



Leader Manual

**Valley Waste Resource Management Tour
for Elementary classes**

A partnership of



This program was collaboratively designed by Sarah Geiwitz, Andrea Gibson-Garrett,
Andrew Garrett, Alan Warner, Atshapi Andrew and Mercedes Herron.
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Table of Contents

I. Planet Protectors Program Description	3
Program Objectives.....	3
Theme and Structure	3
Logistics and Organization	4
Sequence of Events.....	4
II. Pre-Trip Preparation and Activities.....	6
Notifications of Dangers and Hazards On-Site	6
Pre-Trip Activities.....	6
Vortex’s Invitation Video	6
Official Planet Protector Training.....	6
Planet Protector I.D. Badges	6
III. Activity Descriptions	7
1. Intro Briefing Activity (10 min).....	7
2. Nature’s Recycle Depot (30 minutes)	8
3. Waste Transfer Building (15 minutes)	10
4. Recycling Center (20 minutes)	11
5. Sorting Station Game (20 minutes).....	12
6. Recycling Sequence Puzzles (10 minutes).....	13
7. Reusing Waste Items (25 minutes)	13
8. Debriefing Activity (10 minutes)	14
IV. Program Scripts	16
1. Intro Briefing Vortex Script	16
2. Nature’s Recycle Depot Script.....	17
Part Two: Decomposition Game Description.....	18
3. Waste Transfer Building.....	19
4. Scotia Recycling Center	21
5. Sorting Station Game	21
6. Recycling Sequence Puzzles	22
7. Reusing Waste Items.....	22
8. Debriefing Activity	23

I. Planet Protectors Program Description

This program has been designed for Valley Waste-Resource Management (VWRM) to use in developing a hands-on tour of the site. The program is designed primarily for students in grade three, as it focuses on the soil cycle and decomposition topics within the provincial curriculum. The tour, which uses a time traveling theme, follows a story to create flow and cohesion throughout each stop along the way. Within the storyline, time travelers arrive and explain to the students how the world has gone to “the dumps” in the future and that it is up to the participants to learn what to do so they can avoid this future and make the world a better place. Students from the Community Development and Environmental and Sustainability Studies programs at Acadia University are the guides, working under the direction and supervision of the Valley Waste Educators.

Program Objectives

For the program participants to:

1. Understand the soil cycle.
2. Understand why waste management is important and how it connects to nature.
3. Be inspired to creatively reuse materials.
4. Reduce personal environmental impact.
5. Increase appreciation of nature.

Theme and Structure

Using the theme of time travel, this field trip provides participants with the opportunity to learn how to reduce impacts on the Earth and facilitate a better future. In doing so, they learn more about nature, the soil and decomposition cycles and waste management.

Upon arrival at the Valley Waste Resource Management site, the participants are greeted by a leader acting in the role of a time traveler named “Vortex” (complete with a spacesuit), who presents a large poster/mural with key words missing from four boxes on it, Vortex explains to the participants that in his/her recent travels to the future he/she saw our Earth in a horrific state! Garbage was piled up on every street corner and floating in every body of water. The air was so heavily polluted that it was difficult to breathe. It was a very scary sight to see! Vortex then explains to the participants that he/she has come back to the present to find a dedicated group of young people to help prevent our future from turning out this way. Vortex points out that the four key words missing from the mural are what we need to incorporate into our lives to save our future. As the participants progress through the facility and learn more about how our waste impacts the Earth, they acquire the four missing words. Vortex assigns them the task of reporting back to him/her with their findings so they can help save the future.

The four missing words the participants collect during the field trip are respect, reduce, recycle and reuse. While doing a physical activity in which they learn about natural decomposition, the participants learn to **respect** their natural surroundings. After having the opportunity to watch the garbage enter the site at the garbage transfer station, participants understand the need to **reduce** their waste levels.. The participants participate in a sorting activity of recyclable items and learn to **recycle** their consumption and waste contribution. At the re-sale shop and through a craft, the participants have the opportunity to consider how they can **reuse** wasted items.

Finally the participants report back to Vortex and find that they are still missing a 5th and final piece. Through asking questions and group discussion, Vortex helps the participants come to the conclusion that the final piece is that they need to **relay** the information they learned today to their friends and families. Once they have acquired all the missing pieces, the mural is complete. Vortex then asks the participants to close their eyes and imagine what the future will look like once these changes are made. During this time the mural is flipped to the other side, exposing a much more optimistic future. The participants then open their eyes and see the new potential future.

Logistics and Organization

1. Classes are expected to complete pre-trip activities to provide participants with a context for the program.
2. Classes are expected to arrange their own transportation to and from the program site (Valley Waste Resource Management). Students bring their own individual snacks and/or lunches.
3. A professional Valley Waste Resource Management educator coordinates and leads the program. Acadia University students, supervised by the Educator assist with leadership. Teachers are encouraged to participate in and observe the trip program in order to be able to effectively reinforce follow-up activities in the classroom.
4. Classes proceed through the activities as three groups, each with an Acadia student leader. The Educator provides overall direction and. Groups should be pre-defined by the teacher to maximize their ability to work together.
5. The program is currently free of charge to participating classes and schools.
6. It is possible for two classes to come for the program at the same time but they move around the site separately, rotating through activities in a different progression.

Sequence of Events

	Title	Time	
1	Intro Briefing	10 min	Participants begin at the main office building for the introduction and briefing by the Vortex character.
2	Nature's Recycling Depot	25 min	In the wooded area near the office, they participate in a soil decomposition game called "Nature's Recycle Depot." It demonstrates the difference between decomposition of organic and synthetic materials. After they receive their first missing piece: <i>Respect</i> .

