



## **ZERO WASTE AMBASSADORS PROGRAM**

### **2019-2020 Annual Report**

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## Introduction

### About ZWAP!

ZWAP!, our Zero Waste Ambassadors Program, is an award-winning, inquiry-based education program for fifth graders. ZWAP! is designed to motivate young Missoulians to think more critically about materials—where they come from and where they go. Our objective is to empower youth with the knowledge that the choices they make and the actions they take can help create a more sustainable future.

Home ReSource educators traditionally provide a total of 4 hours of engagement for each fifth-grade class through an in-school lesson and a field trip to Home ReSource using our interactive, STEM-aligned curriculum that supports three key messages:

- We have a **CHOICE**. Materials aren't waste until they're wasted.
- There are a lot of **ACTIONS** we can take to reduce waste. Reduce, Reuse, Recycle, Request, Rot
- We can make a **DIFFERENCE** by choosing to reduce waste every day.

**CHOICE + ACTION = DIFFERENCE**

Through ZWAP!, we aim to help students become **ENGAGED** in problem solving around waste, **EMPOWERED** with the skills and knowledge to be Zero Waste Ambassadors, and **INSPIRED** to knock out waste in Missoula. At the conclusion of ZWAP!, our hope is that students have an increased understanding of waste and how to reduce it and feel more confident in their ability to evaluate real-world problems and identify sustainable solutions.

ZWAP! is supported in part by the Dennis and Phyllis Washington Foundation, the High Stakes Foundation, the Louis L. Borick Foundation, the ALPS Corporation, and private donors in our community. At this time, this program is offered at no cost to teachers, schools, or students.

### ZWAP! Online

As we have all experienced in unique ways, COVID-19 has changed the way things are done. ZWAP! is reliant on in-person interactions and discussions with participants, so we adapted. ZWAP! now has an online counterpart, ZWAP-O!, which teaches the same core components of the original program, plus several supplemental activities and additional options. Having ZWAP-O! has allowed us to expand the physical reach of the program, sharing this resource in Bozeman, Helena, Whitefish, and Grand Junction, Colorado.

ZWAP! Online is a continual effort, and will be updated and improved during the upcoming school year. The current version is available at [www.homesresource.org/zwap-online](http://www.homesresource.org/zwap-online)



With this content online, we are able to envision our ZWAP! Toolkit. This toolkit is a resource that will allow ZWAP! to empower students in more classrooms, both in and out of Montana with a program that is easily adaptable and replicable for any school or non-profit organization.

### **ZWAP! Camp**

For the second year, Home ReSource partnered with the ZACC to host a ZWAP! summer camp. ZWAP! Camp continues the educational adventure into reuse and other “R” words like Really fun, Rad, & Right on! From Zero Waste-inspired experiments to building with reused materials and beyond, this week-long, half-day camp is perfect for kiddos who care about creating a sustainable future and who love to be creative.

Due to COVID-19, we were unable to offer full days, but did prepare a week-long half-day camp. Complications from COVID-19 required us to reschedule the original camp and combine with another ZACC camp, Prinstallation Camp. This partnership shifted the focus of the camp to art-making with reused and sustainable materials. Ten kids participated in ZWAP!/Prinstallation Camp, thereby reaching max capacity. Camp took place August 10-14.

### **The ZWAP! Theory of Change**

We believe that as students become knowledgeable about waste, increase their understanding of how to reduce it, and feel empowered that their choices and actions can make a positive difference, they will share their knowledge with peers and adults, evaluate where waste happens in their lives, and choose to make changes to move toward a Zero Waste lifestyle. We further believe that if this transformation takes place in a school district that is actively pursuing a Zero Waste goal, the likelihood of lasting behavior change will increase.

### **Zero Waste & MCPS**

Missoula County Public Schools (MCPS) continues working in partnership with Home ReSource, Missoula Compost Collection, and Republic Services to move the district toward the City of Missoula’s ZERO by FIFTY goal to reduce solid waste by 90 percent by 2050. The partnership with Home ReSource and MCPS began in the 2017-2018 school year and has included Zero Waste planning efforts, presenting plans to the Board of Trustees, various meetings, and continuing to bring ZWAP! to every classroom in MCPS.

In the fall of 2019, Jeannette Rankin Elementary and Home ReSource implemented a Zero Waste Pilot Program, the first of school-wide Zero Waste efforts within MCPS. During the 2018-2019 school year, Home ReSource staff met with Jeannette Rankin Principal Chris Stevens and conducted waste audits to quantify how much was being thrown out. According to the Jeannette





Rankin Elementary Pilot Proposal (Appendix A), it was estimated that by implementing food reuse and composting, the cafeteria waste stream can be reduced by 31% by volume and 74% by weight.

After a few meetings and a couple of waste audits, the pilot plan was ready and infrastructure was put into place within two days. Now at Jeannette Rankin, there is a Zero Waste Station in the lunchroom, recycle bins in classrooms, hallways, and teacher break rooms, and universal zero waste signage throughout the school. At the beginning of the 2019-2020 school year, Home ReSource staff spent a few lunch periods helping students and staff get the hang of the Zero Waste Station.

With help from Jeannette Rankin staff members, we conducted a Reuse Audit to be able to conceptualize the impact of reuse in the lunchroom. Over two separate one week periods, the number of milk cartons and juices were tracked before being sent back to the kitchen, and we found an average of approximately 22 of each drink type were being sent back every day. Rounding down to 100 of each type per week yields a savings of \$35.00 for milk and \$25.00 for juice. Over the course of one school year, savings can be expected to be nearly \$1900 based on milk and juice alone. Whole fruits and vegetables and unopened food packages are sent back to be sanitized and put back on the line and are not accounted for in this audit.

While there were some small challenges and lessons learned, overall feedback from staff and students is extremely positive. This pilot has provided important lessons to move forward and help to ease the transition to Zero Waste for other schools within MCPS.

MCPS started their strategic planning process (it has not been completed due to COVID), and participating members of the community mentioned different sustainability efforts, many groups mentioning Zero Waste specifically. In addition to working towards getting schools within the district to implement Zero Waste systems, MCPS continues to update their purchasing and printing habits, opting for compostable products, recycled content paper, have centralized their printing so teachers are printing less, and taken other sustainability measures as well. MCPS has relied on the expertise of Home ReSource staff to help in the planning process for adding Zero Waste services to other schools, including which schools and how the programs will be best implemented. Home ReSource provided signs specific to materials in the schools to clearly show what can be reused, recycled, and composted, and what has to go to the landfill. This signage can be tailored to each area and school, but has a universal, recognizable design that will eventually be implemented city-wide.

We have continued working with the sixth grade science team to develop a multi-lesson science unit to revisit and explore in more depth the concepts introduced in the fifth grade program. Momentum slowed a bit due to COVID-19, but we look forward to completing that work with the MCPS curriculum team during the 2020-2021 school year.



## About this Report

This report is a summary of our 2019-2020 iteration of ZWAP! and a distillation of the lessons learned in a set of recommendations to continue refining and improving ZWAP!. We are committed to making ZWAP! as fun and effective as it can be; we see continual program evaluation as a critical tool to get us there.

## About Home ReSource

Home ReSource, a 501c3 corporation, was founded in 2003 by two University of Montana graduates who conceived of a retail operation that reduces construction and demolition waste while contributing to a local, green economy. Today, Home ReSource keeps 900 tons of material out of the landfill each year, provides materials and services to over half of Missoula households, and has strong community partnerships, efficient operations, and a growing suite of community programs. Through waste reduction efforts, education, and the channeling of materials and services to those in need, Home ReSource works to build and inspire a more vibrant, just, and sustainable local economy.

At Home ReSource, our end goal is to help create a culture of sustainability. We believe that in order to do so we need to think differently about materials and how to reduce waste. Through ZWAP! and our related Zero Waste work with MCPS, we hope to imbue youth with the skills and knowledge to be Zero Waste Ambassadors in their homes, classrooms, and our community so that they can choose to join the effort to knockout waste in Missoula!



## Summary of ZWAP! 2019-2020: Changes to the Program

With each iteration of ZWAP!, we watch for what is working and what is not, make mid-course corrections, and devise and deploy new ways to guide students to a place where they think differently about materials and understand how to reduce waste. The changes we made this year to our core lesson and activities were minimal. With a sense that those aspects of the program are well-honed, our focus shifted to providing more context, bringing deeper awareness to our delivery, increasing student engagement, and determining ways to best support future Zero Waste educators.

### **We created ZWAP! 2.0.**

Realizing student engagement decreases when we had to turn our backs to add a photo, word, or drawing to the whiteboard, we decided to digitize all of the ZWAP! classroom presentation. Already using a projector for the quiz portion of the presentation, the transition was smooth, and now, we have more images, animations, and other visuals to continue engaging students. Not only has this helped with student engagement, this has increased the ease of presenting ZWAP! in a classroom.

### **We created an online counterpart to the Zero Waste Ambassadors Program.**

Although the Zero Waste Ambassadors Program Online (ZWAP-O!) was created out of response to COVID-19, it has significant potential in supporting the growth of the program. Numbers were lower than if we would have been able to continue in person, but the potential for program expansion with ZWAP-O! is high, creating a much wider spread with opportunities for ZWAP! components to be used across western Montana and beyond. ZWAP-O! also provides a solid foundation for the creation of a ZWAP! Toolkit, making the program even more replicable and applicable. See Appendix J for more ZWAP-O! information.

The entire ZWAP!-O program is available at [www.homeresource.org/zwap-online](http://www.homeresource.org/zwap-online)

### **We rearranged the activities on the Home ReSource Field Trip component.**

With the field trip, some teachers felt it was too much like a regular classroom day, with too much sitting at one time, so we took a look at what changes we could make to break it up. Activities are either “classroom-like” (sitting in the Community Room), or allow for moving around throughout the Home ReSource site. Separating the activities, we rearranged them to keep the sitting activities from being back-to-back. Student engagement was higher overall during this arrangement than it was before, so we will keep it in this order.

### **We have continued work on the proposal for a 6th Grade Unit follow-up.**

Continuing work from 2018-2019, we have progressed the proposal for a 6th Grade unit to revisit some of the main topics introduced in 5th grade through ZWAP!. This work continues and will soon be part of the 6th Grade scope and sequence.



**We're continuing to improve the classroom presentation to better retain student engagement.**

One common recommendation from teachers is that overall, the presentation is just a little too long for most students to sit through and remain engaged. We are adapting the classroom presentation to address this. Included in the adaptations are: shortening the presentation from an hour to 45-50 minutes and integrating quiz questions throughout, instead of having all questions at the beginning of the lesson. See proposed lesson script with integrated questions in Appendix C.





## **Summary of ZWAP! 2019-2020**

### **What We Accomplished: Program Reach**

#### **Scheduled**

Number of Schools: 14

Bonner School, Chief Charlo Elementary School\*, DeSmet Elementary School, Franklin Elementary School\*, Hawthorne Elementary School\*, Hellgate Elementary School, Jeannette Rankin Elementary School\*, Lewis and Clark Elementary School\*, Lowell Elementary School\*, Paxson Elementary School\*, Rattlesnake Elementary School\*, Russell Elementary School\*, St. Joseph School, Target Range School

*\*Missoula County Public Schools*

Participating Classes: 38

Number of Students:

Classroom visits: 960

Field trips: 789

#### **Actual (Prior to COVID-19 Closures)**

Number of Schools: 7

Bonner School, Franklin Elementary School\*, Hawthorne Elementary School\*, Jeannette Rankin Elementary School\*, Rattlesnake Elementary School\*, Russell Elementary School\*, St. Joseph School

*\*Missoula County Public Schools*

Participating Classes: 16

Number of Students:

Classroom visits: 399

Field trips: 276

#### **Online**

Zero Waste Ambassadors Program Online: 106

**2019-2020 Total number of students reached: 505**

**Number of teachers who've been with us since the beginning: 13**

This includes teachers who scheduled and planned to participate in Spring 2020.



## What We Accomplished: Participant Learning

### “What do you Know about Waste?” Quiz

Students who participated in ZWAP! in person took the quiz at the beginning of the classroom lesson and at the end of the field trip. Many students took the quizzes online. The quiz was used as a tool to measure knowledge of waste reduction facts and concepts prior to and after ZWAP!. Quiz scores by year are shown in the adjacent table.

Year	Average Pre-ZWAP! Score	Average Post-ZWAP! Score	Average Gain in Knowledge
2016	55%	90%	67%
2017	59%	86%	45%
2018	68%	79%	16%
2019	41%	81%	97%
*2020	53%	88%	66%

The yearly quiz scores cannot be directly correlated as we have changed the content of the quiz each year in an effort to better emphasize the takeaways of ZWAP!. The quiz questions did not change significantly from the 2018-2019 school year to 2019-2020, however. Pre-test scores increased significantly, though, prompting us to ask teachers about any lessons they use prior to our classroom visit. More teachers are including Zero Waste lessons in their classrooms prior to our ZWAP! visit, resulting in higher pre-test scores from students.

*\*Scores listed in the table above for 2020 are combined averages of in person ZWAP! quizzes and ZWAP-O! quiz results by total number of students. See each version's results below.*

Version of ZWAP!	Average pre-score	Average post-score	Average Gain in knowledge
ZWAP! in-person	52%	87%	65%
ZWAP! Online	55%	93%	69%



## What We Accomplished: Survey Results – Highlights and Common Themes

We invited teachers and chaperones to provide feedback on the ZWAP! experience using Google forms. Due to COVID-19 school closures, only 4 teachers completed the survey. Responses are summarized below.

### Overall impressions

Feedback was positive. Teachers felt the content was relevant and engaging, and the Home ReSource tour was popular. Supplemental activities (included in Appendix D) were utilized in multiple classrooms.

“The content was delivered in a really easy to understand model with lots of visuals and engaging activities.”

### “What did you like best about the ZWAP! experience?”

“Its relevance to our daily life in our community.”

“That students were able to learn about recycling/reusing/etc.”

“Through ZWAP!, students can connect their learning within the classroom to their community and the world.”

### “If you participated in the field trip to the Missoula Landfill, do you think it added value to the ZWAP! Experience?”

“It was really amazing going to the Landfill and seeing how the Missoula community takes care of its garbage... By actually going to a location where most students never will go, the landfill, students were able to see how our consumption of nonrenewable products impacts our community first hand.”

### “What did students have to say?”

“Students love the hands-on activities they do at Home Resource and in the classroom. The scavenger hunt is so much fun for students.”

“Great time! It was really fun! I liked touring Home Resource!”

### ZWAP-O! Impressions

“We will definitely send this out to our students as an extension activity.”

“Online lessons at just the right moment! You are the best!”

“I will use this next week! “

“This is awesome!”

“I LOVE the ZWAP-O!”



## What We Learned & Recommendations for ZWAP!

Each year, the Zero Waste Ambassadors Program gets better, and changes become more minimal. Few internal program or content challenges were found this year. The main challenge remaining with ZWAP! is student engagement, especially due to COVID-19.

### Challenges and changes from 2018-2019

**Splitting students into groups for ZWAP! the Game:** Tables are pre-set with the game boards prior to the field trip and there is a piece of tape splitting the table into two, making it clear what the groups are for the game. Chairs are positioned on either side of the tape, clearly distinguishing what the groups are.

**Grouping students for the Scavenger Hunt:** In the reminder emails prior to the field trip, we talk about the 5 groups for this activity and offer the option of numbering off students, or having teachers choose student groups.

**Too much sitting at one time during the ZWAP! Field Trip:** We re-arranged the order of the activities, alternating those that are primarily set at tables and those with more physical participation.

**Student engagement in the quiz at the end of the field trip:** Students weren't engaged at the end of the field trip, so we "upped the stakes" with the quiz. Challenging each class to show us how much they learned and how they compared to other classes got students more excited for the quiz.

