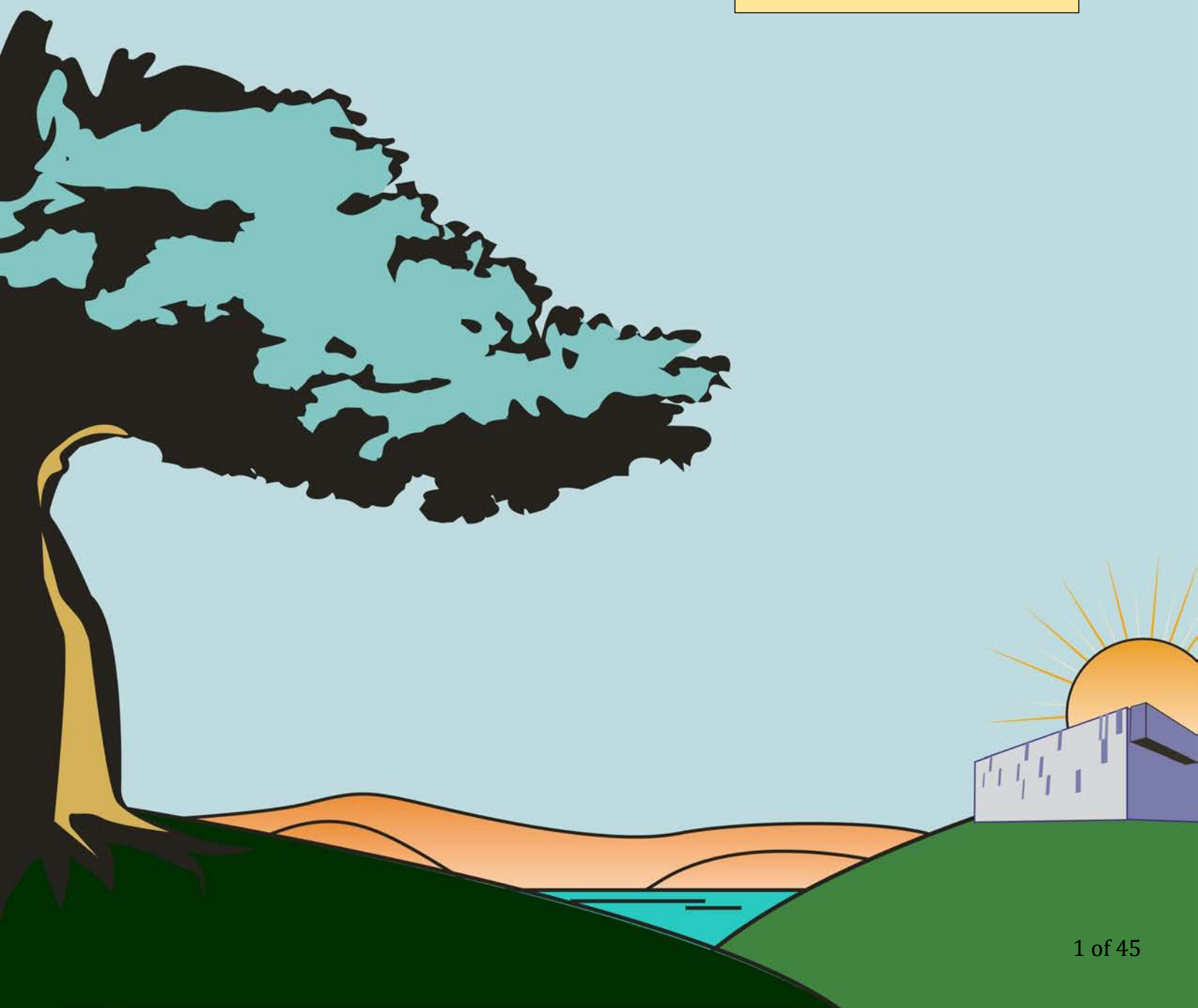


Changing Attitudes Toward Organic Waste Disposal and Composting with Games

Winter 2017

Department of Communications

PIONEERS FOR SUSTAINABLE COMMUNITIES REPORT



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ACKNOWLEDGEMENTS

This report was made possible by the collaboration and support of the City of Hayward, including:

The City Council: Barbara Halliday (mayor), Sara Lamnin, Francisco Zermeno, Marvin Peixoto, Al Mendall, Elisa Marquez, and Mark Salinas

The City Manager, Kelly McAdoo

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Waste Management of Alameda, Inc. Collaborators, Ingrid Severson and Shova Ale

This pioneering year of P4SC would not have been possible without the generous support of Cal State East Bay President, Leroy M. Morishita.



About Pioneers for Sustainable Communities

Pioneers for Sustainable Communities (P4SC) is a year-long partnership between Cal State East Bay and a community partner that represents local or regional government. P4SC is one of a network of campuses nationwide—the EPIC-N Network—that have adopted a model of using course-based, faculty-lead, student research to support the sustainability goals of local communities. P4SC focuses on sustainability, social justice, and quality of life in the San Francisco East Bay region. It leverages the expertise of faculty and the enthusiasm, time, and innovative ideas of students, providing thousands of hours of research to support local partner sustainability programs including: data acquisition and analysis, stakeholder surveys, geo-spatial mapping and referencing used to establish socio-environmental baselines, track progress, and facilitate planning and communications.

- **P4SC Reports** present the final results of one or more full-time equivalent courses devoted to a single P4SC project.
- **P4SC Mini-Reports** present the results of partial courses devoted to a PSC project, typically used for projects in progress.

About Cal State East Bay

Cal State East Bay's beautiful main campus is located in the Hayward hills with panoramic views of the San Francisco Bay shoreline. Situated above the city of Hayward, the campus offers an ideal setting for teaching and learning and yet easy access to the many cities along the bay. The University has a satellite campus in Concord, a professional development center in Oakland, and a significant presence online. Founded in 1957, Cal State East Bay is one of 23 universities of the California State University system (CSU). With an enrollment of over 15,800 students, Cal State East Bay is recognized as a regionally engaged and globally oriented university with a strong commitment to academic innovation, student success, engaged service learning, diversity, and sustainability.

