participants were thoughtful in their observations,

proactive in their research, and engaged in discussions within the group as well as with the instructor. Thus, we believe that the activity was interesting and engaging to the focus group. Since many of our activities have similar principles to the activity we tested, we feel confident in our other activities as well.

The focus group also helped us identify two improvements. We observed that participants were confused about the instructions and required some additional prompting throughout the activity. To prevent confusion, we added clarifications to all of the activities' instructions. Secondly, due to a time constraint, the focus group was unable to discuss adaptation solutions in the activity. When asked for feedback, participants requested for time to discuss solutions since "the root is important, but we should work to reduce the harm." Thus, we made sure that adaptation discussions were part of all activities.

5.2.3 Field Trips

Based on the action competence approach (Caballero Aspe, 2019) and youth interviews, we compiled field trip concepts to give the cohort meaningful experiences in nature and their community. One youth interviewee became interested in climate change activism after a high school outdoor environmental class which brought her "out to beautiful places." Another interviewee noted, "You can feel calmer when connected to nature." Additionally, youth interviewees wanted to see examples of sustainability and adaptation practices. From these examples they could learn from pre-existing initiatives and see that "others care about what I care about." Overall, youth thought a balance of appreciating nature and seeing sustainable initiatives would effectively inspire climate change action.

Organizations were willing to partner with Banksia and host field trips for the cohort. Six organizations, out of the eight organizations we interviewed, identified ways to support the

training program's field trips. We developed nine field trip suggestions after our interviews and research. For reproducibility, the instructor manual contains field trip concepts followed by example locations and partner organizations specific to Banksia. Our sponsor will be able to pick from these suggestions based on the cohort's interest, C.A.R.Y.A. 's budget, as well as program timing. Table 7 lists and details the field trip suggestions. Locations with a star (★) are field trips that we believe possible for C.A.R.Y.A. based on Banksia's connections. However, we did not have enough time to establish those specific partnerships and leave them up to Banksia.

Table 7. Field trip suggestions

Field Trip	Locations and Organizations	Topics
Watching an Intentional Burn	Sunbury burns through Wurundjeri Tribe Narrap Team	Wildfires Extreme Weather
Witnessing Climate Resiliency	Scotsburn fire recovery through Conservation Volunteers Australia	Wildfires Extreme Weather
Waste Management Plant Tour	★E-waste recycling through Enable ★Sunbury Landfill	Waste Management
Exploring Our Waters	Cheetham Wetlands through Conservation Volunteers Australia	Water Quality Oceans
Renewable Energy Plant Tour	★Solar hot water plant through Earthworker	Renewable Energy Greenhouse Gasses
Sustainable House Tour	Local homes through Renew	Air Pollution Renewable Energy Greenhouse Gasses Infrastructure Impact
Exploring a Farm	★CERES organic farm	Agriculture Impact
National Park Visit	Organ Pipes National Park through Conservation Volunteers Australia	Biodiversity
Conservation Volunteering	James Whyte Island Reserve through Conservation Volunteers Australia	Biodiversity

5.2.4 Mini-Projects

Mini-projects were created to give participants familiarity in developing and implementing an adaptation initiative. A mini-project is an initiative done as a cohort, throughout the ten-week training program, with guidance from the instructor. Youth interviewees reflected on how they and their peers felt scared, hopeless, “that they can’t make a difference in the world,” and “misinformed about their impact.” One youth stated, “I never thought I could be a leader.” Mini-projects will help the cohort practice creating a climate change initiative. By conducting the project as a cohort, participants will support each other in learning how to research, act, and lead. Youth interviewees confirmed that guided group mini-projects would help participants believe in their abilities. Interviews with both youth and organizations helped us develop the six mini-project options for the cohort to choose from. Table 8 lists these mini-projects (more details can be found in the instruction manual, Appendix D).

Table 8. List of mini-project options

Mini-Project	Description
Community Garden	Creating or improving a garden to provide healthy food alternatives for the community.
Soft Plastics Recycling	Creating a community initiative to separately recycle soft plastics which jam traditional recycling sorting machines.
Climate Change Communication	Creating social media content to inform community members regarding climate change related health concerns.
Community Compost	Creating or improving a compost system for the community.
Repair Cafe	Organizing an event where community members bring and fix broken items instead of throwing them away.
Habit Forming	Practicing, recording, and comparing sustainable habits.

5.3 Organization Directory

We created an organization directory to document C.A.R.Y.A.'s adaptation initiative network. Six out of the eight organizations we interviewed were interested in partnering with participants after the training program. We found that many organizations provided ideas for adaptation initiatives when asked “How can C.A.R.Y.A. help you?” This trend shows that the adaptation initiatives are truly partnerships with organizations. Table 10 lists organizations and their proposed involvement in C.A.R.Y.A.'s adaptation initiatives.

To make it easier for the instructor and participants to contact organizations, we created an organization directory. Within the directory, all eight organizations supporting C.A.R.Y.A. are listed with their name, contact information, and description. Table 9 shows an example entry in the organization directory. Personal information for this example entry has been redacted out of respect for our point of contact's privacy. Similarly, the contact column has been redacted from the organization directory in Appendix E.

Table 9. Example entry in the organization directory

Organization	Contact	Description
Hume City Council	Liz Turner Email: [REDACTED] Phone: [REDACTED]	Hume City Council is the governing body for Broadmeadows. Field Trip: Provide transportation Adaptation Initiative: Join the council's pre-existing programming, General mentorship

Table 10. Adaptation initiative partnerships with organizations

Organization	Adaptation Initiative Partnership
Hume City Council	<ul style="list-style-type: none"> - Participants can support the council in various workshops and programming - General mentorship
Renew	<ul style="list-style-type: none"> - Participants can support at a Sustainable Housing Day - Renew could offer unpaid internships to participants - General mentorship
Conservation Volunteers Australia	<ul style="list-style-type: none"> - Participants could volunteer on or lead conservation projects - Participants could create STEM activities for field trips - General mentorship
DPV Health	<ul style="list-style-type: none"> - Participants could create climate change workshops for schools - General mentorship
Hume Climate Action Now	<ul style="list-style-type: none"> - General mentorship
Department of Environment, Land, Water, & Planning	<ul style="list-style-type: none"> - General mentorship

6 Discussion

6.1 Summary

We created the C.A.R.Y.A. framework through three deliverables: 1) a background literature review, 2) an instructor manual, and 3) an organization directory.

6.1.1 Deliverable 1: Background Literature Review

Our sponsor requested a literature review on climate change, climate change adaptation, and youth action against climate change. The background section of this report serves as this literature review.

6.1.2 Deliverable 2: Instructor Manual

The training program framework sets up and details the ten-week training program. Because we will not be implementing the training program, we created an instructor manual (see Appendix D) to serve as the training program framework. Designed to be flexible, reproducible, and with an action competence approach, the instructor manual details training program set-up, climate change topics (with activities and field trips), and mini-projects (for adaptation initiative practice). Instructors will have the ability to tailor the program according to participants' interests. Additionally, C.A.R.Y.A. content was generalized for implementation by any instructor regardless of location. Specific details for the Banksia instructor were included separately.

The instructor manual was created using information from various methods. Interviews with youth confirmed that activities, field trips, and mini-projects would be engaging. Interviews with organizations formed partnerships to support in our activities, field trips, and mini-projects. Our interviews and research resulted in 14 climate change topics, 24 activities, 9 field trips, and 6 mini-project options. A focus group tested components of the training program, confirmed our

manual's strengths, and identified points for improvement. Using the focus group's feedback, we were able to further refine the instructor manual for Banksia.

6.1.3 Deliverable 3: Organization Directory

The adaptation initiative network supports the participants in developing and implementing their adaptation initiative after the training program. We established the network through interviews with eight local organizations. Organizations were willing to mentor participants in creating their adaptation initiatives. Participants could also support organizations in their programming as part of their adaptation initiative. To document the network, we created an organization directory (Appendix E), which lists local organizations, their contact information, and details for partnerships with C.A.R.Y.A.

6.2 Limitations

We tried to make C.A.R.Y.A. reproducible while also tailoring content towards the Broadmeadows community, which created three limitations for the C.A.R.Y.A. program framework.

6.2.1 Limitation 1: Target Audience

Youth interviewees and focus group participants may not accurately represent the Broadmeadows community or future C.A.R.Y.A. participants. We were only able to interview youth connected to Banksia due to low response and time constraints. As a result, we had a small sample size with most participants being on the younger end of our targeted age range. Additionally, most of the youth were already involved in acting against climate change or helping their community. While the youth we interacted with may not accurately represent future C.A.R.Y.A. participants, we believe that C.A.R.Y.A. will engage youth because the program's framework can be tailored to future participants.

6.2.2 Limitation 2: Topics

When creating the 14 topics, we focused on how climate change was affecting Broadmeadows and Australia. Topics in the instructor manual may not be as relevant for any implementation of C.A.R.Y.A. outside of Broadmeadows. While we tried to keep topics broad, the topics may need some adjustment depending on the location. We have provided a topic template in the instructor manual to help with the process of creating new topics, if needed.

6.2.3 Limitation 3: Organization Partnerships

All organization partnerships that we established for C.A.R.Y.A. were made through pre-established personal connections from our team or Banksia. In particular, Banksia had gained Hume City Council's Sustainability Engagement Officer's support for C.A.R.Y.A. This support gave our team valuable connections to local environmental organizations. Other instructors that implement C.A.R.Y.A. may not have access to similar connections. We were unable to form partnerships with organizations that we had no prior connections with. Understanding this obstacle, we designed C.A.R.Y.A. for implementation with or without partnerships: activities, field trips, and mini-projects can be led independently by the instructor. Specific partnerships for Banksia were separated from the content instructions.

7 Conclusion

We created the C.A.R.Y.A. program framework to give Banksia a strong program foundation that would empower the Broadmeadows youth in combating climate change:

- Background research in our literature review contextualizes and justifies our framework.
- Guided by discussions with youth and organizations, we created an instructor manual relevant and engaging to future participants.
- The adaptation initiative network offers valuable support in hosting field trips as well as mentoring the cohort's initiatives. Participants will gain meaningful experiences and expert guidance through this network documented in the organization directory.

7.1 Next Steps

While the C.A.R.Y.A. framework provides Banksia with essential resources, there are four additional steps that we recommend to Banksia for successful program implementation:

- 1) Continue establishing partnerships for C.A.R.Y.A., especially with organizations we were unable to contact in time.
- 2) Keep in touch with partner organizations to maintain resources for the participants.
- 3) Promote C.A.R.Y.A. to youth in the community to recruit for the cohort.
- 4) Implement the training program using our instructor manual. Instructors are encouraged to perform their own additional research and tailor the program to the participants.

7.2 Potential Impact

The C.A.R.Y.A. framework lays the foundation for a program that strengthens participants and their community. Because of its flexibility and reproducibility, the instructor manual exists as a resource for any instructor worldwide. Our sponsor, Edgar Caballero Aspe,

has presented the C.A.R.Y.A. framework to the Neighborhood Houses of Victoria. We encourage anyone interested in climate change adaptation to reference and adapt the program framework to help their own community. We believe that C.A.R.Y.A. can cause a ripple effect in inspiring more youth to act.

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Appendix A. Youth Interview

The following semi-structured interview format was used on youth (ages 18-29) interested in climate change adaptation. Information gathered identified what problems youth are interested in and how to best help youth take climate change action.