**Running tight on time:** We've started explaining the Scavenger Hunt while students finish eating their lunches. Students still have 20-25 minutes to eat, 10 minutes of that being unstructured time, allowing them to sit in new places and eat with their friends. This gives us an additional 10-15 minutes for the Scavenger Hunt in the warehouse and other activities throughout the day.

**Preparation component for the landfill winners:** We purchased copies of the book, *Habitat Havoc: Landfills* by Greg Roza to give to each school that was invited to go to the landfill. Teachers can choose additional activities that go along with reading and discussing the book prior to going to the landfill.

**Students struggle with some rounds of ZWAP! the Game:** We have one set of instructions per group, and it is difficult for all of them to all see the instructions, so we have them on the TV in the Community Room in addition to the sheets each group has. After students read instructions aloud, we emphasize points that are particularly helpful so they get extra hints up front. We also redesigned pieces so all definition and number pieces are the same color, making it easier for students to identify each piece type. For particularly tough rounds, we have additional hints on the TV for students to reference. We also draw the game board on the white board and after each round, we work as a group to complete each round on the whiteboard. See Appendix G for specific details on these changes.



**Bus parking availability:** Cars were sometimes parked in the drop-off zone, so we created “Bus Parking Only” signs and put cones out to mark off this area.

**Waivers:** Teachers said it was difficult to get waivers signed and returned in the middle of the year, so waivers are now included in emails leading up to the field trip, with the option of having us bring them on the day of the classroom visit. Parents/guardians were weary of the intensely worded waiver we were using previously, so we updated the liability waiver to a letter on our commitment to safety (Appendix I).





## **Appendix A: Jeannette Rankin Elementary Zero Waste Pilot Program**

### **Jeannette Rankin Elementary Zero Waste Pilot Program Proposal 2019**

Prepared for Christina Stevens, Principal, Jeannette Rankin Elementary School  
by Jeremy Drake, Home ReSource, July 2019

#### **INTRODUCTION**

This is a proposal for a Zero Waste Pilot Program at Jeannette Rankin Elementary School. It is one of 2 pilot programs Home ReSource is facilitating in conjunction with school representatives in the 2019-2020 school year. The other school is C.S. Porter Middle School. These pilot programs are rooted in the MCPS ZERO by FIFTY Zero Waste Plan developed by Home ReSource along with many members of the MCPS community and presented to the Board of Trustees in June 2018.

This proposal is based on information and discussion with the following Jeannette Rankin Elementary representatives: Chris Stevens, principal; Allen Poor, day custodian; Barb Rasmussen, lunch hostess & cook/cashier; Brianna Hanson, health enhancement; Julie Papp, Grade 5; John Fines, Kindergarten.

In a nutshell, the Jeannette Rankin Elementary Zero Waste Pilot Program has three primary focus areas:

1. Reducing cafeteria waste by installing a sorting station (bins & signage)
2. Providing access to Zero Waste Stations in classrooms, hallways, & shared spaces (bins & signage)
3. Educating staff & students about the program

Zero Waste Programs are multi-faceted and we recommend using the ZERO by FIFTY “Four Paths” of Access, Infrastructure, Education, and Policy as a way to grasp all of the elements and to ensure its success. These excerpts are from the MCPS ZERO by FIFTY Zero Waste Plan:

**ACCESS** - “Successful Zero Waste systems, services, and programs are accessible to everyone. Those include source reduction, reuse, recycling, and composting. Ensuring user-friendly, universal access to these systems, services, and programs throughout the district is essential to provide opportunities for all members of the MCPS community to realize a Zero Waste MCPS.”

**INFRASTRUCTURE** - “Effective infrastructure is necessary to support Zero Waste programs. These largely behind-the-scenes systems and services allow for the proper diversion of materials streams and the transformation of processes and behaviors toward Zero Waste.”

**EDUCATION** - “Education of MCPS staff, students, and community members before, during, and after the implementation of Zero Waste programs is key to their success. Establishing a school-to-home-to-community connection between the MCPS Zero Waste initiative and the City’s ZERO by FIFTY effort will support Missoula’s collective Zero Waste goal.”

**POLICY** - “To become Montana’s first Zero Waste school district, MCPS may need to adopt additional district policies and procedures. New policies for the management of materials will support the Zero Waste initiative while creating new efficiencies across district operations.”



## WASTE AUDIT SUMMARY

Home ReSource conducted two waste audits (May 30 and June 6) in an attempt to get a better idea of the composition of the current Jeannette Rankin Elementary School waste stream.

We learned that the cafeteria waste stream is separate from the rest of the school in terms of collection and content.

Three streams -- reusable food, compostables, and landfill -- account for 99 percent of the cafeteria waste stream by volume and 96 percent by weight.

**We estimate that, by implementing food reuse and composting, the cafeteria waste stream can be reduced by 31 percent by volume and 74 percent by weight.**

When talking waste, weight is a more reliable figure because volume can change. For this audit, we did not make an effort to compress any volumes. It is likely that what remains in the landfill stream after removing edible food and compostables could be compressed to take up less volume than is indicated here.

Items identified in the landfill stream included: milk cartons, plastic fruit cups, juice boxes, parmesan cheese packets, ranch dressing packets, Uncrustables wrappers, chip bags, granola bar wrappers, yogurt cups, Ziploc bags, ramen cups, aluminum foil, Lunchables containers, CapriSun pouches, Gogurt packages, and plastic bags.

We were surprised at the amount of compostables in the discards from classrooms and the teachers' lounge.

Five streams -- compostables, combine paper (reusable & recyclable), cardboard, bottles & cans, and landfill -- account for 91 percent of this waste stream by volume and 85 percent by weight.

**We estimate that, by composting and recycling, this waste stream can be reduced by 53 percent by volume and 57 percent by weight.**

CAFETERIA	Avg. volume (gal)	Avg. weight (lbs)
FOOD REUSE TOTAL	7.2	36
TOTAL DISCARDS	165	179
% REUSABLE FOOD	4%	20%
COMPOST TOTAL	44.1	96.47
TOTAL DISCARDS	165	179
% COMPOSTABLE	27%	54%
LANDFILL TOTAL	112.5	39.9
TOTAL DISCARDS	165	179
% LANDFILL	68%	22%
TOTAL REPRESENTED	99%	96%
DIVERSION POTENTIAL	31%	74%
CLASSROOM/ LOUNGE	Avg. volume (gal)	Avg. weight (lbs)
COMPOST TOTAL	38.7	17.92
TOTAL DISCARDS	195	70
% COMPOSTABLE	20%	26%
ALL PAPER TOTAL	43.2	19
TOTAL DISCARDS	195	70
% PAPER RECYCLED	22%	27%
CARDBOARD TOTAL	18	2
TOTAL DISCARDS	195	70
% CARDBOARD RECYCLE	9%	3%
BOTTLES/CANS TOTAL	4.5	1
TOTAL DISCARDS	195	70
% BOTTLES/CANS	2%	1%
LANDFILL TOTAL	73.8	19.52
TOTAL DISCARDS	195	70
% LANDFILL	38%	28%
TOTAL REPRESENTED	91%	85%
DIVERSION POTENTIAL	53%	57%



Zero Waste is considered a diversion rate of 90 percent or greater. Having identified the primary components for diversion from the landfill will be a big step in the right direction.

### PROGRAM DETAILS: ACCESS

In June 2019, we worked with staff to identify several locations within the school to place collection bins and signage to promote waste reduction at Jeannette Rankin Elementary through recycling and composting. After Home ReSource conducted the two waste audits, we identified additional locations that we recommend be included in the Zero Waste Pilot Program.

#### ORIGINAL LOCATIONS:

- **Cafeteria** - a sorting station (bins & signage) to remove liquids, edible food, and food scraps from the landfill stream
- **Classrooms, Hallways, & Shared Spaces** - pairing landfill (trash) bins with recycling bins for paper and, where appropriate, additional recycling bins for commingled bottles & cans
- **Teachers Lounge** - adding a recycling bin for commingled bottles & cans as well as signage to promote other diversion behaviors (pouring liquids in the sink, taking food scraps to the cafeteria compost bin).

#### RECOMMENDED ADDITIONAL LOCATIONS:

- **Cafeteria Prep Area** - bins and signage to divert steel cans & cardboard
- **Offices & Library** - bins (as needed) and signage to divert paper (possibly other materials)

[See Access Budget document for materials details and costs.](#)

### PROGRAM DETAILS: INFRASTRUCTURE

In June 2019, we brainstormed an efficient and effective back-end collection system that we believe will work for custodial and kitchen staff as well as for collection service providers. Home ReSource is currently researching the feasibility and cost of those options and will provide an Infrastructure budget ASAP.

### PROGRAM DETAILS: EDUCATION

In our May 2019 meeting, we touched on education & training elements as well as the idea of using student Zero Waste Ambassadors to help educate peers.

We propose Home ReSource assists with the following educational elements at the launch of the Zero Waste Program:

- Conduct staff training prior to start of school (Monday 8/26)
- Be present at Open House to explain Zero Waste program to school community (8/26)
- Train lunch staff on 1st day of school (Wednesday 8/28)
- Attend kick-off assembly to introduce the student body to the new Zero Waste Stations and how to use them (8/28)



We recommend that Jeannette Rankin Elementary identify a Zero Waste Program point-person on staff who can be the coordinator for student Zero Waste Ambassadors as well as the on-site contact for further training & questions.

There are no budget items associated with Education in this proposal.

### **PROGRAM DETAILS: POLICY**

Home ReSource worked with Superintendent Thane to begin transitioning the MCPS Central Kitchen & Warehouse to compostable single-use food serviceware. Efforts continue to move the district toward more environmentally preferable purchasing policies. We recommend that Jeannette Rankin Elementary School supports district-wide Zero Waste-aligned procurement policies and works to identify ways to Reduce materials use and Reuse materials where possible.

There are no budget items associated with Policy in this proposal.

### **CONCLUSION**

Our hope is that these programs are embraced by the Jeannette Rankin Elementary School community and that tangible results are seen by all. We recommend, as this first phase becomes a part of the school culture, that other waste reduction opportunities exploring the potential of source reduction and reuse are considered.

As efforts continue, using the information collected during the waste audit can help drive food procurement policy decisions as well as educational opportunities for students and families about how to pack a Zero Waste lunch.

Annual waste audits are also a good method for determining what remains in the waste stream and may indicate the need for programmatic improvements, changes, or additions.



**Access Budget Report**

<b>TOTAL ESTIMATED COST FOR ZW STATIONS:</b>	
<b>QUOTE #1 - AS DISCUSSED ON WALK-THROUGH</b>	
\$254.34	Cafeteria
\$295.00	Hallways & Shared Spaces
\$181.50	Classrooms ( <b>22 rooms with signage only</b> )
\$19.00	Teachers' Lounge
<b>\$749.84</b>	
<b>QUOTE #2 - WITH ADDITIONAL LOCATIONS (MINIMUM)</b>	
\$226.34	Cafeteria
\$295.00	Hallways & Shared Spaces
\$181.50	Classrooms ( <b>22 rooms with signage only</b> )
\$19.00	Teachers' Lounge
\$8.25	Cafeteria Prep Area
\$82.50	Offices & Library ( <b>10 rooms with signage only</b> )
<b>\$812.59</b>	
<b>QUOTE #3 - WITH ADDITIONAL LOCATIONS (MAXIMUM)</b>	
\$226.34	Cafeteria
\$295.00	Hallways & Shared Spaces
\$533.50	Classrooms ( <b>22 rooms with bins &amp; signage</b> )
\$19.00	Teachers' Lounge
\$8.25	Cafeteria Prep Area
\$242.50	Offices & Library ( <b>10 rooms with bins &amp; signage</b> )
<b>\$1,324.59</b>	





## **Appendix B: Timeline and Logistics**

### **ZWAP! Timeline**

<b>OCTOBER</b>	<ul style="list-style-type: none"> <li>✓ Observe classroom presentations for Fall Phase Schools</li> <li>✓ Observe and assist Fall Phase Field Trips</li> <li>✓ Prepare spreadsheets for teacher communication records and program metrics.</li> <li>✓ Make sure information for 5<sup>th</sup> grade teachers in MCPS and other nearby districts are current.</li> </ul>
<b>NOVEMBER</b>	<ul style="list-style-type: none"> <li>✓ Check and update ZWAP! Invitation and save as PDF and online.</li> <li>✓ Update email templates for 1<sup>st</sup>, 2<sup>nd</sup>, etc. invitation emails.</li> <li>✓ Create schedules on Calendly.</li> <li>✓ Begin teacher outreach with initial email invitation.</li> </ul>
<b>DECEMBER</b>	<ul style="list-style-type: none"> <li>✓ Make additional follow-up emails and phone calls as needed.</li> <li>✓ Work with teachers as they respond to schedule ZWAP! using Calendly.</li> </ul>
<b>JANUARY</b>	<ul style="list-style-type: none"> <li>✓ Continue scheduling and contacting teachers as needed.</li> <li>✓ Prep ZWAP! materials and updates scripts (if needed).</li> <li>✓ Some Phase 1 teachers may request January class visits, so be prepared to present to schools.</li> </ul>
<b>FEBRUARY</b>	<ul style="list-style-type: none"> <li>✓ Continue scheduling Phase1 and Phase 2 as needed.</li> <li>✓ Present ZWAP! classroom presentations.</li> <li>✓ Record quiz data.</li> <li>✓ Schedule busses for field trips.</li> </ul>
<b>MARCH</b>	<ul style="list-style-type: none"> <li>✓ Continue scheduling Phase1 and Phase 2 as needed.</li> <li>✓ Present ZWAP! classroom presentations and run Home ReSource Field Trips.</li> <li>✓ Record quiz data.</li> <li>✓ Schedule busses for field trips.</li> <li>✓ Due to school closures because of COVID-19: Email and cancel remaining field trips and classroom visits Begin creating plan to put ZWAP! online</li> </ul>
<b>APRIL</b>	<ul style="list-style-type: none"> <li>✓ Email teachers to inform them of the plan to put ZWAP! online.</li> <li>✓ Create ZWAP-O! and email link to teachers.</li> <li>✓ Record scores as students participate in ZWAP-O!</li> </ul>
<b>MAY</b>	<ul style="list-style-type: none"> <li>✓ Update ZWAP-O! links for quizzes.</li> <li>✓ Record scores as students participate in ZWAP-O!</li> <li>✓ Email teachers with ZWAP! and ZWAP-O! Surveys and compile responses.</li> <li>✓ Begin ZWAP! Report.</li> </ul>
<b>JUNE</b>	<ul style="list-style-type: none"> <li>✓ Work on ZWAP! Report.</li> </ul>
<b>JULY &amp; AUGUST</b>	<ul style="list-style-type: none"> <li>✓ Finish ZWAP! Report.</li> </ul>



## ZWAP! Logistics

### Classroom Presentations

- ✓ After classroom presentations are scheduled, be prepared for follow-up/reminder emails.
  - One week prior to class visits:
    - Confirm lesson time, class size, and number of students
    - Send prepped reminder email to let the teacher know of your needs and expectations for the presentation.
    - Attach field trip waiver to email.
  - Prepare materials:
    - Check the Turning Point Application to be sure all previous data is cleared.
    - Have suitcase prepped with “Mystery Item” materials and paper quiz sheets (in case Turning Point doesn’t work), Turning Point kit with clickers and receiver, updated and printed lesson script, and field trip waivers if the teacher requested printed waivers.
  - Set-up in the classroom:
    - Turn on laptop and launch Turning Point presentation.
    - Connect laptop to the classroom’s projector.
    - Set suitcase with “Mystery Items” on a table, desk, chair, or other accessible location.
    - If waivers were requested, give them to the teacher.
  - During the presentation:
    - Hand out clickers for the quiz.
    - Trade clickers for “Mystery Items”
    - Present the program.
  - After the presentation:
    - Save quiz results in Turning Point.
    - Collect “Mystery Items” and pack up laptop, Turning Point Kit, and anything else you brought with you.
    - Add quiz results to spreadsheet (after returning to Home ReSource)

### Landfill Field Trip (if applicable)

- ✓ Select which classes will go to the landfill based on teacher teams that signed up first for both portions of ZWAP!
- ✓ Get date options from teachers and check with staff at the landfill to schedule visits.
- ✓ Send confirmation to teachers of the available dates.
- ✓ Schedule busses.
- ✓ One week prior:
  - Send reminder email to teachers with pick-up time, arrival time, departure time, and time to be back at school.
- ✓ One to two days prior:
  - Check on bus to confirm it is scheduled.

