

# Growing a Promising Future:

## Connecting Families to Collingwood Children's Farm

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<https://sites.google.com/view/d20-farm/home>

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# Abstract

Outdoor interactive education is an important aspect of childhood growth and development. The goal of this project was to provide Collingwood Children’s Farm with an online repository of interactive, multimedia resources that conveyed the farm’s lessons of sustainability and healthy living. These resources aimed to fuel a desire and interest to visit the farm in person and supplement the content the farm provides its visitors. Within this repository, we included online interactive games, coloring pages, and hands-on nature-based activities. In light of the COVID-19 pandemic, these resources will also assist children in connecting with the farm while it is temporarily closed. We organized the resources we have developed in the form of an online interactive map, which the Collingwood Children’s Farm will integrate into its own website based on our implementation and maintenance recommendations.

# Acknowledgements

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We would also like to thank our sponsor, Collingwood Children's Farm for providing this experience to us. We extend our thanks to Sev Darwell, serving as our primary guide and contact on the farm through this difficult time. We appreciate Conor Hickey for her ideas and enthusiasm through the project term. We are also grateful for the farm resources provided by Mia Sutherland, Melina Newman, Rachel Freeman, and Andrew Phillips. Additionally, we thank Evan Zly for his technical support and advice, and Steve Costello for posting our website on the farm's social media. We also appreciate the time spent by all individuals who took our online games survey.

We respectfully acknowledge the Wurundjeri of the Kulin Federation as the traditional owners of the Abbotsford Precinct Heritage Farmlands, the lands that the Collingwood Children's Farm currently cares for and farms on behalf of all Victorians. We thank all Wurundjeri Elders past, present, and emerging, for their guardianship of these lands.

# Executive Summary

Collingwood Children's Farm is a not-for-profit farm located near Melbourne's Central Business District (CBD) (Figure 1). The farm provides educational, interactive content that serves to incite a curiosity in nature and educate the children about sustainable food practices. Due to the city of Melbourne's growing population, the Collingwood Children's Farm continually strives to offer more activities to accommodate its growing visitor base.

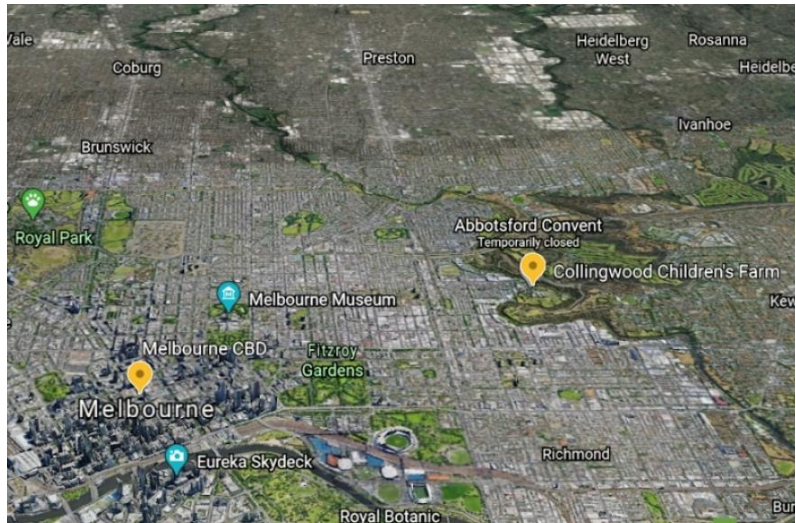


Figure 1: Satellite image of Collingwood Children's Farm in relation to Melbourne's CBD (Google Earth)

In light of the COVID-19 pandemic, the farm had to refocus their efforts by bolstering online presence to continue to provide educational and interactive content to their visitors. The pandemic has blocked the farm's main source of income, tours to young children and school groups, but they continue to provide produce for those in need. Prior to the pandemic, the farm had a website, as well as outreach resources including several podcast episodes related to the farm, but they sought more methods of providing educational experiences to their visitors at a distance.

Our mission was to help Collingwood Children's Farm engage children and families in interactive, play-based learning by developing an interactive map to encourage children to explore new areas of the farm and a collection of self-led, educational activities to supplement the farm's experience. To accomplish our mission, we completed four key objectives:

1. Describe existing farm activities and programs
2. Develop a system to guide farm visitors to new and enriching points of interest
3. Develop a suite of supplementary resources to guide hands-on and online, educational activities for the farm
4. Facilitate future maintenance and development of the repository of resources

We first reached out to farm staff to gather related resources and information about the farm, its crops and animals, its attractions and tour highlights, and related businesses. Through these interactions, **we gained a better understanding of the farm's values**, which influenced our later design choices. The farm's values include encouraging exploration, curiosity, and independence among its visitors. They do not publish a set daily schedule online because they do not want visitors to come to the farm expecting to constantly be entertained by someone. The farm is a large place with so much to explore if visitors slow down and appreciate their natural

surroundings. Since children could not access the farm during the time of our project, we sought to teach them to slow down and appreciate the nature around their home instead. Our activities reinforce the lessons the farm hopes to impart during visits. The farm believes that children can derive a lesson from any part of nature, inspiring both larger scale activities, like gardening, and brief activities, like scavenger hunts.

## Activity Map

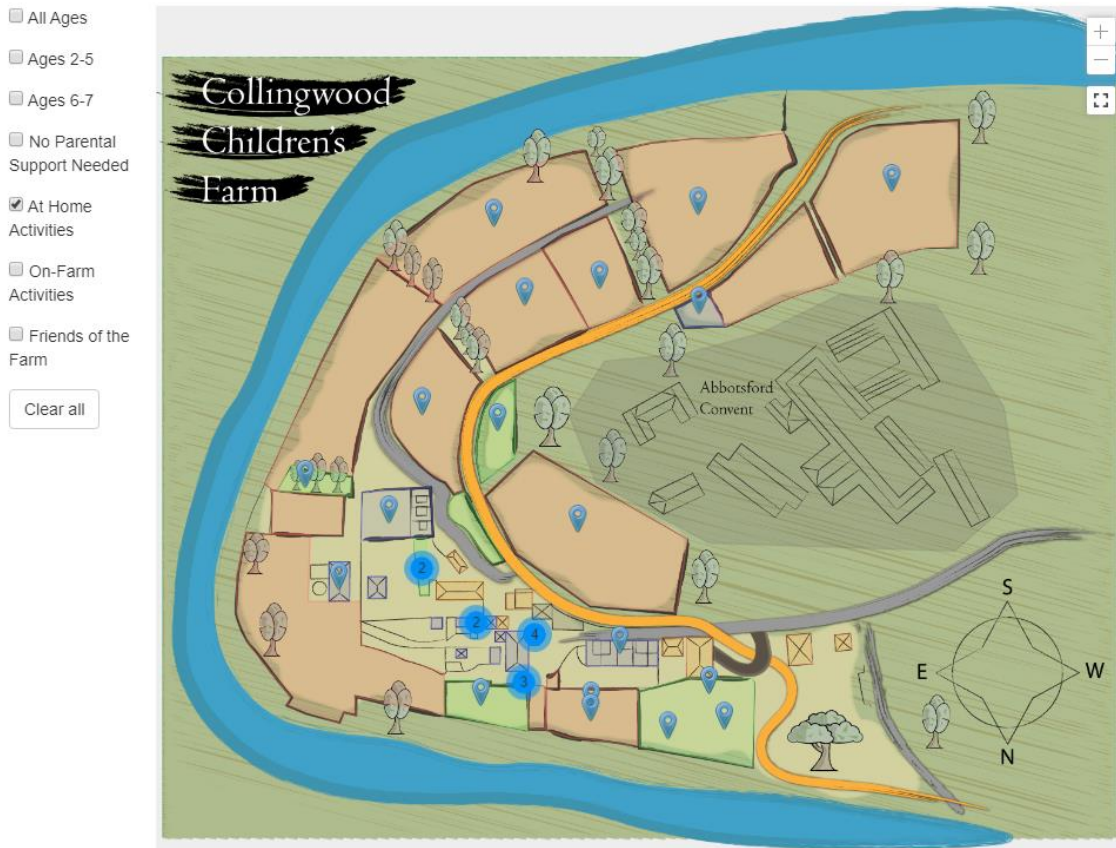


Figure 2: Interactive map filtered to only display at-home activity pins

We created a website, designed to integrate with the farm's existing website, to host the resources we created. We developed a stylized map of the farm inspired by examples from other farms that our sponsor mentioned. We layered many interactive components over this map **to encourage visitors to explore the farm** (Figure 2). Selecting an area provides the user with related information, pictures, and activities (Figure 3). The map contains both activities for children to complete at home and activities that children can experience when they visit the farm in person. The website contains a child-friendly user guide to ensure that every child knows how to access the map and activities.

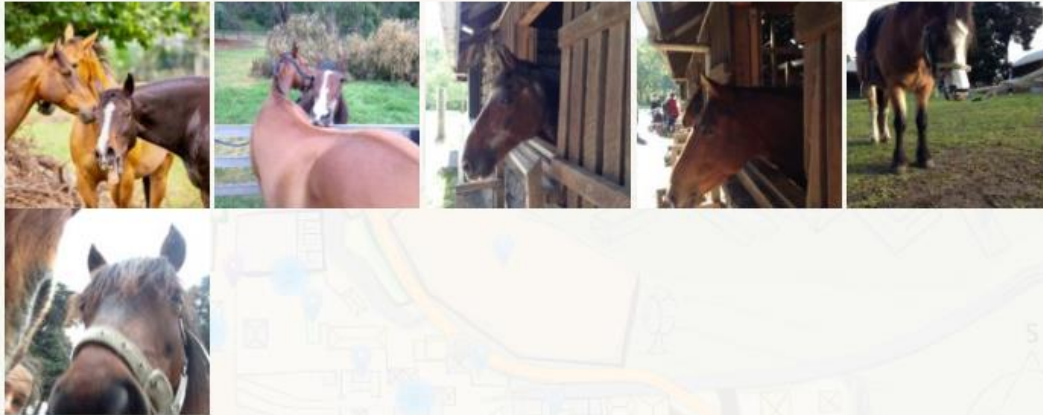
Image 2: Charlie and Aussie (horses) are snuggling. Do you like to hug your friends?

Image 3: Charlie is sticking his head out of his stall. What do you think he is thinking about?

Image 4: Like Charlie, Aussie also likes to stick his head out his stall to interact with the people walking by.

Image 5: Cavi (a pony) is enjoying exploring the outdoors.

Image 6: Brandy (a pony) loves posing for the camera!



Color in Ollie, Jim, and Aussie (Horses)

Color in this photo of Ollie sticking his tongue out while hanging out with his friends Jim (on the left) and Aussie!

### Coloring Page Activity Link

Figure 3: Map information popup for the stables area

Our suite of resources included 31 different activities, falling in three categories: online interactive games, coloring pages, and at-home nature-based activities, which are accessible by clicking on pins distributed across the interactive map.

The two online games, Guinea Pig Cuddles and Grow Your Own Garden, simulate a popular farm activity and the crop growing process, respectively (Figure 4). We sent a survey via a convenience sample to gain feedback and recommendations for how to tweak the online games. This sample included three teachers currently residing in the United States - one who taught children ages two through five, one who taught children ages five through ten, and one who taught ages 15 through 18. Of these teachers, one of them had experience related to farming. From this survey, we received several suggestions to improve compatibility with the target age group, as well as enjoyment. These suggestions included a voice over to give instructions on the Guinea Pig Cuddles game, clarifying certain functionality in the Grow Your Own Garden game, and addressing some formatting concerns. These changes were implemented in the final versions that are accessible on the website.



Figure 4: Grow Your Own Garden Game; the player is selecting which crops to plant

We created 14 coloring pages by tracing images of farm animals provided by an Animal Husbandry worker at the farm (Figure 5). This activity allows children to form a connection with individual farm animals despite the farm’s closure.

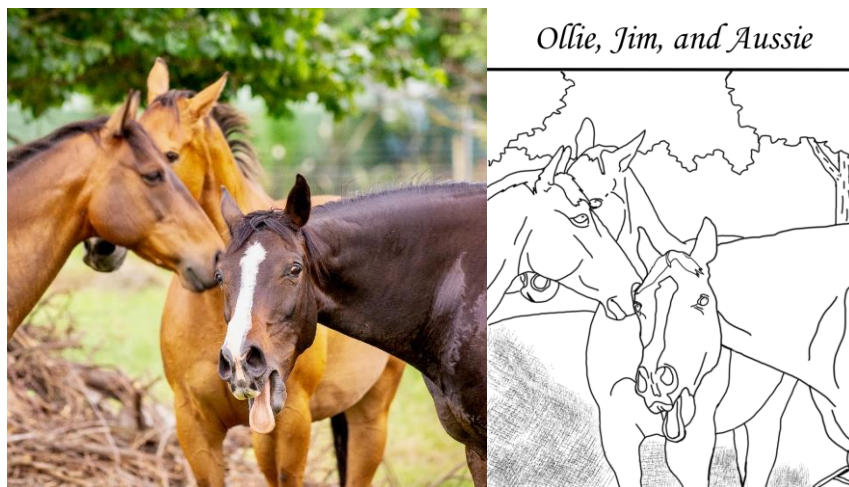


Figure 5: (left) Ollie, Jim, and Aussie; horses at Collingwood Children’s farm (Mia Sutherland), (right) Coloring page of Ollie, Jim, and Aussie

The at-home nature-based activities **guide children through multiple experiences relating to learning goals associated with the farm’s practices**. We created 15 at-home nature-based activities including grow your own turnip garden, craft your own farm animals, make butter, and create your own barometer. Each infographic, like ‘Animal Camouflage Masks’,

# ANIMAL CAMOUFLAGE MASK

Wild Animals prefer to stay hidden, so they can sneak up on prey, or hide from predators. To do so, they blend in with their environment. This is called Camouflage. Can you make an animal that blends in with your environment? Go outside and find materials in the outdoors, like leaves, rocks and sticks. Don't take leaves or sticks directly off plants! This can hurt the plants.



## STAGE 1: GATHER MATERIALS

- Paper plate
- Paper
- Scissors
- Glue
- Sticks/Leaves/Rocks/other natural materials

## STAGE 2: BUILDING THE ANIMAL

Cut out shapes for ears, arms, horns, or other body parts. You will need scissors, so be sure to get an adult's help for this step! Glue the parts to the plate, and let them dry. This is the body of your animal.



## STAGE 3: CAMOUFLAGE

Add the materials you found to the animal to help it stay sneaky. Can you make it look like a nearby plant? Where could this animal hide?

## STAGE 4: FINAL STEPS

Add googly eyes and draw on a mouth, now your camouflaged animal is complete!



Collingwood Children's Farm

conveys an activity containing educational content and instructions (Figure 6). While the activities are shared online, they encourage children to explore elements of the natural world around them.

After integrating this collection of activities into the interactive map, we drafted documentation to help farm staff maintain and further develop the resources we created during the project term. The interactive map creates a virtual connection to the farm and is immediately useful to allow children to connect with the farm while it is temporarily closed. The utility of this resource remains after these circumstances, however, as it will continue to promote exploration of the farm and reinforce any lessons that children learn from the farm in person. It is our hope that the integration of our project will inspire new and old visitors alike to visit the Collingwood Children's Farm and experience its message for themselves.

Figure 6: An example at-home nature-based activity that teaches kids about animal camouflage



# Authorship

This report was written collaboratively by all four members of the team. Each member primarily contributed to the development of one group of deliverables. Brittany Goldstein organized our suite of resources on the website and put together the maintenance plan. This involved developing the interactive map. Jordan Grotz was responsible for the creation of nearly all original graphics and images, including the base map, coloring pages, and the sprites found within the online games. Ryan Keller researched information for and stylized the at-home nature-based activities. Daniel Ribaudó programmed, prototyped, and edited various audio clips for the online games.

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# 1. Introduction

As urban civilization expands, the amount of green space available for children to play on drastically decreases. This decrease can be detrimental to the healthy growth of children within these areas. The lack of green space discourages explorative and active play, negatively stunting mental and physical development, respectively. Moreover, children are most impressionable in their youngest years and by limiting their access to nature in these years, their view of normalcy is less likely to include nature (California Department of Education, 2019). They are less likely to care for or feel strongly about issues impacting their surrounding natural environment. Overall, this has the potential to generate a cycle: when these children grow up, they will not endow an appreciation for nature upon their children, further compounding the problem.

As the home of more than one million different species, Australia is one of the most biodiverse countries in the world; however, most of Australia's population may not get to experience this biodiversity as the majority of residents live within an urban environment (Australian Government, 2019; Ritchie, H., & Roser, M., 2019). The city of Melbourne is expected to nearly double in size from 4.25 million people in 2014 to an estimated population of 7.7 million people in 2051 (Savage, 2014). Children in densely populated city centers have limited access to natural outdoor spaces, especially ones that provide engaging or interactive content. Due to this limiting factor, complementing classroom learning with outdoor education in Melbourne can be challenging for educators.

The implementation of interactive activities in outdoor areas is essential to the education of young children. Collingwood Children's Farm has been providing an avenue for these kinds of experiences to Melbourne children for over 40 years (Williams, 2020; Collingwood Children's Farm, 2020d). The farm's goal is to educate the urban population of Melbourne on sustainable farming and the practices of the Wurundjeri people (Collingwood Children's Farm, 2020d). While the farm provides a learning environment and some activities to engage children and families, the farm leadership desires to offer more child-led interactive activities on the farm to support their growing visitor base, and they sponsored this project to help generate potential solutions. The farm's temporary closure due to the COVID-19 pandemic prohibited us from working on the farm, so we developed online content supplemental to the farm's existing activities and educational components which serve to both aid remote learning and inspire interest in on-farm activities.

Our mission was to help Collingwood Children's Farm engage children and families in interactive, play-based learning by developing a suite of self-led, educational activities hosted on an online map. Through these resources, we aim to foster remote engagement with the farm, which is especially relevant in light of the COVID-19 pandemic. To gain a better understanding of the farm, we first obtained information about activities and programs on the farm by communicating with farm staff. Using this information, we developed a system that would both guide prospective visitors to enriching areas of the farm and integrate the array of related hands-

on educational resources that we had created. Finally, we helped to facilitate the farm's future development and maintenance of this system and its resources.

## 2. Background

This chapter outlines the activities and history of our sponsor, Collingwood Children's Farm, and analyzes the different benefits and methods for outdoor education for children. Additionally, we explore various examples of outdoor play integrated within current educational practice. This information serves as a guide for developing online, interactive activities that cater to the needs of the Collingwood Children's Farm's primary audience - children and their families.

### 2.1 Collingwood Children's Farm

Collingwood Children's Farm is a not-for-profit organization, located five kilometers from Melbourne's central business district in Abbotsford VIC (Figure 7). The organization aims to benefit disadvantaged children through its programs and the revenue generated therein (Figure 8; Collingwood Children's Farm, 2020). The farm's location borders the Yarra River and the Abbotsford Convent, which is home to galleries, cafes, a radio station, a school, art studios, green space, and more (Collingwood Children's Farm, 2020d; Abbotsford Convent, 2019). Activities at the farm primarily target younger children between the ages of two and seven years old. First and second grade school groups frequently visit the farm for field trips relating to their respective curriculums, while younger children, typically ages two through five, visit the farm independently alongside their parents/guardians. As the farm caters to a young audience, its content primarily consists of guinea pig cuddles, cow brushing, tractor rides, and pony rides (Collingwood Children's Farm, 2020e).

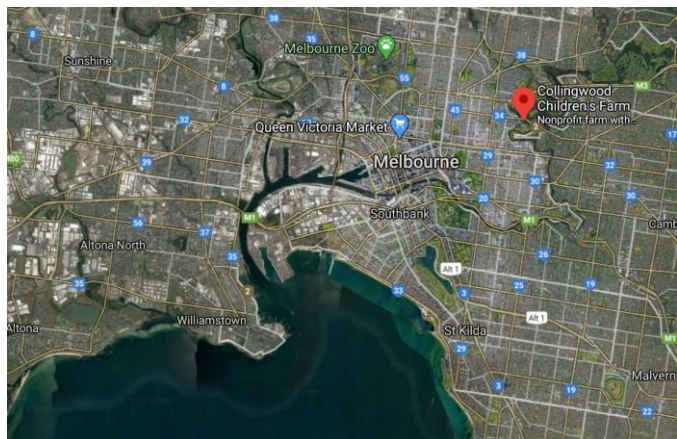


Figure 7: Satellite image of Melbourne, Australia. Collingwood Children's Farm is marked with a red pin. (Google Earth)

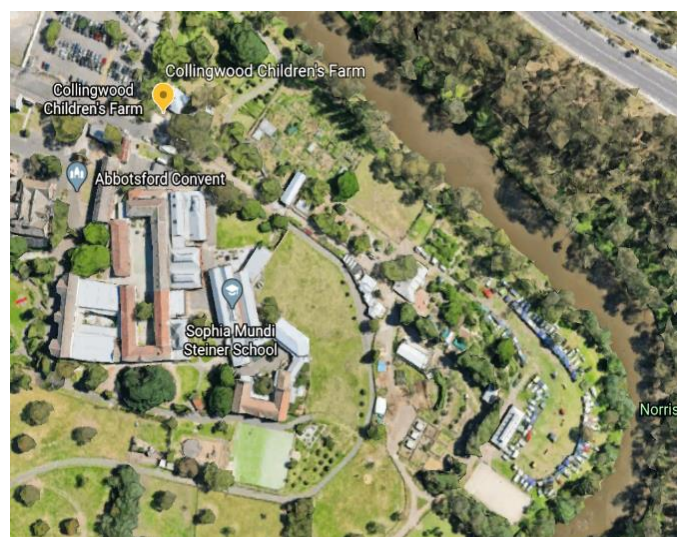


Figure 8: Satellite image of Collingwood Children's Farm (Google Earth)

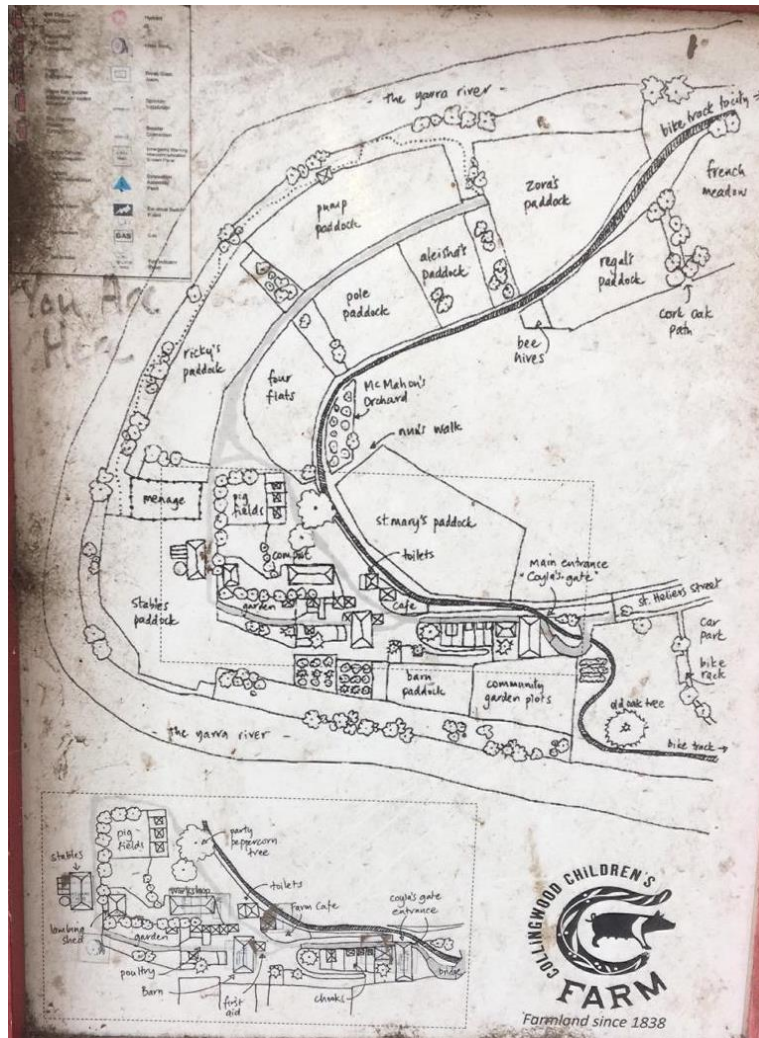


Figure 9: Map of Collingwood Children's Farm (Sev Darwell)

Prior to the Collingwood Children's Farm's existence, the land was farmed by the Wurundjeri, an Aboriginal tribe which plays an active role in influencing present farm activities. The Wurundjeri remain as a strong and active voice in the community (Mar, 2013). Their unique culture and relation to the land has inspired those on the farm to help preserve the history of the land and educate future generations, as seen through the farm's Indigenous food garden (Collingwood Children's Farm, 2020d). The farm and the tribe also maintain a close relationship through proximity; the Wurundjeri's tribal council's headquarters is in the bordering Abbotsford Convent.