Introduction

Hello, we are Minh-Chau Doan, Sadie Dominguez, and Meha Mohapatra. We are partnering with Banksia Gardens Community Services to create a training program for youth climate change adaptation. We have prepared some questions to better understand young people's perception of climate change. Are you 18 years or older? Would you be willing to participate in our interview? Are you 18 years or older? Your answers will be kept completely confidential and anonymous. You do not have to answer all the questions.

Basic Question: What are your personal thoughts on climate change?

Additional Questions:

1. Are you taking any actions to adapt to climate change?
 - a. (yes) Can you give some examples?
 - b. (no) Are you interested in taking action?
 - c. (no) This is what our organization is doing. Would you be interested in our program?
Tell me more.
What are some obstacles that you face?
Have you tried to take this to your community?
What are some ways you wish you could be more eco-friendly?
Are you part of an environmental group?
What is a climate change issue that you consider yourself pretty passionate about?
- a. Why?

Basic Question: What would help you be a better climate change adaptation leader?

Additional Questions:

1. Explore their response:
 - a. Tell me more.
 - b. Where did you learn that?
 - c. How would you improve it?
2. How do you come up with adaptation ideas?
3. What would help you come up with ideas?
4. What activities excite you?
5. What topics interest you?
6. What climate change actions interest you?
7. What are some activities that could inspire you and or others?
8. How can we help other people become leaders?

Appendix B. Organization Interview

The following semi-structured interview format will be used on local organizations that we hope to partner C.A.R.Y.A. with. Information gathered will help CARYA establish a climate change adaptation initiative network.

Introduction

Hello, we are Minh-Chau Doan, Sadie Dominguez, and Meha Mohapatra. We are partnering with Banksia Gardens Community Services to create a training program for youth climate change adaptation. We have prepared some questions to better understand your organization. Would you be willing to participate in our interview? Are you 18 years or older? Your answers will be kept completely confidential and anonymous. You do not have to answer all the questions.

Basic Question: How does your organization address climate change?

Additional Questions:

1. What techniques have been effective?
2. What techniques have been ineffective?
3. How would you like your organization to better address climate change?

Basic Question: Does your organization serve youth, age 19 to 29?

(yes) Additional Questions:

1. How?
2. What works well to engage young people?
3. What does not work well when engaging young people?
4. Do you do any workshops or activities?
5. Thank you for your insight. Could we adopt some of your strategies to our own programming?

(no) Our organization works with youth. Because you are involved in climate change, we believe that your organization could benefit our program in a couple of ways. Here are some ideas (Specify according to the organization).

Basic Question: Would you be interested in becoming a resource for CARYA in the future?

Specify some ways the organization can help, specific to that organization.

Additional Questions:

1. Do you have any additional ideas?
2. We have been asking for your help throughout this interview. What can CARYA provide for you?
3. Are you already in a climate change adaptation network in Melbourne or Australia?
 - a. (yes) How can Banksia join?
 - b. (no) Would you be interested in joining one?

Appendix C. Focus Group Script

The following focus group script was used to host the focus group that tested workshop components.

Introduction

1. Introduce Team

Hi everyone, thank you for making time for the focus group. We are Minh-Chau, Sadie, and Meah, and we are 3rd-year uni students from the States. We have been here in Australia for the past 4 weeks working with Banksia to build the framework for C.A.R.Y.A. Minh-Chau will be taking notes throughout the focus group. Sadie will run the discussions after the activities. And Meha will be assisting where needed.

2. Acknowledgement of Country

We acknowledge the Wurundjeri People, whose land we are meeting on. We pay our respects to their Elders, past and present, and the Aboriginal Elders of other communities who may be here today.

3. Introduce C.A.R.Y.A.

C.A.R.Y.A. stands for Climate Adaptation Requires Youth Action. C.A.R.Y.A. aims to inspire youth of ages 18-29 to create adaptation initiatives. This goal is achieved in 2 parts: the training program and adaptation initiative. The training program is a 10-week program that will hold a 2hr workshop per week. During these workshops the participants (who are collectively called a cohort) will learn about different topics related to climate change. These topics will be taught through activities and field trips. After this, the cohort will move to part 2- initiative development - where they will develop and implement their own adaptation initiative within their own communities.

4. Mitigation vs Adaptation

Mitigation refers to work done to avoid climate change while adaptation refers to work done to manage the risks of climate change.

5. Why They Are Here

We have interviewed most of you before when C.A.R.Y.A. was in an earlier stage. C.A.R.Y.A. is going to be a purposively diverse group and we want the focus group to reflect that.

6. What They Will Do

This is how today will run:

First you will rank 14 climate change topics on a scale of 1-5 where 5 is the most interesting. Next we will do an opening ceremony that will be run at the beginning of every workshop. Then, we will run through an activity about air pollution. Finally, we will discuss highlights and brainstorm how to fix areas of concern.

Ranking Topics

1. Instructed the participants on how to fill out the form and how to rate the topics

Opening Ritual

1. Participants introduced themselves with name, age, and favorite restaurant.
2. Edgar read David Whyte's poem "Courage" while participants passed around a branch.

Air Pollution Activity Instructions

1. Introduce and discuss what air pollution is and how it contributes to climate change (10 min)
 - a. What is air pollution?
 - b. How does it contribute to climate change?
 - c. Difference between air pollution and greenhouse gasses?
 - d. Why is air pollution harmful?
2. Have participants split into groups of 4 and walk into the community to find an item or system in the community that causes air pollution + explain a few observation techniques (15 min)
 - a. Create a relationship map: Show the cause and effect relationships in the process or problem
 - b. Draw what's going on: Illustrate the item or system that contributes to air pollution
3. Research and develop recommendations (15 min)
4. Present this information to the cohort (5 min per group)
 - a. What item/system did the group find?
 - b. How is it harmful - to us, to the environment?
 - c. How can we adapt to this?

Discussion Questions

1. Thoughts on the opening ritual?
2. Thoughts on the environment of the focus group?
3. Are there any improvements to the opening ritual, was it too long?
4. What do you (the participants) feel you learned from the activity?
5. Did the instructor and the videos he showed explain the topic well?
6. Would it be better to go in depth on the topic with limited issues or, have a wide range and choose your (the participants) own issue to focus on?
7. In each workshop, should there be more activities or time for discussion?
8. After doing this activity, what are some ways to adapt to air pollution?
9. What is the difference between mitigation and adaptation?
10. How did you (the participants), feel during the activity?

Appendix D. C.A.R.Y.A. Instructor Manual

The full C.A.R.Y.A. instructor manual has been included. Page numbering will restart according to the instructor manual. The instructor manual can be printed or used as a stand-alone document. This manual will assist the C.A.R.Y.A. program instructor in setting up and leading C.A.R.Y.A. The instructor manual's page size is A4, the standard size used in Australia.

Appendix E. Redacted Organization Directory

The organization directory lists all the local organizations that has agreed to partner with Banksia. We have also included some additional recommended organizations that we believe Banksia will be able to partner with, but we were unable to contact in time. The directory given to our sponsor, Edgar Caballero Aspe, has personal contact information that we have redacted in this appendix out of respect for our organization contacts' privacy. The redacted organization directory has been included as the last two pages in the instructor manual (pages 37-38). The organization directory's page size is A4, the standard size used in Australia.

C.A.R.Y.A.

Climate Adaptation Requires Youth Action

Instructor Manual



Banksia Gardens
Community Services

**Authored By: Minh-Chau Doan , Sadie
Dominguez, and Meha Mohapatra**

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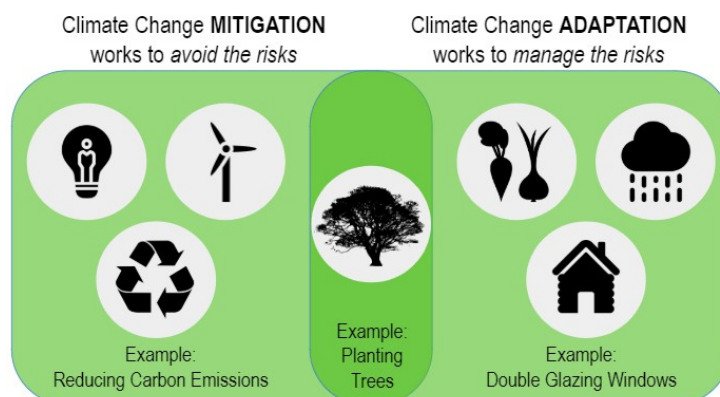
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Introduction

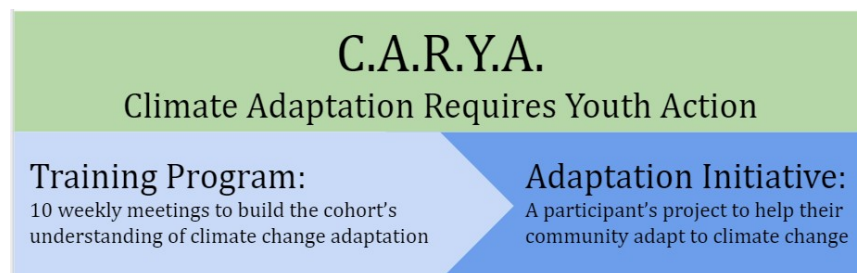
Climate Adaptation Requires Youth Action (C.A.R.Y.A.) aims to interactively teach youth about climate change and provide resources for them to develop their own community initiative. When creating these initiatives, participants will focus on adaptation, rather than mitigation.

Mitigation vs Adaptation

Mitigation refers to work done to avoid the risks of climate change while adaptation refers to work done to manage the risks from climate change. In other words, mitigation works to lessen the effects of climate change, while adaptation acknowledges that climate change is already happening and helps communities prepare for the changes. C.A.R.Y.A. was created for youth to make adaptation changes in their communities.



Framework



C.A.R.Y.A. is a two-part program where the participants will first go through a training program, and second, create their adaptation initiatives. The training program aims to educate youth about climate change and adaptation initiative through meaningful experiences. After the training program, the participants will

develop and implement an adaptation initiative in their community through mentorship from local organizations. Instructors can use this manual to guide similar programs.

Context

C.A.R.Y.A. will be hosted by Banksia Gardens Community Services (Banksia), a vibrant neighborhood house and community service organization. Banksia serves the Broadmeadows community in Hume City of Victoria, Australia. The organization aims to build social cohesion and reduce structural disadvantage through a non-judgmental, strengths-based approach.

Broadmeadows is one of the most disadvantaged areas in metropolitan Melbourne. The Banksia Gardens Public Housing Estate has a long history of issues, including extremely low health and employment outcomes and high levels of violence and crime. Educational attainment is also low, with only 25% completing year 12 in comparison with the Melbourne average of 48.5%. Furthermore, Hume has one of the highest rates of settlement of newly arrived families in Victoria, and around 33% of estate residents are from a non-English speaking background.

The intended participants of the program are cross-cultural youth from age 18 to 29. Through an action competence approach with significant educational experiences, C.A.R.Y.A. will mature a strong cohort of climate change adaptation leaders. Over the course of the training program, the cohort will connect with local organizations to share knowledge and create a climate change adaptation network.