3	Waste Transfer Building	25 min	There is a short walk to the garbage transfer building. Here, the participants rotate through three short stations: viewing the garbage coming into the facility, and activities involving the site map and home sorting process. They receive the <i>Reduce</i> piece
4	Recycling Centre	10 min	Participants walk to the recycling building where they view the recyclables being sorted
5	Sorting Station Game	20 min	Behind the Recycling Centre in an open area they participate in a waste sorting activity similar to what they watched inside.
6	Recycling Sequence Puzzles	10 min	After returning to the office building, the three groups solve a series of picture sequencing challenges. They find the correct order of steps for turning specific waste materials into new products.
7	Reusing Waste Items	25 min	Participants return to main building and visit the Re-Sale shop to understand how many things are thrown away that are still useful. In the outdoor classroom they then decorate a reused milk container and plant a seed to take back to school to complete the soil and waste management cycle and reuse “garbage” in a new form. After they receive the third missing piece: <i>Reuse</i>
8	Debriefing	10 min	Finally, the participants return to the time traveler for the debriefing of the day and completion of the mural at the main building. They receive the final missing piece: <i>Relay</i> .

The program takes approximately 3 hours – 3.5 hours including walking times and breaks. The path for moving about the VWRM facility is shown in Image 1.



II. Pre-Trip Preparation and Activities

Notifications of Dangers and Hazards On-Site

A notification of the inherent dangers and hazards associated with visiting the Valley Waste Resource Management facility is to be sent home with participants prior to the trip. This notification also outlines the various precautions taken to ensure safety and risk management. It is proposed that this be attached to the field trip permission slip, ensuring that parents or guardians are fully aware of such dangers when sending the participant on the field trip. This notification can be found in Appendix A of this document. Along with this notification, the packing list, as available in Appendix B, should also be distributed among participants.

Pre-Trip Activities

It is the responsibility of the teacher to facilitate the following activities with all participants prior to the field trip. These activities provide participants with necessary background knowledge of the storyline and some of the educational topics within this program.

Vortex's Invitation Video

The first pre-trip activity to take place is the viewing of Vortex's Invitation Video. This video introduces the students to Vortex (the main program character), the time travel storyline, and the urgency of the mission to save planet Earth. In this video, Vortex also provides the instructions to complete Official Planet Protector Training for the trip which enables them to earn their Planet Protector I.D. badges. This video is accessible on You Tube at <https://www.youtube.com/watch?v=xnTiHPQPpGo&list=UU9kKP0YY484uoHknPF5dGNA>.

Official Planet Protector Training

After viewing the Invitation Video, the teacher facilitates the Official Planet Protector Training with the class. This training activity can be downloaded Smart Board and Powerpoint formats at: http://commdev.acadiau.ca/Teacher_Materials.html. This activity reinforces the participants' current knowledge of solid waste sorting. It should be framed that although participants may already be aware of appropriate sorting practices, participating in this activity provides them with official certification. In the activity, various examples of solid waste appear on the screen and participants identify the appropriate bin into which it should be sorted. When using the Smart Board version, participants will be able to drag these objects into the appropriate bin. After completing the training, each participant earns a Planet Protector I.D. badge.

Planet Protector I.D. Badges

The Planet Protector I.D. Badge template is available in Appendix C of this document. Participants should write their own name under the "Planet Protector I.D." text, and color the badge. Once completed, all badges should be backed with cardstock paper and attached to string so they can hang around the participants' necks as a name tag. Badges should be colour coded for the cardstock so as to identify which group the student is in. Participants should be divided into three groups before they arrive based on the teacher's discretion to enable balanced groups that work together well.

III. Activity Descriptions

1. Intro Briefing Activity (10 min)

Goals:

- Gain motivation and excitement to learn about waste management to help save our future
- Understand the goals of program

Location: At outdoor classroom of main VWRM office building, or inside board room if weather is poor.

Materials:

- Vortex costume: suit, helmet, gloves, boots
- Mural
- Vests for participants
- Kettle with pieces in it

Description:

1. A leader, acting as “Vortex” the time traveler welcomes the participants to the Valley Waste Resource Management facility with excitement and hope.
2. Vortex first checks that all participants have their Planet Protector I.D. badges, ensuring that they have completed official training. He/she asks what they learned in the training.
3. Once this is confirmed, Vortex explains the disappointing future that he/she has seen, as explained in the storyline description, with the mural as a visual aid.
4. Vortex explains the four key pieces that are missing from the mural are what we need to incorporate into our lives in order to save our future. He/she explains that as they progress through the Valley Waste Resource Management facility and learn more about how our waste impacts the Earth, they acquire the four missing pieces from the mural.
5. Vortex sends the participants away and tells them to report back to him/her with what they found before they leave.
6. Each student receives a vest to wear before they leave.



2. Nature's Recycle Depot (30 minutes)

Goals: For participants to:

- Understand the process of natural decomposition
- Understand differences between decomposition of organic & synthetic materials in nature
- Understand the impact that synthetic materials can have in the natural environment
- Have fun and be physically active

PART ONE: Decomposition Display (10 min)

Materials:

- Decomposer poster
- 3 banana peels at various stages of decomposition & 3 cans)

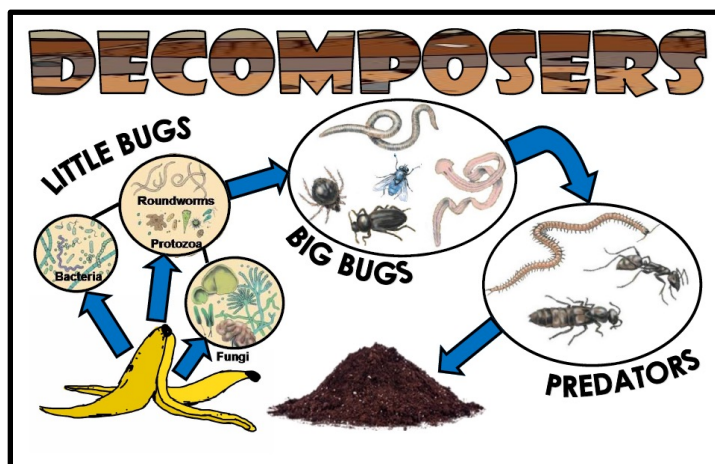
Description:

1. Ask participants what they do with their food waste when they are done with it. Ask if they know what happens to it once it goes into the compost. Use this as a basis upon to explain the decomposer poster.
2. Explain the different decomposers (little bugs, big bugs and predators) and how they break our food down.
3. The “little bugs” depicted in the poster include bacteria, protozoa, fungi and roundworms. The “big bugs” include mites, small beetles, earth worms, flatworms and flies. The “predators” include rove beetles, ants and centipedes.