### Field Trip to Home ReSource

- ✓ After field trips and busses are scheduled, be prepared for follow-up/reminder emails.
- ✓ Print schedule of field trips to leave at the register so staff know when the bus loading zone needs to be clear.
- ✓ One week prior:
  - Send prepped email to teachers to let them know of your needs and expectations for the field trip.
    - Confirm lesson time, class size, and number of students.
    - Double check with teachers to see if they will need an accessible bus.



- Remind teachers that on the Scavenger Hunt, each group of students will need an adult chaperone.
- ✓ One to three days prior:
  - Call and confirm bus reservation.
  - Room and materials prep:
    - Set-up tables and chairs (4 tables and 6-8 chairs per table)
    - Gather and organize materials for each activity
      - ZWAP! the Game – check materials and re-Velcro as necessary
        - Game boards
        - Each round's pieces and envelopes
        - Game instructions
      - Visioning Activity
        - Make sure pencils are sharpened and split into four roughly-equal sized containers
        - Prep paper (tear off pieces) for the number of students
      - Scavenger Hunt
        - Clean lists if necessary
        - Check for marker and tape measures for each basket
    - Check Turning Point Application to be sure all data has been cleared
- ✓ Day of:
  - Prior to the field trip:
    - Place cones and “bus parking” signs on Wyoming Street to keep the loading zone clear.
    - Turn on TV and launch the presentation through Turning Point
    - Double check room set-up and materials for activities.
    - Write “Welcome (school name)” and draw the game board on the white board.
    - Prepare your materials:
      - Timeline, script, game instructions, teacher/chaperone game guides, markers, Materials Economy pictures.
    - Set out ZWAP! the Game boards and envelopes with pieces.
  - After the field trip:
    - Save quiz results in Turning Point.
    - Clean up and re-organize materials to be used for the next field trip.
      - Wipe down scavenger hunt lists and tables.
      - Put game boards and pieces, colored pencils, and scavenger hunt baskets away.
      - Empty Zero Waste Station and clean bins if needed and sweep.
    - Add quiz data to spreadsheet.
    - Send “Thank you/Survey” email to the teacher.

**After a ZWAP! Presentation or Field Trip**

- ✓ Add quiz data to spreadsheet.

**As results come in/After ZWAP! is completed**

- ✓ Compile pre- and post-test data.
- ✓ Compile survey responses and send reminder email if needed.
- ✓ Work on ZWAP! Annual Report
- ✓ Prepare blank spreadsheets, update teacher information, and organize program materials for the next ZWAP! Educator.



## **Appendix C: In Class Lesson Scripts and Outlines**

### **Current 2019-2020 Lesson Script**

#### **ZWAP! 2020 In-Class Lesson Script**

Revised 06/24/2020

Script Key:

Questions to ask class

[Instructions] for educator

### **INTRODUCTION**

1. My name is \_\_\_\_\_. I work at Home ReSource. [Can ask about classroom conventions for behavior, how to get their attention if needed, etc.]
2. [Set expectations for class participation.] I am going to be asking you some questions. Just so you know, I will only call on students who raise a hand first, unless I tell you otherwise. [Certain times it is ok to have students shout out answers]
3. Raise your hand if you've been to Home ReSource before. Hands down.
4. [Optional: If more than 4-5 students raise their hands, ask this. If not, go to number 5] Raise your hand again if you want to describe Home ReSource. [start with 1; ask if anyone wants to add anything – choose no more than 3-4 students total]. Hands down.
5. Raise your hand if you've been to a thrift store like Goodwill before. Hands down
6. Raise your hand if you've been to a hardware store like Home Depot before. We're a thrift store + hardware store.
7. Welcome to the Zero Waste Ambassadors Program or ZWAP! for short. Can everyone say ZWAP!? Good. That's the sound of knocking out waste in Missoula. I am here today to talk to you about where our stuff comes from and where it goes. We'll talk about how we can work together to knock out waste or, in other words, to reduce the amount of stuff we throw away.

### **QUIZ**

8. Let's start out with a quick quiz to see how much we know about waste. [pass out clickers]
  - a. I won't know who has what clicker. Just do your best to guess if you don't know the answer. We'll go over the correct answer after each question. As we go through the quiz, please keep your answers to yourself!
  - b. This first question is practice to see how our clickers work. [How often do you recycle at home?]
  - c. [Explain clickers: Green light, can click more than once to make sure your answer goes in; the last button you click is your answer]
  - d. [If students aren't clicking, you can say, "Moving on in 3, 2, 1..."]

### **STUFF and SYSTEMS \*click\***

9. Next, when I call you, you will come up and quickly grab a mystery item from our suitcase. I want you to – in a very quiet, orderly, and prompt way – return your clicker, grab an object, and return to your seat. I also want you to know that this is possibly the most unimportant decision you will ever



make. [Can call tables/groups/students up as they are quiet to return clicker and get object or ask the teacher to help pass out items to speed students along]

- a. \*Requests\* for objects: Items either stay quiet in your hands or sitting on the table in front of you.
10. \*click\*What is this stuff? Describe it; name it if you can.
11. \*click\*What is it made out of? [plastic/rubber; wood; metal; glass; ceramics; textiles \*click\* STOP on textiles]
12. Where does this stuff come from...
  - a. What is it made of? [get answers: \*click\* IN ORDER: oil; trees; ore; sand; clay/minerals; plants/animals/plastic]
  - b. \*click\*In the world? [get some answers \*click\* EVERYWHERE]
13. Where do these raw materials go next after we find them and harvest or extract them? Let's use the [item student has] as an example. [\*click\* through up to the house.] Extraction (planet) → Production (factory) → Distribution (mall + laptop computer) → Consumption (house + school)
14. \*click\* It's an entire system called the MATERIALS ECONOMY
15. \*click\*Who remembers what a SYSTEM is? [A set of connected things, parts, and processes that form a complex whole].\*click\* People have created lots of systems!
16. \*click\*Does anyone know of a system in nature? (solar, ecosystem, hydrologic cycle, carbon cycle or systems inside the body respiratory, circulatory, digestive).\*click\*There's a difference between these natural systems and the Materials Economy!
17. What shape do systems of nature make? \*click\*They make circles. \*click\*What shape is the system of the Materials Economy? \*click\*It's a line, with a beginning and an end, unlike natural systems. Remember this—we'll come back to it a little bit later!

## TRANSPORTATION and CO<sub>2</sub>/GREENHOUSE GASES

18. \*click\*How do we move things around this system, the M.E.? [trucks, planes, boats, trains, etc. \*click\*Advance slides through modes of transportation. STOP on delivery truck]
19. How far does stuff travel to get to Missoula? [5,000 miles] \*click\* That would be like driving from Missoula to Billings and back over 7 times or Missoula to Yellowstone and back almost 10 times!!
20. How do all those vehicles and machines get the power to extract and transport this stuff? [Fuel] We'd use a lot of gas driving 5,000 miles, wouldn't we?
21. What comes out of the trucks, trains, planes, and boats when they burn fuel?
22. Greenhouse gases, including carbon dioxide (CO<sub>2</sub>). \*click\*
  - a. What do you know about greenhouse gases like CO<sub>2</sub>?
  - b. Does anyone know what the atmosphere is? [layers of gases that surround Earth]
  - c. Have you ever gotten into a car in the summer and it's way hotter in the car than it is outside? \*click\* That's kind of how greenhouse gases like CO<sub>2</sub> work in the atmosphere; they trap heat. (D-E = text from animation/on screen)
  - d. Sunlight reaches the Earth and some of that energy is reflected back into space.
  - e. Some of it is absorbed by GHGs and re-radiated as heat. More GHGs, like CO<sub>2</sub>, means more heat is being trapped, contributing to global climate change.
  - f. [Referring to animation] This isn't a very accurate depiction of our atmosphere compared to the Earth. Really, our atmosphere is much smaller. If you were to take a basketball and put a piece of paper on it, that's about how big our atmosphere is when compared to the Earth.





- g. People used to think the atmosphere was much larger, and that we could keep putting more and more CO<sub>2</sub> into it, but now we realize we need to slow down. This is just like when people thought the oceans were infinite and we could just dump all of our trash there. But we have learned that dumping our trash into the ocean isn't a solution, it just creates a bigger problem!
  - h. Unlike any trash in the ocean, some CO<sub>2</sub> in our atmosphere is natural and essential to life on Earth: we breathe it out, trees breathe it in. Greenhouse gases like CO<sub>2</sub> help keep our planet warm and livable, but we do need to be careful about how much we are adding.
  - i. Who remembers the bad fire season we had in 2017? And how about last winter - Normal? Weird? This winter? We can connect our strange seasons at home with climate change and greenhouse gases, including CO<sub>2</sub> from the Materials Economy. Our stuff affects our climate!
23. Whenever something is extracted from the Earth, produced in a factory, or transported through the Materials Economy, more CO<sub>2</sub> is produced.

### LANDFILL and CHOICE \*click\*

24. Let's talk about what happens next in this system. What do we usually do with our stuff when we're done with it?
25. We throw it "away." \*click\* Then, someone drives it to the landfill.
26. Who remembers how many pounds of stuff the average Montanan throws away every day? 7 lbs
27. Who remembers if that is more, the same, or less than what the average American throws away? More
28. What kind of stuff do we throw away? [Get a few responses; be sure to include toxics] \*click\*
29. What are some of the consequences of throwing this stuff away? [Get a few responses] \*click\*
- a. [If no reply, follow up with: What are some ways throwing things in the dump harms us or our planet?]
30. [Be sure to tell this like a story] Let me tell you a story. When people began to live in big cities, trash and human waste were often thrown into the streets or outside the city gates. Imagine if you were to throw all of your garbage out of your bedroom window! What would Missoula look like? As cities kept growing larger, people began to link trash and sewage with disease. The concept of a common garbage "dump" or landfill was seen as a solution to these public health concerns. And then the landfill was born; waste materials were collected and put into one area outside of town. Then and now, landfills have kept garbage out of the streets and protected public health.
31. Unfortunately, now we have different problems:
- a. \*click\* We're throwing away a lot of stuff!
  - b. \*click\* A lot of it isn't "garbage," it is reusable, repairable, recyclable, etc.
  - c. A lot of it becomes harmful to us and the planet when dumped in a landfill
  - d. Is this a good way to go? [No!]
32. Do we have choices other than the landfill for the stuff that we no longer want? [Yes!]
33. \*click\* We have a CHOICE! Materials don't become waste until they're wasted.
34. Who decides when a bottle or a can or a piece of paper becomes waste or garbage? [We do!]
35. \*click\* It happens right here with us at home & at school.
36. The good news is that there's a simple equation that each of us can use to keep stuff out of the dump & become a Zero Waste Ambassador. \*click\* When we CHOOSE to reduce waste and \*click\* take ACTION, we can make a \*click\* big DIFFERENCE.
37. \*click\* Who remembers the first "R"? [REDUCE] \*click\* Who remembers what it means? \*click\* [USE LESS STUFF] Who wants to guess why REDUCE is with the Earth? When we choose to use less stuff, do we



need oil, trees, ore, etc.? [No!] Do we then need to log, drill, or mine? [No!] If we leave forests, mountains, and open spaces alone, nature's systems can continue to cycle and support life on Earth. Are we life on Earth? [Yes!] Choosing to reduce is one of the best things we can do for the health of our planet and to protect our future. When we put the first "R" into action, we can make the biggest difference!

## LOOPS

38. Now, what shape is a natural system again? \*click\* [Circle]. What shape is the Materials Economy? \*click\* [Line]. \*click\* Using the other R words, we can turn this line \*click\* into circles.
39. \*click\* Who knows the second "R" of waste reduction? [REUSE] \*click\* This is something we do a lot of at Home ReSource. It means \*click\* USE IT AGAIN.] \*click\* These arrows start with us! At our homes and schools, do we choose to send something to the landfill, or do we choose to reuse?
  - a. Small arrow: Examples of reuse behaviors, things that we can reuse at home/school \*click\*
  - b. Mid-sized arrow: Examples of reuse businesses in Missoula [Include Free Cycles, library, thrift stores] \*click\*
40. \*click\* Who knows the third "R"? [RECYCLE] \*click\* It means \*click\* MAKE IT AGAIN. And it isn't as easy as it seems. Just because something goes into the bin, doesn't mean it's going to be recycled.
  - a. \*click\* Big arrow: Examples of materials that can be recycled \*click\*
  - b. Raise your hand if you remember how much energy recycling one aluminum can saves [enough to power a laptop for 300 minutes]
  - c. Raise your hand if you want to guess how many times we can recycle an aluminum can. [An infinite number]
41. Each arrow helps us reduce waste. The smaller the arrow, the smaller the impact that action has.
  - a. When we recycle material vs. making new, it takes less energy like we learned about with the aluminum can. If we donate or sell used items, we have to transport it, but that's about the only energy we need for that. It takes almost no energy to reuse something at home.
42. What good things happen when we reduce waste and close the system? [get some answer]
 

\*click\* Remember this: We can use our equation for becoming a Zero Waste Ambassador to make these things happen! When we \*click\* make the CHOICE to reduce waste and \*click\* put the 3 Rs into ACTION, we can \*click\* make a big DIFFERENCE.

## ZERO WASTE ECONOMY

43. Now, we've talked about different ways we can take action. Are there any items and/or materials that don't fit into our ZW system? [Yes- Styrofoam, wrappers, packaging, etc.]. \*click\* We make waste because a lot of things we use in our lives are DESIGNED FOR THE DUMP. \*click\* [refer to examples given; offer more - chips and snack bags, etc.]
44. The good news is that it doesn't have to be this way! Things can be made to fit into the ZW system instead of being DFTD.
45. Raise your hand if you remember the "R" from the quiz that we can practice to persuade the people who make the stuff we buy & use to change the way they make stuff so that it can fit into this Zero Waste picture? \*click\* [REQUEST]
46. Let's talk about those chip bags again. How could I practice the Request "R" word? I could write a letter [describe what the letter would say]. We could ask our parents to buy less single use plastic and individually wrapped things.



47. So if we put all the R's into ACTION, and the people who make stuff made it so that it could fit into this system do you think we could live in a world that creates Zero Waste? \*click\* That would mean that instead of a Materials Economy, we'd create an economy that produces \*click\* ZERO WASTE!
48. \*click\* Zero Waste is a system that supports people and the planet by using the 3 Rs. It requires us to play an active role and to make the CHOICE to put those Rs into ACTION. In a Zero Waste world, all the things in the Zero Waste Economy are made to last longer, and to be repairable, reusable, recyclable, and compostable. The entire system needs to change. And it's starting.
49. Once we make the CHOICE to practice the Rs & stuff is made to fit into a Zero Waste Economy then can we truly get to Zero Waste.

### CONCLUSION with FIELD TRIP \*click\*[esc. key]

50. Did you know that Missoula has a Zero Waste goal & a plan to get there? Missoula is planning to reduce the amount of stuff it sends to the landfill by 90% by 2050. The Missoula County Public School district is on board too! How old will you all be in 2050? What would it be like to be able to reduce the amount of trash you throw away by 90%?
51. We need your help! If you can reduce waste every day and encourage your friends and family to do the same, imagine how much of a difference we can make! That's why we need each of you to become Zero Waste AMBASSADORS. When you come to Home ReSource for your field trip, we'll talk more about what that means.
52. In the meantime, I'd like you all to quietly think of some ideas for what a Zero Waste Missoula might look like. Think of Zero Waste in your homes, your school, and anywhere else. I will ask to hear your ideas when you visit Home ReSource for your field trip!
53. Thanks! I look forward to seeing you at Home ReSource!