The farm started its operation in 1979 on the property of the Abbotsford Convent, which was then owned by the Victorian Government (Collingwood Children's Farm, n.d.). The convent was sold to private developers in 1997, but through successful lobbying, Collingwood Children's Farm was able to both keep their land and expand to its current size of 20 acres (Williams, 2020). Currently, the farm consists of nine paddocks, an orchard, beehives, a meadow, community garden, barn, bike path, and cafe (Figure 9).



The farm currently hosts many activities that engage their young visitors. The main attractions at the farm are **guinea pig cuddles** and **cow brushing**, which are offered three and two times a day, respectively (Collingwood Children's Farm, 2020e). These activities place a strain on animal and staff/volunteer resources, restricting the farm's ability to increase the frequency of these activities, despite the high demand for them. In addition to their primary activities, the farm rotates through a variety of other programs for children during the week. This includes *helping the gardener; weed, feed, and learn; growing plants; native garden; farm craft; let out the chooks; harvest; and storytelling* (Collingwood Children's Farm, 2020e). Visitors can check the activity board posted at the entrance to the farm to determine which activities are being offered that day (Figure 10). On weekends and school holidays, farmers lead feed-walks two to three times a day where children can meet the animals as the farmer feeds them.

The farm also hosts many monthly events. The first Sunday of every month between February and November is family day (Collingwood Children's Farm, 2020e). During family days, the farm offers guinea pig cuddles, cow brushing, feed-walks, tractor rides, and pony rides. On the second Saturday of every month, the farm hosts a farmers' market (Collingwood Children's Farm, 2020e). This farmer's market supports 60 to 70 local farmer stalls, providing a source of fresh food for the surrounding community, and encouraging sustainable habits through positive local interaction (Alkon, 2012). It also acts as another potential draw for visitors to the farm, separate from the specifically educational or child-based programming.

Although many of the activities offered at the farm require volunteer or staff presence, there are a couple activities located throughout the farm for children to explore on their own. Vines cover bamboo frames, creating **teepee cubbies** for children to explore and enter a fantasy world within (Figure 11). Additionally, a **maze** allows children to trace a chicken's path to its food source (Figure 12).



Figure 10: The farm's activity board (Sev Darwell)



Figure 11: Teepee Cubbies at Collingwood Children's Farm (Sev Darwell)



Figure 12: Chicken maze created by farm employee (Sev Darwell)

In addition to the hands-on activities, the farm's **digital presence** includes a podcast, marking the farm's 40th anniversary, a website, and social media accounts (Collingwood Children's Farm, 2020d). Within the podcast, guest speakers recount stories related to the farm and elaborate on the farm's founding values. Awareness of the farm's history and goals of outdoor and childhood education are integral to our understanding of what children gain from their time at the farm. A **new website** is currently under development to replace the old one that is live at this time. Prior to the COVID-19 pandemic, the farm did not devote much time to its social media accounts, but they are now expanding their social media presence during the farm closure as a way to reach out to the community during these difficult times and beyond.

## 2.2 Outdoor Education & Child Development

Gulay, Yilmaz, Gullax, and Onder (2010) demonstrated that interactivity increases the chances that a child's knowledge will persist in a study which taught preschoolers about soil through interactive activities. They administered a pre-test and multiple post-tests and found that students who participated in the interactive session retained the information at a higher rate than the control group. Encouraging children to interact with the educational content at the farm may help retain the lessons associated.

Curiosity is key when maintaining anyone's attention; children are no exception. When children are taught through visual aids, varied tone of voice, and thought-provoking questions, they become more engaged with the subject (Soydan & Erbay, 2013). To capitalize on fostering engagement and curiosity, many schools have shifted their focus towards more interactive teaching styles, commonly referred to as experiential learning.

### 2.2.1 Experiential Learning

When children are simply given a fact to memorize, their understanding of the topic and problem-solving skills do not develop. Experiential learning teaches children to delve deeper into problems to find generalized solutions through guided play. If children always have access to the answer of a problem, they will not learn to search for more information or apply past experiences to the current problem (Ng, 2014). The role of their interaction is to understand the underlying relations between problem and solution. Moreover, their ability to persevere when a problem becomes difficult will suffer, as they will expect immediate gratification (Fisher, 2013). To increase self-motivation to learn among children, Singapore's Ministry of Education has restructured their kindergarten curriculum to focus on experiential learning (Ng, 2014). The new curriculum revolves around activities such as playing with puzzles, which develops children's problem-solving skills (Ng, 2014).

### 2.2.2 Nature-Focused Teaching Methods

The Montessori and Waldorf schools are two of the most prevalent alternative teaching methods in practice, and their goal is to create a more nature-based education for children (Edwards, 2002). There are valid methods that can be extracted from each of these different educational approaches. The Montessori Schools have teachers take an observer position, allowing the children to lead their own curriculum (Edwards, 2002). The teachers' primary goal is to provide an environment that maximizes children's learning potential (Tharu, 2018). This type of education is beneficial to children ages two through six, as it allows for the children to become more familiar and considerate of their natural environment (Tharu, 2018). The Montessori school's central focus is to help children develop their creativity, confidence, and independence (Tharu, 2018). These ideals directly relate to the goals of Collingwood Children's Farm.

In contrast, Waldorf School methodology focuses on teaching creativity and imagination through the exploration of nature, but educators have a more direct role compared to Montessori Schools (Edwards, 2002). The school reconnects students with the world surrounding them and fosters an ability to see natural beauty in everything (Easton, 1997). The schooling method divides its education into seven-year segments. The first segment (ages zero to seven) aims to connect children to the world through physical connections and storytelling. Each topic is taught through many different artistic activities led by the teacher (Easton, 1997). These activities may include singing, art, acting and outdoor activities.

### 2.2.3 Outdoor Education

A healthy outdoor learning experience is a valuable supplement to the traditional and standard methodology of an indoor learning environment. Children exposed to outdoor education showed more interest in environmental stories and tended to respond negatively to seeing litter thrown on the ground (Nawaz & Blackwell, 2014). In another study on the impact of outdoor education, researchers discerned that children who spend time in outdoor educational environments develop stronger social abilities and more positive mentalities (Elliott & Chancellor, 2014). A collection of many different environments can provide these beneficial experiences.

The Collingwood Children's Farm focuses on sustainability, a topic that is not well represented in the current Australian curriculum, due to the mindset that children cannot make a useful impact on the protection of their environment (Ärlemalm-Hagsér & Davis, 2014). However, children's imaginations generated unique solutions to issues presented when given information about sustainability in the world in an engaging manner (Caiman & Lundegård, 2018). The children studied were between the ages of four and five, directly matching the intended audience for the experiences on the farm. Thus, there is a clear need for expanded education on this topic.

Gardening is a type of outdoor education which relates directly to work done on the farm and corresponds to numerous mental benefits. The act of gardening has also demonstrated itself to be an excellent exercise in learning responsibility and social skills (Kingsley, Foenander, & Bailey, 2019). Taking care of a plant gives both children and adults a sense of purpose, responsibility, and identity (Kingsley, Foenander, & Bailey, 2019). The sense of achievement, social interactions, and natural surroundings enjoyed by joining a community garden can act as a stress reliever to counteract the fast pace of city life (Kingsley et al., 2019). These positive responses encourage children to keep gardening and find others with similar interests. Community gardens are a good place for people to make friends and find positive role models (Kingsley et al., 2019; Ober Allen, Alaimo, Elam, & Perry, 2008). Furthermore, studies have shown that becoming involved in community gardens has a positive impact on youth's nutrition as they learn about plants' use in food and recipes that contain them (Ober Allen et al., 2008). However, to ensure that children are getting the most out of an outdoor experience, an educator must understand the strengths and benefits of that which they are teaching.

Similarly, camping is an excellent resource for both educational and therapeutic experiences for children. It relates to farming in that both activities rely on establishing knowledge of the natural environment and sustaining oneself through it. Australia saw the rise of camps as a form of education through the New South Wales education department. These camps served children as a way of experiencing a more diverse lifestyle divorced from the growing city environments. Their director also noted the social fellowship arising between the children, as well as the strength of the impressions the camp left upon them. This educational experience also sought to instill within the children a desire to conserve and appreciate the local flora and fauna. These camps acted as consistent proof throughout the twentieth century that, "outdoor education was seen to fulfil a range of important socio-moral learning objectives that varied over time" (Georgakis & Light, 2010).

Therapeutically, long term camping experiences fulfill a child's need for "safety, belonging, achievement, power, purpose and adventure" (Cooper & Jobe, 2007). While camping, a child has numerous constructive, positive social interactions to overcome the challenges that nature presents to their group. These accomplishments provide the children a sense of the positive contributions they can make to their surroundings, as well as a feeling of responsibility and strength (Harper, 2017). Much like gardening, outdoor education relative to camping has demonstrated itself to foster positive feelings for environmental stewardship, social interaction, and personal responsibility.

## 2.3 Outdoor Education in Practice

Given the analysis of children's education, it is also essential to examine what methods other nature-based education organizations have implemented to benefit their visitors. Inspiration for the activities we are developing for the Collingwood Children's Farm can be taken from these other programs (see Appendix A). The Turn Back Time Farm in Paxton, Massachusetts is a

primary example of an alternative teaching preschool (Turn Back Time Farm, 2020). The preschool promotes the benefits of a connection to nature such as increased emotional well-being, empathy, and curiosity, by allowing the children to roam the farm freely.

Many places strive to incorporate interactive activities when educating children about science and nature. Some examples from the United States include the Ecotarium in Worcester, Massachusetts and Wolfe's Neck Center in Freeport, Maine. The Ecotarium is a science and nature-based museum that engages children through both indoor and outdoor "explorations" (Ecotarium, 2019a). In the preschool lounge, children can pretend to be a wildlife keeper by weighing and feeding a stuffed animal and examining actual animal X-rays to foster an appreciation for wildlife (Ecotarium, 2019b). This ties in with their mission to expose children to the many animals who call the Ecotarium their home, including mountain lions, owls, skunks, porcupines, turtles, and bald eagles (Ecotarium, 2019a).

Similarly to Collingwood, Wolfe's Neck Center offers many programs for children in a farm setting (Wolfe's Neck Center, 2020). To promote responsibility and a love of animals, the farm has a "farmer for a day" program for children two and older to help with the morning chores such as feeding the animals. Farm storytime is another popular activity, where children's imaginations can roam as they listen to creative stories about the animals on the farm.

The knowledge of effective, nature-based education methods for the farm's target age group was integral to forming a functioning and project-specific methodology moving forward.

## 3. Methodology

Our mission was to help Collingwood Children’s Farm engage children and their families in interactive, play-based learning by developing an interactive map to encourage children to explore new areas of the farm and a collection of self-led, educational activities to supplement on-farm experiences. We accomplished our mission by completing four key objectives:

1. Describe existing farm activities and programs
2. Develop a system to guide farm visitors to new and enriching points of interest
3. Develop a suite of resources to guide hands-on and online, educational activities for the farm
4. Facilitate future maintenance and development of the repository of resources

Due to the COVID-19 pandemic, which prohibited international travel during the project term in early 2020, our project was conducted remotely through interactions with the staff of Collingwood Children’s Farm. The farm ceased non-essential operations during this time in accordance with government policies, influencing choices made throughout the course of this project. This project took place from March 25th to May 13th of 2020.

### 3.1 Describing Existing Farm Activities and Programs

The farm is a complex network of animals, employees, and activities that all interact to create a positive visitor experience as well as a functional farm. To accurately determine the appeal and educational value of each exhibit, we **gathered information and resources** about the farm and its programs by reaching out to available farm staff. This informed the development of our map and activities later in our methodology. Due to precautions taken to impede the spread of the COVID-19 virus, the farm temporarily ceased operation. This limited the number of employees we were able to contact. Our primary contact at the farm, Sev Darwell, recommended specific employees to reach out to based on the information we sought, if he was unable to provide the answers himself. We consulted with an Animal Husbandry Farmer to obtain the pictures and associated names of all the animals on the farm. We contacted the Community Outreach Coordinator to receive all the farm’s promotional videos of the animals and activities. We also received information about the different paddocks from a long-time farm volunteer. Overall, this information gave insight into what types of educational activities and experiences the farm hopes to provide.

### 3.2 Developing a System to Guide Farm Visitors to New and Enriching Points of Interest

We **developed an interactive map** for the farm to provide a virtual farm experience. When choosing how to represent the map, we analyzed different visual styles. The Collingwood



with the newest version of WordPress. We decided upon the **MapSVG plugin** as it fulfilled all the necessary features, provided up to date documentation, and had a low one-time fee.

### 3.3 Developing a Suite of Resources to Guide Hands-on and Online, Educational Activities for the Farm

We created a collection of hands-on activities and online games associated with each area we wished to highlight on the farm. This collection will continue to provide an avenue for nature-based interaction and education during quarantines caused by the outbreak of COVID-19, or other restricting events, and render the farm's teachings more accessible in the long run. It will also increase interest among those planning to visit the farm in person. We created a list of activities and games for each of these areas, targeted at different age group ranges. These activities were conceived with an emphasis on educational messages related to environmental stewardship and/or the ways in which the Collingwood Children's Farm practices sustainability in food development.

The activities we developed needed to appeal to a range of target audiences, specifically the age range two through seven years. Due to the instructional nature of these activities, making the instructions as clear and accessible as possible was a priority. Additionally, there is a massive developmental gap in between these age ranges, so some of these activities needed to be explicitly directed at the younger children (two through five) or the older children (six and seven). In addition to the developmental advancement in this older age group, these children would typically be visiting the farm in the context of a school-based field trip. Thus, this age range has a higher educational content need relative to other visitors.

Once a sufficient list of new ideas was compiled and evaluated, we iteratively worked with management on the farm to elaborate on these ideas and further inspect their entertainment and educational values relative to their target audience. The activity categories include:

1. Online Games
2. Coloring Pages
3. Hands-on Nature-Based Activities

We created each activity in a digital format so others can access them on the website. The instructions for each activity were written to be easily comprehended. We also created visual guides and examples to showcase the end product of each activity. In addition, we saved all files in easy to access formats to make sure that technology did not hinder access to the different activities.

#### 3.3.1 Online Games

To brainstorm, we presented a small selection of game ideas, accompanied by learning objectives and relevance to the farm. We drafted the games as prototypes in Unity and created an



asset list for each (see Appendix C). Afterwards, we brainstormed ways to improve each game based on a questionnaire generated through research on UI for children (See Appendix D). We distributed this questionnaire to a convenience sample of educators from the United States and Australia through an anonymous google form. Due to the movement of classes online placing a strain on teachers, we were limited to teachers our team and sponsor knew through personal connections.

We added sound to our games to improve the clarity of their feedback and enhance their aesthetic. To obtain these various audio clips, we edited existing audio downloaded from Freesound.org. Credits to all authors of original sound effects are found in Appendix E.

### 3.3.2 Coloring Pages

We sketched the coloring pages in reference to animals on the farm using the free Sketchbook software. In certain cases, the details of the image were altered to create a more visually interesting, and comprehensible image. These details included fur/feather texture, stylized grass, and backgrounds.

### 3.3.3 Hands-on Nature-Based Activities

The first step in creating the instructions was to decide what activities could be shared in infographic form. We already had a list of interesting activities from our background research, unfortunately, due to the remote nature of the project, many of these activities could not be effectively converted to infographics. The new infographics started with a brainstorming session, which included input and ideas from our sponsor. We also looked at online catalogues to see what other popular activities already existed and could be modified to fit the farm.

Creating the activity themselves started with educating ourselves on the topics. We thoroughly researched each activity to ensure that the information being conveyed to the children was accurate. Then, each set of instructions underwent review by the IQP team and sponsor. It was important to consider the audience of these activities; The instructions needed to be simple enough to be understood by a young reader, but specific enough to ensure this reader's success.

Finally, we integrated these instructions into a stylized format using Canva, a free online infographic development tool, for formatting and visuals. Again, special consideration needed to be made to make each infographic interesting and engaging for young readers, but still clear and easy to follow. The IQP team and sponsor both reviewed each infographic for a final time before being posted to ensure their quality.

### 3.4 Facilitating Future Maintenance and Development of the Repository of Resources

The implementation of the website and interactive map comes with **full and clear documentation, including instructions for modification and simple additions**. Farm staff should be able to alter suggested activities without extensive knowledge of programming or implementation. This reduces the workload of the farm employees and management while allowing them to easily enable and disable activities in parallel with the state of the farm as it develops and changes over the seasons and years to come. Additionally, we provided the Adobe Illustrator map base, the links to the editable Canva files for each of the at-home nature activities, and the GitHub account passwords, allowing farm staff to make modifications to the base map and each of the activities as the need arises.

## 4. Deliverables

Through multiple discussions with our sponsor, we were able to determine that the farm values encouraging exploration, curiosity, and independence among its visitors. They do not publish a set daily schedule online because they do not want visitors to come to the farm expecting to constantly be entertained by someone. The farm is a large place with so much to explore if visitors slow down and appreciate their natural surroundings. Since children could not access the farm during the time of our project, we sought to teach them to slow down and appreciate the nature around their home instead through our activities, encouraging the lessons the farm hopes to impart during visits. The farm believes that children can derive a lesson from any part of nature, inspiring for both larger scale and brief activities. These discussions formed the framework for our final deliverable. The sections below describe the **website** housing the **interactive map** and created **activities**, as well as the **future maintenance plan** for development of these resources.

### 4.1 Website

The website existed as a temporary home to the interactive map and educational resources while the farm's new website was under development. On its home page, viewers can see an archive of all the educational resources hosted on the website in a blog-style format (Figure 13). Each of these activities has a title, tags, an excerpt, and some include a featured image. The clickable tags indicate what age group the activity is for, whether it requires parental support, and themes the activity encompasses. If users click on a tag, they will be taken to a list of all activities associated with that tag. The excerpts are meant to give the user brief information about the activity and entice them to try it out, without displaying all the instructions on the main page. When the user clicks on the title, they are taken to the activity page to get the full instructions and links to any necessary resources.

The right sidebar of the main page includes a smaller version of the interactive map, so that users can navigate it while looking at the activities, and a search bar to search for a specific activity (Figure 14). Additionally, the footer of the website includes the farm's Facebook page; we wanted to highlight the farm's frequent promotion of activities and events on their social media accounts.

To access a larger version of the aforementioned interactive map, users can click a button in the top header menu, which takes them to a page exclusively for the map.

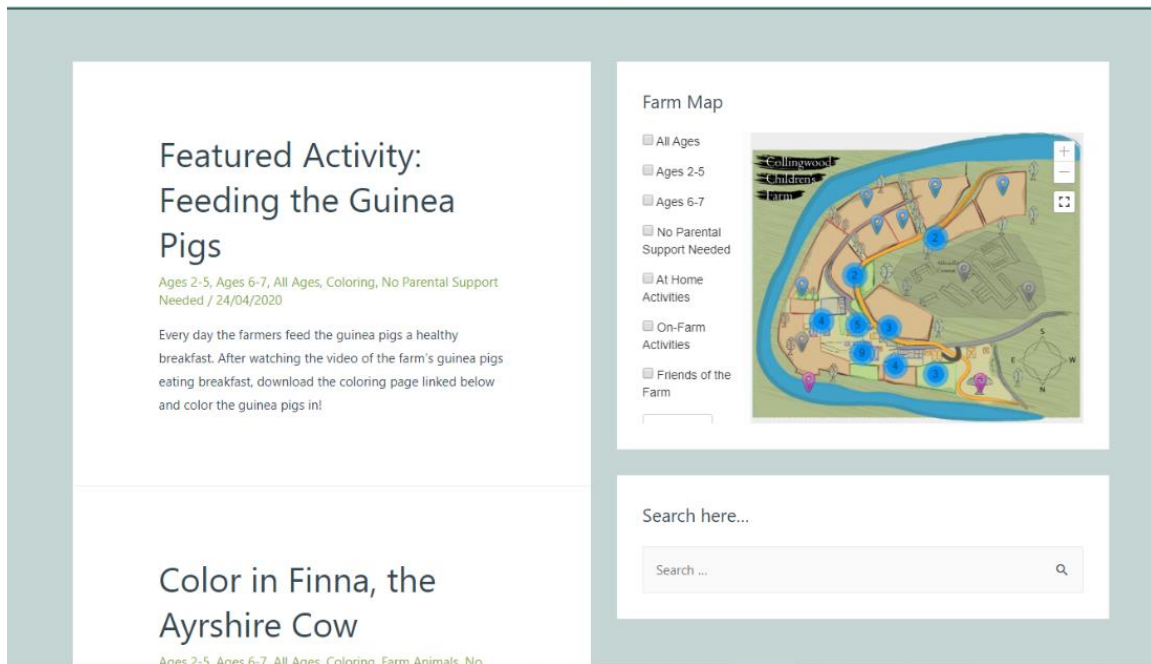


Figure 14: Website homepage

The website launched on the farm's Instagram and Facebook account at 9 am on Friday, May 1st AEDT. On the first day, the website had 81 visitors and 149 views, which averaged out to 1.84 views per visitor (see Appendix F). After this initial spike, the number of visitors decreased on the following days. Additionally, not all the visitors to the website are likely to translate into farm visitors, as we had a large percentage of views each day from countries other than Australia, making their ability to travel to the farm unlikely, especially in light of COVID-19. Over the course of five days, the activity map and home page garnered the most views. However, visitors viewed a large variety of activities. No activity had greater view consistency across more days than the rest to suggest that it was more popular than the other activities.