Explain Decomposition Display:

A logged framed display illustrates a banana (organic material) and pop can (synthetic material) at different time frames (one day, two weeks and two months). Participants see that the organic material decomposes into healthy, rich soil, while the cans remain largely unchanged.

4. The first part of the visual display shows the first stage of decomposition, with both synthetic and organic waste at one day of decomposing.
5. The second part shows the waste at two weeks old.
6. The third part shows the waste at two months old.
7. Ask the participants the following discussion questions:
 - a. “Which object seems to be decomposing faster?”
 - b. “Why do you think can is not decomposing?”
 - c. “Can you see any bugs?”
 - d. “What can this soil be used for after the organic material is fully decomposed?”
8. Explain and discuss why synthetic materials cannot be broken down as easily.



PART TWO: Decomposition Game (25 minutes)

After participants have viewed the process of decomposition through the poster and display, they play a game to simulate the process.

Materials:

- Leaves
- 9 Buckets
- 3 Predator Nest signs.
- 25 gloves (3 different colours, one for each type of insects)

Description:

1. Split into 3 smaller groups and explain how the game works in each small group.
2. Hand out gloves with the group in a circle. Start with fewer predators if the group number is not divisible by three. These gloves have three different pictures (bacteria, beetles and millipedes), indicating the different type of decomposers
 - a. Bacteria represent little bugs
 - b. Rove Beetles represent big bugs
 - c. Millipedes represent predators
3. Explain & demo the movement of each type of bug.
 - a. Little bugs transport leaves from buckets 1 to buckets 2, crunching them up before dropping them in the bucket. They shuffle, keeping their feet together, and can only grab leaves with their glove hand.
 - b. Big bugs transport leaves from buckets 2 to buckets 3, also crunching them up more before dropping them in the bucket. They walk heel to toe and can only grab leaves with their glove hand.
 - c. Predators try to tag big bugs and little bugs. They hop. When little or big bugs are tagged, they must go into “hibernation” by curling up in a ball on the ground. They can re-enter the game if a leader or another participant on their team tags them back in. After predators have tagged a bug, they must go to their “Predator Nest sign on the edge of the game for 3 seconds while they “enjoy their meal” by making eating sound effects.
4. Tell the participants that to play they must shrink down to the size of decomposers and become bugs. To do this, have them close their eyes, curl up into a ball and “think small”.
5. Briefly narrate that they are turning into bugs when they are curled up with their eyes closed. Tell students that they succeeded in shrinking to the size of decomposers and that they are now inside of a leaf pile!
6. Answer any clarifying questions and send the little and big bugs to their respective starting buckets to begin. Then send predators out shortly after, giving the others a head-start.
7. Play for a short time, then call “freeze”. Discuss the game dynamics briefly as to how the bugs are decomposing the leaves. Comment on how the predators are doing vis a vis real life. Then rotate the roles.
8. Freeze a third time and rotate roles so that all of the kids get all of the roles.
9. Once the game is completed, bring the participants together to debrief the activity.
10. Ask the participants:
 - a. “Who won that game?” (Explain that everyone won because decomposition is a process which all decomposers contribute and they all completed their task of decomposing the leaf pile)
 - b. “What is something that you learned about what decomposers do?”
 - c. “What would happen if we tried to do this with man-made things?”
 - d. “What things could we do to prevent man-made things from mucking up this process?”
 - e. “Why don’t these broken up leaves look like actual soil?”

11. At the end of the activity, the participants receive the *Respect* puzzle piece in the large group because they have learned about the decomposition in nature. They have learned that it is important to *respect* the natural processes around them.

3. Waste Transfer Building (25 minutes)

Goals: For participants to:

- Gain a general understanding of how much garbage is wasted on a regular basis.
- Gain an understanding of how the Valley Waste Resource Management facility operates

Location: Takes place in the Garbage Transfer Building

Materials:

- Facility poster map mounted on table with toy trucks
- Table and plastic waste objects to sort

Description:

Upon entering the garbage transfer building, the class remains with their assigned groups and they rotate through three activity stations. The activities are as follows

1. **Tippling floor window:** The leader stands in front of the window facing the participants. The leader explains that this is the location where all of the garbage and compost comes into the facility and is collected and compacted before it is transported to landfill or compost facility
 - a. The leader then moves away from the window to allow participants to look in. Stools are placed in front of the window to ensure that participants of all ages and heights are able to see clearly. The leader has a conversation about the garbage pile and asks the students ways they can make less garbage...
 - How many bags of garbage do you think most families throw away each collection day?
(answer is 2-3)
 - How do you think we can reduce the amount of garbage that we make?
 - b. The leader then moves away from the window with the children sitting in front of her/him. At this point the leader shows pictures of the landfill and describes how material goes there and how it is buried and why this is problematic.
2. **Interactive Facility Map:** The leader directs their attention to the poster map of the facility and explains the flow of garbage within the facility on a greater scale.
 - a) The leader demonstrates the use of a toy truck to bring one type of waste to its proper place in the transfer station. The leader then gives each student a truck and type of waste and they take turns driving their truck to the proper place on the photo map.
 - b) The leader asks the participants if they have any metal, construction material or hazardous waste (paints, gasoline, etc.) in their trucks. Some say yes. The leader shows how these things go



to separate piles and the participants drive their trucks and drop these things there (in their imaginations)

c) The leader can ask other questions like:

- “How many bags of garbage do you think the whole Valley throws away each year?”
(answer is 18,000)
- “Why do you think it’s important that there are separate piles to put different waste?”

3. **Escape from the Landfill Game:** The leader explains that not all waste we throw away belongs in the garbage and landfill. Each child receives a couple of items that kids throw away. The students take turns putting their waste item in the correct bin on the table and discuss their choices.