### CONCLUSION without FIELD TRIP \*click\*

54. Did you know that Missoula has a Zero Waste goal & a plan to get there? Missoula is planning to reduce the amount of stuff it sends to the landfill by 90% by 2050. The Missoula County Public School district is on board too! How old will you all be in 2050? What would it be like to be able to reduce the amount of trash you throw away by 90%?
55. We need your help! If you can reduce waste every day and encourage your friends and family to do the same, imagine how much of a difference we can make! That's why we need each of you to become Zero Waste AMBASSADORS. \*click\* But what is an ambassador? [get a few answers] \*click\* An ambassador is a person who leads by example and encourages others to do the same
56. Can I have volunteers to help me read the next few slides? \*click\* You know you're a Zero Waste Ambassador when you...
- a. \*click\* Drink from a reusable water bottle every day! Bottled water is bad for the planet. It takes a lot of energy and makes a lot of waste to bottle and transport water. Just turn on the tap! Choose to reuse water bottles, shopping bags, clothes, toys, and more.
  - b. \*click\* Practice Zero Waste at mealtimes! Together we can tackle food waste and lunchtime litter. Only take what you think you will eat! Save or share leftovers, and compost your food scraps when possible. Use reusable lunchboxes, cups, dishes, silverware, and napkins.
  - c. \*click\* Shop secondhand first! Think "thrifty" when looking for school supplies and "new-to-you" clothes or shoes. Check out local thrift stores or pawn shops before heading to a big box store. Choose stuff that can be reused, repaired, repurposed, recycled, or composted.



- d. \*click\*Help one person understand! Knowing why waste is bad for the planet and how to reduce it is a great start. Talk to your friends and family about it. Help them understand the choices we make everyday matter.
57. \*click\*Do these sound like things you can do? With your help, we can reduce the amount of stuff that goes into our landfill. Thanks for your time! Are there any questions?

[Remember to save Turning Point data; Collect HR items, Turning Point kit, quiz answer sheets, and the laptop & charger]

**Check in with the teacher before you leave:** Remind teacher to bring at least two chaperones on field trip



**Proposed 2020-2021 Lesson Script**

Quiz Questions integrated into the lesson

**INTRODUCTION**

1. My name is \_\_\_\_\_. I work at Home ReSource. [Can ask about classroom conventions for behavior, how to get their attention if needed, etc.]
2. [Set expectations for class participation.] I am going to be asking you some questions. Just so you know, I will only call on students who raise a hand first, unless I tell you otherwise. [Certain times it is ok to have students shout out answers]
3. Raise your hand if you've been to Home ReSource before. Hands down.
4. [Optional: If more than 4-5 students raise their hands, ask this. If not, go to number 5] Raise your hand again if you want to describe Home ReSource. [start with 1; ask if anyone wants to add anything – choose no more than 3-4 students total]. Hands down.
5. Raise your hand if you've been to a thrift store like Goodwill before. Hands down
6. Raise your hand if you've been to a hardware store like Home Depot before. We're a thrift store + hardware store.
7. Welcome to the Zero Waste Ambassadors Program or ZWAP! for short. Can everyone say ZWAP!? Good. That's the sound of knocking out waste in Missoula. I am here today to talk to you about where our stuff comes from and where it goes. We'll talk about how we can work together to knock out waste or, in other words, to reduce the amount of stuff we throw away.

**QUIZ**

8. Let's start out with a quick quiz to see how much we know about waste. [pass out clickers]
  - a. I won't know who has what clicker. Just do your best to guess if you don't know the answer. We'll go over the correct answer after each question. As we go through the quiz, please keep your answers to yourself!
  - b. This first question is practice to see how our clickers work. [How often do you recycle at home?]
  - c. [Explain clickers: Green light, can click more than once to make sure your answer goes in; the last button you click is your answer]
  - d. I'll let you know when to pick up your clickers to answer a question, otherwise, please leave them sitting on the desk in front of you.

**STUFF and SYSTEMS \*click\***

9. Next, when I call you, you will come up and quickly grab a mystery item from our suitcase. I want you to – in a very quiet, orderly, and prompt way – return your clicker, grab an object, and return to your seat. I also want you to know that this is possibly the most unimportant decision you will ever make. [Can call tables/groups/students up as they are quiet to return clicker and get object or ask the teacher to help pass out items to speed students along]
  - a. \*Requests\* for objects: Items either stay quiet in your hands or sitting on the table in front of you.
10. \*click\*What is this stuff? Describe it; name it if you can.
11. \*click\*What is it made out of? [plastic/rubber; wood; metal; glass; ceramics; textiles \*click\* STOP on textiles]





12. Where does this stuff come from...
  - a. What is it made of? [get answers: \*click\* IN ORDER: oil; trees; ore; sand; clay/minerals; plants/animals/plastic]
  - b. \*click\*In the world? [get some answers \*click\* EVERYWHERE]
13. Where do these raw materials go next after we find them and harvest or extract them? Let's use the [item student has] as an example. [\*click\* through up to the house.] Extraction (planet) → Production (factory) → Distribution (mall + laptop computer) → Consumption (house + school)
14. **QUIZ QUESTION: Grab your clickers! We have two questions here.**
  - a. This is the system that people created to make and transport the stuff that we buy and use. What's it called?
    - i. Ecosystem
    - ii. **Materials Economy**
    - iii. Operating System
    - iv. Grocery Stores
    - v. Railroads
  - b. A system is...
    - i. A supportive or main section of something
    - ii. **A set of connected things, parts, or processes that form a complex whole**
    - iii. A machine designed to convert one form of energy into mechanical energy
    - iv. A set of disconnected things that don't relate in any way
15. [Remind them to put their clickers down] \*click\* People have created lots of systems!
16. \*click\*Does anyone know of a system in nature? (solar, ecosystem, hydrologic cycle, carbon cycle or systems inside the body respiratory, circulatory, digestive). \*click\*There's a difference between these natural systems and the Materials Economy!
17. What shape do systems of nature make? \*click\*They make circles. \*click\*What shape is the system of the Materials Economy? \*click\*It's a line, with a beginning and an end, unlike natural systems. Remember this—we'll come back to it a little bit later!

### TRANSPORTATION and CO<sub>2</sub>/GREENHOUSE GASES

18. \*click\*How do we move things around this system, the M.E.? [trucks, planes, boats, trains, etc. \*click\*Advance slides through modes of transportation. STOP on delivery truck]
19. **QUIZ QUESTION: Grab your clickers!**
  - a. On average, how far do most of the things we buy and use have to travel to get to Missoula?
    - i. 100 miles
    - ii. 500 miles
    - iii. 1000 miles
    - iv. **5000 miles**
    - v. 238,000 miles
20. [Clickers down] \*click\* That would be like driving from Missoula to Billings and back over 7 times or Missoula to Yellowstone and back almost 10 times!!
21. How do all those vehicles and machines get the power to extract and transport this stuff? [Fuel] We'd use a lot of gas driving 5,000 miles, wouldn't we?
22. What comes out of the trucks, trains, planes, and boats when they burn fuel?
23. Greenhouse gases, including carbon dioxide (CO<sub>2</sub>). \*click\*
  - a. What do you know about greenhouse gases like CO<sub>2</sub>?
  - b. Does anyone know what the atmosphere is? [layers of gases that surround Earth]



- c. Have you ever gotten into a car in the summer and it's way hotter in the car than it is outside? **\*click\*** That's kind of how greenhouse gases like CO<sub>2</sub> work in the atmosphere; they trap heat. (D-E = text from animation/on screen)
  - d. Sunlight reaches the Earth and some of that energy is reflected back into space.
  - e. Some of it is absorbed by GHGs and re-radiated as heat. More GHGs, like CO<sub>2</sub>, means more heat is being trapped, contributing to global climate change.
  - f. [Referring to animation] This isn't a very accurate depiction of our atmosphere compared to the Earth. Really, our atmosphere is much smaller. If you were to take a basketball and put a piece of paper on it, that's about how big our atmosphere is when compared to the Earth.
  - g. People used to think the atmosphere was much larger, and that we could keep putting more and more CO<sub>2</sub> into it, but now we realize we need to slow down. This is just like when people thought the oceans were infinite and we could just dump all of our trash there. But we have learned that dumping our trash into the ocean isn't a solution, it just creates a bigger problem!
  - h. Unlike any trash in the ocean, some CO<sub>2</sub> in our atmosphere is natural and essential to life on Earth: we breathe it out, trees breathe it in. Greenhouse gases like CO<sub>2</sub> help keep our planet warm and livable, but we do need to be careful about how much we are adding.
  - i. Who remembers the bad fire season we had in 2017? And how about last winter - Normal? Weird? This winter? We can connect our strange seasons at home with climate change and greenhouse gases, including CO<sub>2</sub> from the Materials Economy. Our stuff affects our climate!
24. Whenever something is extracted from the Earth, produced in a factory, or transported through the Materials Economy, more CO<sub>2</sub> is produced.

#### LANDFILL and CHOICE **\*click\***

25. Let's talk about what happens next in this system. What do we usually do with our stuff when we're done with it?
26. We throw it "away." **\*click\*** Then, someone drives it to the landfill.
27. **QUIZ QUESTION: Grab your clickers! We have two questions here.**
- a. How much stuff does an average Montanan throw away in one day?
    - i. 1 pound
    - ii. 4 pounds
    - iii. 7 pounds**
    - iv. 10 pounds
  - b. How does that compare to average Americans? Montanas throw away \_\_\_\_\_.
    - i. More**
    - ii. Same
    - iii. Less
28. [Clickers down] What kind of stuff do we throw away? [Get a few responses; be sure to include toxics] **\*click\***
29. What are some of the consequences of throwing this stuff away? [Get a few responses] **\*click\***
- a. [If no reply, follow up with: What are some ways throwing things in the dump harms us or our planet?]
30. [Be sure to tell this like a story] Let me tell you a story. When people began to live in big cities, trash and human waste were often thrown into the streets or outside the city gates. Imagine if you were to throw all of your garbage out of your bedroom window! What would Missoula look like? As cities kept growing larger, people began to link trash and sewage with disease. The concept of a common garbage "dump" or landfill was seen as a solution to these public health concerns. And then the landfill



was born; waste materials were collected and put into one area outside of town. Then and now, landfills have kept garbage out of the streets and protected public health.

31. Unfortunately, now we have different problems:
  - a. \*click\*We're throwing away a lot of stuff!
  - b. \*click\*A lot of it isn't "garbage," it is reusable, repairable, recyclable, etc.
  - c. A lot of it becomes harmful to us and the planet when dumped in a landfill
  - d. Is this a good way to go? [No!]
32. **QUIZ QUESTION: Grab your clickers!**
  - a. True or False? Reducing waste is a CHOICE?
    - i. **True**
    - ii. False
33. \*click\*We have a CHOICE! Materials don't become waste until they're wasted.
34. Who decides when a bottle or a can or a piece of paper becomes waste or garbage? [We do!]
35. \*click\* It happens right here with us at home & at school.
36. The good news is that there's a simple equation that each of us can use to keep stuff out of the dump & become a Zero Waste Ambassador. \*click\*When we CHOOSE to reduce waste and \*click\*take ACTION, we can make a \*click\*big DIFFERENCE.
37. **QUIZ QUESTION**
  - a. What is the first "R" in the 3 "R"s of waste reduction?
    - i. **Reduce**
    - ii. Reuse
    - iii. Recycle
  - b. What does it mean to reduce?
    - i. Use less stuff
    - ii. Make it again
    - iii. Put it in the garbage
    - iv. Use it again
38. [Clickers down] \*click\*Who remembers the first "R"? [REDUCE]\*click\* Who remembers what it means? \*click\* [USE LESS STUFF] Who wants to guess why REDUCE is with the Earth? When we choose to use less stuff, do we need oil, trees, ore, etc.? [No!] Do we then need to log, drill, or mine? [No!] If we leave forests, mountains, and open spaces alone, nature's systems can continue to cycle and support life on Earth. Are we life on Earth? [Yes!] Choosing to reduce is one of the best things we can do for the health of our planet and to protect our future. When we put the first "R" into action, we can make the biggest difference!

## LOOPS

39. Now, what shape is a natural system again?\*click\* [Circle]. What shape is the Materials Economy? \*click\*[Line]. \*click\*Using the other R words,we can turn this line \*click\* into circles.
40. \*click\*Who knows the second "R" of waste reduction? [REUSE] \*click\* This is something we do a lot of at Home ReSource. It means \*click\* USE IT AGAIN.] \*click\* These arrows start with us! At our homes and schools, do we choose to send something to the landfill, or do we choose to reuse?
  - a. Small arrow: Examples of reuse behaviors, things that we can reuse at home/school \*click\*
  - b. Mid-sized arrow: Examples of reuse businesses in Missoula [Include Free Cycles, library, thrift stores] \*click\*
41. \*click\*Who knows the third "R"? [RECYCLE] \*click\* It means \*click\*MAKE IT AGAIN. And it isn't as easy as it seems. Just because something goes into the bin, doesn't mean it's going to be recycled.



- a. **\*click\*** Big arrow: Examples of materials that can be recycled **\*click\***
- 42. Each arrow helps us reduce waste. The smaller the arrow, the smaller the impact that action has.
  - a. When we recycle material vs. making new, it takes less energy. If we donate or sell used items, we have to transport it, but that's about the only energy we need for that. It takes almost no energy to reuse something at home.
- 43. What good things happen when we reduce waste and close the system? [get some answer]
  - \*click\***Remember this: We can use our equation for becoming a Zero Waste Ambassador to make these things happen! When we **\*click\***make the CHOICE to reduce waste and **\*click\***put the 3 Rs into ACTION, we can **\*click\***make a big DIFFERENCE.

## ZERO WASTE ECONOMY

- 44. Now, we've talked about different ways we can take action. Are there any items and/or materials that don't fit into our ZW system? [Yes- Styrofoam, wrappers, packaging, etc.]. **\*click\*** We make waste because a lot of things we use in our lives are DESIGNED FOR THE DUMP. **\*click\*** [refer to examples given; offer more - chips and snack bags, etc.]
- 45. The good news is that it doesn't have to be this way! Things can be made to fit into the ZW system instead of being DFTD.
- 46. **QUIZ QUESTION: Grab your clickers!** We've talked about our 3 "R"s of waste reduction – Reduce, Reuse, and Recycle, but there are other "R" words that can help.
  - a. These "R" words describe other ways we can reduce waste. Which of these words describes an action we can take to persuade companies to change how they make or package their products to reduce waste?
    - i. Repurpose
    - ii. **Request**
    - iii. Rethink
    - iv. Respect
- 47. Let's talk about those chip bags again. How could I practice the Request "R" word? I could write a letter [describe what the letter would say]. We could ask our parents to buy less single use plastic and individually wrapped things.
- 48. So if we put all the R's into ACTION, and the people who make stuff made it so that it could fit into this system do you think we could live in a world that creates Zero Waste? **\*click\***That would mean that instead of a Materials Economy, we'd create an economy that produces**\*click\*** ZERO WASTE!
- 49. **\*click\*** Zero Waste is a system that supports people and the planet by using the 3 Rs. It requires us to play an active role and to make the CHOICE to put those Rs into ACTION. In a Zero Waste world, all the things in the Zero Waste Economy are made to last longer, and to be repairable, reusable, recyclable, and compostable. The entire system needs to change. And it's starting.
- 50. Once we make the CHOICE to practice the Rs & stuff is made to fit into a Zero Waste Economy then can we truly get to Zero Waste.