## 4.2 Interactive Map

The map's stylized appearance creates a visual appeal that should be easy for children to comprehend, while still being accurate (Figure 15). We used a paint brush and pencil stroke to outline each building, paddock, and road. We also simplified the representation of the trees to prevent visual clutter.

## Activity Map

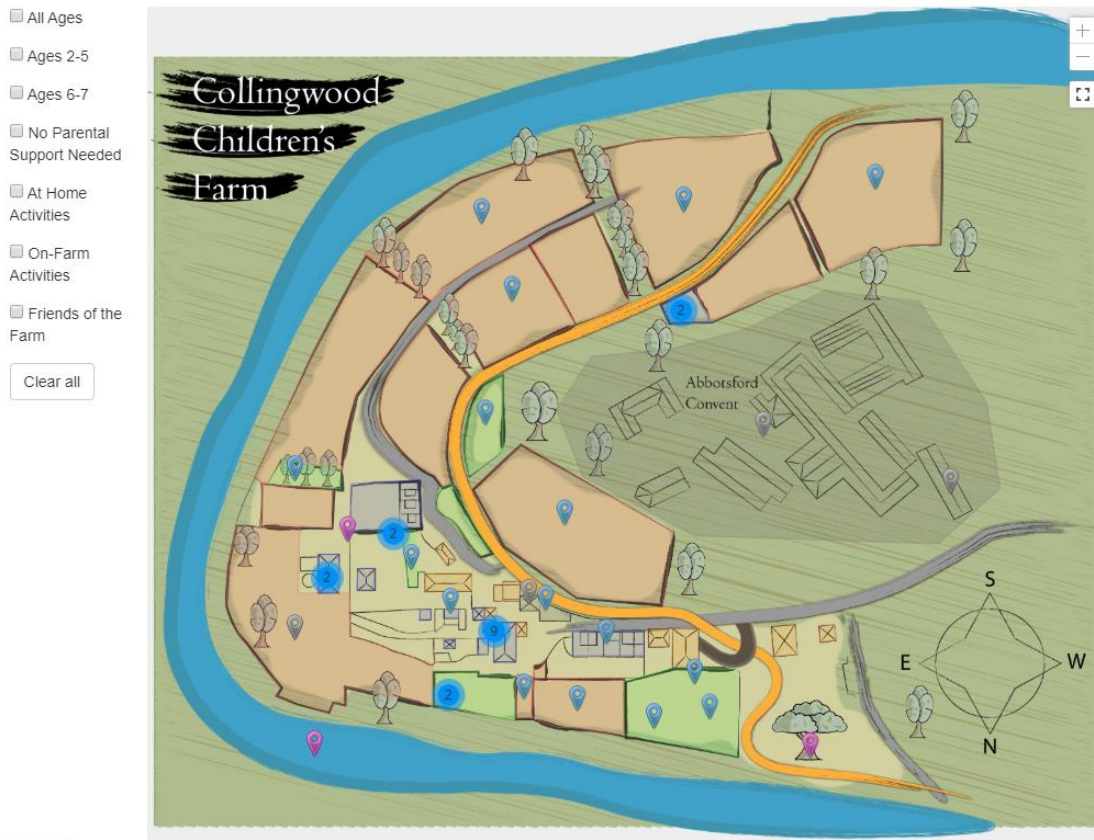


Figure 15: Interactive Activity Map of Collingwood Children's Farm

The map also features a few buildings that are not directly related to the farm. The Abbotsford Convent and Arts Precinct are foundational buildings in the area that have not been represented in previous Collingwood Children's Farm maps. Their inclusion in the map reflects the farm's support and helps those who use the map to more accurately orient themselves.

We added the interactive components of the map using the WordPress MapSVG plugin. Within the plugin, we highlighted each area in the map with a different color to denote its significance (Figure 16). In addition, we added different colored pins at various locations (Figure 17).








Area Key	Marker Key
 Paddocks	 At Home Activity
 Animals	 On Farm Activity
 Vegetation	 Friend of Farm
 Farm Buildings	

Figure 16 (left): Area color legend  
Figure 17 (right): Marker color legend

To gain more information, a user can move their mouse over the different areas of the farm (Figure 18). When the mouse goes over an area, the color brightens, as a form of visual feedback, and the name of the area appears in text. Upon clicking on the area, a new screen will appear with more information (Figure 19). This information may include general descriptions, pictures, videos, and links to other associated resources. The information for any pins associated with the area will also appear in this screen. A user can click on each individual pin for information and a link to the associated activity.

The display of the map can be changed by altering the magnification of the map or by utilizing the different filter options on the left side of the map. The user can zoom into any area of the map using the plus and minus buttons in the top right corner of the map. While fully zoomed out, pins that are within a close proximity will cluster together to declutter the map. When zoomed in, the pins will spread out to their exact locations. The pins that appear can also be filtered by age, need for parental supervision, type of activity, and partnering organization. These search parameters encompass all the pins currently shown on the map.

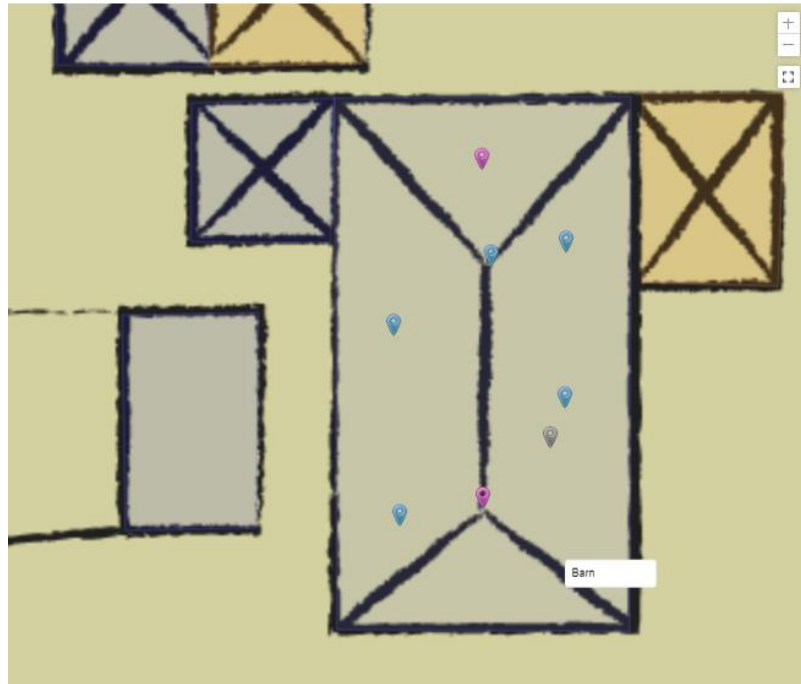


Figure 18: Map zoomed in on Barn with visual hover feedback

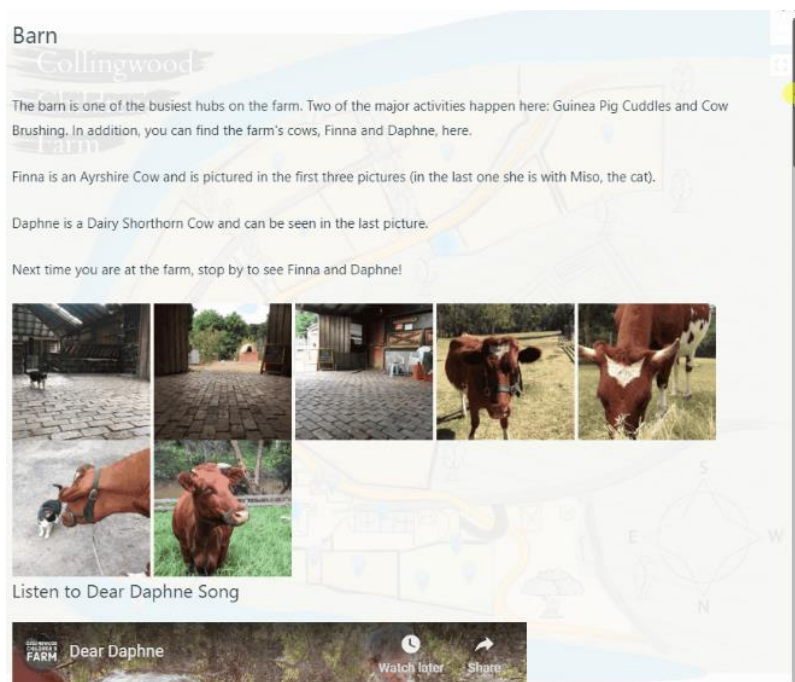


Figure 19: Information popup that appears upon clicking barn area

## 4.3 Activities

A total of 31 activities were developed. These activities were categorized into three different categories:

1. Online games
2. Coloring pages
3. At-home nature-based activities

Each category has multiple associated activities, and each activity, identified by a blue pin on the interactive map, can be accessed at the URL <https://ccfarmmap.com/>.

### 4.3.1 Online Games

We implemented two interactive online game experiences. These two games are: Guinea Pig Cuddles and Grow Your Own Garden. These games received several iterations, based on adviser feedback, sponsor feedback, inter-group feedback, and the feedback of several individuals with farming and/or education-based work experience. The results of the latter group are detailed in Appendix G. The games are accessible through the website and links in Appendix H.

The first game, Guinea Pig Cuddles, is a simple game targeted at the age range two through five. We based the game on the popular Collingwood Children's Farm activity of the same name. We created this game to both excite children about their eventual visit to the farm and teach them about Guinea Pigs. The primary lesson of the game is to teach them how to properly pet Guinea Pigs, so that they are more experienced in handling Guinea Pigs on the farm in person. Moreover, kids will learn about the Guinea Pigs' diet. This lesson primarily encourages children to eat more fruits and vegetables themselves.

The game begins with a screen containing a bell, a guinea pig, and a help button (Figure 20). A voice conveys the instructions for this screen of the game: to pet the Guinea Pig in the correct direction (snout to tail). By doing this, the player will accumulate points, displayed on the top center portion of the screen. Petting the Guinea Pig in an incorrect direction will cause points to be subtracted, but never fall below zero.

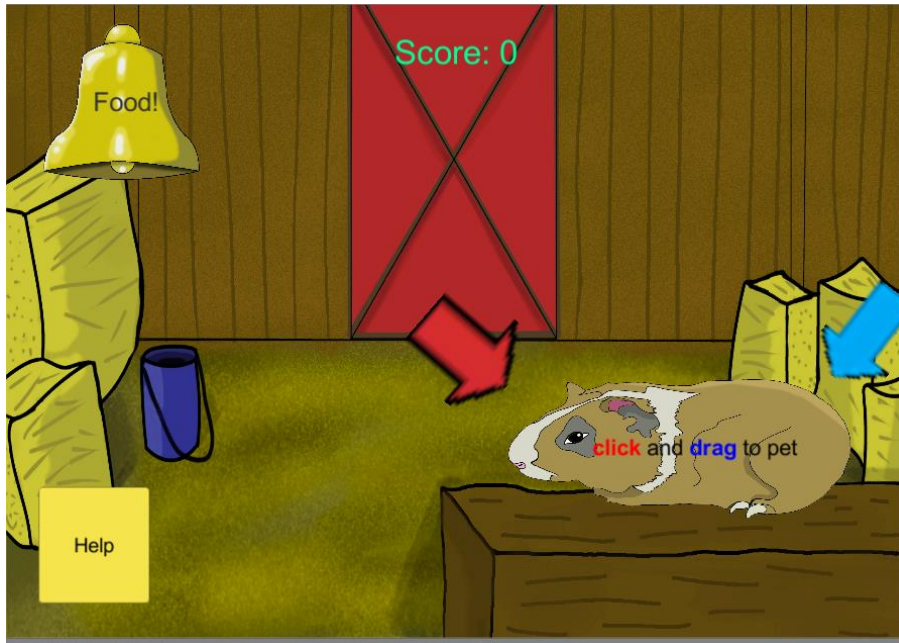


Figure 20: Petting Page of Guinea Pig Cuddles Game

Clicking the bell will bring up a food menu (Figure 21). This food menu contains various treats for a Guinea Pig. The Guinea Pig comments on these treats and encourages the player to enjoy these fruits and vegetables as well. These comments and interactions are to fulfill the learning objectives involving a Guinea Pig's diet, as well as the encouragement to eat fruits and vegetables. Overfeeding the Guinea Pig with any one food item will cause points to be subtracted, and the Guinea Pig to respond negatively. This aims to reinforce the lesson of enjoyment in moderation, as fruits have a high sugar content for Guinea Pigs.

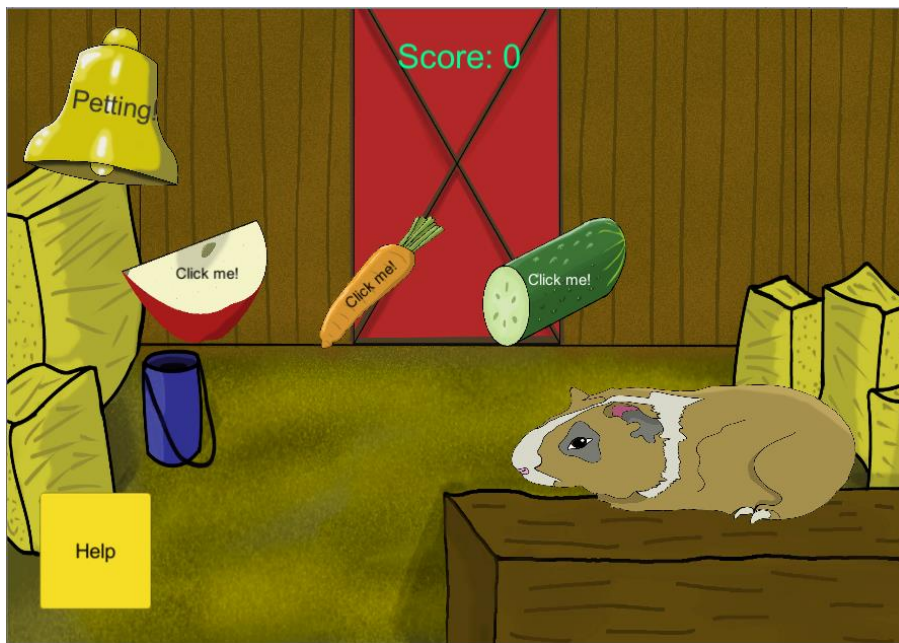


Figure 21: Feeding page of Guinea Pig Cuddles Game



The second game, Grow Your Own Garden, is a more complex game that we designed to appeal to the age range five to seven. Collingwood Children’s farm does a lot of crop growing and has its own gardens, both of which are the inspiration for this game. The primary learning objective of this game is to convey that plants are living things which need food and water. The game teaches kids this by walking them through the basic gardening process, which involves fertilizing, planting, and watering. The Grow Your Own Garden game also has some Collingwood Children’s Farm specific content, such as May-Bell, a pig on the farm. The game also utilizes crops that the farm grows as a source of income.

The primary user interface elements of this game are a patch of ground in the center, a toolbox on the right of the screen, and a dialogue box on the top of the screen (Figure 22). The patch of the ground is the area in which the player can garden. The toolbox on the right of the screen lets the player of the game access different functionalities related to gardening. The dialogue box at the top conveys information about how to proceed in a manner that allows crops to grow in the center of the screen. The dialogue box also affords the player information pertaining to the learning objectives of the game.

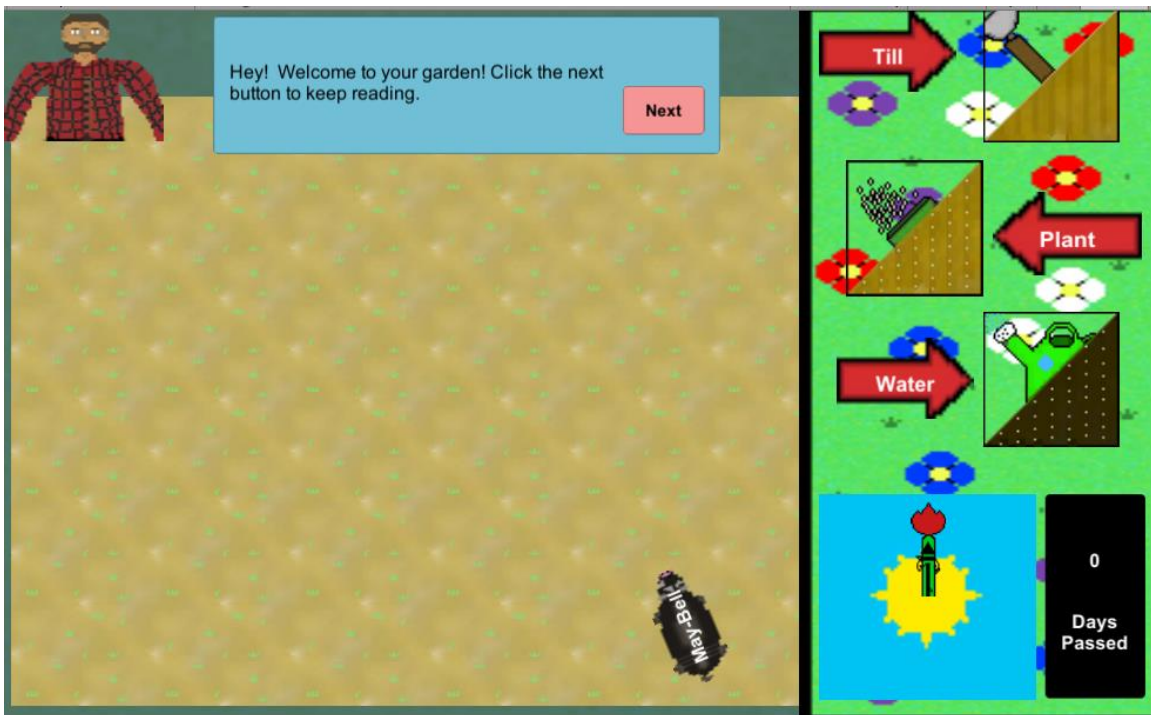


Figure 22: Home Screen of Grow Your Own Garden Game

The gameplay starts with May-Bell the pig wandering around the center of the screen. In this state, the player can only read the dialogue at the top of the screen. This dialogue handles how the pig can fertilize the ground, preparing it for the player’s successful gardening. After the player has read through the dialogue, signified by interacting with a “next” button, the ground will appear fertilized. The player will then receive instructions on what to do next: till the land using the hoe tool, accessed within the toolbox on the right. The player can use this tool to left

click on the ground in the center of the screen to break the dirt, allowing seeds to be planted. After doing this, they can select the seeds button, also within the toolbox on the right of the screen. This will visualize a secondary menu, where the player can select various crops that they would like to plant. After doing so, they may click on tilled patches of the ground to plant seeds. The tiles with seeds planted on them display the icon of the fully grown plant. Next, the player can select the watering tool located within the toolbox. The watering tool allows the player to give the crops water, which is essential to their growth and development. The dialogue box at the top continues to link this to the primary learning objective of the game. After the player has given their crops enough water, they are able to wind the clock within the toolbox in a clockwise direction, progressing time and allowing the crops to grow (Figure 23).

There are several failure states that the player may encounter for a given patch of ground. If the player does not water the seeds, or overwaters them, then crops will not grow on that tile of ground. This teaches the player that crops need the water to survive, but too much can be a detriment to them. Additionally, if the player does not interact with May-bell via a click, then May-bell will eat all crops once fully grown. This teaches the player that there is an appropriate time frame to allow animals to interact with plants.



Figure 23: Grow Your Own Garden Game; land after the user has planted some crops

We also received several suggestions to improve compatibility with the target age group, as well as enjoyment. These suggestions included a voice over to give instructions on the Guinea Pig Cuddles game, clarifying certain functionality in the Grow Your Own Garden game, and updating various text formatting. These changes were implemented for the final version that is seen on the website currently.

### 4.3.2 Coloring Pages

To foster a connection between children and the animals on the farm, we created animal coloring pages. We sketched each coloring page from pictures of the farm's animals (Figure 24). In total, 15 coloring pages were created. The different pages vary in complexity of detail (from a single animal to an entire scene), so there are coloring pages suited for every age between two and seven. The complete collection of coloring pages can be found in Appendix I.

The goal of the coloring pages is to allow for children to become more familiar with the farm's animals. As the children color in the contours of the animal's shape, they will gain a better understanding of the physical traits of that animal. Some coloring pages also contain educational elements such as allowing the children to label the different parts of the depicted animal (Figure 25). The farm values children forming a strong understanding of the different farm animals, and they appreciate children connecting with the current animals on the farm.

Ideally, children will color in a photo and recognize that animal when visiting the farm, and they will become more interested in the actions of that farm animal.

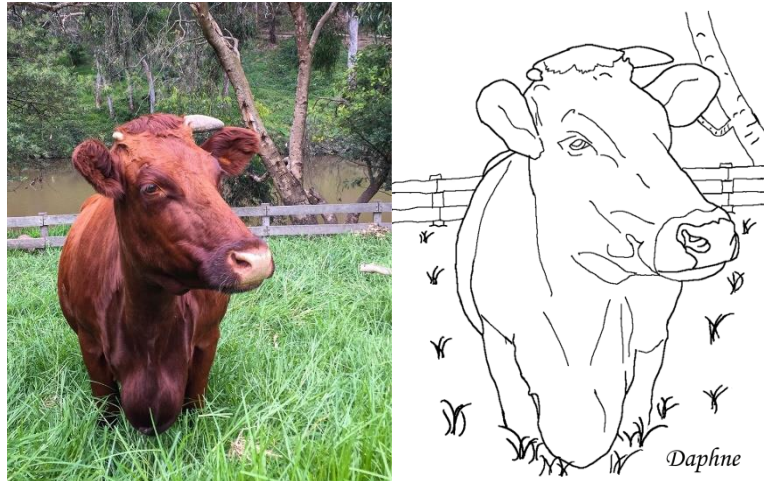


Figure 24: (left) Daphne, a Dairy Shorthorn Cow, at the farm (Collingwood Children's Farm Facebook Page), (right) A coloring page of Daphne

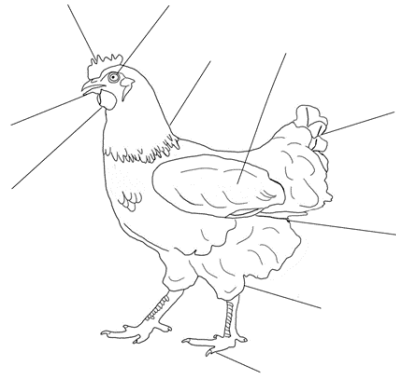


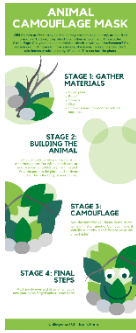
Figure 25: A coloring page of a chook (chicken) with a word bank for children

#### Word Bank

Eye	Vent	Claw
Hackles	Tail	Wattles
Beak	Comb	Thigh
Wing		

### 4.3.3 At-Home Nature-Based Activities

A total of 15 infographic activities were created, each one focusing on a different aspect of nature-based education. The full-sized infographics can be found on the website, and in Appendix J. The following list briefly examines each infographic in alphabetical order:



**1. Animal Camouflage Masks:** This simple infographic is for children ages two through five. The activity is about understanding camouflage. In this activity, children decorate an animal cutout with natural elements to help the animal stealthily hunt prey or hide from predators. This activity helps children understand why farm animals look the way they do and encourages creativity while crafting with natural elements. This activity will involve an adhesive, but many glues are child safe. Parental supervision is only required to minimize mess.