- If there is extra time before the group rotation, the leader pulls out several items that are often thrown away and the kids brainstorm how to reuse them.

4. At the end of the three stations, the participants gather as one group and receive the **Reduce** puzzle piece because they learned the importance of reducing the amount of garbage they send to the landfill.

4. Recycling Center (10 minutes)

Goals: For participants to:

- Understand the process of sorting, reprocessing and reuse of recyclable materials.
- Understand where materials go and how they are managed after the transfer station.

Location: In the meeting room in the Recycling Center.

Description



1. Participants walk across the pavement (with leaders as crossing guards) and walk on the “path” through the break in the trees to the recycling building.
2. Participants follow the leader, entering the site at the back of the facility. At this point, the leader informs the participants of potential risks (such as low pipes, etc. that they could potentially bump their heads on. They walk along the wall of the building, toward the stairs, bringing them to the presentation room. Participants follow the leader up the stairs and into the room where they watch workers sorting for about 5 minutes or until they lose interest.
3. Encourage the participants to ask questions about what the people are doing and what they see. Explain the processes to them.

5. Sorting Station Game (20 minutes)

Goals: For participants to:

- Gain a contextual understanding of VWRM's methods of sorting, recycling and reusing
- Have fun practicing the sorting process

Location: Behind the Scotia Recycling Centre in the open area near the wind mill

Materials:

<ul style="list-style-type: none"> • 8-10 trays • 10 bins for sorting & signs • 2 large bins to hold garbage before it goes on conveyor belt • 2 clear garbage bags 	<ul style="list-style-type: none"> • Items for sorting <ul style="list-style-type: none"> ○ Plastic water bottles (15) ○ Big, clear soda bottles (15) ○ Green soda bottles (15) ○ Small yogurt/ fruit cups (15) ○ Danino drink containers (15) ○ Big yogurt containers (15) 	<ul style="list-style-type: none"> ○ Juice boxes (15) ○ Milk/ juice cartons (15) ○ Plastic juice bottles (15) ○ Soda cans (15) ○ Assorted garbage
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Description:

1. Ask participants to share what they know about recycling.
2. Hold up some examples of items that will be used in this activity and ask participants to state how they should be sorted. Some garbage is also used to show what should not be recycled.
3. Remind participants of the different items made of recycled materials (like polar fleece, etc.). Explain that to make those items, they need to sort out our recyclables into specific types of plastics and metals. For example, only green soda bottles can be made into green shirts.
4. Explain that they will play a game where they will practice this process of further sorting recyclables so they can be made into separate types of new things.
5. Participants will sort materials into the buckets that are provided. There will be enough roles to enable a class of up to 25 to all be engaged in the process simultaneously.
 - a. 1 or 2 participants are responsible for loading the mixed plastics onto the "conveyor belt".
 - b. Up to 10 participants act as the conveyor belt. They do this by standing in one long line, holding trays with things to be sorted and walking down the line. When they reach the end of the line, they dump what is left on their tray in a garbage bag and run to the back of the line.
 - c. Up to 10 participants are "sorters". They stand facing the "conveyor belt." Each sorter is assigned a specific type of recyclable to sort. As the objects come down the conveyor belt, they collect their specific type of plastic in their sorting bucket.
 - d. At the end of the conveyor belt, one participant is responsible for collecting all of the un-sorted objects into a plastic garbage bag.
 - e. If there are enough kids, have two children stand to the side and twirl their arms like windmills to mimic the windmill above them which is powering the conveyor belt. Also note the windmill and point out it could power Vortex's space ship.



6. Demonstration and explanation:
 - a. First assign the people to the conveyor belt. Have them stand in a line with their trays and practice walking down the line and returning to the front. Have them practice making “conveyor belt” noises.
 - b. Next, assign 2 people to load the trays with recyclables.
 - c. Assign the sorters. Have them practice by putting a couple things down the conveyor.
 - d. Finally, assign the “garbage man” at the end of the line to collect the garbage..
7. As objects that have not been collected or that are not assigned to a participant reach the end of the conveyor belt, they are collected into a clear garbage bag.
8. Run the activity and after a short while, stop everyone. Make any relevant observations or ask questions briefly about how the conveyor belt is working.
9. Switch roles and restart the conveyor belt so everyone ends up doing two different roles.
10. Stop the activity. For the following debriefing questions, make sure the participants are in a position to all hear and be able to respond. A large circle for the discussion is recommended. Debriefing questions:
 - a. What happened to the items that got sorted?
 - b. What happened to the items that didn’t get sorted?
 - c. Are there items in the garbage that could have been sorted? Why did they get there?
 - d. How is this game like what happens in real life? (Explain that if people do not sort at home, then things that could be saved are lost)

6. Recycling Sequence Puzzles (10 minutes)

Goals: For participants to:

- Understand the process and steps of recycling items to make new materials

Location: At the sorting game near the Windmill

Props: Multiple sets of sequence picture cards, Items made from recycled materials

1. Split into three groups. Each leader explains that the materials that come for recycling are made into new materials through a series of steps. Hold up a card with one thing that is remade (for example a t shirt comes from old pop bottles). Then show the group a picture card of a pop bottle. Then given them pictures of the steps that are between the pop bottle and the t shirt and have them decide what is the proper order.
2. Each group does multiple sequencing challenges depending on the number of available cards.
3. At the end of the activity, hold up some of the real examples of things made from recycled materials and have the kids answer what the original item was.
4. the participants receive the **Recycle** puzzle piece because they learned the importance of reducing the amount of garbage they send to the landfill.

7. Reusing Waste Items (25 minutes)

Goals: For participants to:

- Appreciate that the Re-Sale Shop allows things to be reused that were considered waste.
- Creatively design a new object out of re-claimed and natural materials.

- Brainstorm and think critically about how to practice the concepts learned on this field trip at home and in school.

Location: At the reuse center and the outdoor classroom or the boardroom if weather is poor.