## CONCLUSION with FIELD TRIP **\*click\***[esc. key]

- 51. Did you know that Missoula has a Zero Waste goal & a plan to get there? Missoula is planning to reduce the amount of stuff it sends to the landfill by 90% by 2050. The Missoula County Public School district is on board too! How old will you all be in 2050? What would it be like to be able to reduce the amount of trash you throw away by 90%?
- 52. We need your help! If you can reduce waste every day and encourage your friends and family to do the same, imagine how much of a difference we can make! That's why we need each of you to become



Zero Waste AMBASSADORS. When you come to Home ReSource for your field trip, we'll talk more about what that means.

53. In the meantime, I'd like you all to quietly think of some ideas for what a Zero Waste Missoula might look like. Think of Zero Waste in your homes, your school, and anywhere else. I will ask to hear your ideas when you visit Home ReSource for your field trip!
54. Thanks! I look forward to seeing you at Home ReSource!

### CONCLUSION without FIELD TRIP \*click\*

55. Did you know that Missoula has a Zero Waste goal & a plan to get there? Missoula is planning to reduce the amount of stuff it sends to the landfill by 90% by 2050. The Missoula County Public School district is on board too! How old will you all be in 2050? What would it be like to be able to reduce the amount of trash you throw away by 90%?
56. We need your help! If you can reduce waste every day and encourage your friends and family to do the same, imagine how much of a difference we can make! That's why we need each of you to become Zero Waste AMBASSADORS. \*click\*But what is an ambassador? [get a few answers] \*click\* An ambassador is a person who leads by example and encourages others to do the same
57. Can I have volunteers to help me read the next few slides? \*click\* You know you're a Zero Waste Ambassador when you...
  - a. \*click\*Drink from a reusable water bottle every day! Bottled water is bad for the planet. It takes a lot of energy and makes a lot of waste to bottle and transport water. Just turn on the tap! Choose to reuse water bottles, shopping bags, clothes, toys, and more.
  - b. \*click\*Practice Zero Waste at mealtimes! Together we can tackle food waste and lunchtime litter. Only take what you think you will eat! Save or share leftovers, and compost your food scraps when possible. Use reusable lunchboxes, cups, dishes, silverware, and napkins.
  - c. \*click\*Shop secondhand first! Think "thrifty" when looking for school supplies and "new-to-you" clothes or shoes. Check out local thrift stores or pawn shops before heading to a big box store. Choose stuff that can be reused, repaired, repurposed, recycled, or composted.
  - d. \*click\*Help one person understand! Knowing why waste is bad for the planet and how to reduce it is a great start. Talk to your friends and family about it. Help them understand the choices we make everyday matter.
58. \*click\*Do these sound like things you can do? With your help, we can reduce the amount of stuff that goes into our landfill. Thanks for your time! Are there any questions?

[Remember to save Turning Point data; Collect HR items, Turning Point kit, quiz answer sheets, and the laptop & charger]

**Check in with the teacher before you leave:** Remind teacher to bring at least two chaperones on field trip



## Appendix D: Classroom Supplemental Activities

CLASSROOM: \_\_\_\_\_



DATE: \_\_\_\_\_

### Class Trash Tracker Sheet

**Directions:**

Please list all of the items you/your classmates throw away each day in your classroom, lunchroom, etc. for an entire week. Do not include items you place into separate bins for recycling, only items that go in garbage cans around your school.

Day 1	
Day 2	
Day 3	
Day 4	
Day 5	
Day 6	
Day 7	

**Questions:**

1. Do you recycle in your classroom? **Circle one:** YES | NO. If YES, what items do you recycle?

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2. Do you reuse items in your classroom? **Circle one:** YES | NO. If YES, what items do you reuse and how?

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NAME: \_\_\_\_\_



DATE: \_\_\_\_\_

## Family Trash Tracker Sheet

### Directions:

Please list all of the items your family throws away each day for an entire week.

Do not include items you place into separate bins for recycling, only items that go in garbage cans around your home.

Day 1	
Day 2	
Day 3	
Day 4	
Day 5	
Day 6	
Day 7	

### Questions:

1. Does your family recycle? **Circle one:** YES | NO. If YES, what items does your family recycle?

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2. Does your family reuse or donate items for reuse? **Circle one:** YES | NO. If YES, what items does your family reuse and how? What items does your family donate for reuse? Please use the reverse side if you need more space.

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CLASSROOM: \_\_\_\_\_



DATE: \_\_\_\_\_

## Using “R” Vocabulary: Rethink and Request

### Accompanying Class Activities for ZWAP! Presentation

#### Rethink Stuff!

Objective: To rethink how we can learn and/or play using fewer materials and products.

Time needed: 20-30 minutes

Materials needed: Butcher paper, markers, and a list or “calendar” of school events and holidays\*

#### Activity:

- Break the class into groups of three or four students
- Assign each group a school event or holiday, and explain to the students that their group will be acting as a planning committee. Each group will get a chance to plan a Zero Waste event by rethinking the stuff people often use for that event or holiday.
- Give each group 10 minutes to:
  1. Make a plan to minimize the amount of products and materials needed to put on the school event or holiday celebration
  2. Make a plan to minimize the amount of waste generated by the event
  3. Write their event plans on a butcher paper poster to be shared with the class. Students are welcome to draw what their event will look like!
- Students should be encouraged to consider decorations, cups, dishes, food items (encourage healthy snacks!), and other items relevant to their event or holiday (e.g., Valentine’s Day cards, Halloween candy, holiday fireworks, theater props, and sports training equipment) in their planning
- After the group breakout session, have each group present their poster and plan for their Zero Waste event to the class. As a class, brainstorm additional suggestions to improve upon these plans, and continue brainstorming additional ways students can continue to rethink the materials they consume in their everyday lives

#### \*Ideas for school event calendar

- Holidays: Christmas, Thanksgiving, New Year’s Day, Valentine’s Day, Easter, and the 4<sup>th</sup> of July
- School events: Homecoming football game, spring formal, band or choir concert, theater production, drama club events, fun runs, birthday parties, and bake sales



CLASSROOM: \_\_\_\_\_



DATE: \_\_\_\_\_

## Using “R” Vocabulary: Rethink and Request

### Accompanying Class Activities for ZWAP! Presentation

#### Request Change!

Objective: To reinforce key takeaways from the ZWAP! presentation by writing letters to organizations or individuals in a position of power to encourage them to adopt more Zero Waste practices.

→For reference: ZWAP! key takeaways

1. We have a CHOICE! Waste isn't waste until it's wasted.
2. Our small ACTIONS make a big difference! We can make a difference by reducing waste every day.
3. We have a lot of OPTIONS to reduce waste! Reduce, reuse, recycle + refuse, rethink, request, etc.

Time needed: 20-30 minutes

Materials needed: Paper, writing utensils, envelopes, stamps, list of potential letter addresses (e.g., name-brand clothing companies, school administrators, government representatives, manufacturing companies)

#### Activity:

- Introduce students to the activity, highlighting the key takeaways of ZWAP! and the final outcome of this activity: a formal request of an individual or organization to reduce their waste
- Have students brainstorm individuals or organizations whom they can request to make everyday products reusable/recyclable/repairable/compostable, and to encourage to adopt other Zero Waste practices
- Send student requests to their addresses, and follow-up with any responses your class receives!



## **Appendix E: Home ReSource Field Trip Timelines**

### **ZWAP! Home ReSource Field Trip timeline**

10:00 to 10:05	Welcome (5 minutes)
10:05 to 10:55	ZWAP! The Game (50 minutes)
10:55 to 11:15	HR Tour (20 minutes)
11:15 to 11:35	Visioning and Sharing (20 minutes)
11:35 to 12:05	Lunch and Zero Waste Station, Scavenger Hunt explanation (30 minutes)
12:05 to 12:40	Scavenger Hunt-come back at 12:26 for reflection (35 minutes)
12:40 to 12:50	Quiz (10 minutes)
12:50 to 1:00	Ambassador Actions, Wall Signing, and packing up (10 minutes)

### **ZWAP! Home ReSource Field Trip timeline (landfill)**

10:00 to 10:25	Welcome and Landfill Discussion (25 minutes)
10:25 to 11:15	ZWAP! The Game (50 minutes)
11:15 to 11:35	HR Tour (20 minutes)
11:35 to 12:05	Lunch and Zero Waste Station, Scavenger Hunt explanation (30 minutes)
12:05 to 12:40	Scavenger Hunt-come back at 12:26 for reflection (35 minutes)
12:40 to 12:50	Quiz (10 minutes)
12:50 to 1:00	Ambassador Actions, Wall Signing, and packing up (10 minutes)



## Appendix F: Home ReSource Field Trip Script

### ZWAP! 2020 Field Trip Lesson Plan

Revised 02/27/2020

#### Script Key:

Questions to ask class

[Instructions] for educator

KEY WORDS to write on the whiteboard

#### INTRODUCTION/WELCOME (5 MINUTES) *Students arrive and choose their seats.*

1. Hello! It's good to see you again. Welcome to Home ReSource and our ZWAP! Room! In case you forgot, my name is \_\_\_\_\_. Can you remind me how to get your attention if I need to?
2. Does anyone remember what ZWAP! stands for? [Zero Waste Ambassadors Program] Today, we are going to discover what it means to be a Zero Waste Ambassador!
3. Do you want to hear about what we will be doing today?
  - a. We are going to play a board game called ZWAP! The Game, where you will work together to recreate the system of stuff we talked about in your classroom. Who remembers what that system is called? [Materials Economy]
  - b. Then, we'll take a tour of Home ReSource so you can learn about what we do, what kinds of things you can find here, and where you will be able to find them.
  - c. Before I left your class, I asked you to start thinking about what a Zero Waste classroom, school, home, or anything might look like, and when we finish the tour, we will come back to the ZWAP! room and you can draw out or write about your ideas.
  - d. Then it's lunch time and I'll show you how to use our zero waste station.
  - e. After lunch, we are going to go on a Reuse Scavenger Hunt, which is why it's super important to pay attention during our tour to see where things are.
  - f. And finally, we will take that quiz again with the clicker and then talk about what actions you can take to be a Zero Waste Ambassador. If you want to take one or more of those actions, then you can sign our wall before you go back to school.
  - g. Sound ok?

**ZWAP! THE GAME (50 MINUTES)** *After students start with the first round of the game, get waivers from the teacher and introduce yourself to any chaperones and ask if they are willing to help supervise the scavenger hunt. Ask about media waivers.*

*Game boards should be set up before field trip. You may not need all 8 boards if it is a small class - aim for 3-4 students per group. have students arrange themselves around the end of the table. Hand out envelopes with instructions and game pieces.*

4. This is a review of the Materials Economy we talked about when I visited your class. What is the Materials Economy again? [The system of stuff.] Who remembers what a system is? [A set of connected things or parts forming a complex whole.] Who remembers the shape of this human-made system? [Line.] How about the shape of Earth's natural systems? [Circle.]
5. This game has several parts that we call "rounds." Before every round, we will look at the game pieces and go over the instructions together. Then, when I say "Go", your team will work together to complete the round. Follow the instructions carefully, and please don't move on to other rounds without



the rest of the class. Once your team has completed a round, you will call “Done” and raise your hands. I will come over to check your progress and give you clues if you’re stuck. Make sure to leave the game pieces on the board after each round.

**\*\*Please treat the boards & game pieces gently and with respect.\*\***

6. **Gameplay** [Get waivers from teacher]
7. **For each round:** I will let you know when you start each round, and we will go over the instructions together each time. Can I have someone read \_\_\_\_? [Popcorn around the room to have students read through the instructions]
8. Have students open the game envelopes for each round after instructions are read for that round. Have teacher/chaperones walk around and make sure students are all participating and on task as everyone begins the round.

**Round 1: Instructions: Recreating the System**

1. Starting at START, velcro each piece in order along the straight black line.
2. Once you are finished, Call out “DONE!” and raise your hands.  
**HINT: Do you remember the MATERIALS ECONOMY, the SYSTEM where things come from and where they go?**
9. Things students may need help with during this round: Where to place arrows.
  - a. Placing arrows between each stop in the ME (ask them how things get from one place to another).
  - b. Arrangement of arrows (each arrow has vehicles on it..where do they go? garbage truck, planes, etc.)
10. **Find the envelope that is labeled “Recreating the System.” These are your pieces for this round.**
11. **Reflection:** Ask students to share where they put their game pieces. Draw and label the Materials Economy on the board. Review the question: **How far do the things we buy and use travel to get to Missoula?** [5000 miles]
12. In our Materials Economy, a lot of our stuff ends up in the dump. In the next round, we’ll start changing the system to one that is closer to the Earth’s natural systems. **Does anyone remember the shape of natural systems?** [Circle]

**Round 2: Instructions: Turning the Line into a Circle** (Arrow game pieces are on the back of the boards.)

1. Velcro the three orange arrow pieces under the Materials Economy.  
**HINT: All of the arrows start with us! WHERE do you spend most of your time? The arrows will lay flat if they are in the right places.**
2. Once you are finished, Call out “DONE!” and raise your hands.  
**HINT: Remember the choices we can make to change the Materials Economy into a system more like the ones found in nature?**
13. Things students may need help with during this round:
  - a. Where do we spend most of our time? The arrows all start at Home/School.
14. **There are pieces in a pocket on the back of your game boards. These are your pieces for this round.**
15. **Reflection:** Ask students to explain where they put each of their loops and draw them on the board. Explain that we’ll think about what these loops mean in the next round.

**Round 3: Instructions: Naming our Choices** (Hint: Each loop has 1 “R” word, 1 definition, and 1 number.)

1. Velcro the pieces where they belong under the Materials Economy on the board or on the orange arrows.
    - The pieces: REDUCE, REUSE, RECYCLE, and LANDFILL need to be matched with the correct definition pieces.
- Remember:** There are two REUSE pieces because there are two ways to reuse in the Zero Waste Economy.





2. Place the black circle numbers next to the “R” words to show the correct order.  
**HINT: The 3 “Rs” of waste reduction are always in the same order, do you remember which one goes first?**
3. Once you are finished, Call out “DONE!” and raise your hands.

16. Things students may need help with during this round:

- a. What is the order of the three Rs? (Reduce, Reuse, Recycle)
  - So the numbers go with the order of the Rs - Reduce = 1, Reuse = 2, Recycle = 3
- b. What does “Reduce/Reuse/Recycle” mean?
- c. If reduce is number one, which of the images in the Materials Economy should that go with?
  - Where did the whole game start?
  - Why does reduce go under the Earth? (If we reduce, we don’t have to make it in the first place and the materials don’t need to be extracted.)
- d. Where can we reuse things? Where do we spend most of our time? (Home/School, Donate/Store)
- e. If we recycle, where do those materials go? (To the factory)
- f. Where is the landfill on the board? What happens to stuff when it goes to the landfill? (Gone for good)

17. **Find the envelope that is labeled “Naming our Choices.” These are your pieces for this round.**

18. **Reflection:** Write the game board labels on the board as you ask the following questions:

- a. What is the first “R” word? Where did you put it and why? Reduce; Under Earth because that’s where it makes the biggest difference/It’s the best thing we can do to protect the health of our planet!; Use less stuff
- b. Where did you put the other “R” words? Recycle - largest loop; Reuse on other two
- c. Where did you put the landfill? What does it mean when things go there?

19. In our final round, you will get a chance to put the “R” words into action with common household objects.

20. **Round 4: Instructions: Tracking our Trash** (As groups are working on the round, ask them to use “Reduce” if they have overlooked it, identify objects that cannot be readily recycled, and ask how they are reusing items.)

1. Take turns drawing one game piece at a time from the remaining envelope. As a team, choose where to put each of these items on the game board.
  - Your choices are: any of the three arrows, in the landfill, or under the Earth to REDUCE the amount you use in the first place!
2. Be prepared to explain your choices and why you made them.
3. Once you are finished, Call out “DONE!” and raise your hands.