**2. Building Farm Animals:** This infographic outlines a simple activity that encourages children, likely ages two through five, to use natural elements and their creativity to model a farm animal or design their own. This activity will require adhesive, but this is a low risk as described in the above activity.



**3. Catalogue Sort:** In this infographic, children take a closer look at grocery catalogues and sort out where each product comes from. This is meant to help children think critically about their food, and the role farms and animals play in keeping our society well fed. This is a more challenging and independent activity meant for children of older ages, such as six and seven years old. This activity requires scissors and glue, but most children of this age know how to use these tools properly. Still, a parent may want to take these tools into consideration. Melina Newman, a teacher who works with the farm, provided the instructions for this lesson.



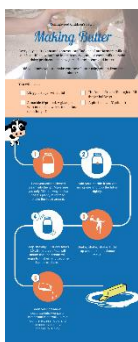
**4. Create a Barometer:** This activity teaches a child how to make a barometer, a device used for measuring changes in pressure. It also explains how to use the barometer to predict the weather. Predicting the weather is an important part of preparing for its effects on the farm, as seen more explicitly in other weather-based activities. This activity briefly touches on more complex sciences behind weather, such as air pressure. Thus, this activity is better suited for the older age group of six and seven-year olds. This activity involves working with glassware, scissors, and rubber bands. Parental supervision is advised.



**5. Gardening Tips and Tricks:** This infographic has four different tricks for keeping a garden healthy. The first two pertain to “feeding” a garden, and making sure plants get the necessary nutrients to remain healthy. The other two focus on protecting a garden. Specifically, how to make natural pesticides and fungicides that will not damage the soil or harm the environment. This is key for understanding the importance of the farm, and the ideals behind farm methods. Children may use these techniques in their own garden or when helping with a parent’s garden. None of the materials for these home remedies are dangerous, although the peppers may cause mild irritation if handled improperly. However, children of all ages may need help collecting and applying these materials.



**6. Honeybees:** This infographic teaches children the anatomy of a honeybee by guiding them through drawing their own bee. It also explains how each part of the honeybee helps it in its missions of pollination and honey making. Honeybees are kept on the farm and are a big part of the farm’s ecosystem. Understanding bees makes them less frightening to small children, but these are complex creatures and are better understood by older age groups, such as the six and seven-year-olds. The infographic does not encourage interaction with the bees, but the crafting activity will require the use of scissors and glue, and thus a little parental supervision. In addition, the child might want to investigate more examples of honeybees, so the instructions advise safe internet usage. Melina Newman, a teacher who works with the farm, provided the instructions for this lesson.



**7. Making Butter:** This infographic explains how to make your own butter in a fun and exciting way. It includes references to the farm’s own butter making workshops for added fun. Making butter can be a difficult process, requiring patience and endurance not found in younger children. This activity is for children ages six and seven. While there are no inherit dangers involved in this project, parents may want to keep an ear out in case their child drops the butter shaker. Melina Newman, a teacher who works with the farm, provided the instructions for this lesson.



**8. Nature Scavenger Hunt:** This infographic activity encourages children to better explore their environment to find the natural objects on this list. Many of these things are present on the farm, and this is a great way to encourage natural exploration of the farm’s many interesting areas. However, this can also be done in many other outdoor areas. Parents need not be involved in the activity, but it is a great way to explore together. Melina Newman, a teacher who works with the farm, provided the instructions for this lesson.



**9. Parts of a Plant:** This infographic covers the anatomy of a plant and provides important lessons on how plants contribute to the circle of life. While this infographic’s activity is simple, it does cover more challenging topics about the food cycle, making it ideal for children six and seven. Melina Newman, a teacher who works with the farm, provided the instructions for this lesson.



**10. Shoebox Farm:** This infographic is about animal care. Children can create a modular shoebox farm, where each pen is made from a shoebox or similar object. Children are encouraged to learn about the habits of each of their animal friends and build a habitat that is best for each one. This is a great way to understand how the farm cares for its animals. There is a great deal of creativity involved in this activity, as the animal pens can be as simple or complex as the child desires. Due to this nature of the activity, children of all ages can make their own animal pens, though more ambitious children may need their parent’s help with tools.



**11. Starting a Garden:** This infographic covers the basics of caring for your own plant. It uses a radish as an example, but also includes resources for more instructions on other types of quick growing plants. This activity aims to help children understand a plant’s life cycle, and our relationship with plants and farms as a source of food. It also can teach children the importance of caring for a living thing. This activity will need parental supervision due to the complexities of growing a plant in one’s home but caring for the plant can be carried out by children of all ages.



**12. Water Cycle:** This activity teaches children about the stages of the water cycle and encourages a child to draw their own representation. This activity aims to help children think about water, how important it is to conserve, and its role in keeping farms green and crops growing. The water cycle is complex and aimed at children six and seven years old. Drawing a water cycle should not need parental supervision.



**13. What's the Weather?:** This infographic encourages children to pay closer attention to the weather, and how it affects their environment. The activity provides a calendar where children can mark what the weather is for each day. Using this chart, children can visualize how seasons affect crops as well as wild plants and animals. This makes children more cognizant of the weather and how it affects the world around them. This chart is great for children of all ages, and does not require parental supervision, but children might need parents to remind them to fill out the chart the first few days.



**14. Worm Farms:** In this infographic, children will learn the steps for creating a worm farm. Optional tips and fun facts are present to improve the worm farm. The goal of this infographic is to teach children the essentials of building the worm farm and understanding the role worms have in decomposition and the vitality of the soil. Having rich, healthy soil is imperative for having a strong farm. Additionally, Collingwood Children's Farm uses worms for composting. This is a more complicated setup than many of the other activities, and will require fair parental supervision, with children ages six and seven years old.



**15. Worm Farm Maintenance:** This is an extension of the "Worm Farms" activity. While "Worm Farms" covers the creation of the farm, this focuses on caring for the worm farm and optimizing its usage. This activity aims to cover caring for living things and provide a greater understanding of the worm's life and lifecycle, demystifying what many young children consider to be "gross." Worm farms require greater upkeep than plants, but still should be accessible to children ages six and seven years old. Children can take a greater role in this activity than the "Worm Farms" setup, but parents may need to supervise some of the more challenging activities, like changing the soil, to ensure the safety of the worms.

## 4.4 Maintenance Plan

Following the completion of the map and activities, we helped the farm transfer the map and activity pages from our website to their new website, which is currently in development. As our website was only meant to be a temporary home for these resources while the farm's new website was under development, it will be no longer accessible as of May 2021. At that time, the only way to access these activities will be through Collingwood Children's Farm's new website.

We created a maintenance plan which explains how to create a new map or edit a pre-existing map with the MapSVG plugin and how to edit the base map with Adobe Illustrator (see Appendix K). This maintenance plan includes links to five YouTube videos we recorded walking through the process of outlining areas, adding information to areas, creating markers, filtering markers, and editing map settings. It also includes a simple guide to the HTML tags that were used in the creation of the map with links to other HTML and MapSVG resources. Additionally, we created a booklet for map users to learn all the navigation features (see Appendix L).



## 5. Conclusion and Recommendations

Collingwood Children’s Farm aspires to offer activities and experiences that educate children about sustainable living and help them appreciate the beauty of nature. With an increasing number of visitors, and restrictions due to the COVID-19 pandemic, the farm is exploring other mediums to convey its lessons. The deliverables showcased in this report comprise a ready-to-use resource that will help the farm continue to educate its visitors in the near future amidst its closure. The interactive map creates a virtual connection to the farm and is immediately useful to allow children to connect with the farm while it is temporarily closed. The utility of this resource remains after these circumstances, however, as it will continue to promote exploration of the farm and reinforce any lessons that children learn from the farm in person. The interactive map also allows for people who do not live near Collingwood Children’s Farm to learn about its values.

Due to restrictions caused by the COVID-19 pandemic, we were not able to add information about the different paddocks located on the farm to the map. In addition, continued discussion with our sponsor developed new uses for the interactive map. We have provided a foundational resource that should be expanded with these recommendations:

1. Continue development of the nature-based activities and coloring pages
2. Label more unique points scattered across the farm
3. Finish integrating the resources associated with the paddock areas of the farm

The continued **development of the activities** for the interactive map will provide a refreshing experience for users who frequent the website. Initially, website visitors will be engaged with the variety of activities offered, but those resources are limited. As the farm grows, and seasons change, we recommend that the farm develop new thematically appropriate activities on a schedule to keep visitors interested in the farm's operation. As we know that the farm has limited time to devote to new activities and visitors can become overwhelmed with too many new activities, we recommend a minimum of one new activity or coloring page a month. This time frame gives enough time for development of a new activity, while keeping frequent guests engaged with the farm. The directions for development of these activities are outlined in Section 3.3.

**Labeling new unique points** across the farm will encourage further exploration of the farm by visitors. While we were unable to visit the farm in person, farm staff have an in-depth knowledge of the appeal of each area. Our sponsor shared some of the outstanding areas of the farm with us, and these locations were included on the map. These unique points are expressed as the purple pins on the interactive map and highlight areas for visitors to explore when they visit the farm. The further development of these points will continue to inspire visitors to seek out new areas of the farm. The video “Creating a Marker” in Appendix K contains instructions on how to add new pins to the map.

**Finishing integration** of the information about each paddock will complete the first version of the interactive map. We recommend that each paddock should contain information regarding the use and history of the paddock. Lastly, a picture of the paddock should also be included. The video “Defining Areas” in Appendix K contains instructions on how to add information to each of the paddocks. With these recommendations implemented, we anticipate the interactive map becoming a key component to help the farm inspire a curiosity in nature.

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## Appendix A: Visual Catalog of Interactive Activities

A visual catalog containing nature-based interactive activities found at other organizations during our research can be accessed here:

<https://docs.google.com/presentation/d/1kneuTI7z89ZsSI83WbNxymqNc8accDFWo-WjplELjx0/edit?usp=sharing>

## Appendix B: Website Requirements

The farm's website developer indicated that the farm's new website is a WordPress 5.4 website that utilizes an Astra theme and Gutenberg, so we were limited to WordPress mapping plugins. Based on his recommendations, we decided to create a WordPress website with these same specifications for development and testing purposes. We researched a variety of hosting companies to host our website and decided upon Bluehost, as it allows plugins to be installed with only the basic package. We registered this website at [ccfarmmap.com](http://ccfarmmap.com). We paid for the website through next year, as the website will hopefully be transferred to the farm's new website by then.

## Appendix C: Online Game Development

We decided that Unity would be an appropriate medium for programming the online games. Our group has experience working in this game engine, and it can be used to quickly prototype without extensive programming. Additionally, Unity can be compiled into WebGL, and thus can nicely be embedded within an existing website.

Since WordPress is unable to host WebGL games, we created a GitHub account to host the online games. Each online game was uploaded to its own public repository with a public GitHub page. The URL to each GitHub page was embedded in the map, linking users to each online game.



# Appendix D: Teacher Feedback Survey

## Consent

Hello! Our names are Brittany, Daniel, Jordan, and Ryan and we are collecting information about your experience with the two online games we have developed, relative to your line of work. We will be using the information from this interview to inform changes to the aforementioned games. By proceeding with this process, you consent to the potential that your responses on this form may anonymously appear in an academic paper.

## General

- Are you a teacher/do you have work experience related to education? **(Yes/No)**
- If so, what age range do you teach? **(Optional Number range)**
- Do you work on a farm? **(Yes/No)**
- Which country are you from **(US/Australia/Other)**
- Which game are you reviewing **(Guinea Pig/Grow Your Own Garden)**

## Sensory Appeal

- Do you feel that the game's appearance will trigger a positive reaction in the intended age group? **(Likert Scale 1-5)**
- Does anything catch the eye as being out of place? **(Open ended)**
- Does any aural component feel out of place? **(Open Ended)**
- Where, if anywhere, could more animations be added? **(List assets/descriptions of assets relative to game state)**

## Physical Appeal

- Is input naturally mapped (Do the controls feel directly related to the actions they invoke)? **(Likert Scale 1-5)**
- Does the game feel intuitive (Do responses to a player action make sense)? **(Likert Scale 1-5)**
- Can the player readily experiment with the controls? **(Likert Scale 1-5)**
- Does the player receive adequate feedback from their input? **(Open Ended)**

## Comprehension

- Does the vocabulary used feel appropriate for the target audience? **(Open Ended)**

## Learning Objectives

- Write what you believe kids can learn from this game. How can these lessons be conveyed more effectively? **(Open Ended)**

- What other lessons would fit into the scope of the game that could be emphasized? (**Open Ended**)

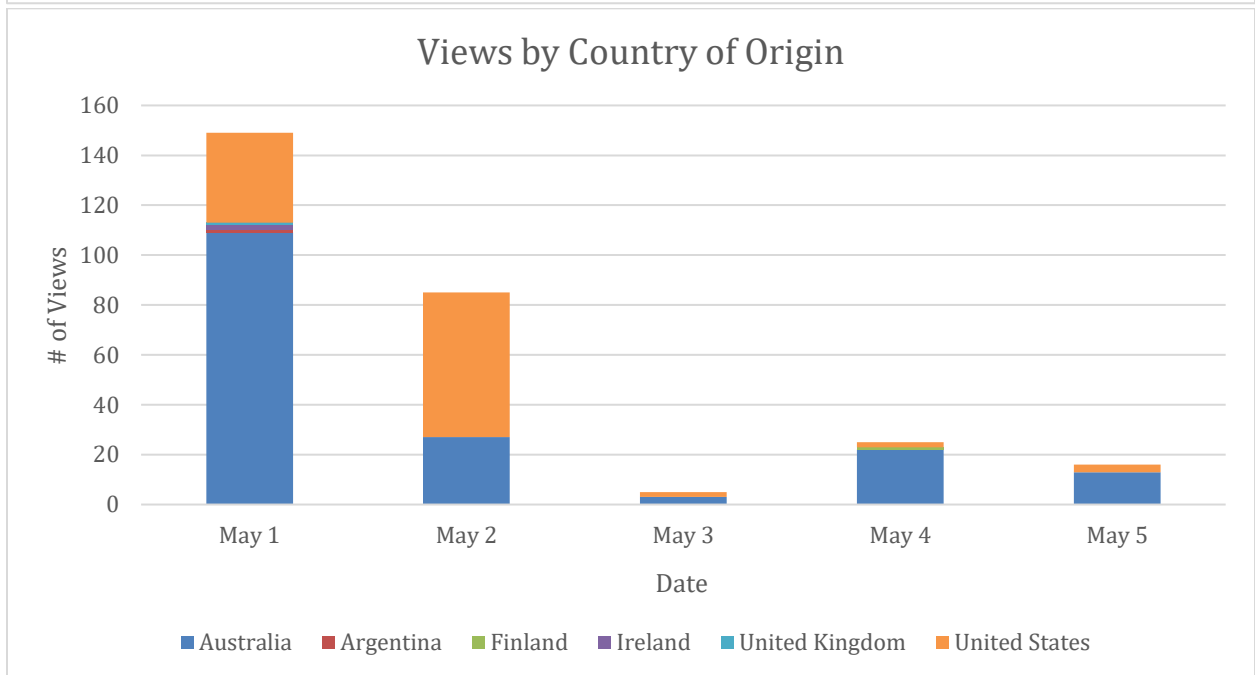
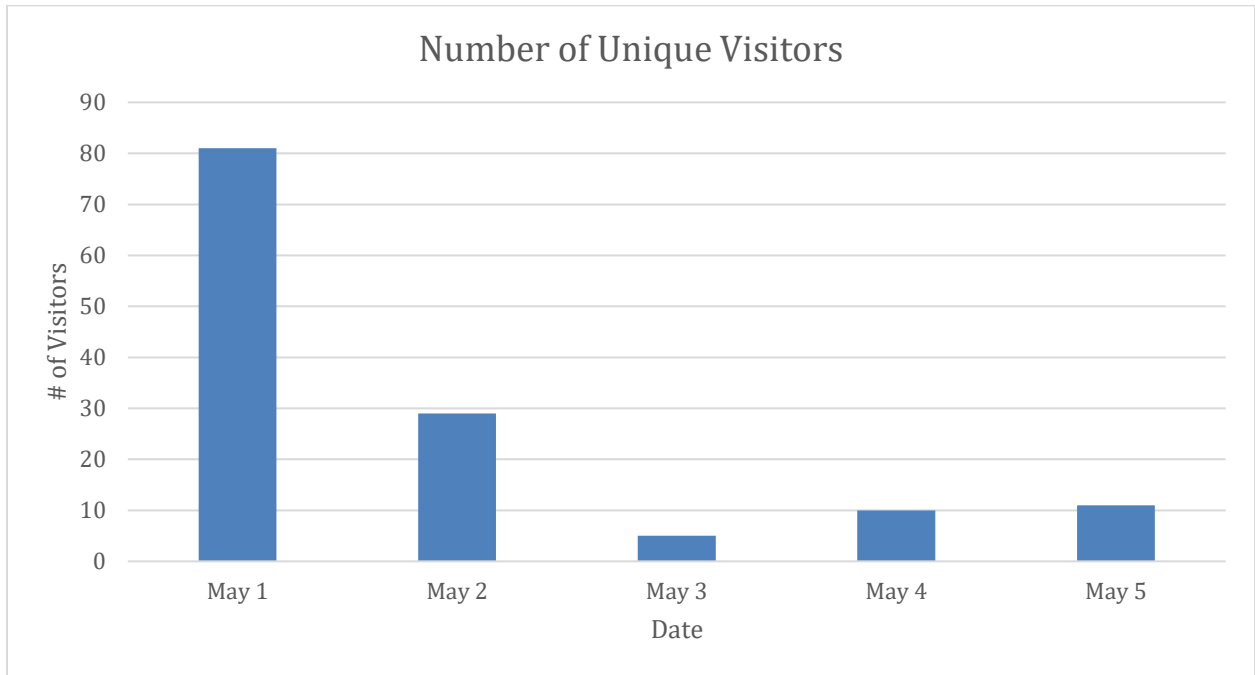
## Appendix E: Sound Effects References

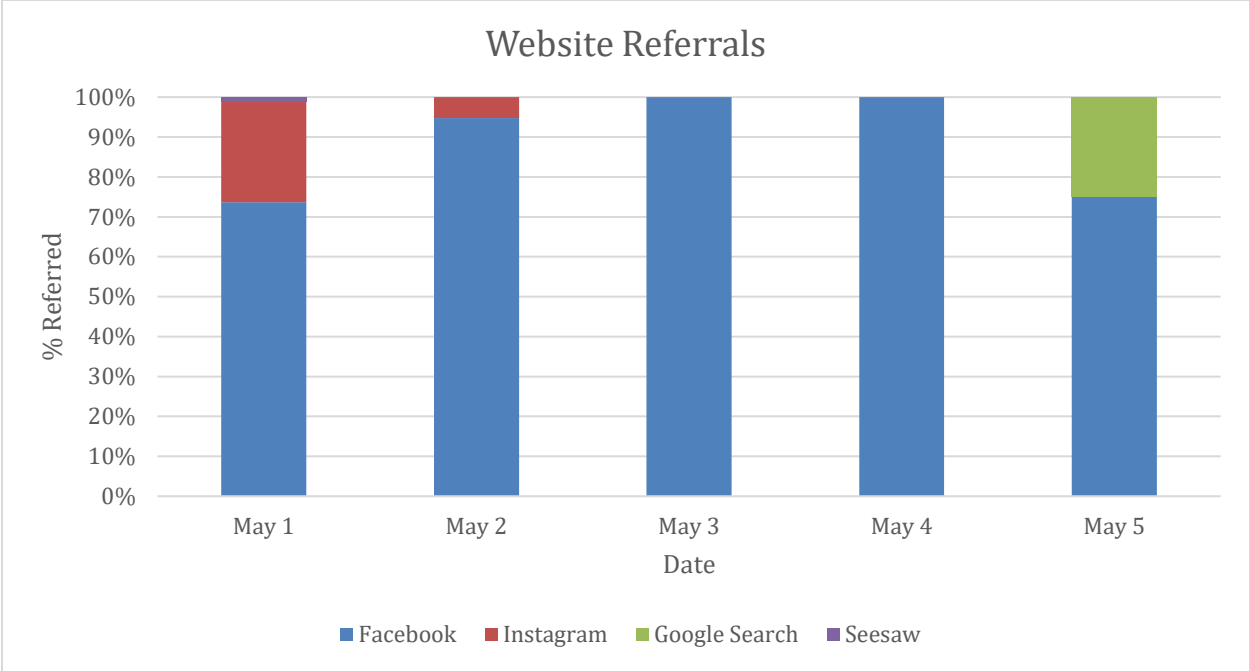
We derived audio for the online games by editing and combining these original audio clips:

- Eating a Carrot by iamshort: <https://freesound.org/people/iamshort/sounds/181271/>
- Eating apple by niwki: <https://freesound.org/people/niwki/sounds/169761/>
- Fuze Switch Flick by LordForklift:  
<https://freesound.org/people/LordForklift/sounds/448394/>
- Goui-gouis 2 by J - Luc: <https://freesound.org/people/J%20-%20Luc/sounds/101957/>
- Guinea pig eating cucumber by Karola3206:  
<https://freesound.org/people/Karola3206/sounds/460092/>
- Hand Bells, D, Single by InspectorJ:  
<https://freesound.org/people/InspectorJ/sounds/339813/>
- Menu Selection by morganpurkis:  
<https://freesound.org/people/morganpurkis/sounds/376614/>
- Petting an Animal by AryaNotStark:  
<https://freesound.org/people/AryaNotStark/sounds/407626/>
- Shacking Coffee Jar by Rikus246: <https://freesound.org/people/Rikus246/sounds/328415/>
- Slow Paper Rip by sgrowe: <https://freesound.org/people/sgrowe/sounds/342540/>
- Soft wind by florianreichelt: <https://freesound.org/people/florianreichelt/sounds/459977/>
- Water drop / Splash by bxyorna: <https://freesound.org/people/bxyorna/sounds/410335/>
- Winding Toy by VSokorelos: <https://freesound.org/people/VSokorelos/sounds/344222/>