Materials:

- 20-25 small containers cut in half
- Composted soil & crunched leaves from Nature's Recycle Depot
- Seeds
- Materials to decorate the cartons
 - Paper cut to size to fit around the container
 - Tape
 - Crayons

Description:

1. After an explanation of the Re-Sale shop and a brief tour, the participants re-locate to the outdoor area or the board room upstairs (depending on the weather).
2. Participants make a craft using provided re-claimed materials.
 - a. Each participant is given a small sheet of paper and asked to come up with one simple step they can do to reduce their environmental impact in their life (help them with ideas as needed). They then draw a picture of this step they will do and write their name on it.
 - b. They each then tape the sheet securely on the side of a reused container
 - c. With the help of a leader, they fill their carton with soil and plant a seed (the type of seed depends on availability and time of year). Note the soil is compost from food waste.
3. At the end of this activity, the participants receive the **Reuse** from the leaders puzzle piece to complete the mural because they used their creativity and problem solving skills to re-imagine previously wasted materials for further use.

8. Debriefing Activity (10 minutes)

Goals: For participants to:

- Connect knowledge of all of the different concepts they learned throughout the field trip for a deeper understanding of waste management and its impact on the Earth.
- Understand the importance of sharing their knowledge with others to ensure a positive future for the Earth.

Location: At outdoor classroom outside the main office building, or boardroom in poor weather.

- Materials:*
- Vortex costume: suit, helmet, gloves, boots
 - Mural
 - All 4 puzzle pieces

Description:

1. Vortex returns and the participants show him/her their new puzzle pieces and explain what they learned. As the participants give the puzzle pieces to Vortex, he/she asks them to explain what each means and what they did to learn it.

2. Vortex places each puzzle piece on the mural, and then realizes that one is still missing.
3. Vortex then asks the participants what else could possibly be necessary to add to the four words “Respect” “Reduce” “Recycle” and “Reuse” to ensure a better future.
4. If the participants are having trouble with this, Vortex can help by giving prompts or asking probing questions. An example of this could be, “How can we help other people to do all of these wonderful things that you learned today, too?” or “What can we do to help others learn what we’ve learned today?”
5. Eventually, the participants come to the conclusion that they must **Relay** or share the things they have learned to help create a healthier Earth in the future. Vortex provides them with this last puzzle piece and explains that they will be relaying their experiences to their families and friends.
6. As Vortex puts the last puzzle piece in the mural, the students are directed to close their eyes and imagine what their future may look like once these changes are made. During this time the mural is flipped to the other side, exposing a much more optimistic future. The participants will then open their eyes and see the new potential future including the four words/pieces in it.
7. Vortex thanks the participants for all that they have done and reminds them to continue practicing their action step and all of the other things that they learned on this field trip.

IV. Program Scripts

1. Intro Briefing Vortex Script

“Welcome everyone! I am so glad you’ve all made it here safely! That must mean that you received my message last week! So, you might remember who I am, but I’ll remind you just in case. My name is Vortex, the time traveler. I travel all over the universe, through time and space in my spaceship, Blip. As I’m sure you already know, you’re here to help with a very important mission. But first, I have a story to tell you. This is a story of my most recent travels. I’ve just returned from far, far in the future - year 3015, to be precise. I know, it sounds cool, but there was nothing “cool” about what I saw.”

[Unveil the mural]

“Here are some images that I was able to bring back from my travels. As you can see, it’s quite a grim sight! What do you see in the picture?... Participants answer...

I know this probably doesn’t look familiar to you, so you might be surprised to know that this is actually our Earth! That’s right, in the future, the planet where you live and learn and play has turned into this... a dump! In the year 3015, garbage is everywhere! It’s piled high on every street corner. It’s floating in the oceans, lakes, rivers and streams. The air is so polluted that it’s hard to breathe. I don’t know about you, but that’s not the way I imagined the future of our planet... So here’s where you come in; I’ve returned to the present to find a group of dedicated young people to help me stop our Earth from turning out this way! From what I hear from your teacher, you seem to be the perfect bunch. I hear that you have been learning a lot about recycling lately, is that right? Can anyone tell me something you’ve learned from receiving your Official Planet Protector I.D. for this mission?”

[Allow time for students to share]

“Oh, great! You guys already know so much! This will definitely help you on this mission. But there’s also a lot more to learn. [Refer to the mural] You may have already noticed that there are four pieces missing from this mural. These are the things that we need to include into our lives today in order to save the future. Today you’re going to be going through the Valley Waste Resource Management facility to learn all about decomposing, recycling, compost and garbage and how they deal with those things here after you don’t need them at home. On your tour, you’re going to come across some challenges that you’ll have to complete. In this space age time capsule [hold up kettle] are the missing pieces of the puzzle. After completing each challenge, you will earn one of these missing pieces that fit in here. Once you’ve completed all of the challenges, you will return here to me and tell me what is needed to save our planet’s future. Do you guys think you’re ready for this? Do you have any questions?”

[Answer any questions]

“Great! I think you’re almost ready. All you guys need are vests. Since you’re going into the facility as investigators looking for clues, you’ll need these to keep you safe.”

[Participants get vests and gloves]

“Now you’re ready to head out. Good luck and don’t forget to come back and tell me what you’ve learned! The future of the planet is counting on you!”

2. Nature's Recycle Depot Script

Part 1: Decomposition Display, Leader...

"Welcome to Nature's Recycle Depot! Here, we're going to learn all about how organic materials, like our food, break down. Can anyone tell me what you do with your food waste when you're done with it?"

[Allow for answers: make sure they say compost]

Right, but does anyone know what happens to our food after it goes in the compost?