**HINT: The “R” words are in order for a reason!**

21. **Find the envelope that is labeled “Tracking our Trash.” These are your pieces for this round.**

22. **Reflection:** Facilitate a discussion with these general questions: Get 3-5 answers for each

1. Who had things that they decided to “REDUCE”? How can we reduce that? Anyone else have that piece?
2. ... “REUSE” at school/home or donations/stores? ....
3. ... “RECYCLE” .... How much energy does it save to recycle one aluminum can? [300 minutes to power a laptop]
4. What ended up in our landfill? Discuss toxics in the landfill, such as e-waste, which can contain lead, zinc, nickel, and other toxic chemicals, which are released into the air and into the groundwater. A lot of these things are designed for the dump! Who remembers the “R” word we can practice to persuade the people who make the stuff we buy and use to make it fit into our loops? [REQUEST]

23. **Emphasize the importance of REDUCE.** Then after covering each loop, Request:

24. Write **CHOICE + ACTION = DIFFERENCE** on the whiteboard while saying: Awesome job! You were all making the CHOICE to keep stuff out of the landfill! You put the “R” words into ACTION. When we do that, we can make a big DIFFERENCE!

25. We talked about this in your class, can anyone remember or think of the difference we can make by using our “R” words?



26. *Make a list on the whiteboard of students' responses. Responses can include: protect animals, protect the environment, clean oceans, less in landfills, less litter, and healthy Earth.*
27. **This is the difference we can make.** This is why the "R" words are so important for us to put into action.

*Quick transition! OK class, I want you all to line up here in a single-file line...*

*Leave game boards as they are as you prepare for the tour. Clean-up can happen at the end of the HR tour, before visioning.*

### **HR TOUR (20 MINUTES)**

28. Establish ground rules. Ask the class what they think good rules would be, and add as necessary. [Walk, stay together, hands to yourselves, inside voices, etc.] Give them a heads up about the scavenger hunt and that they should be looking around while on the tour.
29. Lead students to Garden of Giving - you face the parking lot and they face you.

#### **Garden of Giving**

- a. HR's Mission and History - Does anyone want to describe Home ReSource? What loop from the Materials Economy in ZWAP! the Game does it fit into?
- b. Home ReSource began as a building materials reuse center. It was created in 2003 by two guys. One was a university student, and the other worked in construction. Matt, the student, had learned that a lot of what we throw in the dump comes from construction. Lauren, the builder, had seen how much usable stuff got sent to the dump from the construction job sites he worked on. Do Montanans use and throw away more or less stuff than the average American? [More.] And is reducing waste a choice we can make? [Yes.] Matt and Lauren became friends and made a CHOICE to start Home ReSource to keep stuff out of the dump. They started small, keeping materials in garages until they could find a place to open a store. Now Home ReSource employs 25 people.
- c. We will take a look at everything inside of Home ReSource, but first, let's look at where the HR loop begins. Careful as we cross the parking lot! [Walk to intake/donation sorting area.]

#### **Donations and Diversion**

30. Can you see that yellow sign over there? What does it say? Do you remember when I said Home ReSource is like a cross between a hardware store and a thrift store?
31. Most of what you will see at Home ReSource came out of the trunk of someone's car or the back of someone's truck as a donation. Other items come from a deconstruction crew. They take buildings apart like Legos so that all of the materials like doors, cabinets, windows, etc. can be reused.
32. We help people reuse about 5,500 pounds of stuff every day! Where do you think that stuff would go if Home ReSource wasn't here? [Dump.] How much stuff does an average Montanan throw away in one day? [7 pounds.]
33. Okay, we're going to continue our tour. When I say "Go", follow me as a group. When we get to the corner of the yard, we'll stop. I want everyone to be able to tell the group one thing you see along the way. Remember our ground rules. Let's Go!

#### **Vibrant and Sustainable Local Economy** - *Lead the group to in front of the Bad Goat material.*

34. What did you see? Go around the group quickly and repeat what students say.
35. We love our "R" words at Home ReSource. Reduce and reuse are our favorites. Who remembers what it means to REDUCE? [Use less stuff.]
36. One of the things that makes Home ReSource special is that it is a non-profit business. That means that Home ReSource has a mission. Who can tell us what it means to have a mission? Our mission is a goal



which guides what we do. Our mission is to reduce waste and build a more vibrant and sustainable local economy.

37. The main way we achieve our mission is by helping people reuse building materials instead of wasting them. That's a big way we reduce waste. The second part is to build a more vibrant and sustainable local economy. Who knows what "vibrant" means? *[Full of energy and enthusiasm.]* How about "sustainable"? *[Able to be maintained for many generations.]* And "local"? *[Stays within our community.]*
38. One way we achieve that second part of our mission is by supporting a local business called Bad Goat Forest Products. This is the only product in Home ReSource that isn't reused. It is new, but it helps us achieve our mission because these planks and fence boards are made from trees that need to be cut down around Missoula. Bad Goat provides sustainable lumber for builders in Missoula.
39. Ready to continue our tour? Use your eyes again. Follow me! *Lead the group around the rest of the yard and into the shop.*

**Materials Giving** - What did you see?

40. Welcome to the Home ReSource Woodshop. Here we make new stuff like furniture and art canvases out of old stuff like wood and doors. We use the shop to teach people how to make stuff from reused wood. That's because another part of our mission is to educate the community about reuse. *Take the opportunity to introduce them to anyone working in the shop and tell them a bit about what they do.*
41. While people buy most of the stuff you've seen, we also give it away. The last part of our mission is to give building materials to those in need. So people from schools, churches, other nonprofits, and community events come to us with a list of the materials they need to support their work. Although materials from Home ReSource are always affordably priced, sometimes we give them away for free or sell them at a reduced price. It's called our Materials Giving Program.
42. Any questions? We're going to take one more walk. We'll end up in our classroom again. We'll pass bathrooms and a water fountain on the way—so feel free to stop if you need to. When you return to the ZWAP! classroom, please take a few minutes and clean up your game materials before we break for lunch.
43. Walk through **electrical, plumbing, & hardware departments** before returning to ZWAP! room.
44. Ask students, teachers, and chaperones to help clean up ZWAP! The Game. Hand out paper and colored pencils.

**VISIONING (20 MINUTES)** - hand out paper and colored pencils

45. You can either write or draw about zero waste. *Put the visioning prompt on the screen. Give students 10-15 minutes depending on time, and give 5 and 2 minute warnings before asking some students to share their artwork.*

**LUNCH, SCAVENGER HUNT EXPLANATION, ZERO WASTE STATION (30 MINUTES)**

46. Lunch - 5-10 minutes of eating free time depending on time. *Students can have a few minutes to finish up their visioning if they need a bit more time, but make sure it's only a few minutes so they have time to eat.*
47. For the scavenger hunt, we will be working in teams, which we will assign after we finish lunch.
48. This is one of the lists for the scavenger hunt. Each project has a "shopping list." Your group will imagine that you are building this project! During the scavenger hunt, each team will go back out into the areas we toured to see if you can find the items on your list. Use the marker attached to your clipboard to mark off the items as you find them. This is not a race and you will not actually be building anything today!
49. For those who are excited to actually build something, we are partnering with the ZACC this summer on a week-long ZWAP! camp. Registration is open now! So contact the ZACC if you're interested.



50. You'll notice that some of your projects look really fancy in the pictures! These are pictures of really nice homes and other structures; it is possible to make something this nice with materials from Home ReSource, and you could also do a project that doesn't end up looking like a page out of a magazine!
51. Here's a few tips for reading the items on your list. *Go through PowerPoint slide with the scavenger hunt key.*
52. Are there any remaining questions about the scavenger hunt? Great! Finish up your lunches, and in a few minutes, I'll show you how to use our Zero Waste Station.

### Sorting activity

53. *As students are finishing up, go stand next to the Zero Waste station. Get their attention. Point to the signs/bins as you explain:*
54. Now you will have an opportunity to recycle what's recyclable, compost what's compostable, and reuse what you haven't eaten and don't want to take with you. We can take the items in the reuse basket and share them with the people who work here at Home ReSource. Things that go in there include unopened milk cartons, sealed bags of fruit or veggies, unpeeled or unbitten fruit, and unopened condiment packets.
55. *Invite students who are finished with their lunch to come up and sort their leftovers, then return to their seats until everyone is finished.*

### REUSE SCAVENGER HUNT (35 MINUTES)

56. *Go over the ground rules from the tour as a reminder before assigning teams.*
57. We are going to split into five teams (go with teacher preference first; count off if the teacher has no preference). *Count off.* Each team will have an adult.
58. *Assign (or let students decide) someone to keep track of the list, two to measure wood, mirrors, tiles, etc., and a timekeeper to each group before group dismissal. Groups will return by 12:27(ish). Groups are to return to the ZWAP! room at the end of the scavenger hunt. Ask adults to help gather baskets, tape measures, and 2x4s as groups arrive.*

### Reflection

59. Did anyone find all of the items on their list? If not, that's okay!
60. I'm going to call on each group to tell me what their building project was and to read off the number in red that is on their shopping list. *Record projects and their weights on the whiteboard.* What do you think these numbers mean?
61. These numbers represent an estimated weight of all of the items for your project! How much would all of our projects weigh combined? *4,393 lbs. for all five projects. Anyone remember how much trash an average Montanan throws away in a day? 7 lbs.*
62. We're going to dive into this discussion a little deeper. Take one minute to silently think of a few responses to this question: What happens when we choose to reuse at a place like Home ReSource? *Put the corresponding PowerPoint slide up on the TV. Finish collecting baskets and clipboards. Give students one minute to think of their answer themselves.*  
*If time allows, move to pairs. If not, move to full group share. Go ahead and pair up with one or two people and share your thoughts for 2 minutes. Give students 2 minutes for discussion in pairs. Visit student groups to make sure they stay on track.*
63. Now that you've had some time to think and discuss, I'd love to hear how you answered the question! What happens when we choose to reuse at a place like Home ReSource?  
*"Share" for 3-5 minutes. Can take notes on students' ideas and thoughts on the whiteboard. Make connections to good things list from ZWAP! the Game reflection.*

### ZWAP! QUIZ (10 MINUTES)



64. Explain the clickers if the class did not use them in their classroom. Tell students that each section of ZWAP! will have their final scores compared, and the class that learned the most will get some kind of reward (work with teachers on this one - reward could be extra recess time, free time, games, etc.)

### AMBASSADOR ACTIONS AND WALL SIGNING (10 MINUTES)

65. Who's ready to sign the ZWAP! wall? When you sign the wall in a few minutes, you will get a chance to pledge to be a Zero Waste Ambassador. But what's an ambassador?

*After an answer or two, put up corresponding PowerPoint slide with definition.*

66. I've got a list of four ways we can all be Zero Waste Ambassadors. I'll need a few volunteers to help read out these actions to the class.

67. Have four students read out the "You Know You're a Zero Waste Ambassador When You..." PowerPoint slides.

- a. **Drink from a reusable water bottle every day!** Choose to reuse water bottles, shopping bags, clothes, toys, and more.
- b. **Practice Zero Waste at mealtimes!** Together we can tackle food waste and lunchtime litter. Only take what you think you will eat! Save or share leftovers, and compost your food scraps when possible. Use reusable lunch boxes, cups, silverware, and napkins.
- c. **Shop second hand first!** Think "thrifty" when looking for school supplies and "new-to-you" clothes or shoes. Check out local thrift stores or pawn shops before heading to a big box store. Choose stuff that can be reused, repaired, repurposed, recycled, or composted.
- d. **Help one person understand!** Talk to your friends and family about why waste is bad for the planet and how we can reduce it. Help them understand that the choices we make every day matter.

68. Do these sound like things you can do? If so, I invite you to sign the ZWAP! wall as a symbol of your pledge to be a Zero Waste Ambassador!

*Remind students to sign their name once at a reasonable size. Have students line up single-file by the fridge along the kitchen counter. Pass out markers, and remind students to pass their markers to a friend or return when done.*

*Stand by the double doors. Ask students to form a single-file line starting in front of you by the double doors.*

69. I want to remind you that ZWAP! camp happens this summer at the ZACC & here at Home ReSource, it will be a week-long half-day camp, so if you're interested, contact the ZACC to sign up.

70. Thank you all for being a part of the Zero Waste Ambassadors Program, now go out there and knock out waste!



## **Appendix G: ZWAP! Quiz**

1. How often do you and your family recycle at home? [Question intends to gauge current behavior]
  - a. All the time
  - b. Some of the time
  - c. None of the time
  
2. How much waste does a Montanan throw away compared to the average American?
  - a. **More**
  - b. Same
  - c. Less
  
3. How much stuff does an average Montanan throw away in one day?
  - a. 1 lb.
  - b. 4 lb.
  - c. **7 lb.**
  - d. 10 lb.
  
4. A System is...
  - a. A supportive or main section of something
  - b. **A set of connected things, parts, or processes forming a complex whole**
  - c. A machine designed to convert one form of energy into mechanical energy
  - d. A set of disconnected things or parts that don't relate in any way
  
5. What is the name of the system that people created to make and transport the stuff that we buy and use?
  - a. Ecosystem
  - b. **Materials Economy**
  - c. Operating System
  - d. Grocery Stores
  - e. Railroads
  
6. On average, how far do most of the things we buy and use have to travel to get to Missoula?
  - a. 100 miles
  - b. 500 miles
  - c. 1,000 miles
  - d. **5,000 miles**
  - e. 238,000 miles
  
7. What is the first R in the three Rs of waste reduction?
  - a. **Reduce**
  - b. Reuse
  - c. Recycle





8. What does it mean to Reduce?
- a. **Use less stuff**
  - b. Make it again
  - c. Put it in the garbage
  - d. Use it again
9. Recycling one aluminum can saves enough energy to power a laptop for up to...
- a. 20 minutes
  - b. 120 minutes
  - c. 150 minutes
  - d. **300 minutes**
10. These "R" words describe other ways we can reduce waste. Which of these words describes an action we can take to persuade companies to change how they make or package their products to reduce waste?
- a. Repurpose
  - b. **Request**
  - c. Rethink
  - d. Respect
11. True or False: Reducing waste is a choice
- a. **True**
  - b. False



## Appendix H: ZWAP! Activities

**ZWAP! the Game:** a multi-round review of the Materials Economy, our system of stuff that we discuss in the classroom presentation.

**For students:**

- ✓ Game board
- ✓ Instruction sheet
- ✓ Envelope with game pieces

**For teachers and chaperones:**

- ✓ Game guide

**For ZWAP! Educator:**

- ✓ Script
- ✓ Instruction sheet
- ✓ Presentation on TV and clicker

**Set-up:** Before the field trip, the game boards and envelopes will be placed on the tables for students' arrival.

**Game board**



### Instructions

**Recreating the System**

1. Starting at START, velcro each piece in order along the straight black line.
2. Once you are finished, call out "DONE!" and raise your hands.

HINT: This is the Materials Economy, the system of stuff where things come from and where they go.

**Turning the Line into a Circle**

1. Velcro the three orange arrow pieces under the Materials Economy.

HINT: All of the arrows start with us! Where do you spend most of your time? The arrows will lay flat if they are in the right places.

2. Once you are finished, call out "DONE!" and raise your hands.

HINT: Remember the choices we can make to change the Materials Economy into a system more like the ones found in nature.



### Naming our Choices

1. Velcro the pieces where they belong under the Materials Economy on the board or on the orange arrows.
  2. The pieces: REDUCE, REUSE, RECYCLE, and LANDFILL need to be matched with the correct definition pieces. Remember: There are two REUSE pieces because there are two ways to reuse in the Zero Waste Economy.
  3. Place the black circle numbers next to the “R” words to show the correct order.
- HINT: The 3 “Rs” of waste reduction are always in the same order, do you remember which one goes first? Once you are finished, call out “DONE!” and raise your hands.

### Tracking our Trash

1. Take turns drawing one game piece at a time from the remaining envelope. As a team, choose where to put each of these items on the game board.

- Your choices are:
  - Any of the three arrows
  - In the landfill
  - Under the Earth to REDUCE the amount you use in the first place!