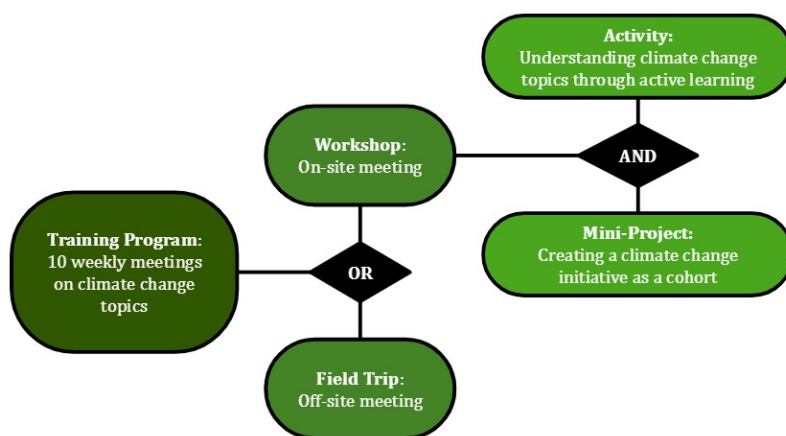
C.A.R.Y.A. Set Up

The flexible curriculum of C.A.R.Y.A. allows instructors to adjust the program according to participant's needs. Though C.A.R.Y.A. can be run by 1 instructor, having 2 instructors is highly recommended to handle the program workload more effectively.

Registration

Participants will first register for C.A.R.Y.A. through the Registration Form. Participants will need to submit a statement of interest that can take a variety of forms such as creating a song, comic strip, letter, or video. Additionally, participants will be asked to rate 14 climate change topics. These data will identify the top 8 topics which the instructor should focus on in the training program. The participants can either fill out this [link](#) or the hard copy attached in this manual (pg. 3).

Part 1: Training Program



The **training program** is a 10-week program for a cohort consisting of eight to twelve participants in the 18-29 age range. Weekly meetings will either take the form of a workshop or a field trip.

A **workshop** is a 2 hour meeting where the cohort will learn about climate change through activities and a mini-project. For workshops, it is advised that the cohort meets at a consistent location (e.g. Banksia community center).

A **field trip** is an off-site meeting to give the cohort contextual experiences. Timing for field trips vary from 2 hours to a full day.

This instructor manual provides suggested activities and field trips for 14 climate change topics. Instructors should select and adapt activities and field trips based on the cohort's interests, program timing, and budget.

A **mini-project** is a small-scale adaptation initiative addressing climate change that the cohort design and implement within the 10-weeks. The mini-projects section will cover more details, including a schedule and suggested projects.

Part 2: Adaptation Initiative

After the training program, participants will develop and implement an adaptation initiatives in their community. The participants will be paired up with mentors from related organizations.

For Banksia, an initial network of organizations has already been established and compiled into an organization directory which is provided separately. The participants are not limited to seeking out a mentor from the organization network provided. Implementations of C.A.R.Y.A. outside of Banksia will have to create their own network of organizations.

Registration Form

The Climate Adaptation Requires Youth Action (C.A.R.Y.A.) program supports a cross cultural cohort in the 18-29 year age range to take action within their community and adapt to climate change. This program will meet once a week for over 10-weeks. The meeting can take the form of a workshop (2 hrs. on-site meeting) or a field trip (longer off-site meeting). Banksia Gardens Community Services in Broadmeadows, Victoria, will host the C.A.R.Y.A. workshops at their community center.

If you are interested, fill out the rest of the form.

Name: _____

Occupation: _____ Email: _____

Phone: _____ Birthday: _____

A) Why are you interested in participating in the C.A.R.Y.A. program?

B) Rank topics 1—14, with 1 being your favorite. C) Shade in the time slots for your availability.

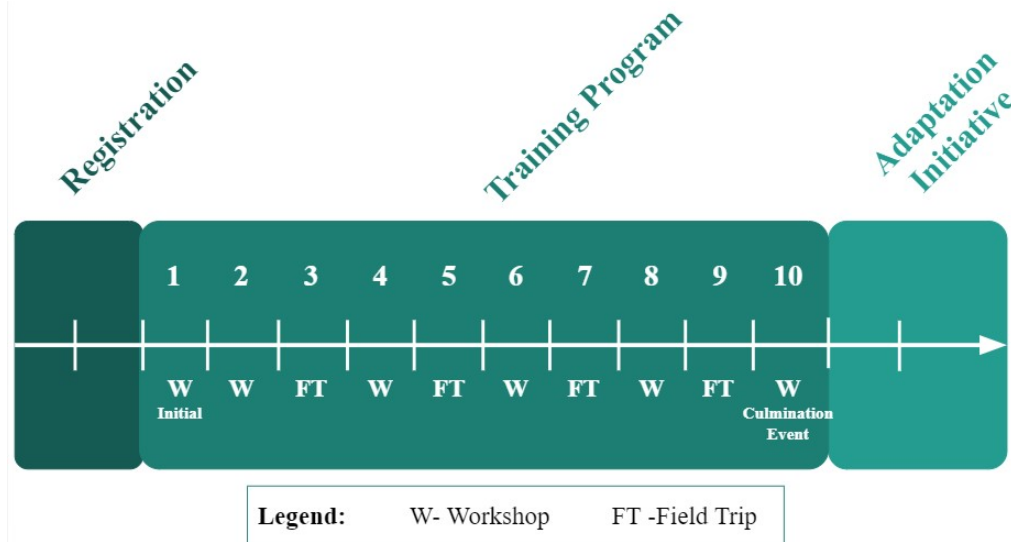
- _____ Air Pollution
- _____ Agriculture Impact
- _____ Biodiversity
- _____ Extreme Weather
- _____ Greenhouse Gasses
- _____ Health Impact
- _____ Heatwaves
- _____ Impact on Vulnerable Communities
- _____ Infrastructure Impact
- _____ Oceans
- _____ Renewable Energy
- _____ Waste Management
- _____ Water Quality
- _____ Wildfires

	Sun	M	T	Th	Th	F	Sat
10am							
11am							
12pm							
1pm							
2pm							
3pm							
4pm							
5pm							
6pm							
7pm							

Other topics of interest?

C.A.R.Y.A. Schedule Overview

Meeting Distribution Example Schedule:



The C.A.R.Y.A. program has a flexible timeline. The 10-week training program is prefaced by registration and followed by the adaptation initiative. The training program will start with an initial workshop where the cohort will receive a program overview (pg. 6). The training program will end with a culmination event (pg. 35) where cohort will share their knowledge with their community about climate change and adaptation initiatives.

The remaining 8 meetings will be formed by the instructor based on the cohort's interest, program timing, and location. This is one example of the timeline for the C.A.R.Y.A. program. Some timeline variations involve:

1. Duration of registration period
2. When and what topics are covered
3. Balance between workshops and field trips (e.g. 6 workshops and 2 field trips)
4. Duration of the adaptation initiative

Mini-Project Schedule:

Week	Mini-Project Phase
1	Introduce and identify what mini-project the cohort wants to work on.
2	Research about mini-project and develop an action plan.
3	
4	
5	Implement the mini-project.
6	
7	Refine the mini-project.
8	
9	Wrap up the mini-project.
10	Present completed mini-project to the community during culmination event.

Workshops + Field Trip Schedules

Meeting Schedule: Workshop

Duration	Event Name	Description
2 min	Acknowledgement of Country	The instructor will deliver an Acknowledgement of Country.
3 min	Opening Ritual	The instructor will read a poem that connects the cohort to climate change. Simultaneously, an item of significance will be passed around
70 min	Activity	The activity is based on the topic for that day.
5 min	Break	
35 min	Mini-Project	More details for mini projects are provided in the mini projects section.
5 min	Closing Ritual	To be developed by the instructor and/or cohort.

Meeting Schedule: Field Trip

The other type of meeting is a field trip. Unlike the workshop, a field trip schedule is not provided. This schedule is up to the instructor because this type of meeting is heavily based on the location and partnerships.

Initial Workshop

The Initial Workshop is the first meeting of the cohort for C.A.R.Y.A.'s training program. This workshop will provide context for the cohort, allow the cohort to bond, and get the cohort to start reflecting on themselves, their community, climate change, and plans for action.

Sample Schedule

Duration	Event Name	Description
5 min	Acknowledgment of Country	
10 min	Introductions	Explain what C.A.R.Y.A. is and how the program will run. The cohort introduces themselves.
10 min	Icebreaker	Cohort plays a game to get to know each other. The instructor will identify this icebreaker.
5 min	Opening Ritual	Reference Meeting Schedule: Workshop.
50 min	Activity	Suggested activities have been detailed below.
5 min	Break	
30 min	Introduction of Mini Project	Explain mini-projects and their purpose. Give examples of projects. The cohort chooses from examples or creates their own.
5 min	Closing Ritual	Reference Meeting Schedule: Workshop.

Activities

Climate Change Graphs

Prep Time: 20 min Activity Duration: 25 min

The cohort will discuss graphs regarding climate change to quickly recollect their knowledge about climate change.

Materials:

- Graphs

Instructor Preparation:

- This activity was adapted from [New York Time's teaching resource on climate change graphs](#). Reference the article for more information, tips, and example graphs:
Note: The graphs in the teaching resource focus on the United States.
- Find climate change graphs. It is suggested to have graphs about the cohort's community or location so that the cohort will feel more connected.
- Identify the method of presenting the graphs (e.g. printing, projecting, tablets, etc.).
- Understand the graphs and anticipate misconceptions that would require clarification.

Initial Workshop Cont.

Activity Instructions:

1. Show the cohort a graph that relates to climate change.
 2. Discuss in pairs: (5 min)
 - a. What do you notice?
 - b. What do you wonder?
 3. Discuss as a cohort: (15 min)
 - a. Their notices and wonders
 - b. What's going on in the graph?
 - c. What story can it tell about climate change?
 - d. Why is this important?
 4. Create a catchy headline to describe the graph. (5 min)
 5. Optional: Repeat for a different graph.
-

What's Your 2040?

Prep Time: 10 min Activity Duration: 50 min

The cohort will take an online quiz to determine their ecological footprint. The cohort will also discuss what they want their community to be like in 2040 and create ideas for achieving that future. This activity allows the cohort to reflect on themselves, their community, and their values.

Materials:

- Devices with Internet Access (e.g. tablets, phones)
- Writing Utensil
- Paper or Whiteboards

Instructor Preparation:

- Provide devices for participants without devices that can access the internet reliably.

Activity Instructions:

1. Take the [ecological footprint quiz](#) to contextualize impact. (10 min)
2. Discuss: (14 min)
 - a. What are some problems in your community?
 - b. Where would you like to improve?
 - c. What do you want your community to be like in 2040?
3. 50 ideas in 5 minutes (6 min)
 - a. Have the cohort work in groups of 4-5 to write as many ideas as possible in 5 minutes.
 - b. Challenge groups to create at least 50 ideas and to create the most ideas .
 - c. Create ideas for solving problems and improving their community so that they can achieve their ideal 2040.
 - d. Give time reminders every minute.
4. Discuss the ideas created. (20 min)

Agriculture Impact

Agriculture refers to food production which includes both plants (crops) and animals (livestock). Current agricultural practices and improper food waste management produce a lot of methane, a type of greenhouse gas. Additionally, agriculture has a huge carbon-footprint due to transportation methods. Methane, along with other greenhouse gasses, when trapped in the atmosphere, raises the Earth's temperature. Not only is agriculture impacting climate change, climate change is also influencing agriculture. Production may increase in temperate climates but decrease in warm regions. In Australia, droughts and storm floods are decreasing crop yield. Food production imbalance could lead to increase food prices, malnutrition, and jeopardize farmers' livelihoods.