P4SC Directors and Staff

Karina Garbesi, P4SC Co-Director, Professor and Director of the Environmental Studies Program, Department of Anthropology, Geography, and Environmental Studies, Cal State East Bay

Craig Derksen, P4SC CO-Director, Assistant Professor of Philosophy, Department of Philosophy, Cal State East Bay

Audrey Wade, P4SC Program Coordinator, Cal State East Bay

With support from Jillian Buckholz, Director of the Office of Sustainability



About the City of Hayward

The City of Hayward was incorporated in 1876. With a population of 150,000, Hayward is the sixth largest city in the Bay Area and proudly the second most diverse City in California. A Charter City, Hayward operates under the Council-Manager form of government with a directly elected Mayor and six member City Council. Hayward is a full service City comprised of thirteen departments providing services ranging from public safety and public works to library and community services. The City strives to be a safe, clean, green, and thriving community for all of its residents. To learn more about the City of Hayward, visit www.Hayward-ca.gov.



Changing Attitudes Toward Organic Waste Disposal and Composting Through Games

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COURSE PARTICIPANTS

P4SC Instructor

COMM4107: Lonny Brooks, Assistant Professor of Communication

MM66: Ian Pollock, Assistant Professor of Art

P4SC Student Participants

A total of 39 undergraduate students worked to produce small-scale prototype games to increase and promote awareness of recycling and composting commonly referred to as three-stream sorting. A number of these students took part in the Zero Up Game Jam as well along with students from various CSUEB departments in business, computer science, and communication.

A total of 7 graduate students as a seminar team produced a workable digital and interactive prototype game called Recycolution that Waste Management of Alameda, Inc., and the City of Hayward have an active interest in developing as part of the redesign of WM's current portable game booth to use at street festivals for promoting sustainability awareness for the City of Hayward and the City of Oakland. The regional EPA representative has much interest in this game as well.

Students in Comm 4107: Relational Communication in Organizations

Mean & Green

Kevin Jung

Robyn Sison

Ryan Yee

Green & Clean

Shannon Bahr

Christine Gohil

Angie Mercado

Yingyi Zhou

Com Pow



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OBJECTIVES

The City of Hayward has identified composting as a route toward greater sustainability. They are partnering with California State University, East Bay to help meet these ends. The students of COMM 4107 Relational Communication in Organizations in Winter 2017 were tasked with developing games to improve attitudes about Compost and Organic Waste.

GAME DESIGN



GAME AND ENVIRONMENTAL PUBLIC RELATIONS DEVELOPMENT

The City of Hayward and Waste Management of Alameda, Inc. (WM), decided to see what student teams might develop in creating a promotional game booth based on the existing game booth that WM had in use and wished to redesign. Their call for development described what they had created and what they now wanted to redesign.

Waste Management is currently developing creative content for a new interactive 3-stream educational booth for streetfest events. A number of years ago, WM worked with another University as a class project to create a concept of a booth game. Unfortunately, the resulting concept was too expensive to materialize, so WM is looking to try once more and this time with Cal State East Bay and the City of Hayward.

Some Guidelines for Creative Development of Zero Waste Game:

- Interactive, fun and educational game/playable media, focused on 3-stream sorting.
- Provide guidance on proper waste handling; Includes recycling, compost, and trash.
- Regarding trash: specifically address hazardous waste and bulky pickup vs. dumping and littering.
- Try to include representative, key items from each stream.
- Game style should be both child and adult friendly.
- Game should be portable (for ease of heavy use & transport for events) and be free standing or fit within a 6'-8' long table and standard event booth area (10' x 10').
- Features should include a strong visual element, the "why" or "need" for recycling and composting and sorting correctly.
- For optimum customer experience, game should be visually driven, rather than text based.
- Game concept should go beyond the standard sorting, "what goes where" and not be a spinning wheel game.
- Product should be designed with economic viability as a factor (production costs of game not to exceed \$5,000).

Games are an often under appreciated communication tool. Games allow us to model complex relationships and experiments with choices in a complex system. Games are a way to have fun and bring people together around a common activity while consciously or unconsciously discovering and exploring ideas around social relations, political, and economic systems, and developing personal and interpersonal skills.

The students simulated creating environmental public relations (PR) practice firms and developed a value proposition for their companies with their recycling game as their deliverable product. Student teams created their own simulated PR firms using an approach for sustainable entrepreneurship known as Models of Impact (MOI) developed by Anthony Manos at VERNICE, Inc. With MOI, student PR firms developed



their pitch and value propositions for their firm and the game they designed for increasing awareness of 3-stream sorting via public awareness interactive games.

Student firms developed their own self-styled names for their firms:

1. No GPMs
2. Green and Clean
3. Mean and Green
4. Compost Cadets
5. Better Tomorrow
6. Waste Management
7. Lettuce Compost

Students created their games based on principles of human centered design from IDEO, a design firm based in Palo Alto that has developed design processes for sustainability focused efforts for community and urban challenges.

“Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.” —Tim Brown, President and CEO, IDEO

Their games developed through a **three phase process** known as **inspiration** where students engaged in research about recycling and composting, **ideation** where students sorted and clustered their ideas based on this research and then transformed them into insight statements, and **storyboards** for outlining how various audiences might interact with their games and finally implemented these ideas into small scale prototypes to materialize their ideas for feedback and final implementation.

Student firms created these games by creating a series of design questions known in the design processes as “How Might We...” questions. These questions asked the following:

- How might we get people interested and actively involved in composting and recycling?
- How might we develop a well informed audience with up to date information, activity meetings and access to composting and recycling?
- How might we incorporate social media in order to have a following of people interested in composting and bringing awareness to local neighborhoods that lack information?

Student simulated PR firms created storyboards based on various audiences diverse in age, gender, and ethnicity and considered how they might approach and interact with the game booth.

The City of Hayward met with the class on several different occasions. During these visits the City explained the significance and importance of composting, as well as



recycling. The City of Hayward showed the class a video that briefly described what composting is and how one can incorporate composting in their daily lives. The video explained what composting is and how to properly separate items in the proper bins (recycle, composting, and trash bins). The City focused the majority of the presentation on the benefits the City offers to those who compost and the long term goals the City has set in place to accomplish.