[Allow for a quick answer]

[This next part should be done using the poster as a visual aid]

In all of our backyards nature is doing its own form of recycling. Under dead logs, piles of leaves, and in the dirt itself! It's done by bugs that we call 'decomposers.' It works in two levels. First, we have the little bugs that sometimes you can't see at all! They would be the protozoa, bacteria, roundworms, and fungi. They are the first to start breaking down natural objects like logs, leaves, and our wasted food by eating it. The next group is made up of the big bugs, like the mites, flies, beetles, earthworms and soil flatworms. They help to decompose things by feeding on the smaller bugs' waste that they leave behind. Lastly, we have the predators! They eat all of the bugs we just talked about; they are the centipedes, rove beetles, and ants. All of these organisms are important when it comes to breaking down natural waste, like our compost. Now everyone come over here! I want to show you how these bugs break down our food."

[Bring the group to the decomposition visual containers; have them stand around them, making sure everyone has a clear view]

"Here in the first spot you can see a banana peel and a pop can. Both of these things have been here for just a couple of days, so the little decomposers in there haven't had much time to break them down. But if we move over to this next one, you'll see that there is also a banana peel and a can, but these ones have been here for about 2 weeks. Does the banana peel look any different? What about the can? Why do you think that is?"

[Allow for some brief discussion]

"Let's move over to this last spot to see if there's any difference. In this one, the banana and the can have been in there for about a year. What do you see? The banana is completely gone! That means that those little bugs, big bugs and predators have been working away at breaking that banana down. Now, all that's left is soil! And this soil can now be used to grow other delicious fruits and vegetables. It's a cycle! Now, let's talk about the can. What happened to it? Why didn't the can break down? How long do you think it will actually take for that can to decompose?"

[Allow some time for discussion]

"Because the can is made of lots of man-made materials that the decomposers don't really like to eat, it actually takes up to 300 years for it to break down! That's a long time! Longer than you and I will even be on this planet, which is one of the reasons that there is so much garbage in the future that Vortex just came back from."

Part Two: Decomposition Game Description

“So now that you guys have seen what happens to our food and natural waste when the decomposers break it down, we’re going to let you can give it a try! In order to do this, we’re going to break into three separate groups.”

[Split the group up evenly and have three different leaders take over each group. The following suggested script should be done in each separate group]

[This explanation should be done while the leader demonstrates. Hand out the bug gloves with fewer predators if the group does not divide evenly into thirds]

“Okay everyone, let me explain how this is going to work. First you have your little bugs. Little bugs move by shuffling their feet like this.”

[Demonstrate little bug shuffle between the buckets with participants watching in a circle]

“The little bugs will start at the first bucket here. They will pick up a small handful of leaves with one hand and “eat it” while they travel to the next bucket. But, DO NOT actually eat the leaves, just crunch them up with one hand. You’ll bring the leaves to the second bucket and drop them in when they’re all crunched up. Then, you’ll go back to get more. The big bugs basically do the same thing, but they do it from the second bucket to the third bucket. They walk heel-to-toe like this.”

[Demonstrate big bug walk between buckets]

“Then, the predators will be trying to tag all of the little and big bugs. Once a predator tags a bug, the bug has to curl up in a ball and go into hibernation like this.”

[Demonstrate hibernation]

“And the predator has to move to the side at this spot which is their “dinner table” for 3 seconds to enjoy their meal by making munching sounds (designate a specific spot a bit away from the buckets with the “Predator Nest” sign, this slows down the predators from catching everyone quickly) The predators hop like this.” [Demonstrate hop]

Does anyone have any questions? [Answer questions]

Great, now before we get started, we have to become little buggies. In order to do that, we have to curl down to the size of itty bitty decomposers. Now, everyone close your eyes and think small! Think smaller than you’ve ever thought before! Right now, we’re all shrinking down to the size of itty-bitty decomposers. “

“Okay, everybody open your eyes! You’ve done it! I think we’re all inside of a leaf pile! And look! You’ve all turned into bugs! Make bug sounds! Now, everyone with yellow gloves are little bugs, everyone with purple gloves are big bugs and everyone with red gloves are predators. Let’s get started!”

[Play the game, this includes stopping game twice to rotate roles, so everyone gets every role. Make any relevant observations of how things are going in the game vis a vis real decomposition, or ask questions as you see fit. Keep it brief and save most things for the debrief]

Game Debrief

“Wow! You guys did a really great job! You decomposed the log by breaking down the ‘food.’ But I’ve got a question. Who do you think won that game?”

[Allow for a few answers]

“Because it takes a whole team of decomposers (little bugs, big bugs and predators) to break something down, everybody won! You all contributed to the process of decomposing this leaf pile, meaning that you all did your job like the little decomposers do. So, can anyone tell me what they think would have happened if we had tried to do this with man-made things like the cans?

[Allow for a few answers]

“It definitely would have been a lot harder. Decomposers only like to break down organic materials, not man-made ones. So, can anyone think of something that we can do to make sure man-made things like cans don’t end up stuck in the ground for hundreds of years, waiting to decompose?

[Allow for a few answers. Make sure to discuss not littering and only composting natural things.]

Wow, those are some great ideas! It’s clear that you all have learned the importance of respecting the natural environment because of the natural processes that take place, like the decomposers breaking down a banana peel or a leaf pile. For that reason, you’ve earned this missing piece of the mural. [Pull it out of the kettle.] Can anyone tell me what it says? Right! It says ‘**respect.**’ What do you think respect means?

[Answers]

We need to respect the natural world around us. Now, you guys hold on to this and remember to bring it back to Vortex when you’re done walking around the facility!

[Give them the respect mural piece]

But wait! I can’t let you go when you’re this size! Let’s all close our eyes again and think big! Reach your arms up to the sky!

[Close their eyes while the gloves get taken away.]

Great! We made it! Now let’s move on!

3. Waste Transfer Building

[Have the participants cross the street in a single file as the leader acts as a crossing guard – **look both ways and stand in the street, blocking cars while the participants cross!** Walk to the transfer building along the edge of the grass. Once the group arrives, they divide into their three groups and go to one of the stations]

Station 1: Tipping Window Station

[the leader stands at the window, facing the participants]

“I’m sure you are all eager to take a peek at what’s behind me! But let me tell you really quickly about what this building is and what you’re going to see. We are in the Waste Transfer Building. That means that this is where all of the garbage trucks bring the garbage bags after they’ve traveled all over the valley picking up everyone’s garbage – including yours and mine. Now, keep in mind that this is **ONLY** garbage and compost. So, any paper or plastic recycling goes where we’ll be going next. After the bags are dropped off, the garbage is all put into compacter to pack it together really tightly. Then, all of that compacted garbage is put into a big truck and brought to a landfill. Then, in the landfill, that garbage

just sits there and gets piled and piled on top of each other until they can't fit any more garbage. So they have to cover up the landfill with dirt and make a new one somewhere else. So does anyone have any questions about that?"