Learning Outcomes

- Gain knowledge on how agriculture contributes to climate change
- Understand how climate change affects agriculture
- Take actions for sustainability related to food insecurity

Additional Resources

Introduction to Climate Change and Agriculture by Farmers for Climate Action➤

Food Security Under a Changing Climate Bulletin by World Meteorological Organization➤

Climate Change and Food Security Framework by Food and Agriculture Organization of the United Nations, Rome➤



Activities

Community Garden

Prep Time: 30 min

Activity Duration: 1 hr 10 min

The cohort will learn about adapting to food insecurity through interacting with a community garden. Community gardens allow the community to eat nutritiously when food prices rise or food becomes unavailable at the market.

Materials:

- Writing Instruments
- Paper
- Devices with Internet Access (e.g. tablets, phones)

Instructor Preparation (Optional):

- Find and arrange a visit to a local community garden

Activity Instructions:

1. Discuss the relationship between climate change and agriculture. (10 min)
 - a. How does climate change affect agriculture?
 - b. Does agriculture contribute to climate change? How?
2. Independently research nutritious plants that would grow well in their climate. (10 min)
3. Go to a local community garden. The cohort will explore the garden in groups of 2-3 participants. Have them take notes or draw their observations about the garden: (20 min)
 - a. What is working or growing well in the garden?
 - b. What is not working well in the garden? Why might it not be growing well?
 - c. Any plants match up to prior research?
 - d. How can the garden improve?
4. Discuss observations as a group. This discussion can be done in the garden or back in the classroom. (15 min)
5. Brainstorm ways to improve the garden. (15 min)
 - a. Conclude 2 concrete recommendations for the garden.

Agriculture Impact Cont.

Native Food Recipe

Prep Time: 2 hr Activity Duration: 1 hr 10 min

The cohort will identify local ingredients to create a food recipe. Using local ingredients reduces one's carbon footprint. Additionally, in times of food insecurity, native plants that thrive in the local environment would be a valuable resource.

Materials:

- Examples of Native Food
- Writing Instruments
- Paper
- Devices with Internet Access (e.g. tablets, phones)

Instructor Preparation:

- Identify nearby sources of native food.
 - ◆ E.g. A place where native crops grow in the wild, a farm or garden that raises native livestock or grows native crops, or gather native food to show at the workshop
 - ◆ [Melbourne Walks](#) has compiled information on native food to Australia (bush food).

Activity Instructions:

1. Discuss the relationship between climate change and agriculture. (10 min)
 - a. How does climate change affect agriculture?
 - b. Does agriculture contribute to climate change? How?
2. Independently research food (crops or livestock) that are native to the local environment. (15 min)
 - a. E.g. Bush food is native to Australia
3. Show the cohort native food. (15 min)
 - a. This will be limited based on what is available in the area. If food can be found in the community or at a local farm or garden, then the cohort can visit the area. Otherwise, examples can be brought to the workshop.
4. Work in groups of 2-3 to create a recipe using mostly native food. (30 min)

Field Trips

Exploring a Farm

The cohort will visit a local farm to witness agricultural production. The cohort can identify ways that climate change is affecting the farm as well as ways that the farm is contributing (or lessening their contribution) to climate change. If possible, the cohort can volunteer at the farm to gain appreciation for the hard work that goes into food production.

Example Locations/Organizations:

CERES Community Food System: Local organic food growing system in Brunswick, VIC. The food system involves gardens, chickens, aquaponics, and beekeeping.

Logistics: Call and email a month ahead of time. Transportation will need to be arranged.

Air Pollution

Air pollution occurs when there is a high concentration of harmful particles in the air - both indoor and outdoor. Things such as soot from bushfires, paints and adhesives, and chemicals released around oil refineries are just a couple of examples. With an increase in air pollution, humans' natural filter is not enough to keep out the harmful pollutants that we put in the air. Other organisms face the same issue. Additionally, pollutant particles such as carbon dioxide and methane contribute to greenhouse gasses - the particles that increase Earth's temperature.

Clarification: Air pollution can be easily confused with greenhouse gasses. These two contributors to climate change affect our health in different ways. Air pollution affects the quality of air we breathe in, whereas greenhouse gasses affect the atmosphere processes like temperature and its impacts on Earth's ecosystems. Emission of carbon and methane contribute to both air pollution and greenhouse gasses.

Learning Outcomes

- Understand what is air pollution
- Gain knowledge on how air pollution contributes to climate change
- Reflect on critical thinking skills to create adaptation techniques to air pollution

Additional Resources

Air Pollution and Health by Government of WA ➤

Basic Understanding of Different Pollutants by Learn to Care4Air ➤

Real-Time Air Quality Index Visual Map by The World Air Quality Project ➤

Common Air Pollutants and Their Health Effects by NSW Government ➤

Explaining Different Sources of Air Pollution by National Geographic ➤

Activities

Identifying Air Pollution Items/Systems

Activity Duration: 40 min

This activity requires the cohort to divide into groups of 4 to identify and analyze one pollution item or system in the community. The activity will aim to map air pollution sources and effects (e.g. inefficient traffic lights that allow cars to be running while standing idle for a long time causes a lot of unnecessary fossil fuel burning). They will then try to find an adaptation to the effects that this item or system are causing. They will present their findings and recommendations to the rest of the cohort.

Materials:

- Colored Writing Utensils
- A3 to A1 Butcher Paper

Activity Instructions:

1. Introduce and discuss air pollution and how it contributes to climate change. (10 min)
 - a. What is air pollution?
 - b. How does it contribute to climate change?
 - c. Difference between air pollution and greenhouse gasses?
 - d. Why is air pollution harmful?
2. Split into groups of 4 and walk into the community to find an item or system in the community that causes air pollution and explain a few observation techniques. (15 min)
 - a. Create a relationship map: Show the cause and effect relationships in the process or problem.
 - b. Draw what's going on: Illustrate the item or system that contributes to air pollution.
3. Research and develop recommendations. (15min)
4. Present this information to the cohort. (5 min per group)
 - a. What item/system did the group find?
 - b. How is it harmful - to us, to the environment?
 - c. How can we adapt to this?

Note: Keep extra time to delve more into the recommended solutions.

Air Pollution Cont.

Field Trips

Sustainable House Tour

This field trip will show the cohort what a sustainable house actually looks like. Also, this field trip will show them the different types of adaptations that can be implemented in houses.

Example Locations/Organizations:

Renew: A company focused on improving their members' residences through sustainability. The cohort will tour some eco-friendly and sustainable houses.

Logistics: Email one month ahead of time. Either contact Hume City Council for transportation or use public transportation to get to the house.



Biodiversity

Biodiversity refers to lifeform variation that exists among ecosystems, species, and genetics. Variety of all three aspects leads to healthy ecosystems and rich biodiversity. According to Professor Hoffman from the University of Melbourne, “Climate change is affecting habitats of several species, which must either adapt or migrate to areas with more favorable conditions. Even small changes in average temperatures can have a significant effect upon ecosystems.” Climate change is increasing at a rate too fast for species to adapt to, which leads to less biodiversity, weakens ecosystems, and can have serious ramifications such as species extinction.

Learning Outcomes

- Gain understanding about the importance of biodiversity
- Relate climate change to biodiversity
- Develop a connection to nature

Additional Resources

Local Assessment of Melbourne: The Biodiversity and Social-Ecological Dynamics of Melbourne, Australia by RMIT [↗](#)

Climate Change and Biodiversity Review by the Australian Academy of Science [↗](#)

Australian Biodiversity Resource Book from Australian Science Teachers Association (download link) [↗](#)

Activities

Biodiversity Walk

Prep Time: 5 min Activity Duration: 1 hr 5 min

The cohort will plan and lead a walking route around their community that teaches about biodiversity and climate change. The cohort will develop a connection to nature in their community as well as understand how nature is changing as a result of climate change.

Materials:

- Writing Utensils
- Whiteboard or Paper
- Community Maps (one copy per participant)
- Photographing Device (camera, phone, etc.)

Instructor Preparation:

- This activity has been adapted from Cool Australia’s Outdoor Learning Activity. Read through the [original lesson plan](#) [↗](#) for more information and tips. A free teacher account is required to access the lesson plan.
- Find/create maps of the community. Limit the area to around 5 minutes or 400 meters radius from the meeting location.

Activity Discussion

1. Discuss biodiversity and climate change’s impact on biodiversity with the cohort. (10 min)
 - a. Clarify that biodiversity works on various levels: ecosystems, species, and genetics.
2. Explore community in groups of 2-3 participants. (20 min)
 - a. Give each group a map of the community, writing instruments. Ensure that each group has a photo device.
 - b. Observe and record biodiversity of the community. Give examples of what to document:
 - i. Location of biodiversity observation (take a picture and mark on the map).
 - ii. Interactions among aspects of biodiversity.
 - iii. Interesting or surprising features.
 - iv. If climate change is affecting biodiversity, how climate change might affect biodiversity?
3. Share and discuss observations: (15 min)
 - a. What was interesting? What surprised you?
 - b. How might / does climate change affect your biodiversity observation?
 - c. What can be done to help support biodiversity in our community?

Biodiversity Cont.

4. Cohort plans an interactive walk to highlight biodiversity in the community and raise awareness about climate change's impact on biodiversity. (20 min)
 - a. Pass out more maps, whiteboards, paper, or writing instruments as needed.
 - b. The route should cover 3-5 areas with interesting observations / locations.
 - c. Cohort should create supporting documentation for the walk which can take the form of informational signs, an information sheet, audio tour, video tour, etc.
 - d. The walk should cover similar information to what groups documented in step 2 and discussed in step 3.
5. If time permits, take the walk together. Otherwise, encourage cohort to lead their family and friends through the walk as a fun outing in their free time.

Field Trips

National Park Visit

The cohort will visit a National Park to connect to nature. The cohort can look for and identify the biodiversity (plants, animals, insects, etc.) within the park. Reference the Biodiversity Walk activity for potential discussion topics.

Example Locations/Organizations:

Organ Pipes National Park: A 300-acre national park with interesting landscape and good walking trails. Reference the park's [Species Field Guide](#) for more information on the park's biodiversity. The cohort can help monitor the park's biodiversity by downloading the Climate Watch App or filling out [recording sheets](#). The organization listed below is not vital for the success of this field trip. The instructor can independently organize a visit to this location.

Conservation Volunteers Australia: A volunteer organization for conserving nature. Conservation Volunteers Australia will provide transport and guide a field trip at Organ Pipes National Park.

Logistics: Call 2-3 weeks ahead of time.

Conservation Volunteering

The cohort can volunteer on a conservation project to protect biodiversity in their area. Some projects include reintroducing species, restoring habitat, and/or preserving habitat. The cohort would gain a meaningful experience in nature through observing biodiversity and helping to preserve it.

Example Locations/Organizations:

Conservation Volunteers Australia: A volunteer organization for conserving nature. Conservation Volunteers Australia has been transforming W. James Whyte Island Reserve from degraded agricultural land to a conservation reserve. The organization will provide transport and guide conservation efforts at this reserve.

Logistics: Call 2-3 weeks ahead of time.

Extreme Weather

Extreme weather is the prime way that we experience and notice climate change. Climate change has increased the strength and frequency of extreme weather. Some examples are heat waves, bushfires, floods, droughts, cyclones, and other storms. To be prepared for these extreme weather events, communities must learn how to adapt and change their lifestyle so that they are less affected.

Activities

Various Extreme Weathers

Choose some of the following activities based on the cohort's interest.