Some of the goals the City has in place are to reduce the amount of waste in Hayward by 80% by the year 2020. Another goal is to have waste that is sent to landfills to contain less than 10% of materials that are compostable or recyclable. Along with informing the class of the long term goals, the City went into great detail on the benefits available to those who compost; throughout the presentation the City emphasized how convenient and beneficial composting can be and many classmates were surprised at the number of services the City offered. One service that surprised most of the class was the Organics Service which involves the City distributing free green carts/bins for families and businesses to separate their trash conveniently. Along with being able to separate trash with convenience, the City and Waste Management have a franchise agreement with one another to ensure that trash from homes and businesses is collected in a timely manner. The City briefly described the process of what happens to the collected material once it arrives to the composting facilities (Redwood Facility and Blossom Valley).

One thing that the City emphasized several times was the importance and value of education. From their experience and knowledge most people do not compost or do not compost correctly because they do not know how. A lot of people are also unaware of many of the services the City offers to those who would like to start composting. The City went over “Compost Giveaways”, which consist of the City of Hayward giving out free bags of compost to community members once a year. When the class heard this information they were immediately intrigued and astonished. Most of the students asked details for the next event (with intentions of going), some students even asked why they haven’t heard of this giveaway. The City also informed the class of a couple of different outreach groups (Waste Management, Cascadia, and the City-led outreach) that attends events and talks to the Hayward community with the intention of informing and teaching others the importance and convenience of composting.

THE GAMES

No GPMs

No GPMs Presentation Notes:



Ready, Set, Sort

No GPM's Environmental
Consulting Group



Game Design

- Name: Ready, Set, Sort !
- Slogan: Why Waste, When You Can **Sort** !
- Type: Exciting and Competitive Speed Sorting Game



Game Instructions

Game leader will control the lighting on the board

Led remote control lighting that will flash colors for specific holes in the board.
(Red=Trash Blue=Recycle
Green=Compost)

Once it lights up the person is timed to put the correct items in the bin.

The items are objects that will have compost or reusable items pictured on it. The objects will be easy to differentiate for kids and adults.

It's a timed game meant for two people at a time

Winner can win gift card to their favorite "green" restaurant or choose from a prize we'll have in Buckets

Inspiration : Batak Pro Lite Game



Photo Booth

#wmnogpms





Materials Needed

Budget
\$2000

2 Wood / Plastic panels about 5ft
high and 2 ft wide

LED lights (Remote Controlled)
For both sides

12 Baskets (Clients Style
Preference) 6 for each side

Paint

Custom Poster Board
(Instructional Diagram)





GREEN AND CLEAN

Green and Clean created a game called “Eco-go”. This game is a flash card, with two different teams (Red team and Blue team), that is played on an app. The “Eco-go” app has three different levels the players can go through. The first level would be a booth game. The second level consists of the flashcard questions, which would have questions about composting, recycling, and gardening. Finally, the third level would have a paintball, canon ball, and coloring section for the gamers. This game is meant to target all age groups. Adults can enjoy the question trivia, while children will enjoy the learning games and eventually participate in the question trivia.

The Green and Clean team definitely created a game with a different approach than the other teams. This team wanted to create a game that was applicable to all age groups and was the only group to create a game that would not cost a dime (because creating apps is free). This team has proposed a vision that once their app is to become popular, other companies will want to promote their ads on it, which will end up creating revenue.

Green and Clean Presentation Notes:

◉ *Model of Impact: Social Action* ◉ *Revenue Model: Advertisement* ◉ *Value Proposition: We have utilized technology to create a game experience that will stay with the booth participants long after they leave* ◉ *Products: Phone app that is both fun and educational. Game involving app and physical props (flashcards)*

Our Game Design Eco - Go

◉ *Booth game- Eco-Wiz Level (Flash card game)* ◉ *Red Team* ◉ *Blue Team* ◉ *Prizes for the team who gets three answers correct*

Stage One

◉ *Eco-Wiz Level (Flash Card Game on the App)* ◉ *Multiple choice questions about Composting/Recycling*

◉ *Eco-Learn Level* ◉ *Composting Tips* ◉ *Gardening Tips* ◉ *Local Event listing*

Stage Two

◉ *Nationwide distribution of the app across all Waste Management* ◉ *Paintball level* ◉ *Cannon level* ◉ *Coloring Book level* *Stage Three*

Why create waste when you can easily create compost?

Learn how to compost with the swipe of your finger.

Plan for an extravagant tomorrow by making extraordinary choices today.



MEAN AND GREEN

Mean and Green created a game called “Trash Me”. This game is a card/board game where the players wear cards on headbands that have a picture of some type of waste. The players will ask the others players clues on what the waste is and try to guess what the waste is and where it goes when it becomes trash. Throughout the game there are clues that will be available to the players to help them guess what card is on their headband. The clue cards/posters will consist of items that are organic, landfill, and recyclable materials. The overall purpose of the game is to teach the players about composting. At the end of the game there aren’t any losers or winners but there are tickets to the “Davis Street Complex” where the players can learn more about composting and recycling.

Mean and Green are determined to use their game to impact all generations by a social impact. Not only will this game be fun for all age groups but it will teach and motivate everyone to compost and recycle correctly. Mean and Green are not interested in a money profit, but they are interested in motivating others to help rebuild/save the environment.

Mean and Green Presentation Notes:

Environmental Consulting Practice

☐ *Impact Model: Social Awareness*

☐ *Revenue Model*

Booth Game Encouraging Composting Awareness

Game Design

☐ *TRASH ME!*

Think

☐ *Heads Up! but themed around trash and where it goes.*

How To Play

☐ *Players will wear a printed card with waste on it. to narrow down and guess what they are.*

☐ *The player will*

☐ *Player is encouraged*

bin they belong in. what they are:

☐ *The player will*

Clues

☐ *Posters like these with silhouette images will be in the booth to narrow down the possible item they are.*

How To Play

☐ *Players can switch off turns and play a few rounds. ☐ Players will learn what items go in what bin.*

☐ *There are no winners*

“ticket” to visit the Davis Street Complex to learn more about recycling and composting.



Slogans

□GOING GREEN IS AS EASY AS 1,2,3 BINS! □SUSTAINABILITY TODAY FOR A TOMORROW

COMPOST CADETS

The Compost Cadets created an innovative separating game that involved a kiddie pool (which signified the ocean), magnetic fishing rods and mock waste with magnets attached. The pool would be filled with mock waste as two players would fish for trash and put the collected trash into the proper waste bins (recycle, trash, compost). Whoever sorts the most trash correctly would win a prize. Everyone who interacts with the game tent would receive refrigerator magnets and/or stickers to put on their bins at home to remind them where materials go. Compost Cadets' overall goal of their game is to promote positive waste sorting.