[Allow questions]

"Okay, now I'm going to let you all take a look. And I want you to remember what you see because we're going to talk about it later." [Move out of the way and let the students look for a couple of minutes. Step stools will be available so they can see over the edge]

"Okay, what did you guys see in there?"[Answers]

"How many bags of garbage do you think most families throw away each collection day?"

[Answers... About 2-3 bags per garbage day]

"What's something you think we can do reduce the amount of garbage that we make with our families and in our schools?"

[Answers... Recycle & compost, buy in bulk, buy with less packaging or packaging that can be reused/recycled, don't waste food...]

Station 2: Interactive Facility Map

"Wow, you guys definitely know your stuff! Now I want to show you what this facility looks like. [Rotate to map station] This is a picture of the whole facility taken from an airplane. You can see that we're here and this is the first building you guys were where we met Vortex. We have lots of different piles and stations for different types of waste (HHW (like paints, gasoline, chemicals), metals, refrigerators, lumber, brush etc.). I'm going to give you each a small truck like this one and we're going to pretend that each truck has waste to get rid of (ask each child what waste they have in their truck). Now I want you to line up at the scale house and drive your waste to the correct building or pile.

[First do a demonstration with your truck, then hand out the trucks and waste pictures and have the children take turns "driving" their trucks in to the facility and dropping off the materials they have in the correct places]

"How many bags of garbage do you think the whole Valley throws away each year?"

[Answer.. Approx. 18,000 bags each year]

"Why do you think it's important that there are separate piles to put different waste?"

[Answer: Because different waste is sent different places to be recycled, composted or put in landfill]

Station 3: Escape from the Landfill

"Great! Now we're going to see what great sorters you all are at school. [Rotate to station] Sorting the right way the first time is so important. It makes sure that the wrong things don't end up in the landfill. All of the waste items I have in my hand were found in the garbage but some of them could have been recycled or composted! Each of you are going to take turns and put the waste in the right place on the table— compost, paper recycling, container recycling or garbage.

"You've probably noticed that some items still have to go in the garbage. Can anyone think of a way to reuse or reduce any of these wrappers?"

Answer questions: Bring yogurt/applesauce from home in a reusable container, use reusable drink boxes, try making your own fruit leather, avoid single serve cracker/snacks and pack your own at a home in reusable containers [Leader can show examples of each]

“Okay, let’s keep on going. The only place we haven’t been yet is the recycling building. Next we’re going to see what happens with the recycling up at the recycling center.”

After all groups have been to all the 3 stations, gather the children as one group and give them the 2nd puzzle piece. After watching all of the garbage come into the transfer station, they understand the need to **reduce** what they throw away.

4. Scotia Recycling Center

[Before entering the recycling center, remind the participants of all of the potential dangers of entering the facility. There will be some low hanging pipes and poles as we walk over to the stairs, etc. Have them follow the leader into the meeting room above the floor. The participants can take a few minutes to watch what happens on the floor before the presentation. Try to keep your group together looking out one window and explain how the sorting line works and what the machines are doing as they watch and ask questions.]

5. Sorting Station Game

“You all just saw where all of our recyclables get sorted into the specific type of plastic or metal, etc. that they are, right? This is done because when we make something out of recycled materials, it has to be made almost entirely of the same kind of material. So, a green T-shirt made out of recycled soda bottles is made of only green soda bottles. Here, we’re going to play a game where you’ll be able to sort out recyclables and refundables from garbage just like the workers did when you were watching them. You guys are going to act out a human sorting station! Here’s how it’s going to work. Some of you will be the “conveyor belt” by passing along trays of objects. It will be the job of two of you to load these objects onto the conveyor belt at the start of it. Then, some of you will be sorters. You will be assigned a specific type of thing to sort off of the conveyor belt and you will collect those things into your bins. Then, there will be a few people at the end of the line. One of you will hold a clear garbage bag. Two of you will empty the trays into the garbage bag as they come to the end of the line. And two of you with the trays will run these trays to the front of the line when they are empty and start down the line again with new items that you have picked up.”

[Leader will assign roles. Try to do this by allowing people to get the roles that they want, but re-assure them that we can play again and switch up roles. Answer any questions and help them get into position to play.]

[Play the game and stop once in the middle to switch up the roles. Also check to see what ended up in the garbage and see if there are any things in there that could have been sorted off the belt. Make any brief observations or ask any key questions at the break if it is helpful but save most of the discussion for the final discussion Once the game is done, gather everyone around for a debrief]

“So, let’s look at what’s inside this garbage bag. What do you guys see?”

[Answers] coffee cups, chip bags, and some recycling that bypassed the sorters

“So, why do you think we see recyclables in there?”

[Answers] Didn’t see/ get them fast enough

“When we miss things when we’re sorting, they end up in the garbage, right? And do you all remember what happens to garbage? Where does it go?”

[Answers] The landfill/ aka. dump

“Right, it goes into the landfill. So, how is this game like what happens in real life?”

[Answers] Sometimes the workers at the recycling facility miss bottles because there’s too much garbage around the good recycling or the recycling is too dirty to be recycled (someone didn’t rinse the containers).

“Unfortunately, a lot of recyclable things go into the landfill, meaning that they can’t be recycled or reused. What’s something that we can all do to help stop this from happening?”

[Answers] Make sure recycling is clean. Make sure we only put in good recycling.

“We can definitely make sure that we sort all of our garbage properly! From this activity you have earned the “Reduce” puzzle piece of the puzzle. [pull it out of the kettle] This is because you have learned about the importance of reducing the amount of stuff we put into the landfill.”