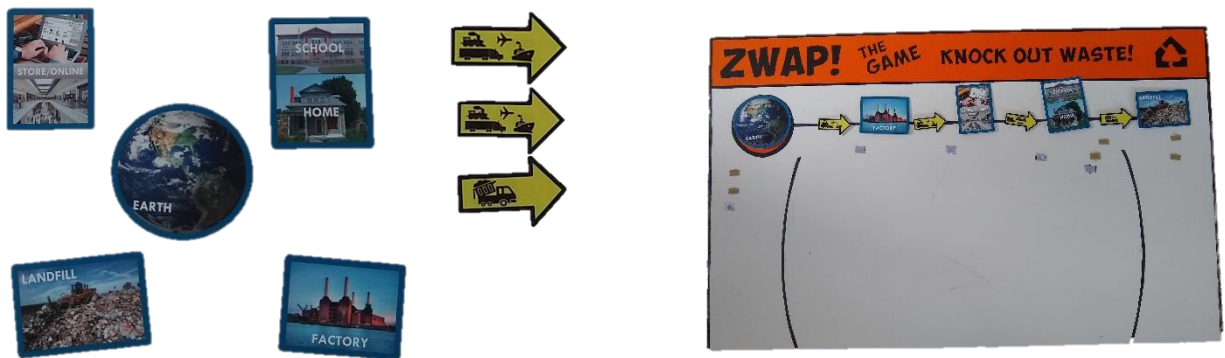
2. Be prepared to explain your choices and why you made them.

3. Once you are finished, call out “DONE!” and raise your hands.

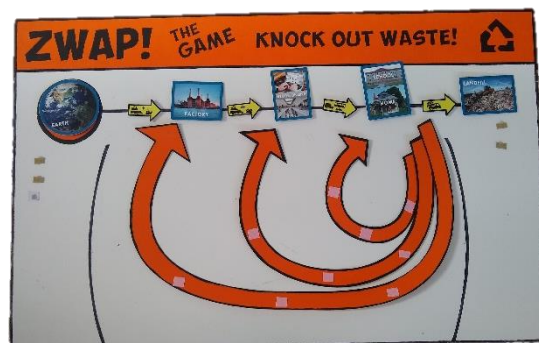
HINT: The “R” words are in order for a reason!

### Game Pieces and Placement

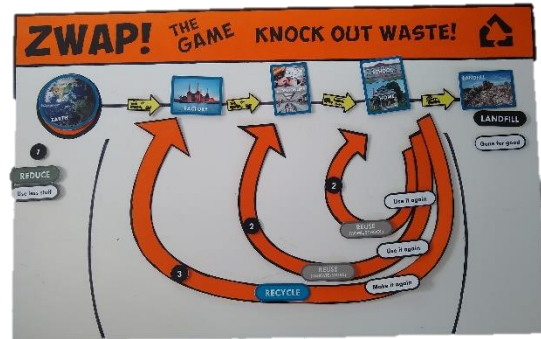
#### Round One: Recreating the System



#### Round Two: Turning the Line into a Circle



### Round Three: Naming Our Choices

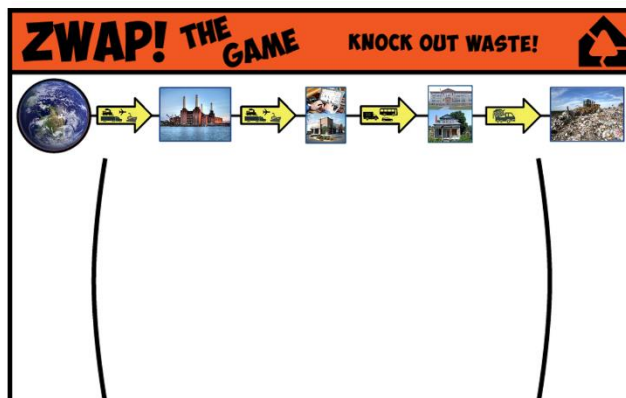


### Round Four: Tracking Our Trash

STYROFOAM TAKE-OUT CONTAINER	BANANA PEEL	DEAD BATTERIES	BROKEN PHONE CHARGER	OLD, WORN OUT CLOTHING	
PLASTICS #3-#7	EMPTY CEREAL BOXES	HALF EATEN MEAL	BROKEN CELL PHONE	TIN CAN	
NEWSPAPERS	BROKEN BICYCLE	OLD XBOX	GLASS JAR	BROKEN TELEVISION	USED PLASTIC GROCERY BAG
DRIED OR MARKER	DRESSER	OLD COAT	FOOD WRAPPERS	OLD LAMP	USED TOOTHPASTE TUBE
MAGAZINES	CARDBOARD PIZZA BOXES	PLASTIC OJ CONTAINER	OLD COUCH	EMPTY GLUE BOTTLE	EMPTY MILK CARTON
	GOOD ON ONE SIDE PAPER	USED PLASTIC FOLDERS	USED ZIPLOCK BAG	BROKEN FLASH DRIVE	PLASTIC UTENSILS
	OLD RULER	BROKEN PENCIL	USED CLOROX WIPES	PLASTIC WATER BOTTLE	USED TISSUES



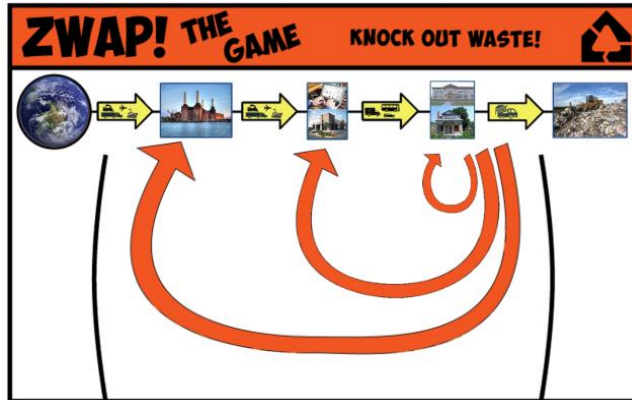
### Teacher/Chaperone Game Guide



#### 1: Recreating the System

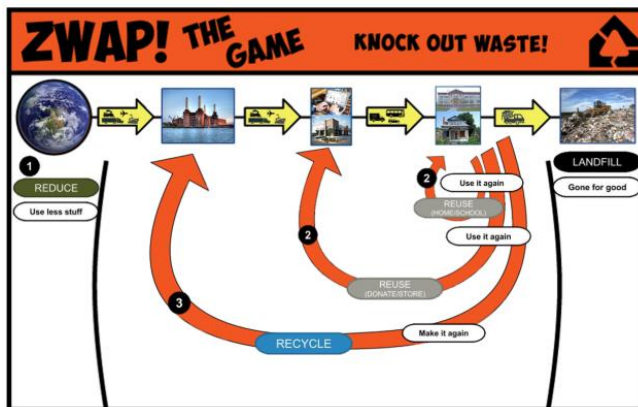
- How do things get from the Earth to the factory?
- How do things get from one place to another? What vehicles transport them?





## 2: Turning the Line into a Circle

- Where do we spend most of our time? The arrows all start at Home/School.



## 3: Naming Our Choices

- What is the order of the three Rs? (Reduce, Reuse, Recycle)
  - So the numbers go with the order of the Rs – Reduce=1, Reuse=2, Recycle=3
- What does "Reduce/Reuse/Recycle" mean?
- If Reduce is number one, which of the images in the Materials Economy should that go with?
  - Where did the whole game start?
  - Why does reduce go under the Earth? (If we reduce, we don't have to make it in the first place and the materials don't need to be extracted.)
- Where can we reuse things? Where do we spend most of our time? (Home/School, Donate/Store)
- If we recycle, where do those materials go? (To the Factory)
- Where is the landfill on the board? What happens to stuff when it goes to the landfill? (Gone for good)

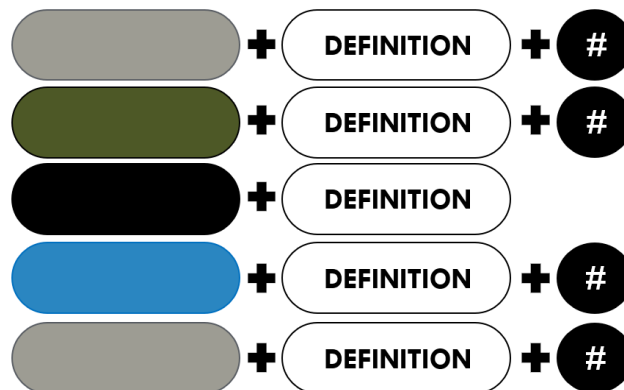
## 4: Tracking Our Trash (have students to explain their choices)

- Could it go anywhere else on the board? Can you Reduce/Reuse/Recycle it?

## Additional updates in the presentation

Students aren't engaged when we are going through the instructions, and it may be due to them sharing instruction sheets, so we now display all instructions on the TV in addition to each group having a sheet.

Students have had a hard time figuring out how to group the pieces from Round Three: Naming Our Choices. We now encourage them to match the word (solid color piece), definition (white piece), and number pieces before placing them on the game board and have a guide displayed on the TV.





## Home ReSource Tour

This portion of the ZWAP! experience is a 20 minute walking tour through the yard, warehouse, and work shop at Home ReSource. We walk through every department and take a few stops to chat on this tour, including at our Garden of Giving, Donation Intake (off to the side and out of the way of vehicles), our Bad Goat Lumber supply, and Work Shop.

At each stop, students are encouraged to name things they have seen between stops and ask and answer questions relevant to the area of Home ReSource they are currently in. Not only is the tour educational and filled with many fun facts, it helps students know where to find things when they break into groups (with adult chaperones!) for the Reuse Scavenger Hunt.

## The Visioning Activity

What do you think of when you think of Zero Waste? What does it look like in your classrooms, schools, homes, and communities?

Students are given this prompt and then encouraged to draw or write about whatever they think of when they think of a Zero Waste world. There are no wrong answers!

## Reuse Scavenger Hunt

Students are split into five groups, each having an adult with them, for the scavenger hunt. With the Reuse Scavenger Hunt, students are not gathering materials, but checking them off of a list once they found it in the store. Upon returning to the Community Room, we share project lists with each other and discuss the impact each project can have when made with reused materials instead of buying things new. Each group has tape measures and lists to track their items so each student has a role to play while out in the store.

### Project Lists

#### Reuse Scavenger Hunt: Chicken Coop Conundrum



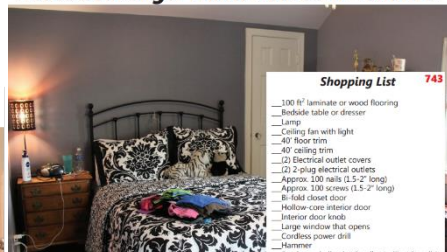
#### Reuse Scavenger Hunt: Treehouse Tango



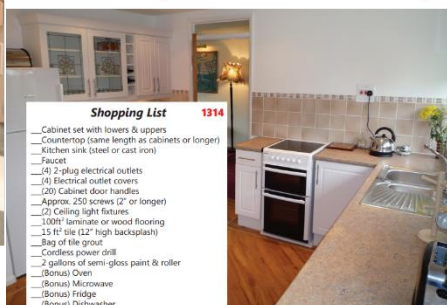
#### Reuse Scavenger Hunt: Bathroom Blitz



#### Reuse Scavenger Hunt: Bedroom Bonanza



#### Reuse Scavenger Hunt: Kitchen Clean-Up





## **Appendix I: Commitment to Safety letter and Media Waiver**



Dear Parent or Guardian,

We are excited to offer an opportunity for your child to participate in ZWAP!, our Zero Waste Ambassadors Program for fifth graders. ZWAP! is designed to help young Missoulians begin to think more critically about materials—where they come from and where they go—and to empower them with the knowledge that their choices can make a big difference toward building a sustainable future for all of us.

Part of the ZWAP! experience is a field trip to Home ReSource to participate in many hands-on activities (including a board game we invented and a scavenger hunt), see building materials reuse first-hand, and learn about how our nonprofit business reduces waste and is helping build a more vibrant and sustainable Missoula.

Included with this letter is **our commitment to student safety** and a **media waiver**. Please take a few minutes to review the attached forms prior to your child's visit.

The **media waiver** allows you to tell us whether or not you would like Home ReSource to use your child's image to inform the community about ZWAP! and our other Community Sustainability programs.

**IMPORTANT! All participants must wear closed-toed shoes on this field trip.**

***Please initial the commitment to safety statement and complete the media waiver. Return both to your child's teacher prior to the visit to Home ReSource.***

Thank you and we look forward to your child becoming a Zero Waste Ambassador and helping to knockout waste in Missoula!

If you have any questions or concerns please contact:

Hillary Sward  
Zero Waste Educator  
hillary@homeresource.org  
(406) 541-8301

Zero Waste Ambassadors Program



Knockout waste in Missoula



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2019-2020 Report





## Our Commitment to Student Safety

We are committed to providing a safe educational experience for all participants.

While the activities of the ZWAP! field trip are fun and not inherently dangerous, we want everyone to understand there are certain risks inherent at our facility. Our retail store, where the scavenger hunt takes place, contains heavy objects, sharp objects, pokey objects, and potentially objects in the aisles. The yard may be dusty, muddy, snowy, or contain small patches of ice. We work every day to minimize these risks and will keep students away from any conditions we consider risky beyond what one might encounter in a normal shopping experience.

This is an outline of our standard 3-hour ZWAP! field trip to Home ReSource:

- Welcome (Home ReSource Community Room)
- Drawing activity (at tables in Community Room)
- Tour of Home ReSource (as a group with ZWAP! educator and adult chaperones around the store)
- Lunch break (at tables in Community Room)
- Scavenger Hunt (student groups with adult chaperones around the store)
- Closing (at tables in Community Room)

We put forth our best effort to make ZWAP! field trip activities as safe as possible, including setting safety ground rules with students prior to the tour and scavenger hunt.

Our safety ground rules are:

- We walk
- We keep our hands to ourselves (except on the scavenger hunt when students can handle objects)
- We stick together with our group

We want you to feel confident about entrusting your child to us and to the ZWAP! experience.

If you have any concerns about the field trip, please feel free to call Jeremy Drake, Community Engagement Manager, at (406) 541-8301.

Thank you!

**I acknowledge that I have read this document:**

---

Initials of Parent or Guardian





## Media Waiver

**This Agreement must be read and completed by all individuals as a condition for participation.**

*Home ReSource would like the option to use your picture to promote our community Zero Waste education efforts. These images may be shared on our website, on social media sites (i.e. Facebook), or in print. It's okay if you'd rather we not use your image, just please initial at the bottom to indicate that preference.*

I \_\_\_\_\_ hereby authorize Home ReSource and those acting pursuant to its authority, or with its permission, to interview and/or to have photographs, audio or audiovisual recordings (Media Images) made of me.

I agree that Home ReSource may use Media Images of me **without my name** and for any purpose, including such purposes as publicity, education, and web content.

I understand that these Media Images may be released to the public by the news media or by Home ReSource in broadcast, print, or internet media. I also understand that the Media Images may be used by Home ReSource for advertising and marketing purposes.

I release Home ReSource and its employees from any and all liability connected with capture or use of these Media Images.

I waive all rights, interest or claims for payment in connection with any exhibition or release of these Media Images. I understand that this consent is voluntary and can be revoked at any time. I give my consent in the interest of public information, and for furtherance of education, client services, and research goals of this organization or for other lawful purposes.

I acknowledge that I have legal authority to sign this form on behalf of myself or the individual participating in Home ReSource activities.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Name of Parent or Guardian

\_\_\_\_\_  
Signature of Parent or Guardian

=====

>> DO NOT DETACH – RETURN ENTIRE PAGE TO HOME RESOURCE <<

Initial here \_\_\_\_ if you **DO NOT** want Home ReSource to use your Media Images in any Home ReSource related media.