Drought: [Australian Institute for Disaster Resilience's lesson plan on Droughts](#)

Flood: [Australian Institute for Disaster Resilience's lesson plan on Floods](#)

Bushfire: [Australian Institute for Disaster Resilience's lesson plan on Bushfires](#)

Heat Waves: [Australian Institute for Disaster Resilience's lesson plan on Heat Waves](#)

Cyclone: [British Red Cross Lesson Plan on Cyclone Dorian](#)

Field Trips

Watch an Intentional Burn

This field trip will allow the cohort to connect with Aboriginals who prevent wildfires by organizing intentional burns. The cohort will understand how and why these intentional burns are a beneficial adaptation. During the field trip, the cohort will also get the opportunity to see how intentional burns are performed.

Example Locations/Organizations:

Wurundjeri Tribe's Narrap Team: The Wurundjeri Tribe, the Traditional owners of the Greater Melbourne region, reformed during the 1980s. In this process, they put together a Narrap Team to perform intentional burns in Sunbury by client requests. The cohort can watch how the Wurundjeri's Narrap Team performs an intentional burn.

Logistics: Email a month ahead of time to get dates, confirm a week in advance of chosen date.

Important Concerns: Accommodate participants with asthma or other breathing conditions.

Learning Outcomes

- Increase knowledge about extreme weather
- Reflect on why extreme weather frequency is increasing
- Develop adaptation ideas to protect communities from extreme weather events

Additional Resources

[Australian Institute of Disaster Resilience](#)

[Extreme Weather Caused By Climate Change Has Damaged 45% of Australia's Coastal Habitat by Extreme Weather Climate Australia Coastal](#)

[How Are Extreme Events Changing by Australian Academy of Science](#)

[About the climate extremes analyses by Australian Government Bureau of Meteorology](#)

[The National Climate Assessment by U.S. Global Change Research Program](#)



Extreme Weather Cont.

Witnessing Climate Resiliency

The purpose of this field trip is to allow the cohort to witness environments that have recently been affected by an extreme weather event. The cohort will focus on understanding what adaptations the community is putting in place. The location and focus of this field trip will depend on what extreme weather events affect the cohort's community (e.g. floods, cyclones, fires).

Example Organizations/Locations:

Scotsburn: A community recovering from a burn in late 2015. The organization listed below is not vital for the success of this field trip. The instructor can independently organize a visit to this location.

Conservation Volunteers Australia: A volunteer organization for conserving nature. They will provide transportation for the cohort to see Scotsburn.

Logistics: Call 2-3 weeks ahead of time.



Greenhouse Gasses

The greenhouse effect is a natural phenomenon that allows Earth to absorb some of the Sun's solar energy and become warm. This phenomenon is thanks to greenhouse gasses:

(H_2O) Water Vapor	(CO_2) Carbon Dioxide	(CH_4) Methane
(N_2O)	$(CFCs)$ Chlorofluorocarbons	(O_3) Ozone
$(HCFCs \text{ and } HFCs)$ Hydrofluorocarbons		

These gasses trap the Sun's energy and emit the energy in the form of heat. Without greenhouse gasses, the Earth would be too cold to sustain the variety of life that it does today. Unfortunately, humans have added more greenhouse gases than needed. This has resulted in global warming - a factor in climate change.

Learning Outcomes

- Gain an understanding about greenhouse gasses
- Gain an understanding the greenhouse effect
- Strengthen critical thinking skills to create adaptation techniques to combat the greenhouse effect

Additional Resources

Greenhouse effect by Australian Government: Department of Agriculture, Water, and the Environment [↗](#)

Greenhouse Gases: Refining the Role of Carbon Dioxide by NASA GISS [↗](#)

Global Methane Emission and Mitigation Opportunities Factsheet by Global Methane Initiative [↗](#)

How long will global warming last? by Real Climate [↗](#)

Activities

Compare, Contrast and Change Commutes

Activity Duration: 1 hr 10 min

This activity will require the cohort to analyze their route to school or work from home through the lens of greenhouse emissions. The goal is to find the route that requires the least amount of greenhouse emission. There will be a debrief after this activity.

Materials:

- Devices with Internet Access (e.g. tablets, phones)

Activity Instructions:

1. Split into 7 groups to research how a specific gas effects Earth and a way to adapt to the emission. (10 min)
2. Present information to the cohort. (3 min per group - 21 min)
3. Each participant will locate their initial destination and final destination. (2 min)
 - a. Initial Destination - Home
 - b. Final Destination - Work or School, if N/A use Community Center
4. The cohort will find 4 different routes: (10 min)
 - a. Route 1 : What they currently take
 - b. Route 2 : Fastest route
 - c. Route 3 : Lowest Greenhouse Emission
 - d. Route 4 : What most people take

Note: If a route fits multiple category, make sure they state that when presenting.

5. Present routes and debrief: (30 min)
 - a. Discuss which route they want to take and why?
 - b. Have them discuss what obstacles they face in going on 'Route 3 : Lowest Greenhouse Emissions.'
6. Make a class pledge to try to take Route 3.

Greenhouse Gasses Cont.

Josh's House

Activity Duration: 1 hr 10 min

Learn about Josh's House, the zero emission house.

Material:

- Paper
- Writing Utensil

Activity Instructions:

1. Watch 1-2 episodes from this [series](#). (20 min)
 - a. When Josh, the narrator, asks a question, have the cohort write a response.
 - i. E.g.: Josh wanted to know why these types of houses wouldn't sell. Pause the video and give the cohort some time to develop ideas why.
 - b. The cohort will jot down what methods used to adapt to climate change.
2. Discuss and share: (10 min)
 - a. After watching the episodes have participants discuss in groups answers to these questions. (10 min)
 - b. In the meanwhile, ask participants to go to the board and write 2-3 adaptation initiatives Josh took.
3. Discuss: (30 min)
 - a. What adaptation techniques they can implement?
 - b. Ideas that they have?
 - c. What are some obstacles they can face?

Field Trips

Renewable Energy Plant Tour

This field trip will allow the cohort to see how renewable energy is created and used. While taking the tour, have the cohort notice the type of renewable energy used, why it's being used and any alternatives that the plant could incorporate. Also, have the cohort think about the non-renewable energy that is being replaced by renewable energy.

Example Locations/Organizations:

Earthworker Solar Hot Water: Previously a fossil fuel community that transitioned into a worker-owned factory that produces renewable energy appliances and components.

Logistics: Email a month ahead of time. Simultaneously contact Hume City Council for transportation assistance.

Sustainable House Tour

This field trip will show the cohort what a sustainable house actually looks like. Also, this field trip will show them the different types of adaptations that can be implemented in houses.

Example Locations/Organizations:

Renew: A company focused on improving their members' residences through sustainability. The cohort will tour some eco-friendly and sustainable houses.

Logistics: Email one month ahead of time. Either contact Hume City Council for transportation or use public transportation to get the house.

Health Impact

When physical, biological, or ecological systems are disrupted as a result of climate change, this can negatively impact human's health. Some impacts include increased risk of diseases, allergens, mental health impacts, asthma, heat-related illness, malnutrition, and injuries. Figure 1 shows how climate change can impact human's health through various methods.

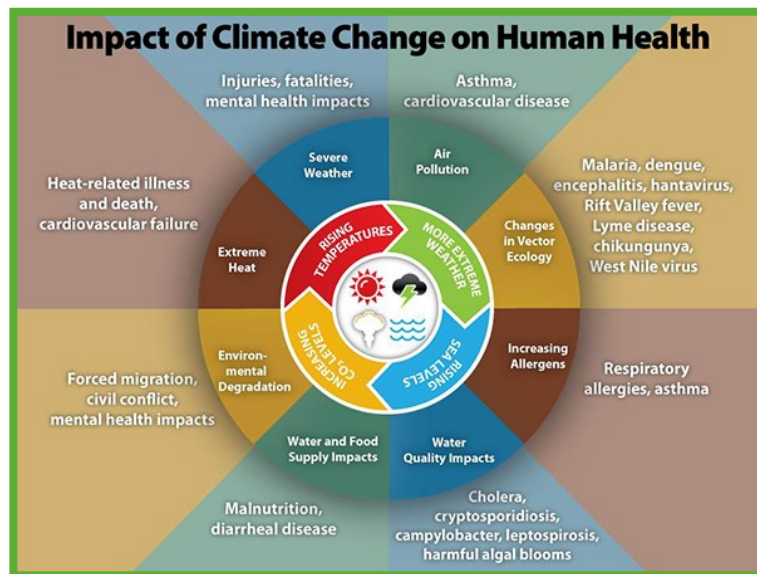


Figure 1. Impact of Climate Change on Human Health (CDC, 2019)

Learning Outcomes

- Gain an understanding of the effects of climate change on health - both mental and physical
- Embody healthy and sustainable eating habits
- Understand how to adapt to reduce climate change effect on health

Additional Resources

Health Impacts of Climate Change: Adaptation Strategies for Western Australia by Australia's Department of Health [↗](#)

Climate Effects on Health Summary by the United State's Centers for Disease Control and Prevention (CDC) [↗](#)

Activities

Healthy Sustainable Cooking

Prep Time: 2 hr Activity Duration: 1 hr 10 min

The cohort will create a meal made with ingredients that meet 4 criteria: healthy, little to no processing, native, and in-season. Participants will discuss and find other meals that use ingredients meet the four criteria. Additionally, they will learn why eating with these 4 criteria are important to adapting to climate change.

Materials:

- Ingredients
- Cooking supplies
- Recipe

Instructor Preparation:

- Understand Cohort's allergies and dislikes.
- Find recipe(s) beforehand.
 - ♦ Option 1: Decide on your own.
 - ♦ Option 2: Have participants find the recipe(s) via email or in previous meeting.
- Gather ingredients and cooking supplies.
- Secure a cooking location.

Health Impact Cont.

Activity Instructions:

1. Cohort should delegate tasks amongst themselves and begin cooking. (40 min)
2. During step 1, discuss how this meal is an adaptation to climate change:
 - a. Why these particular ingredients?
 - b. How does this help us adapt to climate change?
3. Eat the meal while continuing the discussion. (30 min)
 - a. What are other recipes that use ingredients that fit these criteria?
 - b. How can we ensure that we use ingredients that fit these criteria?

DPV Health: A medical clinic that organizes many community outreach programs.

Logistics: Email 2 weeks ahead of time.

DPV Health's dietician will lead this activity and provide more health information during the activity.

Interview a Psychologist

Activity Duration: 1 hr 10 min

The cohort will interview a psychologist to learn about the mental health impacts of climate change and what adaptation techniques are out there.

Materials:

- Writing Utensils
- Paper

Activity Instructions:

1. The psychologist will give a quick introduction to how climate change effects mental health. (10 min)
2. Take time to create a few questions to ask the psychologist. (10 min)
3. "Interview" the psychologist: (50 min)
 - a. The cohort should show that they are actively listening (e.g. writing notes).

Dr. Susie Burke: Climate Change Psychologist. The cohort will be able to learn how mental health is affected by climate change from an expert.

Logistics: Email a month ahead of time.



Heatwaves

Heatwaves are 3 or more days of high maximum and minimum temperatures that are unusual for the area. Heatwaves can negatively affect human health and services. Heat waves kill more people than any other natural disasters. Climate change is increasing the frequency of extreme heat events. Heat-related deaths and illnesses are preventable when appropriate measures are taken. Awareness and adaptation is important for community resilience against increased heat events.