6. Recycling Sequence Puzzles

[At the sorting conveyor belt activity near the wind mill, split into three groups with each leader doing the explanation]

“So all of the things you saw being sorted in the recycling center are shipped away and used to make new things. For example, this t shirt [hold up a picture] is made out of recycled pop bottles [show picture of pop bottles]. But to change it from old stuff into new stuff it has to go through a series of steps. Here are some pictures of the steps that the pop bottles go through. Lets see if you as a group can figure out the right order of pictures to get from the pop bottles at the start to the new t shirts. Go...

[Each group does multiple sequencing challenges depending on the number of cards sequences.]

At the end of the activity, one leader hold ups some of the real examples of things made from recycled materials and the kids answer what the original item was.

The participants receive the **Recycle** puzzle piece because they learned the importance of recycling things into new products..

7. Reusing Waste Items

Reuse Store:

[Bring everyone to the Reuse Store. Explain that this is a store filled with things that have been salvaged from what people have thrown away. Make a point of expressing how much usable things there are in there]

“This is the re-use store. Here at Valley Waste Resource Management, when something is thrown away that is still usable, we bring it here to re-sell. Look at how much stuff there is in here! This is just an

example of how much stuff people throw away that can still be used! So, we're going to go upstairs and make something out of items that have been thrown away!"

[Have class tour through store but stress that they are not allowed to touch anything. Then bring everyone to the outdoor classroom or the board room, if weather is not conducive to being outside.]

Environmental Step, Flower Pot & Seed Planting:

"Today we're going to use old milk and juice cartons as flower pots! So, we're going to give everyone one carton that has been cut in half, then we're going to decorate our new flower pots!"

"Before we decorate our flower pots, I want all of us to think about everything we're done today. Then, I want everyone to pick one thing that we want to do at home or at school that will help us to practice what we have learned today. That could be sorting our garbage or picking up litter... anything that you want to do! This is called an Action Step."

[Ask kids to suggest a few ideas but stress that each person should come up with his/her own idea that he/she really wants to do. Then give them time to think about what their Action Step. Leaders may help by having 1-1 conversations with kids. Start putting out art supplies.]

"Once you've decided what your Action Step will be, you can either write it or draw it on a piece of paper that we will glue to our flower pots. The paper and the crayons are here."

[Help them if they need it. Once they are done, help them tape their action step drawing onto the carton, and then help them fill the milk carton with soil and let them plant seeds]

[After they are done, have a discussion about their action steps. Ask them to share what they want to do]

Once most people are done, ask... So what has been the purpose of turning the milk cartons into flower pots? [Answers will likely relate to "reuse"]

Yes we are re-using things, and most importantly we are thinking creatively and solving problems about how we turn old things we do not need into new things we do need. We are *re-imagining* how things can be used. That is really important. There are so many things being thrown away that we have to do a lot of re-imagining. Guess what, that is the third piece of the puzzle, **reuse**. You have earned it by re-imagining what can be done with a milk carton. [pull the piece out of the kettle]

7. Debriefing Activity

[Once the craft is completed and the re-imagine piece given out, have all the participants sit and call out together for Vortex to come back out. Vortex will come back with the mural...]

"Hello everyone! I see that you have made it back from your tour. I hope this means that you have discovered the missing pieces of the puzzle! Can anyone tell me the first puzzle piece that you received on this tour?" [Answers]

"I see, you learned about *respecting* the natural world and all its processes. It's a very important thing to help our Earth! I'll stick it on the mural. Great, what else did you receive?"[Answers]

"*Reduce*, yes reducing the amount of garbage we contribute to the landfill is also very important! If we don't want our future to look like this [the mural], then we have to make sure that we make less garbage! What's the next one?" [Answers]

Yes *recycle*, remember how we watched the sorting line and then we did the sorting machine ourselves? It showed you how important it is to recycle things properly so that it becomes an easier job for all the workers who do the sorting jobs here at Valley Waste. What is the next one?

"Okay, we have to *reuse* the things that we would otherwise throw away to make them into new things! That's another great way to reduce the amount of garbage that we make. I'll put it on the mural. This is great! We just need one more! What's the last one?" [Answers]

"What? You don't have one? You thought there were only four pieces? Oh, this isn't good. There is another one. Oh my, what do we do? How can we prevent the future from getting trashed like this? I'll tell you what.. You all learned a lot today. I bet that if we put our heads together, we might be able to come up with the last puzzle piece. What do you guys think? Does anyone have any ideas?" [Answers]

"Hmm, those are great ideas. But, what about what we just did here? You all came back from the tour and you told me all about what you learned. You shared things with me. Think about it, if you are the only ones on the planet that know how to help, do you think that will be enough to make a better future. Nope, you are a tremendous group but we need even more Planet Protectors. Do you think that maybe teaching others and relaying what we know about saving the future is important?" [Answers]

[Vortex pulls out the last Relay puzzle piece and sticks it on the mural. They will likely get the sharing idea but may need to be helped to get the *relay* word precisely]

"Wow! You guys did it! Now, let's see if we can make this work! I want you all to close your eyes and imagine what the world might look like in 3015 with these puzzle pieces. Imagine it!"
[Flip the mural]

"Oh wow! Everyone open your eyes! Look, you've all changed the mural! Instead of the garbage dump, it's turned into this beautiful Earth with lots of plants, great sorting systems and very little garbage. That's amazing! I think you guys saved our future! Before I go, would you be able to chant the four words that will help everyone protect the planet. Ready, set..."
["respect, reduce, recycle, reuse, relay" ... repeat a couple of times]

Thank you so much for everything that you've done! I have to continue to my next challenge now, but I don't want you all to forget about what we've learned today. We can't just solve the puzzle without actually practicing what we learned. So, remember your action steps and check in with your friends to make sure they do theirs too. And remember to relay information to your other friends, parents and siblings. The future still depends on you! Thank you, Planet Protectors!" [Leaves in a hurry]