The Compost Cadets hope to use their game as a way to interact with the community while building a sense of togetherness amongst the community. They believe that this game will help bring neighbors together, which can help make the journey more interesting and fun. This game will hopefully turn composting into a habit, which will help the community's sustainability flourish. Along with the game, the group thought that email blasts would be a quick and free method to spread information to the community. In order to keep costs at a minimum, the group would reuse materials from previous games as well as shop in bulk for other needed materials, which would keep the cost as low as \$25 per game. What makes this game stand out is it shows that pollution and trash do not just happen on land, but happens in water as well.



Compost Cadets Presentation Notes:



Proper waste sorting is an easily learned practice that promotes environmental ownership for our local community.





"Cleaning up the Ocean"

Materials needed:

- Kiddie pool
- Magnetic fishing rods
- Mock "waste" with magnets attached
- Whiffle balls to add to the challenge
- Recycle, trash, compost bins

Rules

- Two players at a time
- Players use their fishing rod to "fish" out the waste
- Sort the waste in the appropriate bins
- Whoever can sort the most correct items wins and gets a prize

Slogans

- Stop, think, sort. For what it's worth, 5 seconds can save the Earth!
- For a better tomorrow, begin composting and build the bright future today.
- Treat the planet how you would want to be treated, and it will do the same to you.
- Let's think green and keep the Earth clean!



Additional Information

- Promote positive waste sorting through social media, interact with community members.
- Send out fridge magnets and/or stickers to put on bins that can visually help proper sorting.
- Email and text blasts to keep people inspired
- School newsletters

BETTER TOMORROW

The group Better Tomorrow decided to create a game that targeted mostly children. The goal of this game would show/teach the players the full cycle of composting after it is picked up. The game would be set up like a game board, each spot on the board would be a different step throughout the compost journey and the game piece would be an apple core, moving through the different steps of composting. The different steps of the game go as follows: apple core, garbage, landfill, methane OR alternatively, apple core, organics, compost, garden. The players can see what happens if they do or do not compost, which shows them the importance of composting and the effect that one person can have on the world. At the end of the game the players can see that by composting the apple core, they have contributed to planting an apple tree or they have contributed to more trash on the planet. There would also be a series of compost questions asked to the players throughout their board game journey.

The group's overall goal is to create a more sustainable future by taking a childhood game and incorporating education into it. Because the goal is to teach others the importance of sustainability, the budget for this project is kept at a bare minimum. The group intends to reuse both recycled materials and materials from past games to create their game.



Better Tomorrow Presentation Notes:

Mission Statement • To create a simplified learning experience for children to understand the importance of composting: Composting is a sustainable practice that will benefit the community and environment for future generations

Objectives

- *Learn the full cycle of composting after the apple core is placed in the composting bin*
- *What happens after the garbage is picked up?*
- *The idea of the game is for players to understand that the decisions they make can either lead to a new apple tree or lead to hindering our future*

Process

COMPOSTING PROCESS=GAMEBOARD

F G G

• *A roadmap showing the journey of an apple core from disposal to the growth of another apple tree* • *Players are asked questions about how they dispose their apple core (organics) which determines where it goes next... - Organize the step-by-step process of composting - Learn the benefits of composting* • *Apple core → Garbage → Landfill → Methane*

Apple core → Organics → Compost → GARDEN • *Visuals of the apple core, organics bin, waste bin, garbage truck, facility, landfill, windrow piles, compost and a garden as well as information about each step*

Game Questions

- *Sand, coal and ashes can be compost. True or False*
- *Heat is used for the decomposition process. True or False*
- *Can coffee grounds, egg shells and horse manure be compost? Yes or no*
- *Fill in the blank: Water + oxygen + _____ = Composting*
- *Name one reason why composting is important for the environment.*



WASTE MANAGEMENT AND ASSOCIATES

Waste Management and Associates Presentation Notes:

Waste Management & Associates

-Rebecca, Adam, Aaron, Thomas



Awareness and Involvement

-Bringing the Community Closer

-Business/Employee Engagement

-Makes a more stable connection

Between the people that run the city,
And those that live in the city.





Sustainability

- Natural Environment which leads to
- Healthy Communities which leads to
- Healthy People which leads to
- Stable Economy



Road To Awareness

Relay Race





LETTUCE COMPOST

Lettuce Compost Presentation Notes:

LETTUCE COMPOST



Target: Kids

- Kids are the future
- Kids influence parents



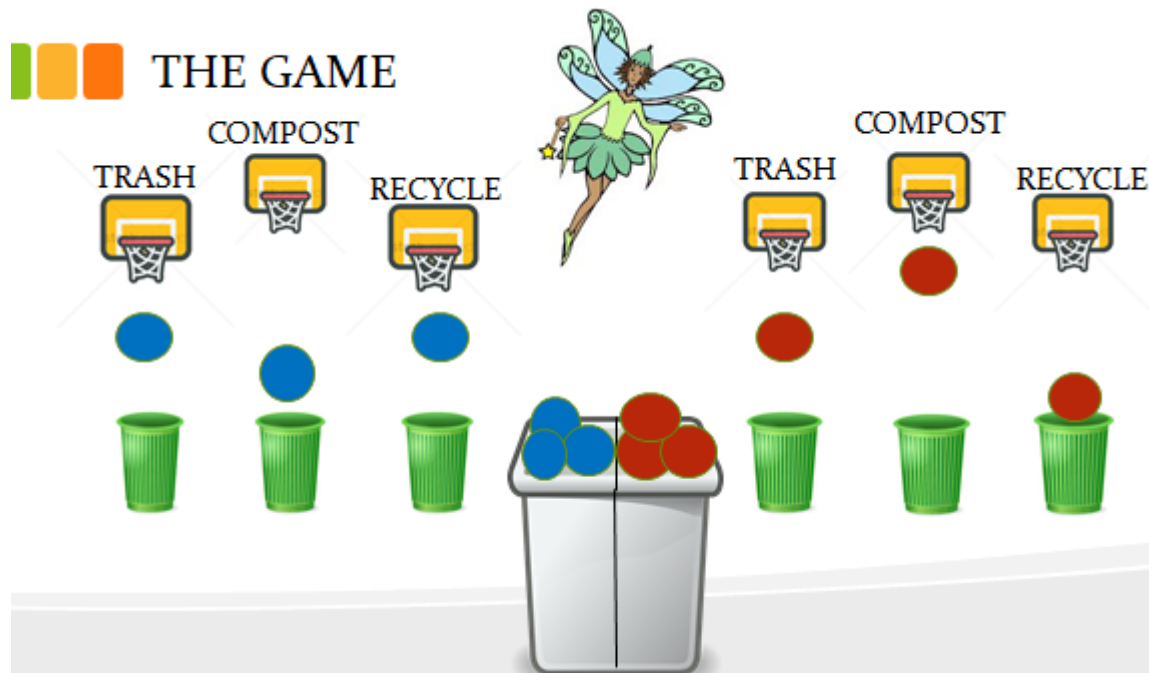


COMPOST FAIRY



- Brings the “magic” of composting into homes
- Informs and educates children and adults about composting
- Sings songs and visits schools

THE GAME





SPREADING THE WORD



#FEEDHERRIGHT

SLOGANS

- MINDFUL WASTE, PROBLEMS ERASED
- EARTH IS ALIVE, FEED HER RIGHT
- IN THE DIRT, NO MORE HURT
- COME POST ABOUT YOUR COMPOST!





GRADUATE SEMINAR GAME DEVELOPMENT

OR

THE ADVENT OF RECYCOLUTION

The graduate students in a graduate seminar called *MM66: Interactive Content Delivery* taught by Professor Ian Pollock used human-centered design principles in developing a final and workable full scale digital prototype for their game booth in working with WM and the City of Hayward. They developed a promotional film and accompanying powerpoint presentation, with details as follows:

Recycolution Game Demonstration and Pitch

Today we want to show you our amazing new recycling game that we developed by using human-centered design thinking, featuring:

- A. Discovery
- B. Learning
- C. Building

Developing the Recycolution Game

Our challenge was to develop a game that would educate, train, and inspire users to become better recyclers.

To accomplish this task we had to go directly into the community and speak with people who recycled or didn't, learn from experts, and witness firsthand for ourselves what happens at recycling and waste facilities...Overall, we wanted to know why people recycle and why they don't.

- We spoke to extreme recyclers who shared what motivated them to become life-long recyclers.
 - a. Each were motivated by a deep-seated passion.
 - b. They had vivid mental maps and a clear vision about the impact of waste on the environment and future generations.
- We spoke to non-recyclers, who spoke about their reservations to practice this behavior.



- Experts also offered input:
 - a. 2% of people recycle.
 - b. Recycling is labor intensive.
 - c. Older people are more likely to recycle.
 - d. Recycling is not seen as cool.
 - e. Recycling is too common place (people aren't moved by it).

Next, we had to synthesize the crucial insights from our fieldwork and identify common themes, recycling challenges, and then discuss how we might address them in our game.

- After an intensive discussion we came up with the following challenge statements:
 - a. It is difficult to see the real impact of our recycling.
 - b. It is difficult to know what to recycle and where.
 - c. We can't see the consequences of waste.

These insights led us to develop solutions starting with “How Might We...” statements to address these obstacles to recycling:

“How might we.....”

- I. ...develop playful ways to learn about the recycling and recycling locations?
- II. ...use playable media to help train/educate people into becoming practicing recyclers?
- III. ...design an interactive game which will enable urban residents to visualize/realize the impact of individual and collective recycling efforts?
- IV. ...create a way for people to focus on the positive aspects of recycling and remove the stigma?

These “How Might We...” statements propelled us into the prototyping stage.

- We took a week to individually think about game prototypes that would address our “how might we” questions and we came up with some diverse but relevant ideas that we presented in our next meet up.



- There was the proposal to develop an augmented reality game titled “Trash Bandit.”
- Another team member suggested making a narrative game about a dystopian future where trash has spread to every inch on the planet.
- To address the problems of sorting, a carnival style mallet game was recommended and an old school top-down game was proposed which tasked players with collecting thrown away items and place them in the correct bins to advance to the next level.

We went back and forth on each, cross-referenced them to our design challenge, reflected on feasibility and viability. Suddenly, when we looked at these renditions, ideas emerged:

- I. Mix the sorting/collecting game with the carnival style mallet game.
- II. Take advantage of the physical space where this game will be showcased.
- III. Add in game elements of throwing objects in the right bin or hoop.

The result: A ‘Dance-Dance Revolution’ style game, but with a recycling twist.

- In order to understand how this game would play out in the field, a basic prototype was built using Power Point slides, upbeat music, and floor panels made from paper and cardboard.

The Alpha Testing results were encouraging:

- I. Participants were having fun.
- II. Participants learned new information—even those who are regular recyclers.
- III. Participants immediately started implementing what they learned.
- IV. Our observation of participants helped us to tweak the speed of the game, improve visuals, and drove us to include specific sound effects.



The Advent of Recycolution

Mateo Fowler | Laura Greene | Ken Imah | Connie Tang |
Yasser Moten | Stephen Leber | Madlen Bouthillier |
03.14.2017

“Everything has a place,
and there is a place for
everything.” - Aunt Mona

- ❶ **Pizza boxes, paper towels and napkins are paper so they go in the blue recycling cart.**
 Nope. They're often contaminated with food and grease and can't be reused as paper. They can go in your green organics cart.
- ❷ **Foam meat trays and egg cartons should go in the blue cart.**
 Nope. Unfortunately all foam products should go in the black landfill cart; they are not easily recycled.
- ❸ **Throw plastic bags away; they can't be recycled.**
 Nope. Clean bags can be recycled! Just bag-the-bags and put right into the blue recycling cart.
- ❹ **It's best to put food scraps down the garbage disposal.**
 Nope. Food and grease can clog pipes and cause backups and sewer spills. Prime cloggers are cheese, gravy, salad dressing and meats. Plus, it takes a lot of resources and energy to remove all of the food waste at the water treatment plant. Place all of your food scraps in the green organics cart.
- ❺ **I need to wash all the bottles and containers before I recycle them.**
 Nope. Just make sure they're empty and fairly clean—use a spoon, spatula or napkin to clean out the container (and compost the napkin in your green organics cart).