Activities

Heat Wave Escape Room

Prep Time: 1 hr Activity Duration: 40 min

The cohort will learn heatwave adaptation strategies through a simulation. For the cohort's safety, a cool room should be nearby for immediate relief and recovery for the cohort. Safety and comfort of the cohort should always be prioritized over the activity.

Materials:

- Towels
- Shades
- Curtains or Blinds for Windows
- Fans or Air Conditioning
- Water
- Electronic Appliances

Instructor Preparation:

- Set up the room to heat up. In the summer, window shades/curtains/blinds can be opened (but not the actual window).
- Strategically place relief materials around the room.
- Allow time for the room to warm up.
- Set up a cool room nearby that participants could go to immediately for health concerns and heat relief.

Activity Instructions:

1. Enter a hot room and find ways to reduce the heat as well as keep cool. (15 min)
 - a. Damp towels can provide relief (even better if they were placed inside a refrigerator).
 - b. The cohort can cover windows to block out the heat.
 - c. The cohort should stay hydrated.
2. Discuss the simulation: (25 min)
 - a. How did you feel? emotionally? physically?
 - b. What helped you keep cool?
 - c. What other techniques can you use in a heat wave?
 - d. What are some techniques that you have personally used to stay cool?
 - e. Why are heat waves happening? Is there a relationship to climate change?

Learning Outcomes

- Reflect on what heat waves are, their causes, and their effects
- Gain an understanding of the relationship between climate change and extreme heat events
- Apply strategies to adapt to heat waves
- Create an action plan for heat waves

Additional Resources

Heatwave Lesson Plan by the Australian Institute for Disaster Resilience➤

Heat Exhaustion VS Heat Stroke Infographic by the Californian Government➤

Heat Wave Misconceptions and Strategies by BBC➤

Framework for Adapting Households to Heat Waves by National Climate Change Adaptation Research Facility➤

Video on What Not to Do in a Heatwave by CNN➤



Heatwaves Cont.

Hot Weather Fashion Show

Prep Time: 30 min Activity Duration: 55 min

The cohort will create a fashion show to learn how to adapt their outfits to heat waves.

Materials:

- Variety of clothes (large sizes preferred so that it fits any participant), should include clothes that are good, bad, and misleading for hot weather.

Instructor Preparation:

- Collect donated clothes or have the cohort bring in clothes. If the cohort brings in clothes, this activity could also be presented as an activity for a clothing swap. For tips on How to Dress for Hot Weather reference [WikiHow](#).

Activity Instructions:

1. Each participant creates an outfit from the clothes. Make sure that all outfits are being represented. (10 min)
 - a. Good outfit for hot weather
 - b. Outfit that seems suitable but is not ideal for hot weather
 - c. Obviously bad outfit for hot weather
2. Showcase the outfits in a fashion show. Pair up participants to present each other's outfits (the pair swap outfits so that the creator explains the outfit as the partner models). Explain each outfit. (25 min)
 - a. Why this outfit is good, bad, or misleading for hot weather?
3. Discuss the fashion show: (20 min)
 - a. Why are heat waves happening? Is there a relationship to climate change?
 - b. What else can you do besides change your outfit to adapt to a heat wave?
 - c. How can we be sustainable and responsible with our fashion?
 - d. How can we help our community adapt to / prepare for a heatwave?

Heat Wave Walk

Prep Time: 10 min Activity Duration: 1 hr

The cohort will walk around the community to identify good and bad spaces to be in during a heatwave.

Materials:

- Maps of the Community (Digital or Physical)
- Writing Instruments
- Paper

Instructor Preparation:

- Prepare maps of the community for the cohort. The maps should have some intention behind them (any important places that you think should be included in the walk should be in the map).

Activity Instructions:

1. Discuss heatwaves and climate change: (20 min)
 - a. What are heat waves? Why are they happening?
 - b. Do you think heatwaves are happening/affect you?
 - c. How does climate change relate to heatwaves?
 - d. How can we adapt to heat waves? What are some techniques that the cohort already use?
2. Have the cohort split up into groups of 3-4 to walk around the community and identify good and bad places to be in during a heatwave. The group should be marking these places on the map as well as taking notes about their observation. (20 min)
3. The cohort shares their observations and creates a cumulative map of safe and unsafe places during a heat wave. Encourage the participants to share this resource with their friends and family, especially those who will be more vulnerable to heat waves. (20 min)

Impact on Vulnerable Communities

Vulnerable communities are impacted by climate change significantly. According to the IPCC (Intergovernmental Panel on Climate Change), “People who are socially, economically, culturally, politically, institutionally, or otherwise marginalized are especially vulnerable to climate change and also to some adaptation and mitigation responses (medium evidence, high agreement). This heightened vulnerability is rarely due to a single cause. Rather, it is the product of intersecting social processes that result in inequalities in socioeconomic status and income, as well as in exposure. Such social processes include, e.g. discrimination on the basis of gender, class, ethnicity, age, and (dis)ability.” It is extremely important for vulnerable communities to adapt to climate change.

Learning Outcomes

- Reflect on how climate change effects the participants on a personal level
- Gain knowledge about how climate change effects vulnerable communities

Additional Resources

Climate Change 2014 by Intergovernmental Panel on Climate Change [↗](#)

Climate Change and Health by World Health Organization [↗](#)

Activities

Impact Chat

Activity Duration: 30 min

This activity will allow the cohort to reflect on how climate change has affected them. This will give the cohort a personal connection to climate change by relating it to their own life.

Activity Instructions:

1. The cohort will discuss how climate change has affected them:
 - a. Have events been canceled due to negative climate change (heat, smoke, etc)?
 - b. Have you had to take a day off from work/school due to climate change?
 - c. Have you had any health impacts due to climate change?
 - d. If a major event happened would you have the ability to recover from it easily?

Photovoice: Climate Change in the Community

Activity Duration: 40 min

The cohort will be able to notice how they are being affected within their everyday life.

Activity Instructions:

1. Divide cohort into groups of 3-4.
2. Walk around community with the goal of finding examples of negative climate change effects.
3. Take a picture of the example when found. (20 min for steps 1-3)
4. Regroup and have each group explain why their example is a negative climate change effect. (20 min)

Infrastructure Impact

As the climate continues to worsen, our homes need to become more sustainable and be able to withstand the changes. Infrastructure impact takes two main forms, changes done to buildings (new and existing) and the impact climate change has on infrastructure. Changes done to buildings can include things like implementing renewable energy, composting, and naturally regulating the temperature of a building. In order to adapt to the changes affecting the world, the infrastructure must be adapted to fit the needs of the people that inhabit it. Adapting infrastructure to the changing climate will also decrease one's reliance on energy (ex. less air conditioning needed).

Learning Outcomes

- Understand the effects climate change has on infrastructures
- Gain knowledge on how to adapt already existing infrastructures
- Create a vision for a future where new structures are built with sustainability in mind

Additional Resources

Renters Guide to Sustainable Living by Renew

Climate Proofing Australia's Infrastructure by National Climate Change Adaptation Research Facility

How Climate Change Impacts Infrastructure by The University of Sydney

Activities

DIY: Sustainable Home

Activity Duration: 1 hr 10 min

Through this activity, the cohort will find ways to make their own home sustainable.

Materials:

- Renters Guide to Sustainable Living
- Paper
- Pencils
- Devices with Internet Access (e.g. tablets, phones)

Activity Instruction:

1. Individuals research ways to make their homes more sustainable. (20 min)
2. Discuss solutions as a cohort. (15 min)
3. Create DIY sustainable solutions. (30 min)
 - a. Ideally, most of these solutions will use items that would normally go in the trash.
 - b. If the materials are available, the participants will build a prototype of their ideas.
 - i. If the materials are not available, have them sketch out their ideas.
 - c. Ex: Create "double-glazed windows" by using take-away containers.
 - i. Tape the containers together in the shape of the windows.
 - ii. Instead of using heating or air conditioning, put the containers in the windows in the morning.
4. Present step 3 to each other and explain how this is adaptation. (10 min)

Field Trips

Sustainable House Tour

This field trip will show the cohort what a sustainable house actually looks like. Also, this field trip will show them the different types of adaptations that can be implemented in houses.

Example Locations/Organizations:

Renew: A company focused on improving their members' residences through sustainability.

Logistics: Email one month ahead of time. Either contact Hume City Council for transportation or use public transportation to get the house.

The cohort will tour some eco-friendly and sustainable houses.

Ocean

Climate change is causing ocean acidification and ocean warming. Ocean acidification is the decrease of ocean pH due to increased carbon dioxide absorption by the ocean. The ocean's neutralization is harming the ocean's biodiversity. Coral bleaching in the Great Barrier Reef is a result of ocean acidification. Carbon dioxide in the ocean is also trapping heat and causing ocean warming. Ocean warming is a major contributor to global warming and extreme weather events.

Clarification: Ocean pollution is also an important matter but caused by human waste, not climate change

Learning Outcomes

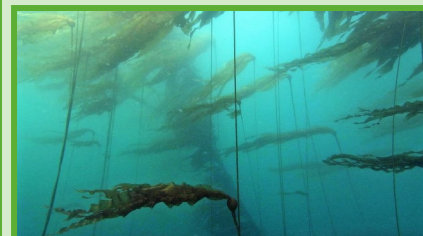
- Clarify what ocean acidification is and its effects
- Gain knowledge about ocean warming
- Reflect on ocean warming's relationship with climate change

Additional Resources

Ocean Acidification Introduction by Smithsonian Institution's Ocean Portal [↗](#)

Ocean Warming Reference by National Geographic [↗](#)

Ocean Warming Lesson Plan by Let's Talk Science [↗](#)



Activities

Seafood Audit

Prep Time: 5 min Activity Duration: 50 min

The cohort will identify sustainable seafood as an adaptation strategy towards climate change effects on the oceans and its biodiversity.

Materials:

- Whiteboard
- Dry Erase Markers

Instructor Preparation:

- Read [Australian Geographic's Guide to Sustainable Seafood \(2018\)](#) [↗](#)

Activity Instructions:

1. Cohort creates a collective list of seafood they consume (7.5 min)
2. Split the list between the cohort to research how sustainable each seafood is. (7.5 min)
3. Discuss the seafood audits with the cohort: (20 min)
 - a. What counts as sustainable seafood?
 - b. Why is being sustainable important?
 - c. Why is seafood important?
 - d. How does climate change affect our oceans? our food?
 - e. Discuss and differentiate ocean acidification and ocean warming.
4. Have the cohort identify ways to be more sustainable: (15 min)
 - a. Adaptation strategies can include consuming sustainable seafood and avoiding species that are being harmed by ocean warming and acidification.

Ocean Cont.

Ocean Acidification Impact Test

Prep: 30 min Activity Duration: 1 hr 10 min

The cohort will set up an experiment to visualize how ocean acidification affects seafood. For this activity, it is recommended to set up the experiment and continue to a different activity. Set aside time at the 30 min and 60 min mark during the experiment to observe changes.

Materials:

- Shells
- Fresh Water
- Salt Water
- Vinegar
- Glass Jars

Instructor Preparation:

- This activity was adapted from [Ocean Wise's Ocean Acidification Experiment](#)⁷. It is recommended to read through the original lesson plan for more information and tips.

Activity Instructions:

1. Provide the cohort with shells or have the cohort collect empty shells from seafood. (5 min)
2. Place shells in jars containing fresh water, salt water, or vinegar. (5 min)
3. Observe changes in the shells in the different solutions after 30 minutes and 60 minutes have passed from experiment set up. (10 min)
4. Discuss these changes with the cohort:
 - a. What is ocean acidification? its effects? relationship to climate change?