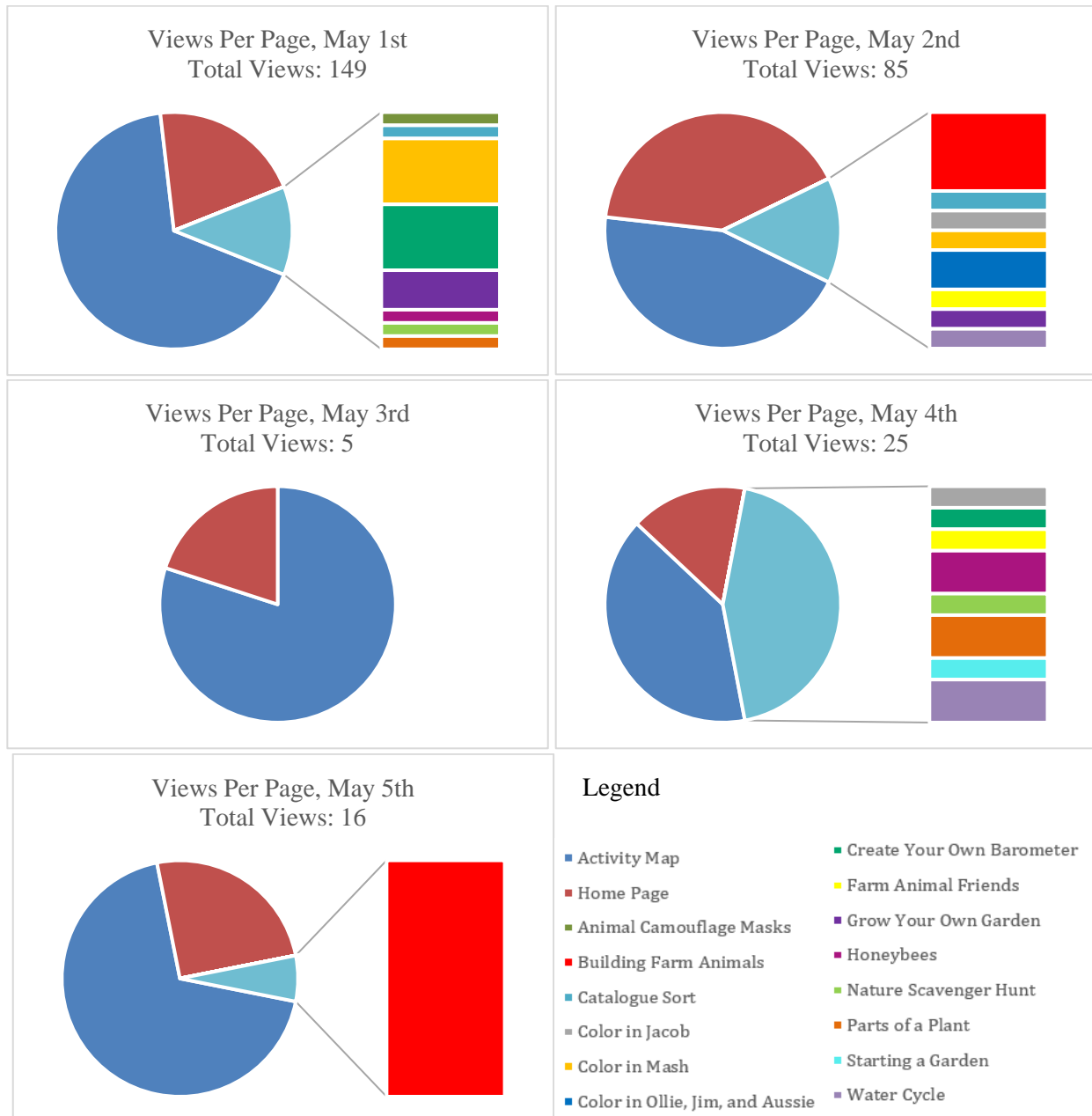
# Appendix F: Website Statistics

The graphs below are all statistics about number of views our website ([ccfarmmap.com](http://ccfarmmap.com)) received the five days following its release on Collingwood Children’s Farm’s social media accounts on May 1<sup>st</sup>, 2020:



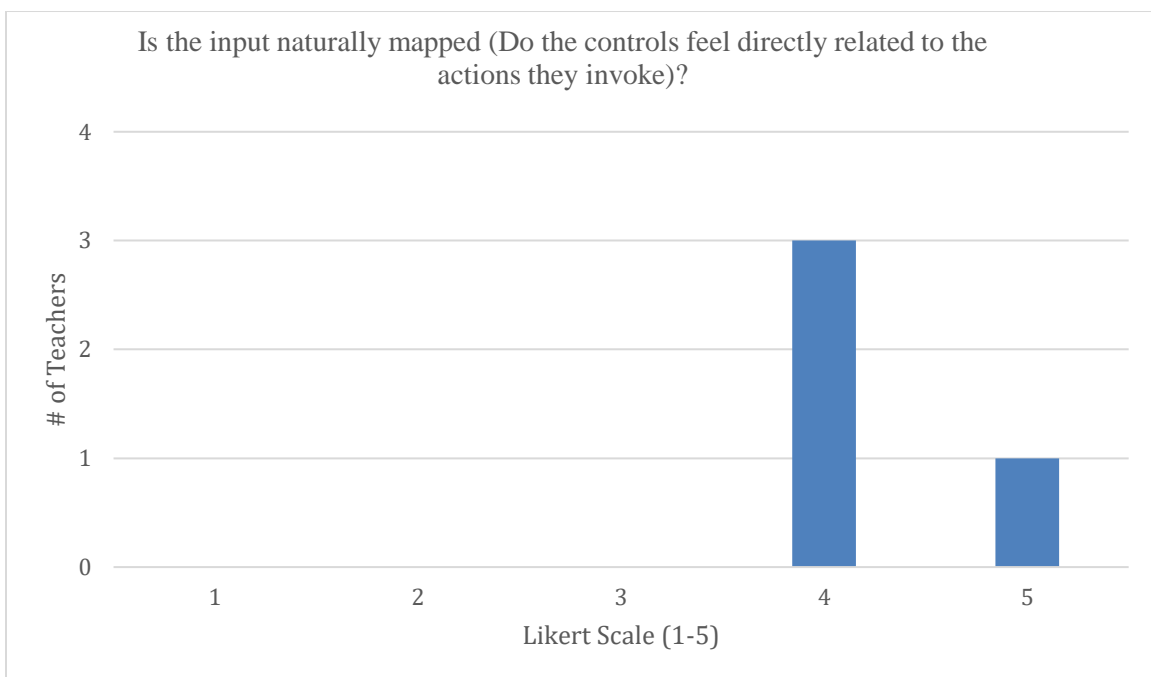
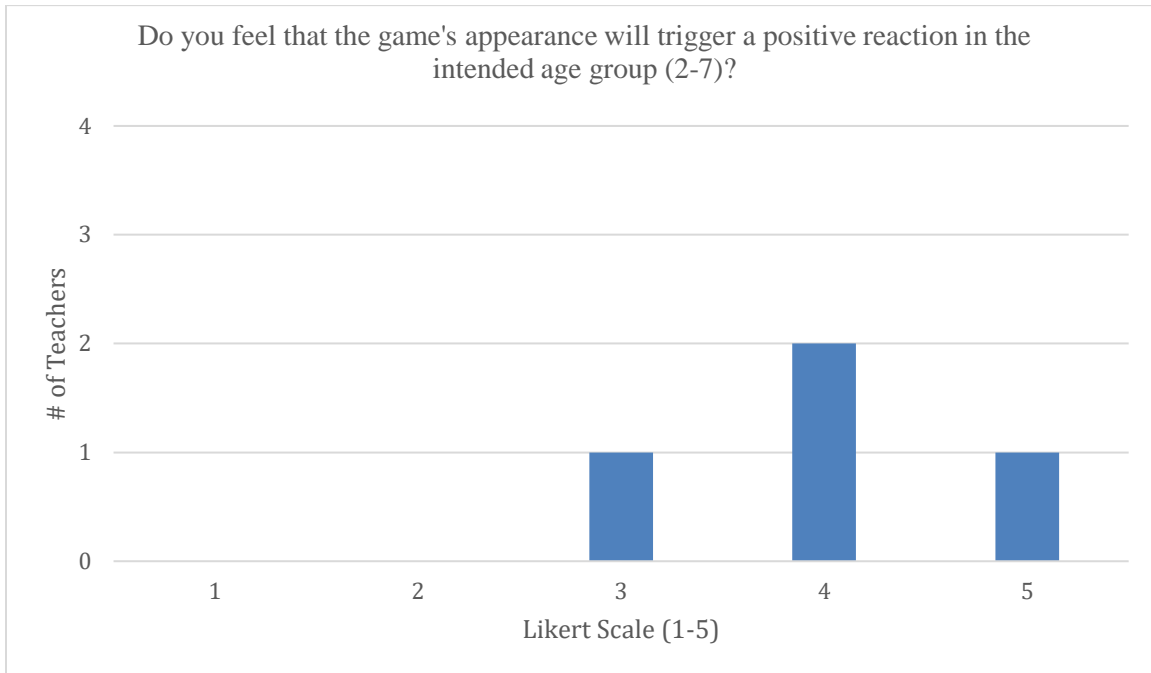


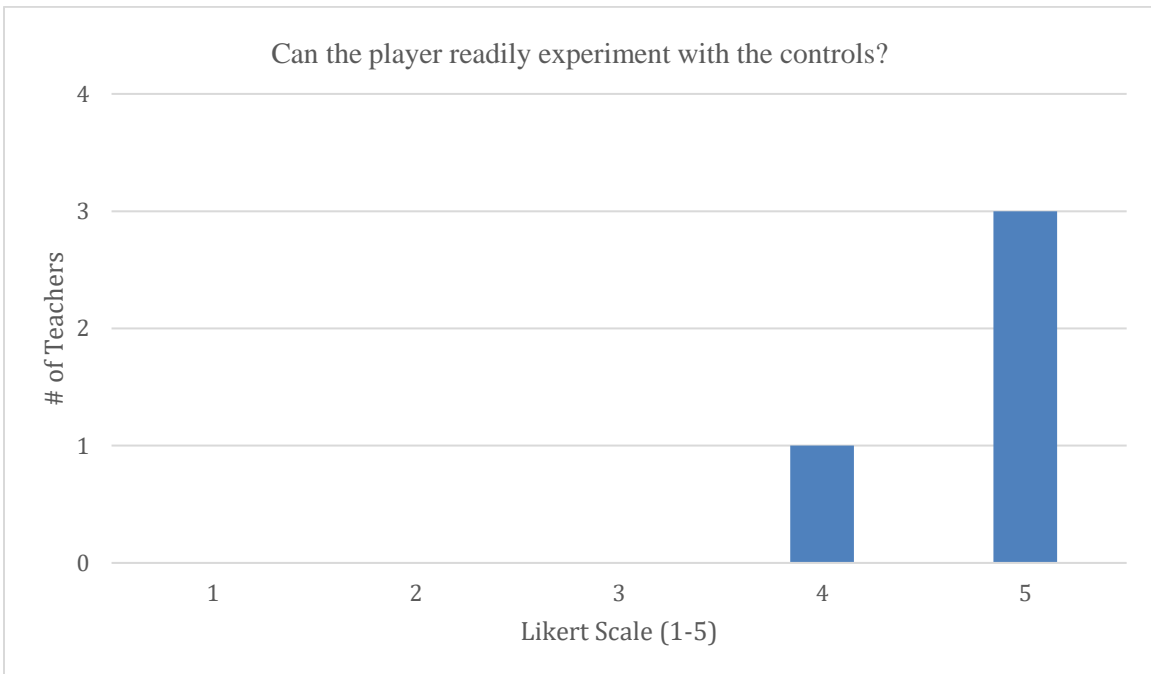
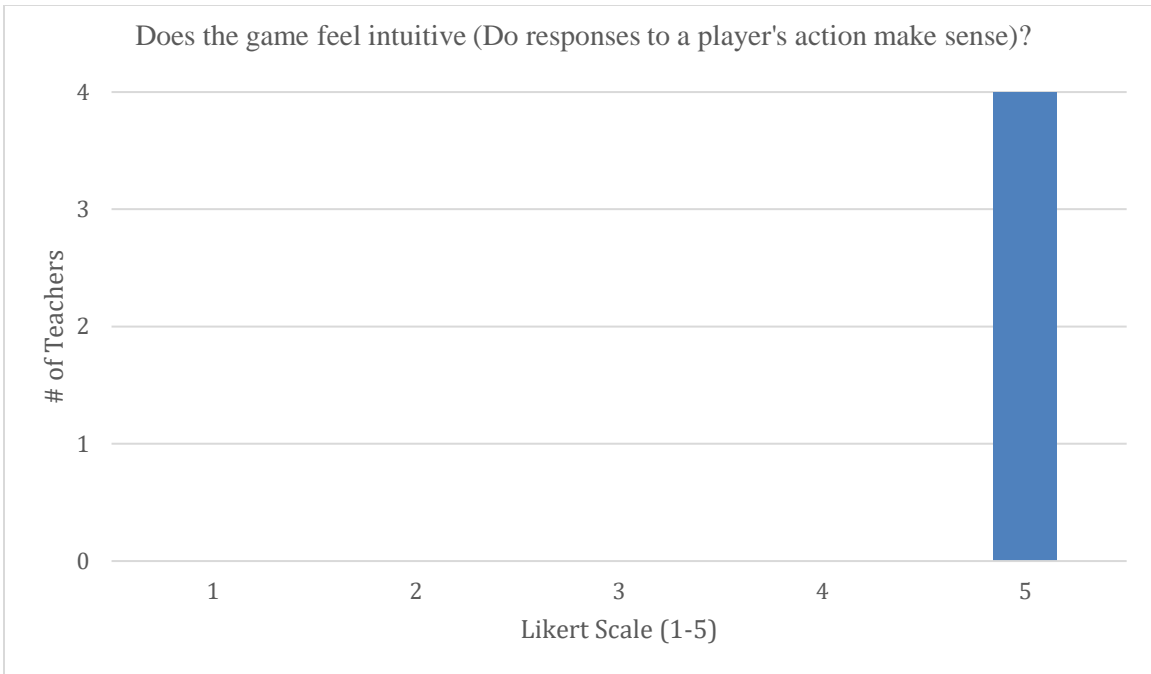
The number of views each page on our website received over the five days. Pages represent the home page, activity map, and each individual activity posted on our site. Pages that did not receive any views are not represented in these pie charts. Within the pie charts, the number of views the home page received compared to the map and the activity pages can be seen. The number of views each activity page received compared to the other activity pages can be viewed in the bars enlarged next to the pie charts.



## Appendix G: Survey Results

These figures show the quantitative results of the survey we sent out to teachers, requesting their feedback on our online games (Guinea Pig Cuddles and Grow Your Own Garden):







## Appendix H: Online Games

Below are the URLs to access the two online games we developed for Collingwood Children's Farm.

Guinea Pig Cuddles can be played here:

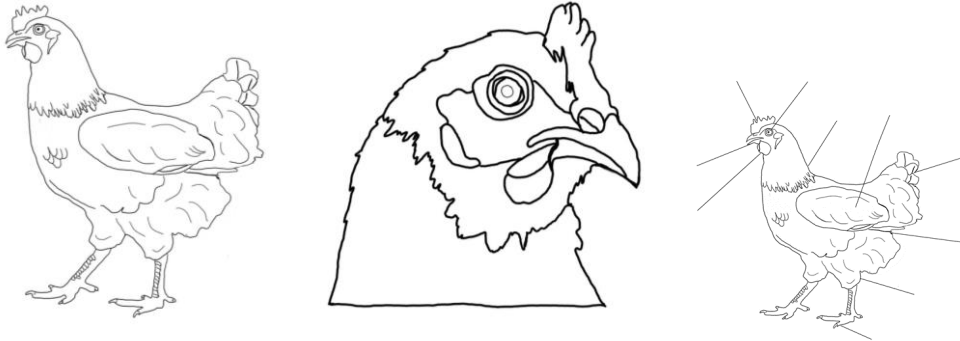
<https://mpcfarmd20.github.io/GuineaPigCuddles/>

Grow Your Own Garden can be played here:

<https://mpcfarmd20.github.io/GrowYourOwnGarden/>

# Appendix I: Coloring Pages

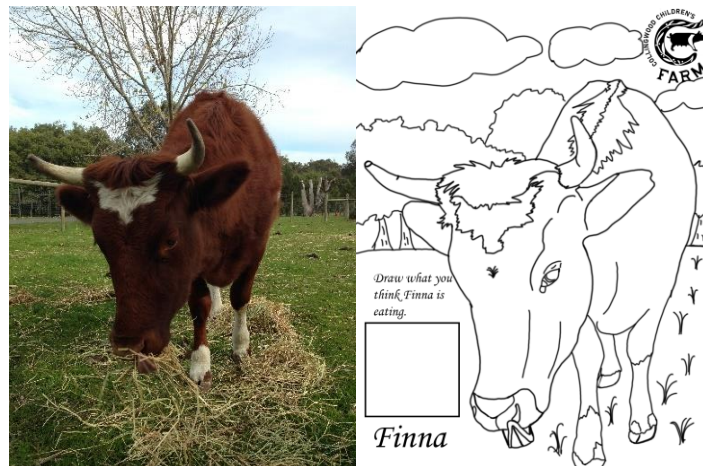
This is the complete set of coloring pages we developed over the course of this project along with the images that inspired them.



Word Bank

Eye	Vent	Claw
Hackles	Tail	Wattles
Beak	Comb	Thigh
Wing		

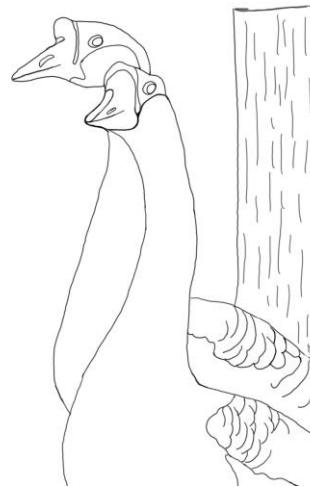
Coloring pages of a chook's (chicken) body (left), head (center), and fill in the labels version (right).



Finna, an Ayrshire Cow, on the farm (Mia Sutherland)



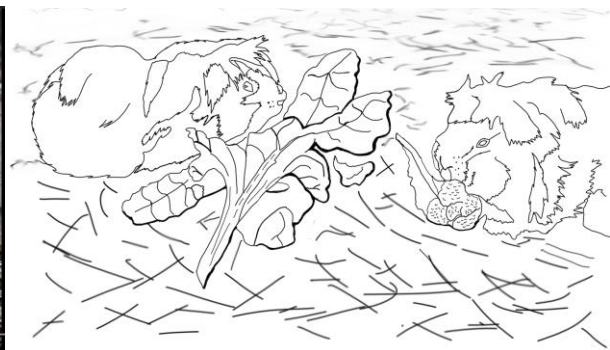
An Anglo-Nubian goat that used to live on the farm (Collingwood Children's Farm, 2020a). The farm continues to own goats of this breed.



Geese that roam the farm (Collingwood Children's Farm, 2020a)



A coloring page of a guinea pig



A screen shot of the farm's Guinea Pigs eating Breakfast (Collingwood Children's Farm, 2020b)



Charlie, a horse on the farm (Collingwood Children's Farm, 2020a)



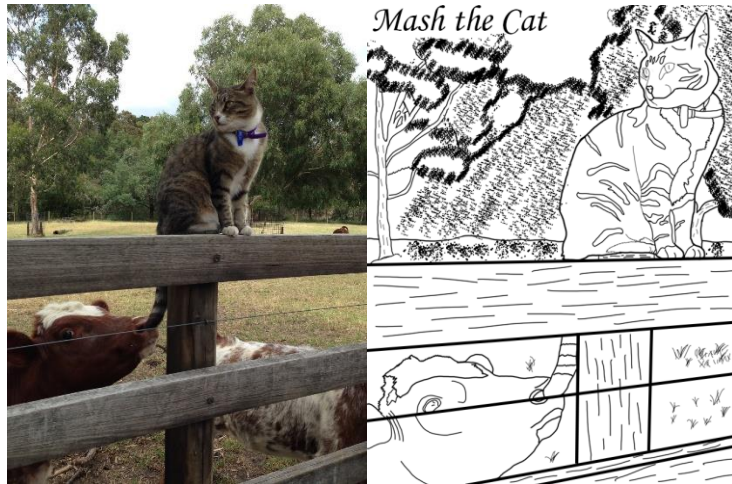
*Jacob*



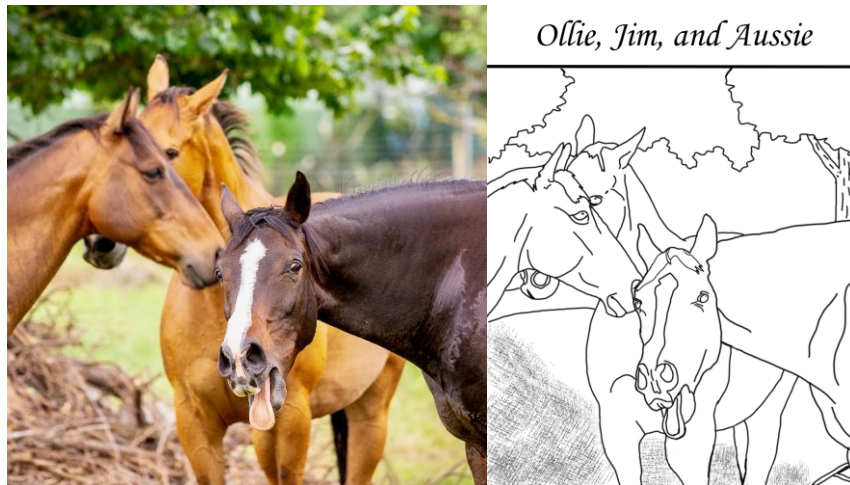
Jacob, a Berkshire pig on the farm (Collingwood Children's Farm, 2020a)



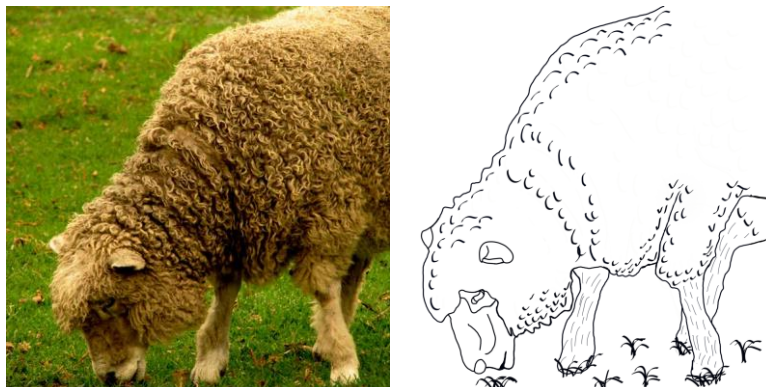
A screen shot of a video of the farm's chooks (chickens) being let out of their pen in the morning (Collingwood Children's Farm, 2020c)



Finna (Cow) sniffing Mash's (Cat) tail (Mia Sutherland)



Ollie, Jim, and Aussie – three of the farm's horses – are playing with each other (Mia Sutherland)



An English Leicester Sheep that used to live on the farm (Collingwood Children's Farm, 2020a) The farm continues to own sheep of this breed.