\_\_\_\_\_  
Printed name of individual requesting not to use Media Image

Home ReSource use only: Received by (Initials of HR representative): \_\_\_\_\_ Date: \_\_\_\_\_



## Appendix J: ZWAP-O!



### The Zero Waste Ambassadors Program – Online!

#### GETTING STARTED

Before other activities, students will take a pre-test and watch a short intro video which explains what ZWAP-O! is, and what they can expect.

#### CLASSROOM PRESENTATION

Here, students will find a pre-recorded video presentation of ZWAP! which has been tailored for their online learning.

#### MATERIALS ECONOMY



## ZWAP-O!

The Zero Waste Ambassadors Program Online has six main components for educators and students to mix and match as needed.

When you visit ZWAP-O!'s main page, you will find options for:

- ✓ Getting Started
- ✓ Classroom Presentation
- ✓ Virtual Tour
- ✓ ZWAP! the Game
- ✓ Supplemental Activities
- ✓ Ambassador Actions



#### SUPPLEMENTAL ACTIVITIES

These activities are exclusive to the online version of ZWAP!, and have not been part of the in-person curriculum.

#### AMBASSADOR ACTIONS

If students choose to one or more of our Ambassador Actions, then they, too, can become Zero Waste Ambassadors.

Actions include:

- Drinking From a reusable water bottle every day!
- Practicing Zero Waste at mealtimes!
- Shopping secondhand first!
- Helping one person understand!

#### VIRTUAL TOUR

Students can experience a virtual version of the ZWAP! tour at Home ReSource

#### ZWAP! the GAME

Students can go through this online quiz game step-by-step, learning about the Materials Economy, our current system of stuff, along the way

Activity Books



### ZWAP! ONLINE






**Home ReSource**  
A Community Sustainability Center





## **Appendix K: ZWAP! Camp Details**

ZWAP camp combined with Prinstallation Camp to focus on reused materials and sustainable art-making and project building.

Activities at will include:

- Home ReSource tour video
- Drill and hand tool safety and orientation
- Simple structured project to get a hang of using tools, measuring, and following instructions
- Projects
  - Reuse “name tags” - using materials from HR and name prints they carve, students will print and decorate their name plates. Students will drill holes to tie twine to hand their name sign. These will be taken home at the end of camp. Can use their first name, initials, last name, etc.
  - Mason Bee Houses for the community - <https://feltmagnet.com/crafts/mason-bee-house-plans#>
  - Wooden planter - not this one, but something based on this. Will be approx. 5x5x5 <https://www.diynetwork.com/how-to/outdoors/structures/how-to-build-a-wooden-planter-box>
  - Free build (as time permits) - using materials from HR, campers are able to build anything they want.
- Pollinator and mini-ZWAP! presentations
- ZACC Tour and print-making activities led by ZACC staff
- Planning for mural or combining plans into one mural
- Mural building



## Home ReSource ZWAP! Camp Safety and Sanitation Procedures:

**Camp was at the ZACC, so we followed their safety and sanitation procedures.**

### Planned procedures to be used for future camp events:

**Masks:** Masks are required when indoors during camp. Weather permitting, we might move outside for some projects and can remove masks due to adequate spacing and ventilation in the outdoor space.

**Bathrooms:** Students will be able to use the restroom one at a time as needed and will be required to wear a mask and wash their hands upon returning to the Community Room

**Spacing:** Campers will have assigned places for the entirety of camp. See diagrams below for possible table/camper spacing - suggestions for 10 and 8 campers respectively.

**Tools/Equipment:** Each camper will have their own tools and basket assigned to them for the three days at Home ReSource. Only the camper will handle their tools from the start at HR on Monday until the end of the day Wednesday. At the end of each day, campers will wipe down their tools. Pieces used for projects will be in one bucket, and campers will be required to wash and sanitize before picking pieces each time and I will spray a sanitizer after each camper picks what they would like. Use of common equipment will be as limited as possible.

- Each camper will have their own drill, set of screwdrivers, hammer, safety glasses, and needed screws/nails

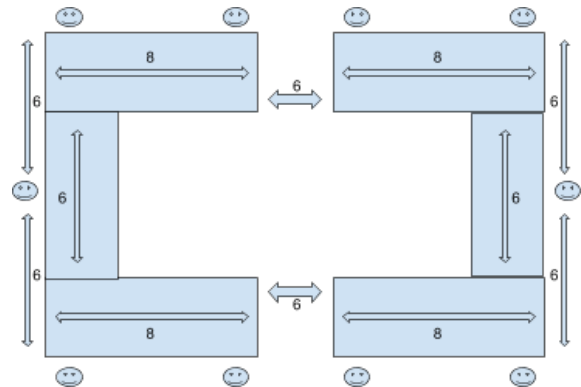
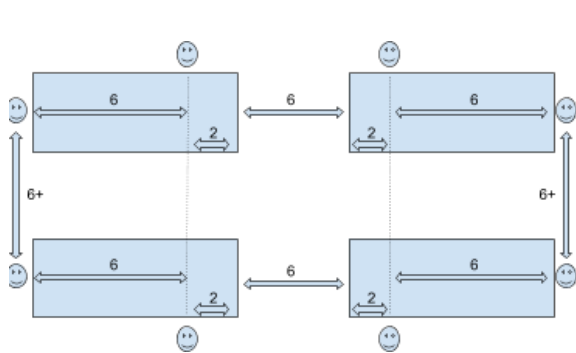
**Tables:** Tables will be sanitized before and after each day.

**Hand washing and sanitizing:** There is a sink in the Community Room that will be used for ZWAP! Camp at the following times at least, if not more frequently:

- Whenever a camper or staff member enters the room. This could be the start of camp, after taking a break to use the restroom, coming in from outside, etc.
- Before and after handling equipment that is used by another camper or staff member
- Before picking pieces to use for projects

**Common Areas:** Campers will go in and out of the Community Room using only the double doors on the north side (Wyoming Street) of HR at the start and end of camp. These doors are not used by other staff or community members. Campers and parents will be greeted outside, and once checked in, campers will go inside and select their seat.

**Pick-up and Drop-off:** According to ZACC procedures, but will occur at Home ReSource Monday-Wednesday and at the ZACC Thursday-Friday





## **Appendix L: Proposed 6<sup>th</sup> Grade Curriculum**

\*To be completed Fall 2020 and implemented Spring 2021

### **ZWAP! 6th Grade Unit Proposal**

Prepared by Noelle Herring & Jeremy Drake, Home ReSource, January 2019

What are we proposing? We are proposing a 6th grade unit as a follow up to ZWAP!, the Zero Waste Ambassadors Program for 5th graders delivered each spring by Home ReSource educators. The unit would be a deeper dive into the topics introduced in the 5th grade ZWAP! lesson. Currently, 70 percent of MCPS 5th grade classes are signed up for ZWAP! In 2019. This proposed unit would be taught by 6th grade teachers in their classrooms, not by Home ReSource educators.

### **Resources**

<http://www.co2list.org/files/carbon.htm>

**NGSS Standards** Earth and Human Activity MS-ESS3-1

- Human use of limited and non-renewable resources affect Earth's resource distribution.
- All human activity draws on Earth's natural resources and there are short and long term consequences which can be both positive and negative.
- Formation of resources.

MS-ESS3-3

- Monitoring and minimizing human impact on the environment.
- Designing and evaluating solutions to human impacts.
- Examples of human impact: water usage, land usage, and pollution.
- Human activities affect the biosphere, damaging natural habitats.
- Typically as per capita consumption increases, so do the negative impacts on the Earth.
- Causal and correlational relationships
- Economic and societal constraints/ limitations to solutions. MS-

ESS3-4

- Changes of appearance, structure, and composition of Earth's systems and the rates at which they change.
- Changes in human populations and Earth's systems in a given region or ecosystem over a given time.



## Lesson 1: Understanding my carbon footprint as related to climate change? (1-2 day)

## Long Term Objectives

Understand the role the Materials Economy plays in climate change by understanding atmospheric CO<sub>2</sub> and its impacts on the Earth (ESS.3.4) *(Tie back into the previous learning about volcanoes, climate change and weather)*

## Learning Targets

- I can explain what a carbon footprint is
- I can explain how my carbon footprint affects climate change

## Vocabulary

Carbon footprint  
Ecological footprint  
Climate Change  
CO<sub>2</sub>

[Carbon footprint lesson](#)

*Hot Tip: have students start collecting their waste audit data at the beginning of this week.*

- Quick Write - What have you done already today?
- (Pair share) Cold Call for responses
- Are you affecting climate change? Did you use something what have you done today that has used fossil fuels?
- Share teachers list of things done today and highlight items that are part of carbon footprint
- Partners turn to each other and determine what a carbon footprint is based upon what the teacher highlights
- Teacher defines carbon footprint
- Online Ecological/carbon footprint calculator [\(click to view options\)](#)
- Exit Ticket : What are three things you could do to lower your own carbon footprint.
- HW : Talk to mom and dad about what you can do



## Lesson 2: Mapping Materials

Long Term Objectives	
Quantify the role the Materials Economy plays in climate change by understanding CO <sub>2</sub> emissions related to production & transportation of the stuff we use everyday (ESS.3.4)	
Learning Targets	Vocabulary
<ul style="list-style-type: none"> <li>I can explain what <a href="#">materials economy</a> means</li> <li>I can explain the relationship between the materials economy and climate change</li> <li>I can use data to identify where products are from and how they are produced</li> <li>I can calculate the CO<sub>2</sub> emissions that it took to produce an item</li> <li>I can calculate the CO<sub>2</sub> emissions that a product had in transportation.</li> </ul>	Materials Economy Emissions CO <sub>2</sub>
<p><b>Entry Task :</b> Watch the graphic and whole class discussion (cold call) on <a href="#">Materials economy</a></p> <p>Activity: <a href="#">Story of stuff intro</a> (Stop it at 1:18 (please) and ask “What is missing”)</p> <ul style="list-style-type: none"> <li>Show the <a href="#">CO<sub>2</sub> List</a> and then pick two items to model the weight different. (ie: 1 pound burger vs 22 pound of CO<sub>2</sub> (textbooks))</li> <li>Groups of 3:               <ul style="list-style-type: none"> <li>Pick 3 classroom items and determine where they are from, how much CO<sub>2</sub> it took to create them. (Scaffolding: Prepare a <a href="#">list of items</a> in the classroom for them to choose from) <a href="#">Record it on a template</a> <ul style="list-style-type: none"> <li>Calculate transport distance x transport CO<sub>2</sub> emissions + manufacturing CO<sub>2</sub> emissions = total CO<sub>2</sub> emitted</li> </ul> </li> </ul> </li> </ul> <p><b>Closing:</b> Whole class share out? What had a lot of transportation emissions? What was the farthest something traveled?</p>	



## Lesson 3: Real World Innovators

Long Term Objectives	
Assessment	
Learning Targets	Vocabulary
•	
<p>Chose one or two different strategies for assessing student current understanding.</p> <p>Check for Understanding : KWL: Know, Want to Know, Learned Students use this assessment tool to brainstorm all that they know about our collective and individual impacts on natural resources</p> <p>Activity: Sketch a quick drawing of the materials economy or write a paragraph to show what you know about this topic.</p> <p>Rumors activity: Students write down one thing they learned on an index card from lesson 1 and 2. Stand up and share with someone else, then switch cards. Student now has to explain to a new partner what is on their new card. Continue several times at teachers discretion.</p>	



## Lesson 4: Resource Distribution

Long Term Objectives	
Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.(ESS.3.1)	
Learning Targets	Vocabulary
<ul style="list-style-type: none"> <li>I can describe how natural resources are spread unevenly on earth</li> <li>I can explain current and past geoscience processes that result in uneven distribution of resources on earth</li> <li>I can discuss the effects of uneven distribution of resources on earth</li> </ul>	Uneven Geologic process Biodiversity Geoscience distribution
<ul style="list-style-type: none"> <li>The impacts on earth systems from the Materials Economy</li> <li>How resources like oil, and metal ore are refined and made into things               <ul style="list-style-type: none"> <li>Water usage, land usage, pollution, changes to biosphere</li> </ul> </li> </ul> <p> <a href="https://drive.google.com/file/d/16WL0IXBG7eh9ZNct1scLNBRXXX--uT2m/view?usp=sharing">https://drive.google.com/file/d/16WL0IXBG7eh9ZNct1scLNBRXXX--uT2m/view?usp=sharing</a> </p>	



## Lesson 5: Comparing Resource Consumption Among Different Countries

Long Term Objectives	
Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. (ESS3.4)	
Learning Targets	Vocabulary
<ul style="list-style-type: none"> <li>I can compare and contrast how different countries/cultures consume resources.</li> <li>I can explain why there is uneven resource distribution among countries/cultures.</li> </ul>	
<ol style="list-style-type: none"> <li><a href="https://www.npr.org/sections/pictureshow/2010/08/10/129113632/picturingpossessions">https://www.npr.org/sections/pictureshow/2010/08/10/129113632/picturingpossessions</a> Gallery Walk with a Notice and Wonder protocol</li> <li>Classroom share out. What do you notice in the photographs?</li> <li><a href="https://www.worldpopulationbalance.org/population_energy">https://www.worldpopulationbalance.org/population_energy</a> Students in pairs or small group look at two countries and compare them to the US.               <ol style="list-style-type: none"> <li>CER- Make a claim about what you see. What evidence supports this? what does this mean? What is your reasoning?</li> </ol> </li> <li>Whole class share out findings.</li> </ol>	





## Lesson 6: What do we Waste?

## Long Term Objectives

Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (MS-ESS3-3)

DCI ESS3.C Human Impacts on Earth Systems

- Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things.
- Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.

## Learning Targets

## Vocabulary

- I can identify waste problems within our school or classroom.
- I can create a solution to a current materials economy problem within our school.
- I can construct an argument for using one R over another.
- I can explain the impact of waste on different cultures.
- I can analyze the impact of our recycling on other countries.
- I can critique or debate our use of resources and disposal methods.'
- I can construct an argument for using one R over another.

**Lesson 6: What they'll learn:**

The impact of waste on different cultures

- How different countries and cultures consume resources
- How the consumption of resources from developed countries affects underdeveloped countries

*Classroom activity:*

- Social comparison and correlation between where resources come from, rates of consumption, population, economic and societal constraints
- Example: Missoula/USA vs. India vs. Brazil
  - Looking at how much stuff the average person has and consumes from each place, what the landscape looks like where resources are being extracted and/or manufactured, where waste ends up and how it affects nearby people and places, etc.

Current efforts to mitigate climate change and solve waste problems

- Actions they can take to solve these problems

*Classroom activities:*

- Identifying and researching a related problem (e.g. e-waste, food waste, plastic. etc.)
  - Could be a school/ classroom focused problem, (e.g. paper waste, marker waste, etc.)



- Presentation to class on proposed solutions (group project)
- Example: the class wastes a lot of paper. A proposed solution might be to be more mindful of paper usage, reuse the empty spaces on old worksheets, adopt a recycling regimen, etc.
- Classroom/ school trash audit
  - Monitor the materials the class throws away
  - Reassess whether it should be thrown away or reused and/ or recycled.
  - Opportunity for a creative component: ideas for reuse in the classroom, art projects, etc.



## Lesson 7: Finding Solutions: Solving Real World Problems

Long Term Objectives	
What solutions exist and how to solve real-world problems created by the Materials Economy. (ESS.3.4)	
Learning Targets	Vocabulary
<ul style="list-style-type: none"> <li>• I can identify waste problems within our school or classroom.</li> <li>• I can create a solution to a current materials economy problem within our school.</li> <li>• I can construct an argument for using one R over another.</li> <li>• I can explain the impact of waste on different cultures.</li> <li>• I can analyze the impact of our recycling on other countries.</li> <li>• I can critique or debate our use of resources and disposal methods.'</li> <li>• I can construct an argument for using one R over another.</li> </ul>	
Waste Audit as a Classroom through the course of a week and then assess it and come up with a personal action/commitment that they can take.	