Field Trips

Exploring Our Waters

The cohort will visit a body of water (beach, lake, sea, river, wetlands, etc.) to learn about the ocean while immersing themselves in nature. The cohort will interact with the water as well as help with ocean clean up as needed. The cohort can follow the body of water and observe changes in the water and surrounding environment throughout the journey. Water temperature and pH can be measured and analyzed along the way, if materials allow.

Example Locations/Organizations:

Cheetham Wetlands: Artificial and natural lagoons created on old salt works land within Point Cook Coastal Park in Port Phillip Bay, Australia. The organization listed below is not vital for the success of this field tip. The instructor can independently organize a visit to this location.

Conservation Volunteers Australia: A volunteer organization for conserving nature. Conservation Volunteers Australia will provide transportation and guide a field trip to the Cheetham Wetlands. Potential activities include volunteering on conservation projects.

Logistics: Call 2-3 weeks ahead of time.

Renewable Energy

As the earth runs out of resources such as gas, more and more people are turning to renewable energy as the main source of their energy. One of the main advantages of renewable energy is that the resources are constantly replenished and never run out. This energy comes in many forms including wind, water, geothermal energy, and bioenergy. Renewable energy allows communities to adapt to the change in resources. In addition, renewable energy mitigates climate change by producing little to no greenhouse gasses.

Learning Outcomes

- Gain knowledge on how renewable energy is both an adaptation and mitigation practice
- Create a vision with renewable energy and understand the cost associated with it

Additional Resources

What is Renewable Energy by Australian Government Australian Renewable Energy Agency [↗](#)

Renewable Energy 101 by National Geographic [↗](#)

Renewable Energy, Explained by National Geographic [↗](#)

Activities

Energy Audit

Activity Duration: 1 hr 10 min

This activity will show cohort how already existing buildings run and where renewable energy can be implemented.

Materials:

- Building
- Whiteboard
- Markers (at least two different colors)

Activity Instructions:

1. Split cohort into groups of 4 to walk around the building (activity site).
2. Groups take notes on the different parts of the building that consume energy. (30 min)
 - a. Note areas that could implement renewable energy.
 - b. Note areas where renewable energy is already in use.
3. Cohort will create a map of the building on the whiteboard.
4. Using one color, the cohort will add already existing renewable energy usage.
5. In another color, the cohort will note (either in drawings or words) where they think renewable energy sources can be implemented/improved. (20 min for steps 3-5)
6. Discuss how the cohort could implement renewable energy in their homes. (20 min)
 - a. What are the barriers to renewable energy? (e.g. cost)
 - b. Are there ways to reduce the cost? (e.g. government subsidies)

Field Trips

Renewable Energy Plant Tour

This field trip will allow participants to see how renewable energy is created and used. While taking the tour, have the cohort notice the type of renewable energy is used, why it's being used and any alternatives that the plant could incorporate. Also, have the cohort think about the non-renewable energy that is being replaced by renewable energy.

Example Locations/Organizations:

Earthworker Solar Hot Water: Previously a fossil fuel community that transitioned into a worker-owned factory that produces renewable energy appliances and components.

Logistics: Email a month ahead of time. Simultaneously contact Hume City Council for transportation assistance.

Waste Management

Waste management is the collection and distribution of human waste. Proper waste management is important for sanitary waste disposal. Waste comes in different materials, such as food waste and daily waste (plastics and paper). Each material is processed in different ways. Current waste management systems include recycling, landfill, compost, incineration, and waste to energy conversion. Improper waste disposal and management create methane gas - a type of greenhouse gas which contributes to climate change.

Activities

Waste Audit

Prep Time: 30 min Activity Duration: 1 hr 10 min

Identify items that get commonly misplaced and where they should go. The cohort will also develop recommendations to eliminate misplacement and decrease the amount of slow-degrading waste.

Materials:

- Tarp
- Gloves
- Paper
- Face Masks
- Writing Utensils
- Devices with Internet Access (e.g. tablets, phones)

Instructor Preparation (Optional):

- Identify/Collect waste from all locations at the activity site.

Note: Include compost and recycling. The cohort can also collect as part of the activity.

- Divide waste by the number of groups.
 - ♦ Anticipate that groups will be around 2-3 participants.

Activity Instructions:

1. Create groups of 2-3 participants. (2.5 min)
2. Assign waste to groups. (2.5 min)
 - a. If prior prep, assign collected waste.
 - b. No prep, assign waste locations.
3. Record and categorize data as a group. (15 min)
 - a. Where was it found? - Trash Can, Recycling Bin, Compost, etc.
 - i. Make sure they remember where each item comes from throughout this activity.
 - b. What kind of categories of material did the group see?
 - i. E.g. Food waste, Cardboard, Plastics, Metal, etc.
 - ii. These categories are up to the group's interpretation.
 - c. How much of that material?

Learning Outcomes

- Understand how the material is processed through waste management systems
- Gain knowledge about the importance of proper waste management
- Embody proper waste disposal techniques
- Understand the negative repercussions of improper disposal

Additional Resources

Waste Management Resources

Premier Waste by Importance of Waste Segregation

Pacific Year of Climate Change
2009 Fact Sheet Waste & Climate Change by Secretariat of the Pacific Regional Environment Program (SPREP)



Waste Management Cont.

4. Categorize data as a cohort. (20 min)

- What kind of categories of material were seen?
 - E.g. Food waste, Cardboard, Plastics, Metal, etc.
 - These categories are up to the cohort's interpretation.
- Create a chart. Use the example below that combines the waste's location and its category. Make sure that the chart can be seen by the entire cohort.
- Each group adds their findings to this chart.

		Recycling	Compost	General Waste
Waste Categories	Food Waste			
	Cardboard			

5. Analyze and discuss recommendations. (30 min)

- Research categories and understand how they should be properly discarded.
- Which category was commonly misplaced?
 - Where should have it been placed?
 - Why do you think this material was discarded incorrectly?
- Create solutions to decrease misplacement.
- Discuss negative repercussions from improper waste disposal.

Field Trips

Waste Management Plant Tour

This field trip will allow participants to see how waste is collected, sorted, and processed for proper discarding. The cohort will understand the effects of waste management, and what material can harm the process.

Example Organizations/Locations:

Enable: An organization that collects and either fixing or properly discards electronics to reduce the harmful effects of improper e-waste management. Enable will allow the cohort to understand how to properly discard electronics and involve the community in reducing harmful e-waste.

Logistics: Email a month ahead of time.

Sunbury Landfill: A local landfill to Broadmeadows run by the Hume City Council. A visit to Sunbury Landfill will allow the cohort to be more aware about where their waste is going and how it is being processed.

Logistics: Email 2-3 weeks ahead of time.

Water Quality

Water Quality refers to the characteristics, both visible and invisible, of both water and the surrounding sediment. It is important to have a diverse range of water quality because different levels of water quality are needed to support a diverse ecosystem. In addition to supporting the ecosystem, water quality has a major effect on the water that humans can use for everything from drinking to swimming. As climate change increases the frequency and strength of extreme storm events, important nutrients get washed out and contaminants get washed in, thus decreasing the water quality.

Activities

Create a Water Filter

Prep: 20 min Activity Durations: 1 hr 10 min

Through this activity, the cohort will create their own water filter and understand the importance of having clean water. The cohort will also come up with additional ways they can implement water filtration within their own homes. Creating the filter and discussion should each take 35 min. Activity taken from [All About Water Filters](#).

Materials (per Participant):

- 1 Water bottle
- 150 ml of Sand
- 75 ml of Gravel
- 75 ml Activated Charcoal
- 1 Cotton Ball

Instructor Preparation:

- The day before the activity, wash the gravel and sand.
- Make a small hole at the top of each water bottle.

Activity Instructions:

1. The participants will stuff a cotton ball into the top part of the water bottle and turn it over.
2. They will cut off the bottom of the bottle (no more than 1/6th of it).
3. On top of the cotton, they will add roughly 75 ml of charcoal, then 150 ml of sand, followed by 75 ml of gravel.
4. Participants will add water to it and use the smaller cut part of the bottle to collect the filtered water.
 - a. If the cohort is confused, they can look at this [image](#).
5. The cohort will research and discuss where water filters are necessary. (35 min)
 - a. Are there situations where you or the community would need a large scale water filter system?
 - i. Mention places like King River.
 - b. What would a change in the water quality mean for people and the environment?
 - c. What can you use in your own homes to ensure the water is drinkable?

Learning Outcomes

- Understand what effects water quality has on both the environment and humans
- Gain knowledge on how to improve their own water

Additional Resources

Water quality by Government of Western Australia- Department of Water and Environmental Regulation

Water quality by Melbourne Water

Eutrophication will increase during the 21st century as a result of precipitation changes by American Association for the Advancement of Science Report



Water Quality Cont.

Field Trips

Exploring Our Waters

The cohort will visit a body of water (beach, lake, sea, river, wetlands, etc.) to learn about the water quality while immersing themselves in nature. The cohort will interact with the water as well as help with ocean clean up as needed. The cohort can follow the body of water and observe changes in the water and surrounding environment throughout the journey. Water temperature and pH can be measured and analyzed along the way.

Example Locations/Organizations:

Cheetham Wetlands: Artificial and natural lagoons created on old salt works land within Point Cook Coastal Park in Port Phillip Bay, Australia. The organization listed below is not vital for the success of this field tip. The instructor can independently organize a visit to this location.

Conservation Volunteers Australia: A volunteer organization for conserving nature.

Logistics: Call 2-3 weeks ahead of time.

Conservation Volunteers Australia will provide transportation and guide a field trip to Cheetham Wetlands.



Wildfire

Wildfires are naturally occurring and can be beneficial to the environment. However, climate change is increasing wildfires' frequency, intensity, and damage throughout the world. For instance, in the United States' Rocky Mountains, forests are losing their resilience to wildfires due to decreased moisture. In Australia, extreme weather patterns, long droughts and higher temperatures have increased the risk of fire and have allowed fires to spread uncontained.

Activities

Famous Fires

Prep Time: 20 min Activity Duration: 40 min

This activity will allow the cohort to compare recent wildfire and discuss the impacts.

Materials:

- Videos about the wildfires in Brazil (the Amazon), United States (California), and Australia (NSW & Vic) (19-20 Bushfire Season)
- Videos: politics and media informing fires

Instructor Preparation:

- Before the workshop, find videos that cover relevant and current wildfires.
- Prepare a discussion about fires being caused by climate change (do not expect a conclusion as the science is complicated).
- Prepare a discussion about media and politics impact in fires.

Activity Instructions:

1. Organize small groups and discuss perceptions about fires (6 min):
 - a. State in bullet points the following:
 - i. Why were the fires so strong and broad in Australia 2019-2020?
 - ii. What did the government need to do?
 - iii. What would you do in a fire risk situation at home?
2. Each team should go around the room to watch. *Videos: politics and media informing fires (see resources).*
3. Return to tables and add to the butcher paper:
 - a. What should we do when information is uncertain?
 - b. Are the wildfires really an issue of climate change? Why?
4. Explain the fires using the *Australia fires: A visual guide to the bushfire crisis* link (resources). (7 min)
5. Discuss and explain critical thinking using 3 concepts: Fact, Assertion and Opinion.
6. Finalize creating common conclusions. Write them on a board or butcher paper for everyone to see.