5 Recycling Myths - RecycleSmart



Our design challenge

Design an interactive 3-stream educational game that will be:

Adult and child friendly

Visually driven

Affordable

Portable

~~Inclusive of representative items for each stream~~

What is design thinking?

"Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success." —Tim Brown, President and CEO, IDEO

Key Elements of Design-Thinking

- Human-Centered
 - Collaborative
 - Optimistic
 - Experimental
 - Positive Social Impact
-

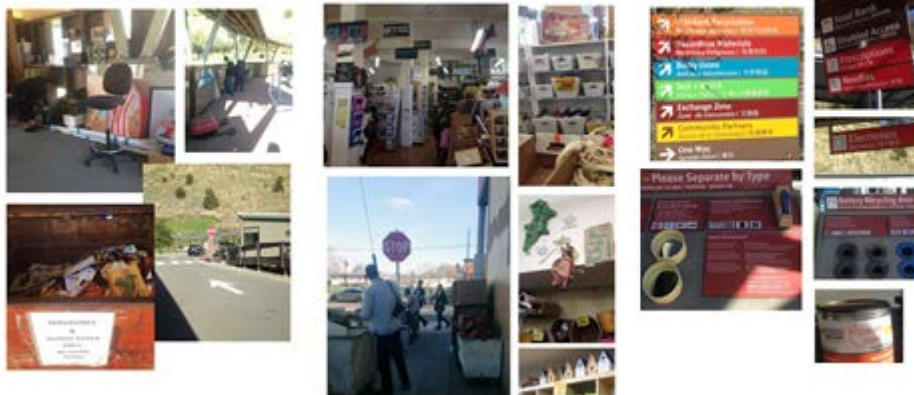


Inspiration/Discovery

Inspiration/Discovery



Inspiration/Discovery





Inspiration/Discovery

Extreme Recycler:

Joanne (Walnut Creek, CA)



Inspiration/Discovery

Extreme Recycler:

Stuart (Walnut Creek, CA)



Recycling for over 30 years

Boycott non eco-friendly businesses

Each person's mountain of trash as a legacy



Ideation/Learning

Ideation/Learning



Ideation/Learning

We learned the existence of the following recycling challenges:

- It is difficult to see the real impact of our recycling
- It is difficult to know what to recycle and where
- We can't see the consequences of waste



Ideation/Learning

"How might we" use playable media to learn about recycling and recycling locations?

"How might we" use playable media to help train/educate people into becoming practicing recyclers?

"How might we" design an interactive game which will enable urban residents to visualize/realize the impact of individual and collective recycling efforts?

"How might we" create playable media to focus on the positive aspects of recycling and remove the stigma?

Prototyping/Implementation

Prototyping/Implementation





Prototyping/Implementation

Participants were having fun

Participants learned new information—even those who are regular recyclers

Participants immediately started implementing what they learned

Our observation of participants helped us to tweak the speed of the game, improve visuals, and drove us to include specific sound effects

To conclude, this class has worked tirelessly for the past 12 weeks researching, learning, and prototyping to create a game embodying the true ethos of Human-Centered Design

- Our game is inspired by insights derived from our field work, crafted on our learnings, and prototyped in the actual field
- We know this game will teach better recycling habits and assist us to tackle the waste problems we are facing
- Our game is specific yet also flexible to any community in our country which supports recycling





GAME JAM

In conjunction with the game development for promoting recycling and awareness of three stream sorting, Professors Ian Pollock and Lonny Avi Brooks created a 'Zero Up Sustainability Game Jam' where students from the departments of communication, biology, computer science and business worked together over one day long session to create board games to promote issues of sustainability.

This was a 7 hour long free-form open prototyping event where students had the opportunity to meet and make new friends and learn to create playable media to communicate important details about environmental practices.

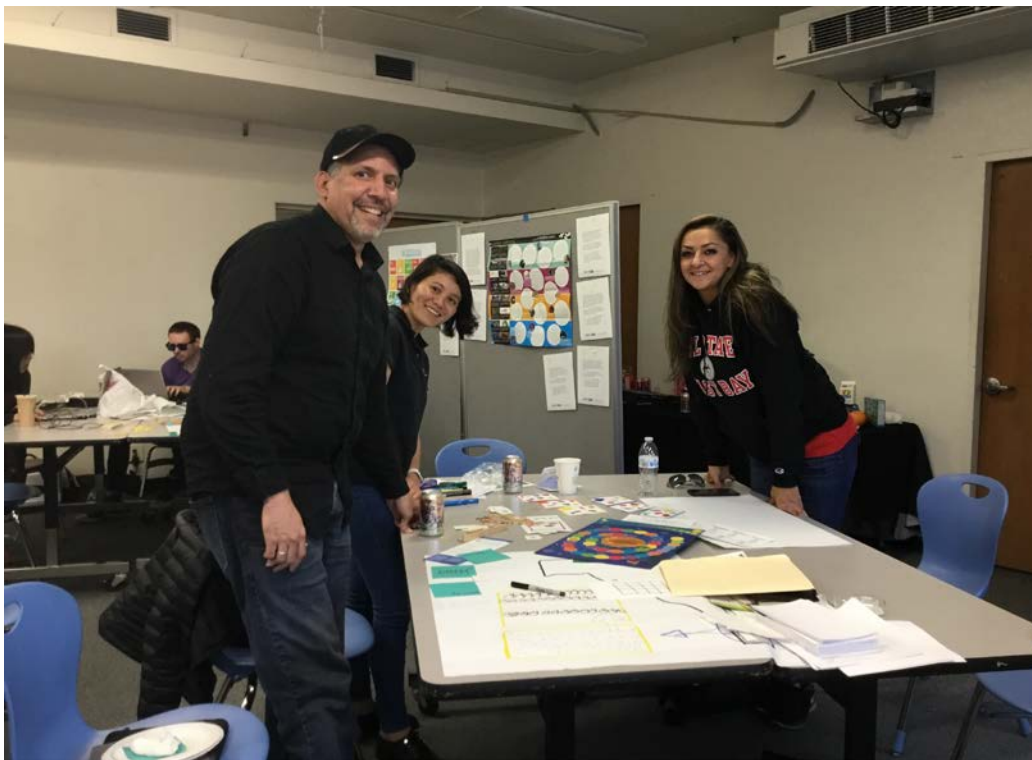
Student teams developed three board games from the Zero Up Game Jam:

- I. Solar Domination game: Players see how rapidly they can develop competing solar grids that acquire more power as they build their solar grids through competitive strategy and luck.