Daphne, a Dairy Shorthorn Cow on the farm (Collingwood Children's Farm Facebook Page)



*Olive The Sheep*




Olive, a Shropshire Sheep on the farm (Mia Sutherland)

# Appendix J: At-Home Nature-Based Activities

This is the complete collection of at-home nature-based activities developed over the course of this project.

## ANIMAL CAMOUFLAGE MASK

Wild Animals prefer to stay hidden, so they can sneak up on prey, or hide from predators. To do so, they blend in with their environment. This is called Camouflage. Can you make an animal that blends in with your environment? Go outside and find materials in the outdoors, like leaves, rocks and sticks. Don't take leaves or sticks directly off plants! This can hurt the plants.



### STAGE 1: GATHER MATERIALS

- Paper plate
- Paper
- Scissors
- Glue
- Sticks/Leaves/Rocks/other natural materials

### STAGE 2: BUILDING THE ANIMAL


Cut out shapes for ears, arms, horns, or other body parts. You will need scissors, so be sure to get an adult's help for this step! Glue the parts to the plate, and let them dry. This is the body of your animal.

### STAGE 3: CAMOUFLAGE

Add the materials you found to the animal to help it stay sneaky. Can you make it look like a nearby plant? Where could this animal hide?

### STAGE 4: FINAL STEPS

Add googly eyes and draw on a mouth, now your camouflaged animal is complete!



## BUILDING FARM ANIMALS


There are lots of different animals on the farm! All animals are special, and look a bit different. Can you make your own animal with things you find outside?

Materials:

- Leaves, sticks, rocks, and anything else you can find outside
- A piece of paper, or other backdrop
- Glue
- A crayon, marker, or other writing utensil


**Look around for a fallen leaf. Don't take leaves off living plants, because that can hurt them!**

**You can find leaves under trees, and under bushes or flowers. If there aren't any plants in your house, you can ask your parents to take you to the park!**




**Leaves come in all kinds of shapes! Animals do too. Glue your leaf to the center of a piece of paper.**

**Glue can get messy! Make sure to have a parent help you prepare for this part!**




**Glue the other pieces you found to the paper and the leaf.**


**Maybe the rocks are eyes, and the wood chips are eyebrows. Sticks can be legs, horns, or maybe a smile! Have fun with it!**



**Some shapes can be hard to find, add any extra parts to your animal with a crayon or marker!**



**Now that you've made an animal, it needs a name! Choose a name for your animal and what for their species.**



Collingwood Children's Farm

COLLINGWOOD CHILDREN'S FARM



# Catalogue Sort

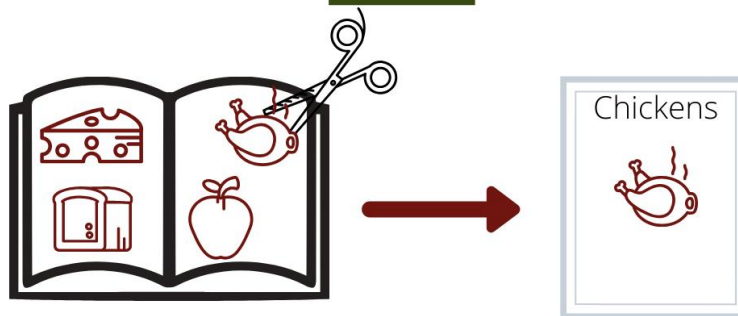
## Where does your food come from?

At Collingwood Children's Farm we raise animals and plants which give us food and other products.

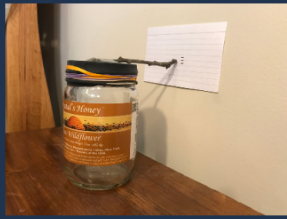
For this activity you will need:

- old supermarket catalogues
- the worksheet attached below
- a pair of scissors
- glue or tape

Cut some products out of your catalogues and stick them in the correct column, showing where each product comes from!







## CREATE A BAROMETER

A barometer measures the air pressure in the room. Based on the air pressure, you can predict if it will be sunny or rainy!

### COLLECT MATERIALS

- A Glass Jar
- A Balloon
- A Couple of Rubber Bands
- Tape
- A Skinny Stick
- A Piece of Paper
- Scissors

### 1. FIT THE BALLOON OVER THE JAR

With adult supervision, cut across the balloon to create a wider opening. Stretch the balloon tightly across the top of the jar.

Stretch rubber bands around the top of the jar to keep the balloon in place. Make sure no air can get in or out of the balloon.

### 2. ATTACH STICK TO BALLOON

With adult supervision, glue the end of the stick to the center of the balloon. Make sure the stick isn't too heavy. If the glue is taking a while to dry, add some tape to keep the stick in place.

### 3. MEASURE THE AIR PRESSURE

Place the barometer against a wall and tape a card against the wall where the stick ends. Mark where the stick points when completely vertical as the base point. Check back over the next couple days to see if the stick moves.

### WHAT DOES IT MEAN?

If it moves up, then the air pressure surrounding the jar has increased, meaning it is likely sunny outside. If it moves down, then the air pressure surrounding the jar has decreased, meaning it is likely cloudy or rainy outside.

# Gardening Tips & Tricks

## Keeping your garden, and the environment, healthy

Gardens are complicated environments. They are several small ecosystems living together just outside your door, allowing you to see and taste plants from all over the world. This complicated web of life contains many plants, insects, and other organisms living together, each with its own unique needs.

We've made some tips and tricks to help you take care of your garden in a natural way. These methods can help keep all the plants in your garden healthy while keeping your ecosystems safe and functioning as well.

### FEED YOUR GARDEN!

Plants use nutrients from the soil to make their fruit. After you eat their fruit, the soil around the plant may begin to run low in nutrients. Give back to the soil by mixing in a little compost from time to time! Want to know how you can make compost at home? Check out our guide in the link below!

### EXTRA PLANT FOODS!

Some minerals are hard to get, even from compost. Eggshells are a great source of Calcium for plants (Especially tomatoes). Grind them up and add them to the soil. Banana peels are great for Potassium. Bury one or two pieces under the top layer of soil. More than that can be too much!

### KEEP BUGS AWAY!

Many insects don't like the taste of spicy peppers! Blending up a habanero pepper in a Liter of water can make for a great natural insecticide. However, it's still very strong, and the acids in the spice can hurt the plant, so only apply a little bit, and only where there is an insect problem.

### STOP FUNGUSES!

Sometimes funguses can grow on plants too! If you see mildew, or fuzzy black spots, you can mix 60 mL of baking soda with 5 mL of soap in about 4 Liters of water. Once again, Baking soda and soap are a strong base, so only apply a little bit to the plant at a time, and only where there is a clear fungal problem.

Remember to wash your hands after using these home remedies. Getting dirt, or habanero pepper in your eye can be very unpleasant!





# HONEYBEES

Honey bees can be found all over the farm, collecting nectar and pollen, pollinating flowers, and heading back to their hives in the apiary to feed their queen and the baby bees.

**Have a go of drawing a honey bee of your own!**

- YOUR BEE WILL NEED:**
- 6 LEGS
  - 2 ANTENNAE
  - A FURRY BODY
  - FOUR WINGS
  - A PROBOSCIS

The **furry body** is used to catch sticky pollen.

Ask your parents to look up more photos and diagrams to help you.



The **proboscis** is used to suck sweet nectar from flowers.

The **wings** can beat up to 200 times a SECOND!

Watch the video "Meet the European honey bee" to learn more about these amazing little creatures!



# Making Butter

Every day at 10.15 am and 4pm you can find one of our farmers milking our beautiful cow Daphne in the barn. We can use cow's milk to make dairy products such as yogurt, cheese, cream and butter.

Did you know you can make your own butter using cream from the shops?

- You will need:
- A big plastic jar with a lid
  - Thickened Cream (Enough to fill the jar halfway)
  - A marble (Optional. A glass jar with no marble works too - it just takes longer!)
  - A pinch of salt (Optional)

- 1 Pour your cold thickened cream into the jar. Make sure you only fill it half way so that there's plenty of room to shake the liquid around.
- 2 Add your marble if you are using one and pop the lid on tightly.
- 3 Shake, shake, shake it! Get up and make it a dance move!
- 4 Keep shaking! (Usually takes 10-15 minutes). You will notice that the cream will begin to thicken and become harder to shake.
- 5 Soon your cream will separate into two parts: butter and buttermilk! Drain out the excess liquid and mix some salt in if you choose to. Enjoy!



# NATURE SCAVENGER HUNT

Spending time in nature is so important  
for our health and happiness.

**GO FOR A WALK IN A  
PARK OR GARDEN AND  
SEE HOW MANY THINGS  
YOU CAN TICK OFF THIS  
LIST!**



- An ant
- Something fuzzy
- An animal footprint 🐾
- Something yellow
- A worm
- A spiderweb
- A chewed leaf
- Something round
- Something that smells nice
- Something round
- A feather
- Something spiky

**A printer friendly list can be found below.**

# PARTS OF A PLANT

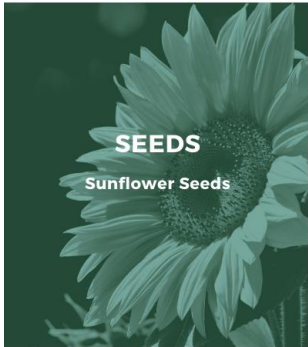
Plants turn energy from the sun into energy we can eat! Each part of the plant is sometimes eaten (see examples below). Use the worksheet linked below to draw or collage as many foods as you can think of under each of these categories.



**STEM**  
Celery



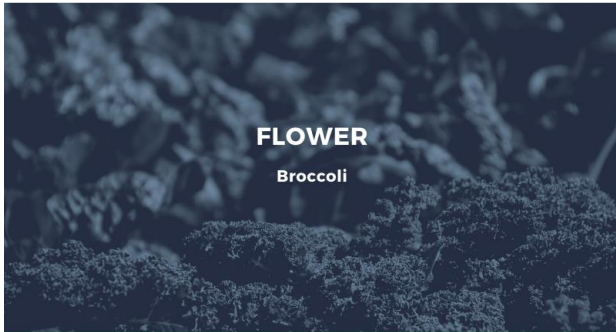
**LEAVES**  
Spinach



**SEEDS**  
Sunflower Seeds



**FRUIT**  
Tomato



**FLOWER**  
Broccoli

# SHOEBOX FARM

Make a habitat for your animals. Learn about what they like, don't like, and the important parts of animal care.

## MATERIALS:

- Shoe Box
- Toy animals
- Food for your animal (Ex: grass, plastic meats/fruit)
- Bedding for your animal (Ex: Hay, cloth, sand)
- Small container for water
- Sticks, rocks, etc.
- Glue



## GETTING STARTED

Get a shoebox and open it up. If you don't have a shoebox, you can use other cardboard boxes or even a sheet of paper.

## WHERE TO LIVE

Decide which animal lives here. If you have toy animals, maybe they would like to stay there. Make sure to finish all the steps before letting your toy animal stay there, or they might get sticky!



## MAKE THEM COMFORTABLE

What would each animal want to have in their pen? Some animals like grass, while others like fruit. Where do they sleep? What can they do for fun?

YOU CAN LOOK AT THE FARM'S WEBSITE TO SEE WHAT OUR ANIMALS LIKE, AND HOW WE CARE FOR THEM.

## WHERE TO SLEEP

Use glue to build a house, roosts, or a place to eat using what you found! Let the glue dry before putting your toy animal in.



## THE NEXT STEPS

You can make lots of these for each animal, and put them together to make a farm..

**COME VISIT US ON THE FARM TO LEARN MORE!**

COLLINGWOOD CHILDRENS FARM

# STARTING A GARDEN

A GARDEN IS A GREAT WAY TO EXPERIENCE CARING FOR LIVING THINGS. IT'S ALSO A GOOD WAY TO LEARN ABOUT PLANTS AND WHERE YOUR FOOD COMES FROM. GARDEN PLANTS ARE IN MANY KINDS OF FOOD, AND MOST ARE VERY GOOD FOR YOU.

## MATERIALS:

GATHER THESE BEFORE YOU BEGIN!

- Gardening Pot
- Radish seeds
- Garden soil

## DECIDING WHAT TO GROW

WHAT WORKS BEST FOR YOU?

Plants live in different climates. Celery likes to grow in water, while Radish like to grow in the ground. This guide will teach you how to grow a Radish. If you want to plant something else, instructions for some other fun plants can be found here: <https://www.installitdirect.com/learn/kids-gardening/>

## GETTING STARTED

- First, you need **something to grow your garden in**. A garden box, pot, or cup can do nicely. Be careful though, The container needs to be able to let extra water out the bottom, so you may need to put a hole in the cup. Get help or ask a parent to do this step!
- Next, you need to **decide what you want to grow**. This guide focuses on Radishes, but we also recommend Snap peas, Turnips, or Celery. These plants are hardy, grow quickly, and are delicious!

## PLANTING THE SEED

- For a Radish, **fill the pot up with soil**, so that it's 3 centimeters or so below the rim. You can use soil from your yard, but don't mess up part of your yard to get it. Potting soils can be expensive, but will contain extra ingredients to help your plant grow!
- Make a hole in the center of the pot, 4-5 centimeters deep, and **insert the seeds**. Cover the seeds, and water the pot. Place it where it can get 6-8 hours of sunlight per day.

## CARING FOR YOUR CROP

- Over the next few days, **lightly touch the soil to see if it's damp**. Make sure you touch around the side of the container, so you don't disturb the seed. If the soil is damp, then it's happy. But if it start to feel dry, that means it's time to water it again. Slowly fill the pot with water until the bottom starts to leak.
- After a few days, you should see your **baby Radish beginning to grow**. After 2 weeks, it should be ready to harvest and replant.

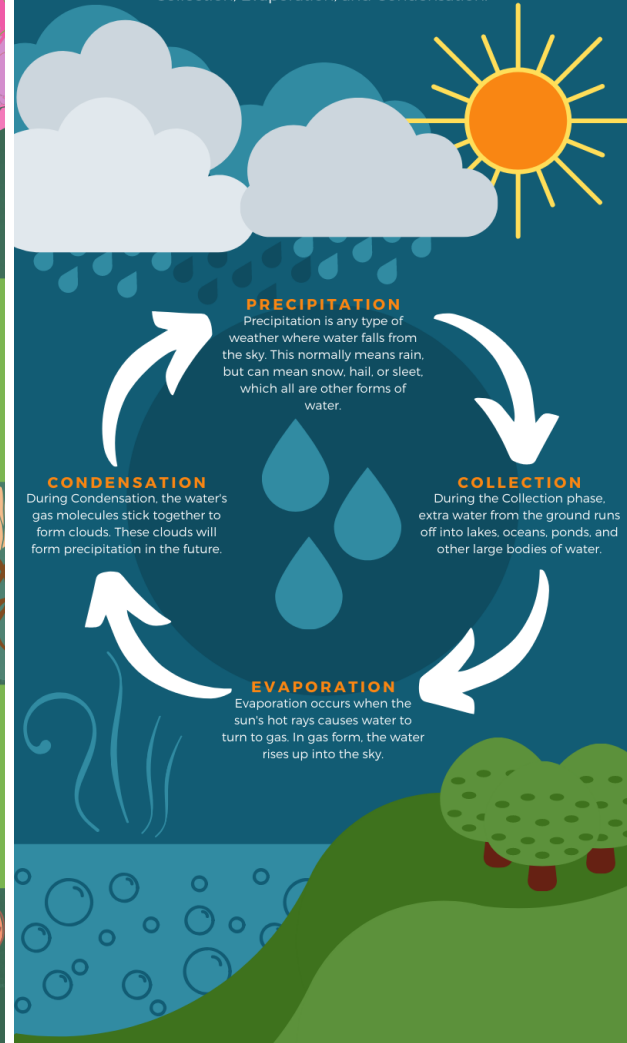
## NEXT STEPS

- Once you have harvested your Radish, ask your parents about delicious recipes, or check out some of ours in the link below!
- You can also check out some our tips to make your crops happier and healthier in the other link below!

# WATER CYCLE

Did you know that all of Earth's water is constantly being recycled?

There are four main steps in the rain cycle: Precipitation, Collection, Evaporation, and Condensation.



NOW THAT YOU HAVE LEARNED ABOUT THE 4 PHASES OF THE WATER CYCLE, CAN YOU DRAW YOUR OWN?

## What's the Weather?

Farmers need both water and sun to grow crops. However, too much of any weather type can be harmful to the plants. Let's explore how different types of weather impact crops.

### Sun

Crops need sunshine, because it provides nutrients, which is food for plants. However, too much sun can cause the ground to dry up. This is called a drought.

### Rain

Crops get thirsty like humans and need water from rain. However, too much rain causes the crops to flood.

### Wind

Wind can help farmers spread pollen and seeds. However, when it is really windy out, it can knock over crops that grow above ground, injuring them.

### Lightning

Lightning can strike crops, damaging them.

### Frost

When water freezes, it expands to become ice. When the weather becomes cold, the water inside crops expands, hurting them.

Create a **Weather Chart** to keep track of the daily weather patterns.

1. **Print out the blank weather calendar** template linked below
2. **Write in the month, year, and number the days**
3. **Hang up the calendar** on your refrigerator, a bulletin board, or other convenient place
4. Each day, **look out the window** and move a marker (a magnet, clothespin, etc) along the left column to point at the current weather outside
5. At the end of the day, **color the weather patterns** that you saw during the day in the day's box

Calendar Template linked in What's the Weather? Activity:

**MONTH:**

**YEAR:**

*What is the weather like outside right now?*

Sunny 

Cloudy 

Windy 

Rainy 

Thunder & Lightning 

Frost 

SUN	MON	TUE	WED	THU	FRI	SAT

# WORM FARMS

Worms are amazing little critters that live in the soil. They help break down old food and dead plants to return their nutrients to the soil.

**Materials:**

- ✓ A clear plastic bin, or a polystyrene market bin
- ✓ Black paper, or a garbage bag, if you want to use the clear plastic bin
- ✓ Ice pick or box cutter
- ✓ Garden Soil
- ✓ Newspaper
- ✓ Worms

## 1) FIND A HOME FOR YOUR WORMS

Worms like moist environments, so their home needs to be made of something waterproof, like plastic or polystyrene.

**TIP:** If you want to see the worm tunnels, use a clear plastic container wrapped in black paper. Remove the paper after a few days to see the tunnels. Just be sure to put it back after you're done!

## 2) PUNCH HOLES IN THE BOTTOM OF THE CONTAINER

This will need a sharp tool, so ask your parents to do this part for you.

**FUN FACT:** Worms like to live in the dark, because worms breathe through their skin, and too much sun can dry it out.

**TIP:** Worm Leachate, or Worm Wee, will drip through these holes. This is actually a really great fertilizer. Put 10 ml of Worm Leachate in 2 liters of water and water your plants with this!

## 3) FILL THE CONTAINER A LITTLE OVER HALFWAY WITH WORM BEDDING

Worm bedding can be made from garden soil, shredded newspaper, and small food scraps. Make sure that the bedding is not too dry, and not too wet. Worms like a moist environment, but too much water can drown them.

**FUN FACT:** Worms sense danger through vibrations in the soil.

## 4) INTRODUCE THE WORMS TO THEIR NEW ENVIRONMENT

Earthworms can be found after a rain, or special composting worms can be ordered online. These worms are red, and are smaller than earthworms.

## 5) SOAK A NEWSPAPER AND LAY IT OVER THE WORM BEDDING

This will keep the habitat moist for longer. cover the habitat, but make sure there's still room for airflow!

**FUN FACT:** compost worms can eat up to a third of their body weight every day

# CARING FOR YOUR WORM FARM

Caring for your worms is important if you want to keep them happy and healthy.

Wait a week for the worms to get accustomed to their new home, then you can start to add a few small pieces of food scraps.

Slowly add more food to the enclosure over the course of weeks or months. As the worms breed, more worms will be available to help compost leftovers. Eventually there should be enough of them to handle all the daily leftovers!

**TIP:** Worms are sensitive to certain strong foods. Citrus fruits, onions, and garlic can't be digested by your compost worms.

**TIP:** don't add too much food too fast! The extra food will rot, and that's not good for the worms.

Be sure to keep the top newspaper damp by soaking it again once in a while, or replacing it when needed.

**FUN FACT:** Worms lay eggs called capsules. They look like little golden grape seeds. If you see these in your worm habitat, it means your worms are prospering!

**FUN FACT:** Worms don't have teeth! How do they eat? Much like chooks, they have a gizzard.

When the habitat starts to get full, its time to change the soil. The old soil is filled with Worm poo, called Worm Casts. Casts are a great garden fertilizer, and can be found in many bagged fertilizers. Carefully move the soil to one side of the enclosure, then add a new layer of worm bedding to the empty side. After a few days, remove the castings and fill the rest of the container with fresh bedding.

You can expand the worm farm by making more enclosures, and connecting them directly, or with tubes filled with soil. Just make sure the conditions are right, and your worms will be happy in any home.

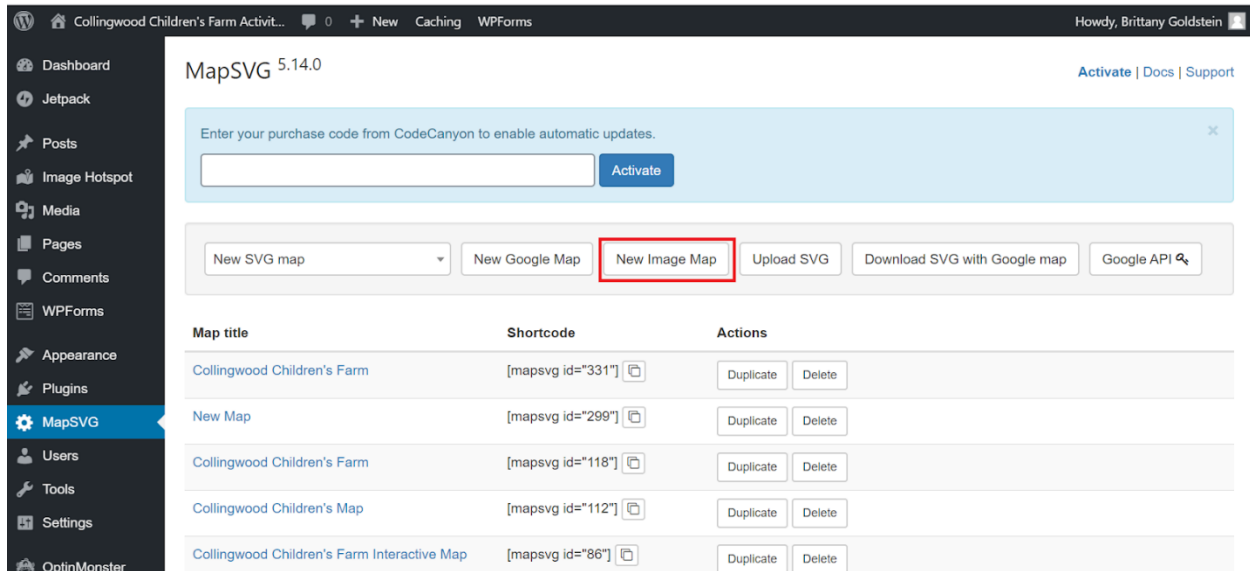
**FUN FACT:** some people think that cutting a worm in half will make two worms. This is not true! This will instead kill the worm. Be careful when moving soil or removing the worms, as not to hurt them.