Learning Outcomes

- Understand wildfires
- Reflect on how climate change, the human political context and media are impacting wildfires
- Learn how critical thinking is used to discern information about wildfires

Additional Resources

Video on The Science of Wildfires by SciShow➤

How did Australia fires start and what is being done? A very simple guide➤

Australia fires: A visual guide to the bushfire crisis❓

Australia fires: Morrison heckled by bushfire victims by BBC News➤

Australia fires: Rain brings relief but huge blazes expected by BBC News➤

Australia fires: Misleading maps and pictures go viral - BBC News➤

Letter to the Editor about the 2019-2020 Australian fires supported by NSW Department of Planning, Industry and Environment➤

Video on Indigenous Fire Methods Protect Land Before and After the Tathra Bushfire by ABC Australia➤

Video on Bushfires in Australia: What Ignited the Deadly Crisis by Global News➤

Fire Safety Tips from the Australian Government➤

Wildfire Cont.

Guest Lecturer: Intentional Burns

Activity Duration: 40 min

In this activity, the cohort will have the opportunity to learn about intentional burns from someone who sets the burns.

Wurundjeri Tribe's Narrap Team: The Wurundjeri Tribe, the Traditional owners of the Greater Melbourne region, reformed during the 1980s. In this process, they put together a Narrap Team to perform intentional burns in Sunbury by client requests. The Wurundjeri Tribe's Narrap Team will provide the cohort information about intentional burns, why they're important, and the cultural meaning behind the burns.

Logistics: Email asking for a representative to come and speak

Field Trips

Watch An Intentional Burn

This field trip will allow the cohort to connect with Aboriginals who prevent wildfires by organizing intentional burns. The cohort will understand how and why these intentional burns are a beneficial adaptation. During the field trip, the cohort will also get the opportunity to see how intentional burns are performed.

Example Locations/Organizations:

Wurundjeri Tribe's Narrap Team: The Wurundjeri Tribe, the Traditional owners of the Greater Melbourne region, reformed during the 1980s. In this process, they put together a Narrap Team to perform intentional burns in Sunbury by client requests. The cohort can watch how the Wurundjeri's Narrap Team performs an intentional burn.

Logistics: Email a month ahead of time to get dates, confirm a week in advance of the chosen date

Important Concerns: Accommodate participants with asthma or other breathing conditions.

Witnessing Climate Resiliency

The purpose of this field trip is to allow the cohort to witness environments that have recently been burned by wildfires. Additionally, the cohort will observe how communities are adapting and how nature is recovering.

Example Organizations/Locations:

Scotsburn: A community recovering from burning in late 2015. The organization listed below is not vital for the success of this field trip. The instructor can independently organize a visit to this location.

Conservation Volunteers Australia: A volunteer organization for conserving nature. They will provide transportation for the cohort to visit Scotsburn.

Logistics: Call 2-3 weeks ahead of time.



Mini-Project

A mini-project is an initiative done as a cohort throughout the training program. The instructor will guide the cohort through developing and implementing their climate change initiative. The mini-project serves as practice for part 2 of C.A.R.Y.A. By doing the project as a cohort, the cohort will support each other in learning how to research, act, and lead.

Example Projects

Six mini-project options are listed below. The cohort can choose from these examples or create their own. A suggested schedule for the mini-projects during the training program:

Schedule		<h3>Climate Change Communication</h3> <p>The cohort can create and spread social media content to inform their community members about climate change related health concerns. Using social media as a platform allows for quick, frequent, and timely updates. The cohort can develop strategies to grow their audience and present engaging information. One organization that the cohort can partner with is DPV Health, a Victorian health care provider. DPV has already established their social media platforms, which would make it easier for the cohort to reach out to their community.</p> <h3>Community Compost</h3> <p>Composting is the collection and decomposition of organic solid waste (often food waste). Composting results in recycled organic material (compost) which works well as plant fertilizer. The cohort can create or improve a compost system for the community. Community composting can help build food consciousness, fertilize plants, and reduce carbon emissions.</p>
Week	Mini-Project Phase	
1	Introduce and identify what mini-project the cohort wants to work on.	
2	Research about the mini-project. Develop action plan.	
3		
4	Implement the mini-project.	
5		
6		
7	Refine the mini-project.	
8		
9	Wrap up the mini-project.	
10	Present the completed mini-project to the community during culmination event.	

Community Garden

The cohort can create or improve a community garden. The cohort will research plants that are nutritious and grow well in their local climate. Growing plants native to the location is encouraged. The garden would help the community eat local and prepare for food insecurity.

Habit Forming

The cohort will individually choose, practice and record a new environmentally sustainable habit. Some examples are using a reusable water bottle, burning less fossil fuels on their way to work, and bringing their own bags to shop. As a whole, the cohort will compare their progress. The cohort can also work together in helping their community adopt a habit.

Repair Cafe

Repair cafes are meeting spaces where community members bring and fix their broken items instead of throwing them away. The cohort will organize and host a repair cafe event to help their community minimize waste, save money, and extend product life.

Soft Plastics Recycling

Soft plastics (plastic bags, wraps, etc.) jam automated sorting machines when placed in general recycling. Soft plastics can be separated and recycled at specific plants instead in some cities (e.g. Australia's REDcycle program).

Evaluation Technique

To evaluate each meeting, there are two techniques used, observation and discussing one question with the cohort. These techniques can be used together or individually.

Questions:

At the end of each meeting, the instructor can ask the cohort one question related to the learning objectives for the topic. This question can be answered in any form the instructor(s) prefer (written, verbal, etc.). Each question should be related to the Action Competence Framework - a framework that emphasizes 8 aspects for effective environmental education.

Action-Taking for Sustainability	Knowledge
Connectedness	Vision for Sustainable Future
Embodiment	Reflection
Emotion	Social Network

Below are some sample questions:

- How do wildfires affect (both positively and negatively) their surroundings?
- Reflecting on the impacts of climate change that are exasperated in vulnerable communities, what are some ways to take action against them?
- How can you embody adaptation techniques into your life?

Observation:

If C.A.R.Y.A. is run by two instructors, each instructor will have a specific role.

1. Instructor 1 : Runs the meeting (or certain parts). They will focus on making sure the program runs smoothly.
2. Instructor 2: Observes the cohort during the meeting. They will be taking notes on: the cohort's ability to achieve the learning objectives, engagement. At times, Instructor 2 can assist in running the meeting.
3. The instructors can switch roles as often as they see fit.

Culmination Event

Purpose

The purpose of the culmination event is for the cohort to share their knowledge with the community in an engaging way. This document details *Family Trivia Night* - one example of a culmination event. The instructor and cohort are not limited to this example and can create their own culmination event.

What Is Trivia

Trivia is a game in which an individual or a group must correctly answer as many questions as possible. The individual or group that has the highest score wins. This creates a healthy environment to encourage learning and discussions. Below is a sample itinerary that allocates time for set-up and clean-up. The actual event will be around 4 hours.

Sample Itinerary			
Duration	Event Name	Host	Description
1hr -30 min	Set-Up	The cohort	What you need to do varies by venue.
5 min	Acknowledgement of Country	Instructor	
20 min	Welcome Speech	Instructor	Explain what C.A.R.Y.A. is. Explain what the cohort did. Explain the purpose of this night. Explain Cohort's mini-project and results. Introduce the MC.
20 min	Intro and Rules	MC	Explain what Trivia is, how the night will work, and the rules for trivia.
10 min	Pass Around Materials	The cohort	Do this while stating the rules.
2 hr 30 min	Play Trivia + Eat	All	Have C.A.R.Y.A. participants walk around and help teams when need be.
20 min	Present Prizes	MC	
10 min	Closing Ceremony	MC	
1hr -30 min	Clean-Up	The cohort	What you need to do varies by venue.







Preparation Tasks

Main Information is in this [link](#) . Other tasks not mentioned:

- Marketing and RSVP
 - Flyers around the community
 - Post on social media
 - Talk to friends and family
 - Find a method of RSVP
- Decide on rules. See these [example of rules](#) .
- Prizes (Optional): Something small but consistent with the *Climate Change Adaptation* theme
E.g. Reusable Water Bottle or Native Herb plant

Adaptation Initiative

After the 10-week training program, the participants will move on to creating their own adaptation initiative. Participants can work individually or in groups to develop this. Each initiative will receive a mentor. To ensure valuable mentorship, the mentor's expertise will be related to the initiative. Participants also have the option to support a previously existing initiative within an organization. Below is a table that lists organizations and how they are willing to help in the Adaptation Initiative stage.

Organization	Adaptation Initiative Partnership
	<ul style="list-style-type: none"> Participants can support the council in various workshops and programming. General mentorship
	<ul style="list-style-type: none"> Participants can support at a Sustainable Housing Day. Renew could offer unpaid internships to participants. General mentorship
	<ul style="list-style-type: none"> Participants could volunteer on or lead conservation projects. Participants could create STEM activities for field trips. General mentorship
	<ul style="list-style-type: none"> Participants could create climate change workshops for schools. General mentorship
	<ul style="list-style-type: none"> General mentorship
	<ul style="list-style-type: none"> General mentorship

Redacted Organization Directory

Organization	Description
Hume City Council	Hume City Council is the governing body for Broadmeadows. Field Trip: Provide transportation Adaptation Initiative: Join the council's pre-existing programming, General mentorship
Renew	Renew is an organisation that inspires, enables and advocates for people to live sustainably in their homes and communities. Field Trip: Sustainable House Tour Adaptation Initiative: Volunteer at Sustainable Housing Day, unpaid internship, General mentorship
Conservation Volunteers Australia	Conservation Volunteers Australia strengthens the health of communities and ecosystems through volunteer opportunities. Field Trip: Exploring Our Waters, Witnessing Climate Resiliency, National Park Visit, Conservation Volunteering Adaptation Initiative: Develop STEM activities, General mentorship
DPV Health	DPV Health offers health care services to people of all ages with the goal of ensuring the health and wellbeing of their community. Activity: Healthy Sustainable Cooking Adaptation Initiative: Create climate change workshops, General Mentorship
Hume Climate Action Now	Hume Climate Action Now is an activism group in Hume that talks to their elected officials about climate change. Adaptation Initiative: General mentorship
Victorian State Government Department of Environment, Land, Water, & Planning	Department of Environment, Land, Water, & Planning is focused on creating a liveable, inclusive and sustainable Victoria with thriving natural environments. Adaptation Initiative: General mentorship
Land Management Narrap Team (Wurundjeri Tribe)	The Wurundjeri Council provides a holistic approach to working in the traditional Country. Activity: Guest Lecturer: Intentional Burn Field Trip: Watch an Intentional Burn
Psychologist	Dr. Susie Burke is a psychologist that focuses on the mental health impacts of climate change. Activity: Interview a Psychologist
★ Earthworker	Earthworker brings together people to solve the social and environmental problems faced by communities and the planet. One initiative they have is a factory making renewable energy appliances. Field Trip: Renewable Energy Plant Tour

Redacted Organization Directory Cont.

Organization	Description
★ Enable	Enable's goal is to break unemployment cycles by connecting with community, environment, and improve prospects of participating in gainful employment. Field Trip: Waste Management Plant Tour
★ Sunbury Landfill	The Sunbury landfill is near the Broadmeadows community and has a viewing platform. Field Trip: Waste Management Plant Tour
★ CERES	CERES is an environmental education center, urban farm, and social enterprise hub located in Melbourne. Field Trip: Exploring a Farm

Any organization preceded by a star (★) is a recommended organization; partnership with Banksia has not yet been established.