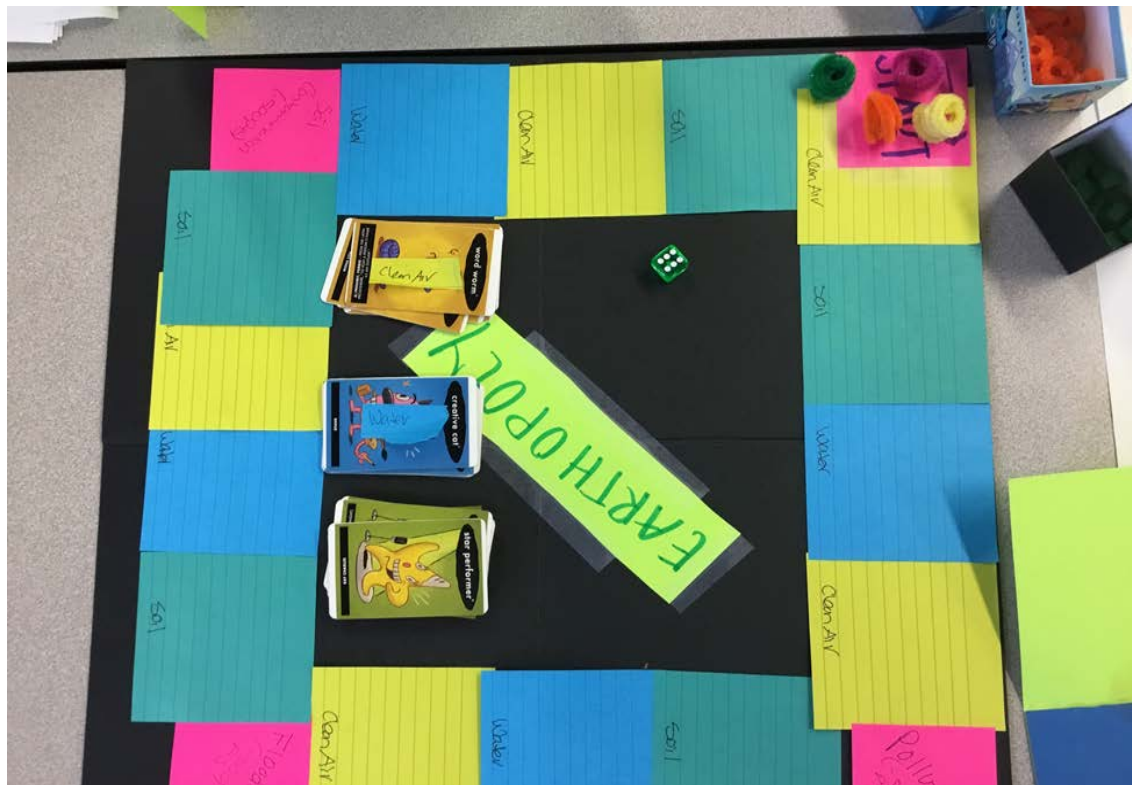


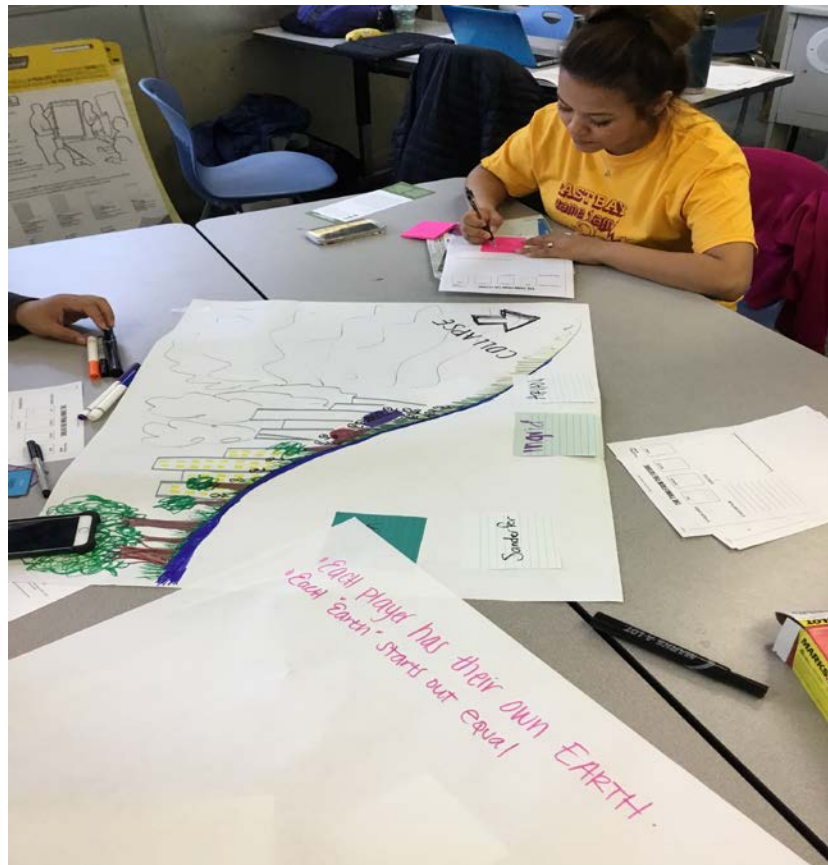
- II. Permaculture game: Players learn how to build effective farms through the cultivation of sustainable and self-sufficient crops.





- III. Earthopoly: Players learn how to create a more sustainable Earth by transforming the cut throat competitiveness of capitalism into a collective winning strategy to add to everyone's well being.







REFLECTIONS

QUICK REFLECTIONS

The list below quotes from students' quarterly journals and includes positive statements the students made regarding their compost/recycling journeys.