# Appendix K: Maintenance Plan

## Creating a New Map

To create a new map for the farm, go to the plugin homepage of your WordPress site. There, you can upload a base map image of the farm, by clicking “New Image Map”. Make sure you upload a clear image. We recommend ‘.png’ files. If the image is not uploading for some reason, it might be too large. Try compressing it into a slightly smaller size and then uploading it.



## Embedding a Map

If you want to embed the map in a WordPress page, post, or widget, create a shortcode block. Within the shortcode block, paste the shortcode that can be found next to your map on the home screen of MapSVG plugin. This shortcode will indicate that your map should be embedded here.

Collingwood Children's Farm Activit... 0 + New Caching WPForms Howdy, Brittany Goldstein

Enter your purchase code from CodeCanyon to enable automatic updates.

New SVG map | New Google Map | New Image Map | Upload SVG | Download SVG with Google map | Google API 🔍

Map title	Shortcode	Actions
Collingwood Children's Farm	[mapsvg id="331"]	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
New Map	[mapsvg id="299"]	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
Collingwood Children's Farm	[mapsvg id="118"]	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
Collingwood Children's Map	[mapsvg id="112"]	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
Collingwood Children's Farm Interactive Map	[mapsvg id="86"]	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>
Collingwood Children's Farm	[mapsvg id="14"]	<input type="button" value="Duplicate"/> <input type="button" value="Delete"/>

Collingwood Children's Farm Activit... 0 + New Caching WPForms Howdy, Brittany Goldstein

Search for a block

Most used

- Page Break
- Paragraph
- Image
- File
- [/] Shortcode**
- HTML
- Custom HTML

Stick to the top of the blog

Pending review

Author: Brittany Goldstein

Categories:

Tags:

Add New Tag

Document

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Save Draft Preview Publish... ⚙️

Document Block

[/] Shortcode

Insert additional custom elements with a WordPress shortcode.

[/] Shortcode

[mapsvg id="118"]

Document → Shortcode

## Defining Areas

Watch the video titled “Outlining an Area Using MapSVG” for instructions on how to outline new regions: <https://youtu.be/gIbc-tWOGeU>

If you want to alter areas already made, zoom in on the area, click on “Edit SVG file”, and then click on the area. Use the points that appear and the side features to change the area shape, color, and name as shown for a new area in the video.

The current regions are colored as follows:

Area Type	Fill	Stroke
Paddocks	rgba(255,0,0,0.1)	rgba(255,100,100,0.4)
Animals	rgba(0,0,255,0.1)	rgba(100,100,255,0.4)
Vegetation	rgba(0,255,0,0.1)	rgba(100,255,100,0.4)
Farm Partners	rgba(100,100,100,0.2)	rgba(100,100,100,0.2)
Farm Buildings	rgba(255,140,0,0.1)	rgba(255,140,100,0.4)

## Edit Area Definitions

Watch the video titled “Defining Areas using MapSVG” for instructions on how to change the fields of information each area stores and how to edit the information within each field: <https://youtu.be/vlxhVDMqZD4>

Since the description field uses HTML to store information, we have created an HTML guide which can be found on page 81.

## Creating a Marker

Watch the video titled “Creating a Marker with MapSVG” for instructions on how to create a new marker (pin) on the map and edit the information contained by a marker: <https://youtu.be/ZG0Wh1ni0i0>

Since the description field uses HTML to store information, we have created an HTML guide which can be found on page 81.

## Filtering Markers

Watch the video titled “Filtering Markers” for instructions on how to filter markers by a label you have created: <https://youtu.be/XEpfZlvTpls>

## Edit Settings

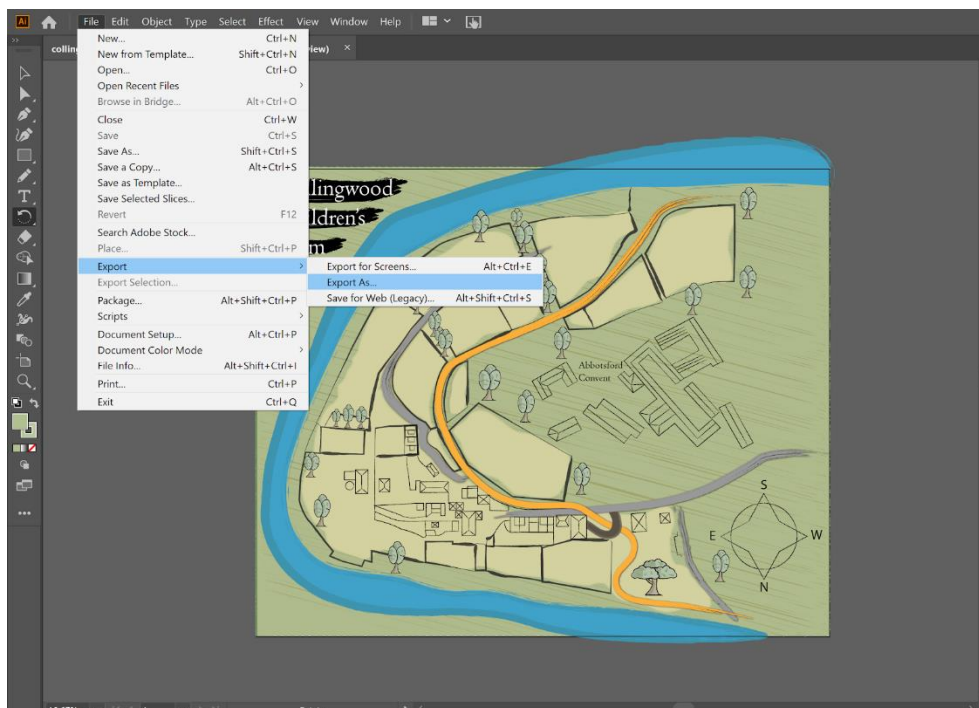
Watch the video titled “Settings” for instructions on how to modify the basic settings for any MapSVG map: <https://youtu.be/jFjC5oe0RA4>

## Editing the Base Map

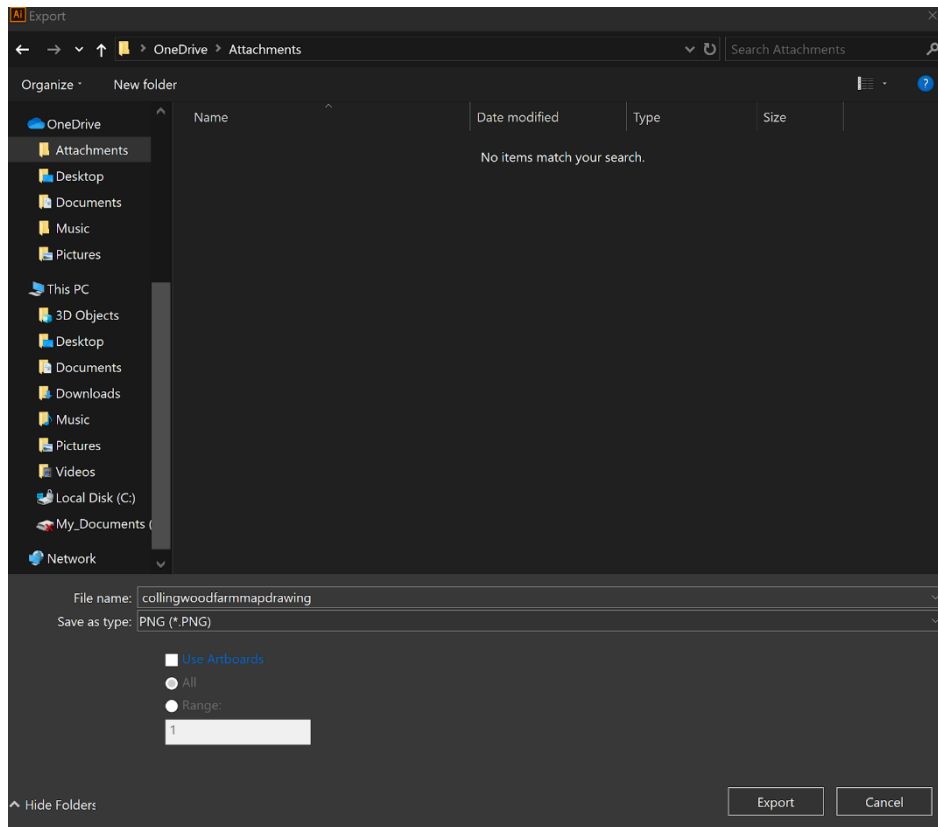
The base map was created in Adobe Illustrator. Each layer of the map has been named according to what it contains. You can easily change every little aspect of the map by focusing on one layer at a time. In addition, there is a layer that is invisible titled: background image. This layer contains everything but the trees, and black outlines of the paddocks and buildings. Make this layer visible if there is ever an error when exporting the map.

## Exporting the Map

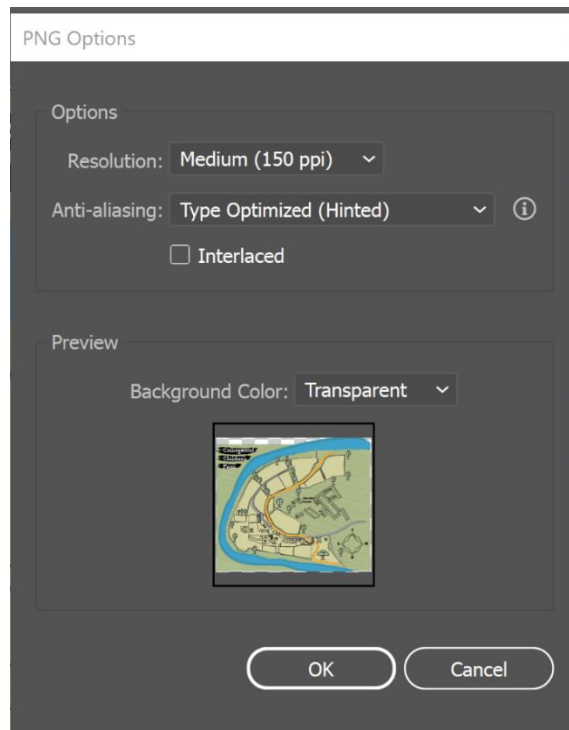
If you make any changes to the base map, you will need to export a new version to be uploaded to the MapSVG plugin. Within the application: click file > export > export as.



Then choose your location, make sure to set the type and PNG, and click export.



Lastly, there will be a final screen for settings. Choose 150 PPI and transparent background as shown below.



## Other Adobe Illustrator Resources

Here are links to YouTube videos that explain how to use the fundamental features of Adobe Illustrator:

- <https://www.youtube.com/watch?v=3GzumUieDPY>
- [https://www.youtube.com/watch?v=b7O-dp0L\\_Qo](https://www.youtube.com/watch?v=b7O-dp0L_Qo)
- <https://www.youtube.com/watch?v=EOOmA9DeMb4>
- <https://www.youtube.com/watch?v=tXpnKIUMZQA>

## A Quick Guide to HTML

### What is HTML?

HTML stands for HyperText Markup Language, and it is the main coding language used for website development. It can seem very daunting at first, but anyone can use it with this primer.

### How to Approach HTML?

Think of HTML as a syntax for how you would like the website to appear. What you see as a button in a text editor (like Google Docs or Microsoft Word) are represented as text in HTML. The general name for this specific text is called a tag.

### Tags

All the buttons in Figure 29 are represented by different tags in HTML.



Google Docs Toolbar

An example syntax of a tag is: ‘<p> </p>’ This is the tag for a new paragraph. Any text you put in between will appear as a new paragraph. Here is an example:

`<p>I am writing a new paragraph</p>` appears as:

I am writing a new paragraph

There are many different tags to produce different results. Tags can also be placed inside of each other to obtain the desired effect. If we wanted the previous paragraph to be bolded, we could use the <b></b> tag. Here is an example:

`<p><b>I am writing a new paragraph</b></p>` appears as:

**I am writing a new paragraph**

## How is HTML used in the interactive map and activities?

HTML is used for all the formatting of the text that appears in the pop ups on the interactive map.

**Barn**

Collingwood Farm

The barn is one of the busiest hubs on the farm. Two of the major activities happen here: Guinea Pig Cuddles and Cow Brushing. In addition, you can find the farm's cows, Finna and Daphne, here.

Finna is an Ayrshire Cow and is pictured in the first three pictures (in the last one she is with Miso, the cat).

Daphne is a Dairy Shorthorn Cow and can be seen in the last picture.

Next time you are at the farm, stop by to see Finna and Daphne!

Listen to Dear Daphne Song

Dear Daphne

Watch later Share

Area Information Pop Up Page

We will now walk you through all the different tags used in formatting these.

### Headers

To denote text as a header you can use the tags:

`<h1> </h1>`

`<h2> </h2>`

`<h3> </h3>`

`<h4> </h4>`

`<h5> </h5>`

`<h6> </h6>`

H1 will appear as the largest header, while h6 will be the smallest header. It will look like this:

# Heading 1

## Heading 2

### Heading 3

#### Heading 4

##### Heading 5

###### Heading 6

### Paragraphs

As stated, the paragraph tag is `<p> </p>`. Any text between the tag will appear in a paragraph.

### Formatting

When working with text you might want to change part of its appearance such as making it bold, italicized, or even change the color and size. This can all be done with different tags. First, here is a list of common formatting tags:

Bold	<code>&lt;b&gt;&lt;/b&gt;</code>
Italicized	<code>&lt;i&gt;&lt;/i&gt;</code>
Highlighted	<code>&lt;mark&gt;&lt;/mark&gt;</code>
Crossed out	<code>&lt;del&gt;&lt;/del&gt;</code>
Underlined	<code>&lt;ins&gt;&lt;/ins&gt;</code>
Subscript	<code>&lt;sub&gt;&lt;/sub&gt;</code>
Superscript	<code>&lt;sup&gt;&lt;/sup&gt;</code>

Any text inside of these tags will display with that specified format. Multiple tags can be used on the same section of text.

To change the color and size of text, you will have to use the “style” attribute. Different tags can be modified with different attributes. In the scope of the interactive map, we will only be changing the style of the paragraph (`<p></p>`) tag and the header (`<h1></h1>`) tag. To change the color of the text follow this format (The style attribute has been highlighted to stand out):



<p style="color:blue;"> I want this text to be blue </p> will result in:

I want this text to be blue

Change the name of the color in the style attribute to achieve different colors.

To change the size of the text you can use this syntax:

<p style="font-size:200%;"> I want this text to be larger </p> will appear as:

I want this text to be larger

## Links

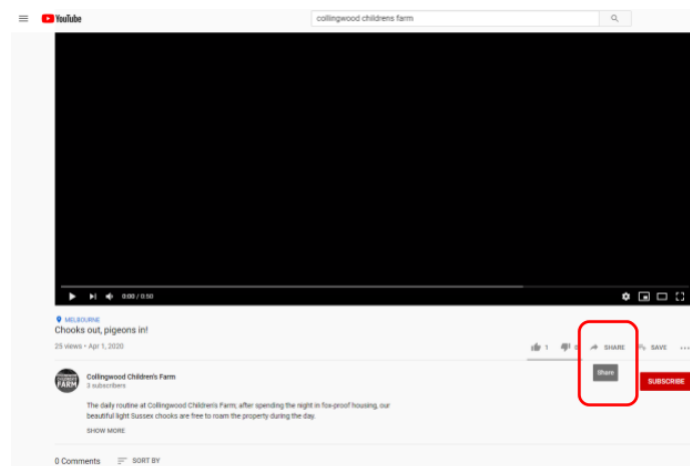
To create a link on the page you will want to use this tag: <a href="url"> link text </a>. The 'a' tag is a special type of that that allows for the href attribute. Href stands for hyperlink reference; this is the destination that you want the link to go to (the quotation marks are necessary). The 'link text' is the text that will appear on the page for the user to click on. Let's use the map website in an example. In this case, the URL will be <https://ccfarmmap.com/>, and the link text will be 'Click here for an interactive map'.

<a href="https://ccfarmmap.com/"> Click here for an interactive map </a> will appear as:

[Click here for an interactive map](https://ccfarmmap.com/)

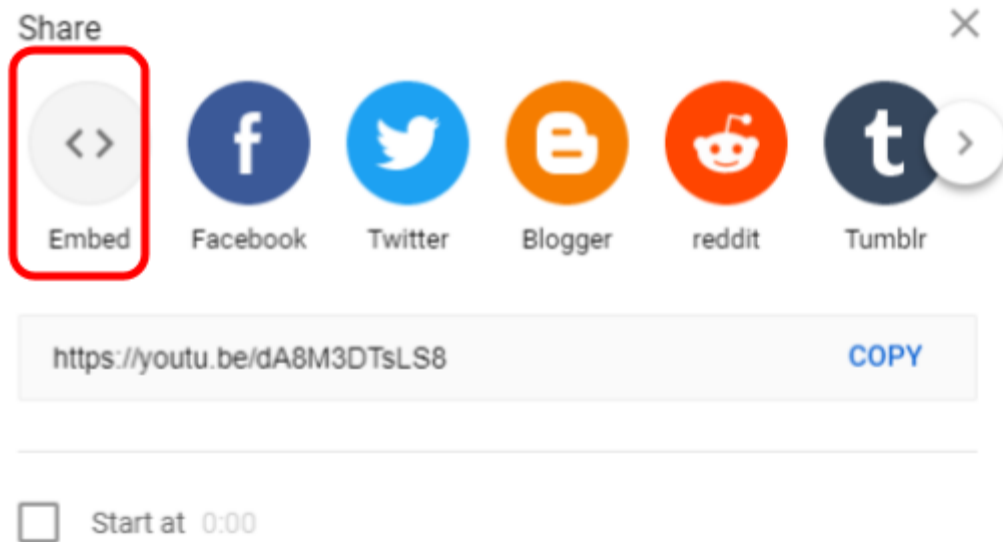
## Embedding Videos

Lastly, you might want a video to appear on the popup page. This is called embedding a video. This process is very simple if you first upload the video to YouTube. First find the video on YouTube and locate the share button.



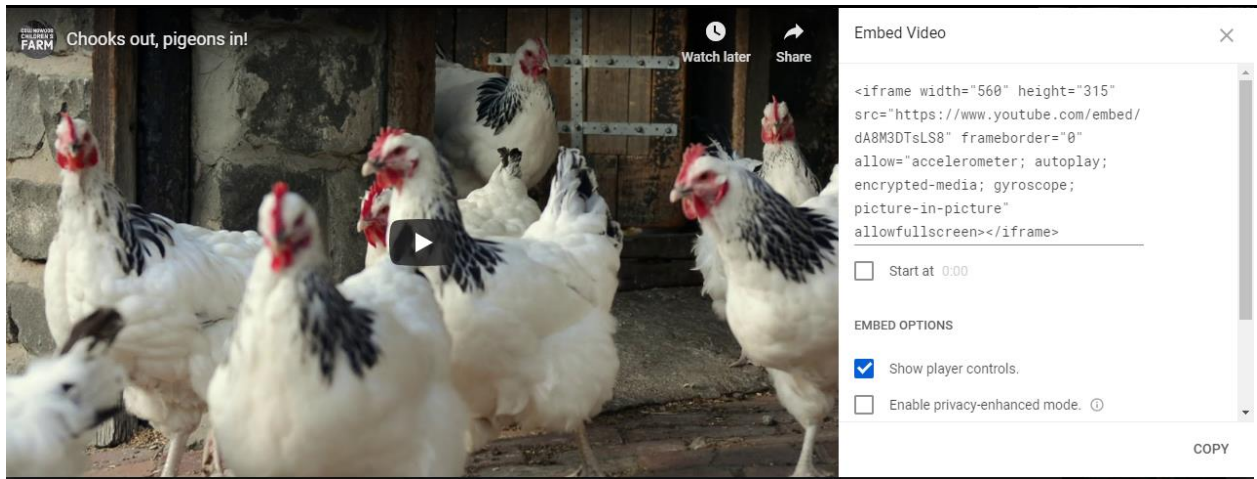
Share button highlighted

Click on that button, and you will be brought to a new screen. Click on the embed button.



Embed Button Highlighted

Finally, you will be brought to the screen below, which shows the embed video text. Copy the text from the right of the screen. If you want the video to appear in a map pin or region, paste this text in the description boxes, which accept HTML. If you want the video to appear in a WordPress page, create a new HTML block and paste in this text.



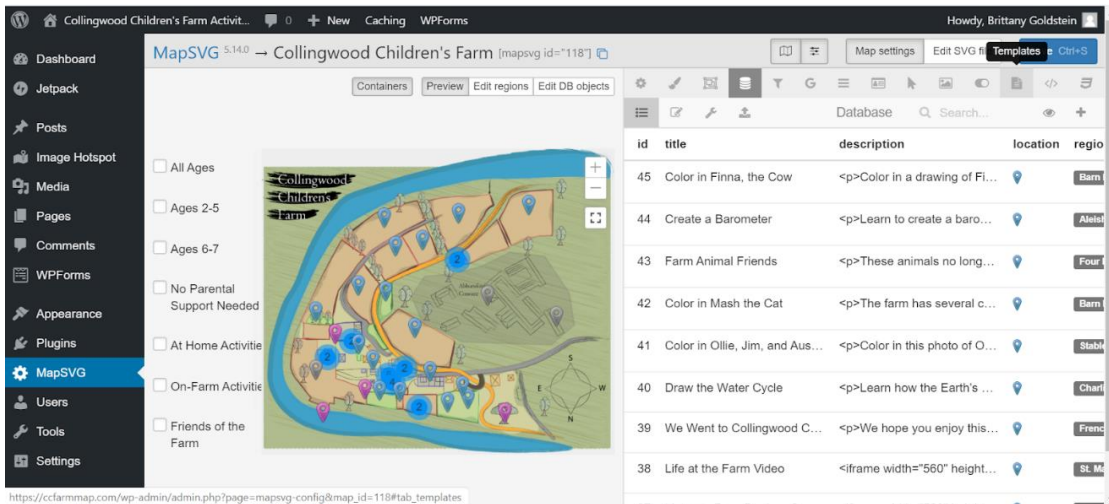
Example of YouTube's provided embedding code

## HTML Templates

Currently, links on the map are styled so that they are larger and bolded, as follows:

<p style="font-size:125%;"><b><a href="https://ccfarmmap.com/create-a-barometer/">Create a Barometer Activity Link</a></b></p>

All other text is placed in <p></p> brackets within individual pins. However, with this information and the resources below, feel free to change this. Additionally, if you feel confident in HTML, you can change the generic styling of all the pins/areas, by going to the HTML template layouts.