- I am also spreading the word about composting to as many people as I can.
- One of my cousins started composting and she is even spreading the word to other people that she knows. It is a slow process, but I believe little by little, with each and every person and household making the change to start composting if they aren't, things will start shaping up and we will see a greater amount of action and participation taking place.
- I also have been trying to get in-touch with the landlord to request a bucket from Waste Management.
- If I had a bucket it would probably encourage me to do more and also allow for my roommates to partake into composting.
- Composting is a really great process to help with the environment. Glad I have been exposed to it, so I can do better for the Earth.
- This week, I did a little composting. I did do more research on composting this week and found out tea bags are a part of composting.
- As stated last week, I am planting aloe vera, but I also started planting carrots and lettuce. I am trying to be more efficient in life. my plants have officially started growing And I cannot wait until they are fully developed. Just thinking about it makes me excited.
- I have gotten better at recycling, especially paper and cardboard boxes. I'm finding myself using more of my eco friendly bags
- Since I have not been composting, I have been recycling in my regular routine.
- Now, I feel like if I have a banana peel, I will either wait until get home to throw it in a compost bin, or I will even go put it in the dirt somewhere.
- This week i was able to help my friend learn more about composting while she cooked. I should her how to set aside a destinate area for her scraps while she cooked.
- I have been using a compost bin at my house for a long time now
- So composting has been easy since placing a bin in the house. It has become a habit in the home, however taking out the trash of it twice a week has been hard to



remember and the funk has been real. But other than that everything has been going great.

- So composting so far has been a lot easier. I recently bought a composting bin that is not tiny and hides the smell well.
- Ever since I have been introduced to composting, I have become more aware and if I don't compost something that I am supposed to, I start to feel guilty for some reason.
- This week, I continued composting and got a chance to talk to a few of my co-workers about it. To my surprise most of them already did compost.
- I usually throw everything in the "waste" can because I didn't really care to think about throwing it in the right spot. But now I'm more aware of throwing my trash where it belongs.
- I asked her why she doesn't use a kitchen compost pail and she didn't even know what that was! I told her to contact her city to have them send out a free one to her house. She was so excited and I was happy that I was able to apply my learned knowledge from this course to our discussion.
- I had not been to the recycling center in years, but the process is still easy and quick.
- Taking this class is making me think more green, so, I am planning on recycling again. I haven't done it for more than several years now.

The list below reflects direct quotes from students' quarterly journals. This specific list is negative opinions affiliated with the students' compost/ recycling journeys. Many of the students mentioned education and convenience being a reason why they don't compost/ recycle.

- Composting has been hard for me to do lately because I've been swamped with school and work that when I'm home, I don't even have time to cook or anything nor time which results in not composting.
- I feel like composting in some places aren't as educating to the community like the city of Hayward and I have found this to be a problem because the area where I live and surrounding cities just don't seem to compost or even know what it is.
- I feel like a big part of why people don't compost is that they either don't know about it or they feel too lazy to do so.
- My family is just not ready to make that drastic change yet. So for now I am doing composting solo.
- I have been eating out a lot so composting hasn't been a big deal.
- It made me realize that part of the reason why composting and the green bin isn't used to its full potential is probably because people just don't know.



- I have found that it is much harder than I originally thought to change my habits. I'm consistently in a rush and find that I sort my trash to the point of almost not even thinking about it.
- Last week was very hectic, so I did not do very well composting.
- I have to admit, this week I was really bad at keeping up with composting. I have a midterm on Monday, the super bowl, and other things going on in life that has made it easy for me to not be good with composting. I threw a lot of compostable stuff in the garbage unfortunately.
- It's easier to just throw everything in the garbage when you're extremely busy.

SOME DETAILED FINAL STUDENT REFLECTIONS

Ecotopia opened my eyes to a world that I never knew could exist, and yet might one day be possible. It encouraged me to look beyond what I already see and envision a better world in the near future. It left me to ponder what I can do to help improve the environment, sustainability, and overall health and wellbeing of the planet. It starts with changing my own habits and then working to influence and motivate others to do the same.

The consulting and game design group project was quite enjoyable. It was exciting to explore my creativity and work with a team to develop a game design for a real life company and then pitch the product design to them. I got a more in depth understanding of storyboarding and prototyping. Having learned new techniques, to benefit me as I apply them to my future endeavors.

I learned that sustainability through composting and recycling is so much more than what I understood before. The importance of its impact on my life and the lives around me is irrevocable. I have a new found respect for people in this field of study and industry. I am also more knowledgeable and aware of how important it is for environmental awareness and that go green campaigns should be taken more seriously in our society. I feel like I accomplished something of value this quarter thanks to this course.

--Shannon Bahr

I really enjoyed this course and the objectives I was able to obtain. Composting is a norm in my house and has been for some years, so instead of doing the composting assignments at my house I did them at my boyfriend's apartment. I learned so much from seeing their struggles and progress and was glad that I could spread the word about the importance of proper waste sorting and composting to them. Successful word-of-mouth was one of the main elements we hoped to achieve in this course about composting, so I was glad I could see that through.



Ecotopia was an eye opening book and I was grateful we were assigned to read it. It was refreshing to imagine a futuristic nation that relied on the Earth and clean living. The theme of the novel went along with the course by focusing on the environment. Not only did it relate to the course material, but I could associate it with current times even though the novel was written in the 1970s. Trump's war on the climate has just begun, and continually hearing overwhelming news coverage of his climate change denials, going to war with the EPA, and overall inattentiveness to basic scientific facts, makes me worry constantly about how our environment will be negatively impacted. Ecotopia was a breath of fresh air and let my mind wonder to a peaceful world that could exist if our communities and governments make the right choices when it comes to clean living.

Creating our project for the City of Hayward and Waste Management was exciting. It was fun to work with my group members to collaborate on ideas and work with each other as a team. Not only did I learn from the chapters and in class assignments, but the overall gist of the process of the project was so valuable because many people in the class, including myself, will be able to apply this process to opportunities in our careers. Collaborating with team members, expanding ideas, working as a client, working with your clientele, are all scenarios that many of us will encounter so I am relieved we were able to see the process through.

--Katherine Epps

I really liked how we partnered with Waste Management and the City of Hayward because I truly felt we were helping make a difference. They came a few times which was great and we really dove into helping them create a composting game. Learning about the future of composting related to our Ecotopia reading. We want a clean environment that is sustainable and pro-compost. That is what we saw in the reading as well as futuristic ideas for other things like cars.

Our composting journal was my favorite. I have composted for a few years so it really taught me to dig deep and truly focus on certain aspects of composting. Overall, the class assignments and activities all related to each other, making for an exciting and meaningful quarter.

--Shannon Panec