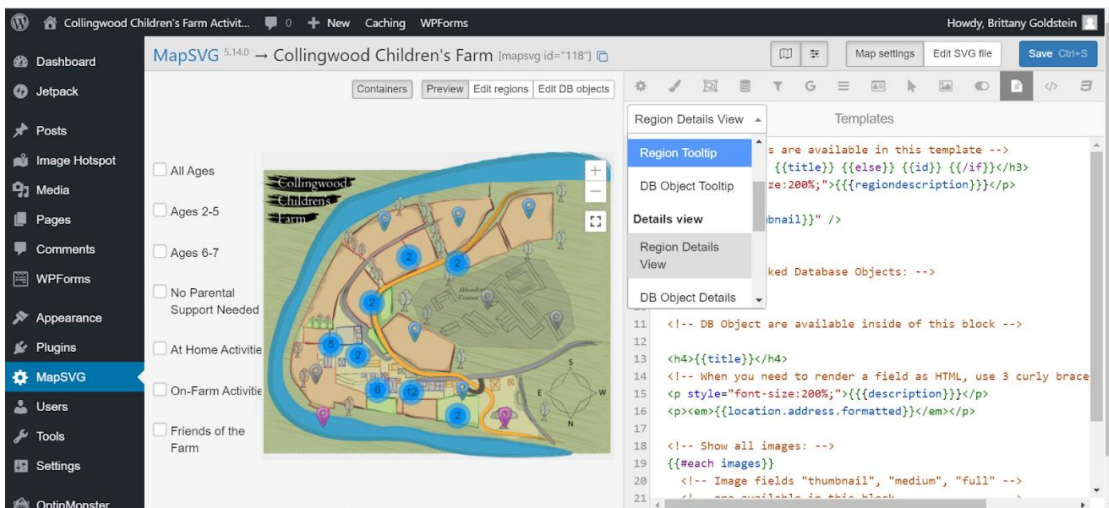


The template button on the MapSVG menu

This will allow you to change the HTML template for each type of popup for an area (region) and marker (DB). If you want to display a new field that you have created for your area or marker you can do something along the lines of:

<p>{{{field\_name}}}</p>

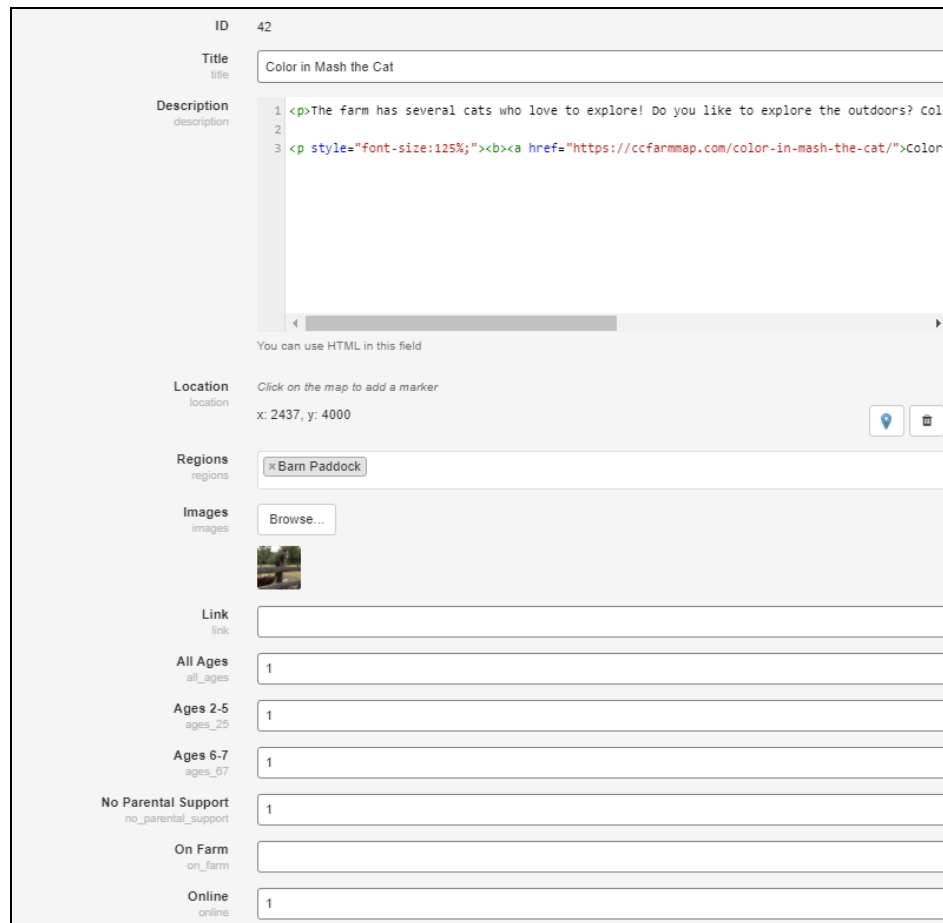
You must always use three brackets when referencing a field name.



Template Screen in MapSVG

## Future Resources

With this information, you should be able to format the text in the interactive map pop up pages to your liking. This can seem like a lot of information at once, so look at the other pages/activity pins for reference to see how they are done. There are a ton of resources for HTML on the web if you want to try out more formatting techniques. We would recommend going to <https://www.w3schools.com/html/default.asp> if you have any more questions on the topic. Additionally, the creators of the MapSVG plugin have created a thorough set of documentation which can be found here: <https://mapsvg.com/docs/>

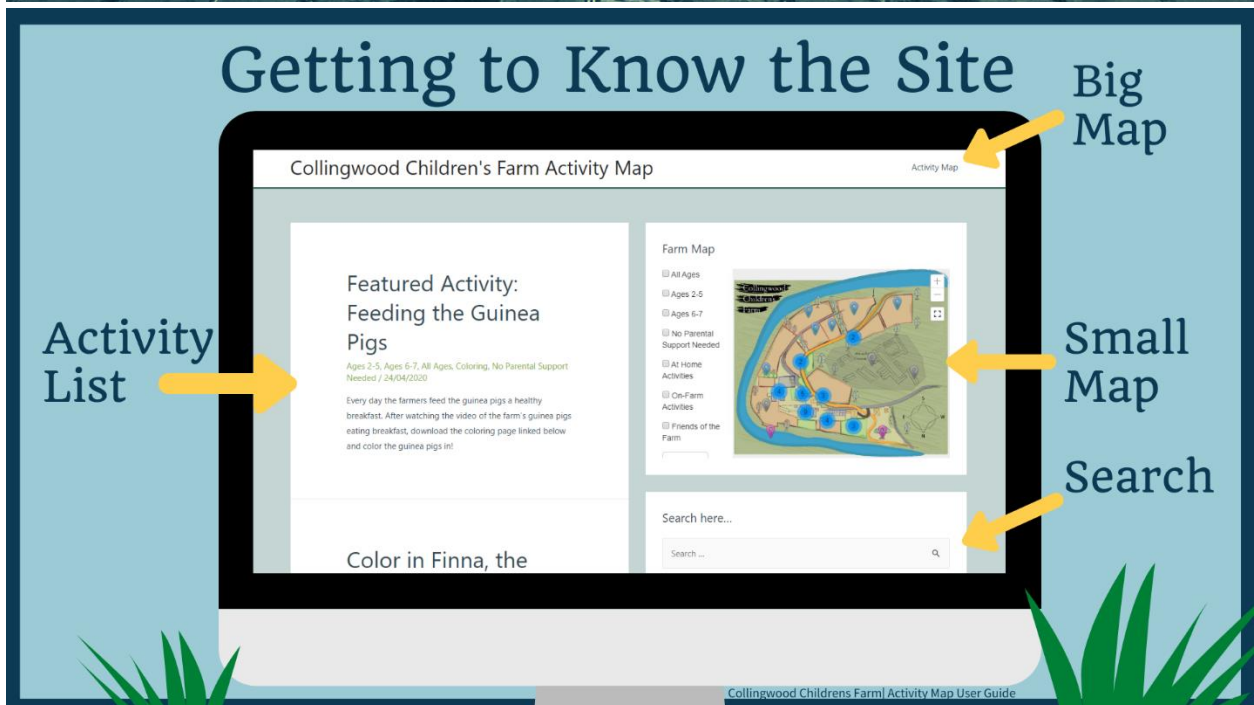
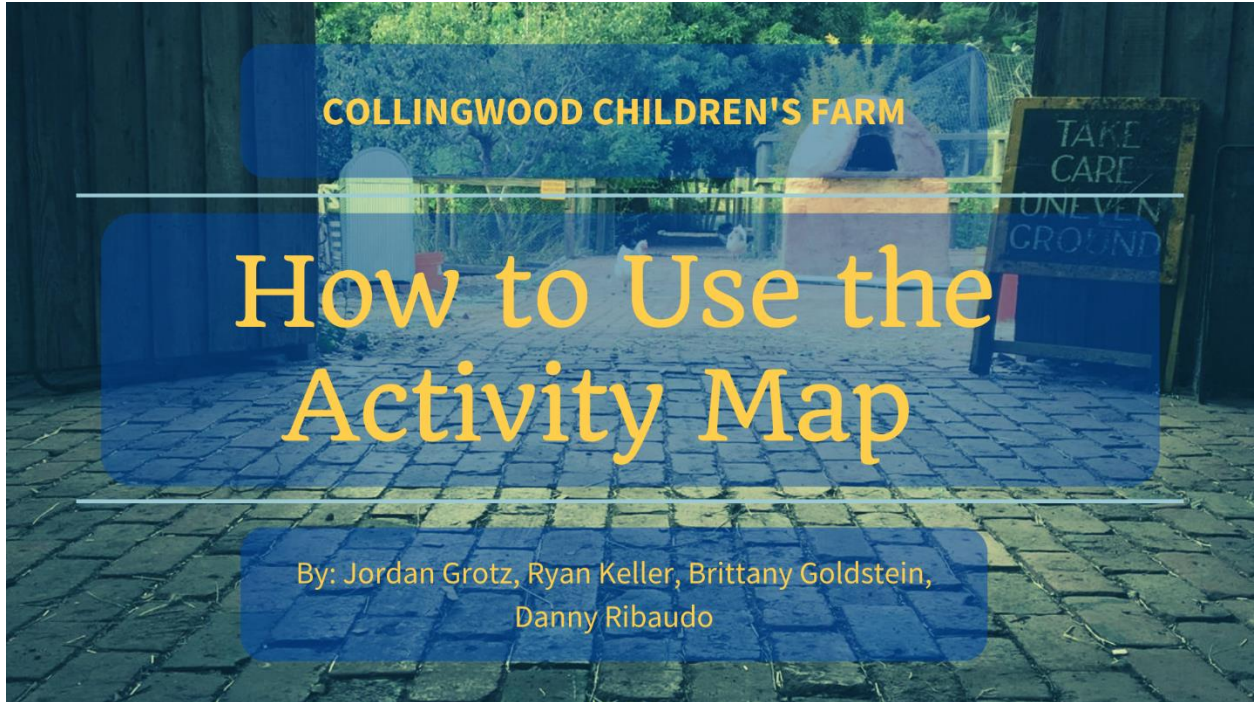


The image shows a screenshot of an activity form interface. The form is titled 'Color in Mash the Cat' and has an ID of 42. The 'Description' field contains three lines of HTML code: 1. <p>The farm has several cats who love to explore! Do you like to explore the outdoors? Col, 2. (empty), 3. <p style="font-size:125%;"><b><a href="https://ccfarmmap.com/color-in-mash-the-cat/">Color. Below the description field, there is a note: 'You can use HTML in this field'. The 'Location' field is set to 'x: 2437, y: 4000'. The 'Regions' field contains 'Barn Paddock'. The 'Images' field has a 'Browse...' button and a small image thumbnail. The 'Link' field is empty. The 'All Ages' field is set to '1'. The 'Ages 2-5' field is set to '1'. The 'Ages 6-7' field is set to '1'. The 'No Parental Support' field is set to '1'. The 'On Farm' field is empty. The 'Online' field is set to '1'.

Example Activity HTML

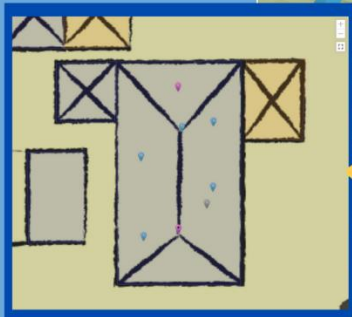
# Appendix L: User Booklet

This user booklet explains how to use the interactive map in a graphically appealing way to children, who are the map's primary audience.



# How to Explore the Map

Zoomed view makes the pins easier to locate.



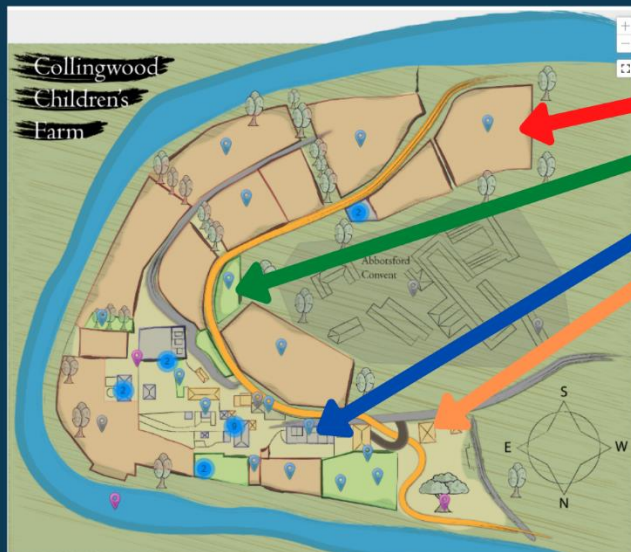
Bigger  
Smaller  
Reset



Click and drag to move around

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## What's on the Map?



Each area is highlighted in a different color:

- Paddocks
- Planting Areas
- Animal's Housing
- Farm Buildings

Pins mark points of interest:

- 📍 At-Home Activities
- 📍 On-The-Farm Activities
- 📍 Friends of the Farm

Click on each area and pin to learn more!

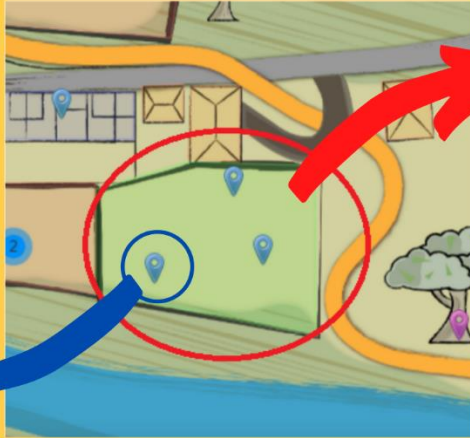
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# Pins and Areas

Pins are the markers placed on the map

## Pins

Click a pin to open an activity!



## Areas

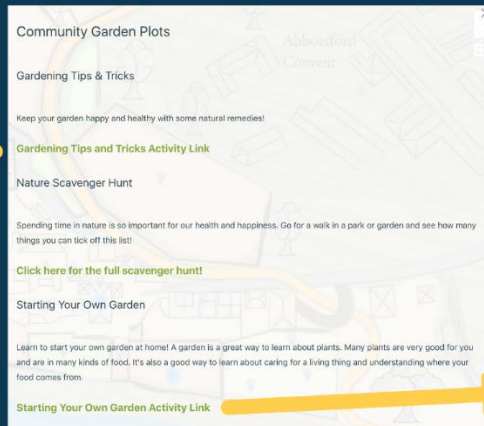
Click an area to get information, pictures, and activities.

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# How to Get to the Activities



See what activities interest you the most!



THE GREEN LINKS ARE YOUR TICKET TO THE DIFFERENT ACTIVITIES!



Collingwood Childrens Farm | Activity Map User Guide

# Finding Your Favorite Activities

## WHAT IS FILTERING?

Filtering shows only the activities that you want to do.

## WHAT DOES EACH FILTER DO?

**All Ages:** Activities intended for children of all ages

**Ages 2-5:** Show activities for children ages 2-5.

**Ages 6-7:** Show activities for children ages 6-7.

**No Parental Support Needed:** Show activities that do not need parental support.

**At Home Activities:** Things to do at home. These pins are colored blue.

**On-Farm Activities:** Things to do at Collingwood Children's Farm. These pins are colored purple.

**Friends of the Farm:** Groups that work with the farm. These pins are colored gray.



Collingwood Childrens Farm| Activity Map User Guide

## 3 Types of Activities

### Nature Activities

Follow these guides to start your own garden, predict the weather, and more!



Collingwood Childrens Farm| Activity Map User Guide

### Coloring Pages

Color in a picture of your favorite animal from the farm!



### Online Games

Learn how to pet a Guinea Pig or how to grow crops!





# 3 Types of Activities

## Nature Activities

Follow these guides to start your own garden, predict the weather, and more!



Collingwood Childrens Farm Activity Map User Guide

## What does a Nature Activity Contain?

### FOLLOW THE INSTRUCTIONS

Step by step instructions will guide you safely through each activity



### COLLECT WHAT YOU NEED!

This handy checklist has everything you'll need before getting started.

### ENJOY THE FRUITS OF YOUR LABOR

Share what you have accomplished and enjoy it!

Collingwood Childrens Farm Activity Map User Guide

# Try to Find all the Nature Activities on the Map

**WORM FARMS**  
 1. Fill the container a little deep...  
 2. Add the worms...  
 3. Fill the container a little deep...  
 4. Add the worms...  
 5. Add the worms...

**SHOEBOX FARM**  
**MATERIALS:**  
 • 1 shoebox  
 • 1 piece of paper or other bedding  
 • 2 cups, wooden or other strong wood  
**GETTING STARTED**  
 Cut a channel and open it up...  
**WHERE TO LIVE**  
 Place the worms in the shoebox...  
**MAKE THEM COMFORTABLE**  
 Add some soil and worms...  
**WHEN TO KEEP**  
 The worms will be happy...  
**THE NEXT STEPS**  
 Add some soil and worms...  
**COME VISIT US ON THE FARM TO LEARN MORE!**

**BUILDING FARM ANIMALS**  
**Materials:**  
 • Laminated, clean, and anything else you can find  
 • A piece of paper or other bedding  
 • 2 cups, wooden or other strong wood  
**Look around for a hollow leaf! Don't break them!**  
**How to build:**  
 1. Make a hole in the middle of the leaf...  
 2. Place the leaf in the shoebox...  
 3. Add some soil and worms...  
**Water Cycle**  
**What's the Weather?**  
**Sun**  
**Rain**  
**Wind**  
**Lightning**  
**Cloud**

Collingwood Childrens Farm| Activity Map User Guide

# Try to Find all the Nature Activities on the Map

**Making Butter**  
**Ingredients:**  
 • 1 cup of heavy cream  
 • 1/2 cup of salt  
**Instructions:**  
 1. Pour the cream into a bowl...  
 2. Stir the cream...  
 3. Add the salt...  
 4. Continue to stir...  
**Starting a Garden**  
**MATERIALS:**  
 • Garden soil  
**BEHAVING WHAT TO DO NOW**  
**SETTING STARTS**  
**PLANTING THE SEED**  
**CARING FOR YOUR CROP**  
**Next Steps**

**Parts of a Plant**  
**STEM**  
**LEAF**  
**SEED**  
**FRUIT**  
**FLOWER**

**Nature Scavenger Hunt**  
**GO FOR A WALK IN A PARK OR GARDEN AND SEE HOW MANY THINGS YOU CAN PICK UP THIS LIST!**  
 • An ant  
 • Something fuzzy  
 • Something that smells nice  
 • Something yellow  
 • A worm  
 • A sidewalk  
 • A shadowed leaf  
 • Something round  
 • Something that smells nice  
 • Something round  
 • A leaf  
 • Something soft  
**A printer friendly list can be found below!**

**Honeybees**  
**Have a go of drawing a honey bee of your own!**  
**YOUR BEE WILL NEED:**  
 • 2 ANTENNAE  
 • A ROUND BODY  
 • FOUR LEGS  
 • A PROCESSOR

**Gardening Tips & Tricks**  
**Keeping your garden, and the environment, healthy**  
**FEED YOUR GARDEN**  
**KEEP BUGS AWAY**  
**EXTRA PLANT FOODS**  
**STOP FENCING**

**Catalogue Sort**  
**Where does your food come from?**  
**For this activity you will need:**  
 • The newspaper catalogue  
 • The worksheet attached below  
 • A pair of scissors  
 • Glue or tape  
**Our some products out of your catalogue and stick them in the correct columns, showing where each product comes from.**

Collingwood Childrens Farm| Activity Map User Guide

# 3 Types of Activities

## Coloring Pages

Color in a picture of your favorite animal from the farm!



Collingwood Childrens Farm| Activity Map User Guide

## Try to Find all the Coloring Pages on the Map



Collingwood Childrens Farm| Activity Map User Guide

# 3 Types of Activities

## Online Games

Learn how to pet a Guinea Pig or how to grow crops!



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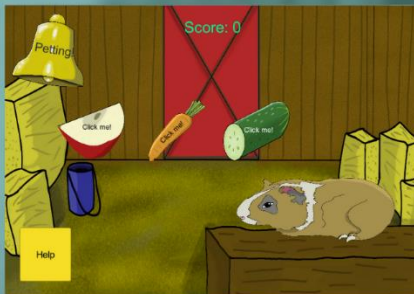
## How to Play "Guinea Pig Cuddles"

### Petting

Click and drag in the right direction to gain points.

Petting the wrong way will upset the guinea pig.

Click the bell to switch to feeding.



### Feeding

Feed the guinea pig by clicking on the foods, this will gain points.

Don't overfeed the guinea pig, or you'll lose points.

Click the bell to go back to petting.

Collingwood Childrens Farm| Activity Map User Guide

# How to Play "Grow Your Own Garden"



## MAY-BELL

May-bell is a pig on the farm.

## PLANTING

Click the seed icon to see what seeds you have. Click on the plant you want grow and then click tilled land to plant the seed.



## TILLING

Once May-Bell has finished fertilizing the land, click her to send her home. Click the hoe and then the land you want to till.

## WATERING

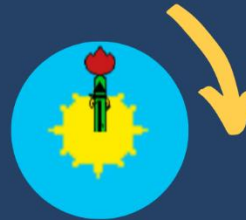
Water your seeds with 2 to 4 clicks. Any less will not be enough water for the plants, any more will flood the plants.

Collingwood Childrens Farm| Activity Map User Guide

# How to Play "Grow Your Own Garden"

## ADVANCING TIME:

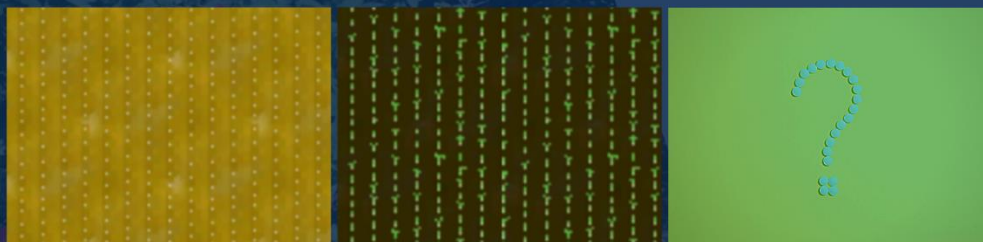
Drag the big hand of the clock in a clockwise circle with your mouse and your plants will grow!



Just planted

Starting to grow

Fully grown?



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