



## Good-natured comedy to enrich climate communication

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### ABSTRACT

This report explores the use of good-natured comedy to diversify the modes of comedy that can be used in climate communication beyond satire to others modes that are possibly more supportive of sustained climate action. Student's self-assessment on a class project involving this type of comedy were collected through an on-line survey to generate data to explore their feelings of hope and their views of their own growth as climate communicators. Research findings suggest that student participation in creating good-natured comedy helps students positively process negative emotions regarding global warming, sustain hope, and grow as communicators of climate. These findings are from a practice-focussed study that shares primarily the self-reported results by students of a project offered over one semester. These findings show promise in the exploration of comedy for students to process emotions that allow joy, fun and hope to sustain their commitment to grow as climate communicators.

### KEYWORDS

Comedy; climate communication; hope; environmental stewardship; youth engagement; humour; practice-based research

*Drawdown, Act Up!* is a student project that invites students to create original games and short comic skits to actively communicate top climate solutions. In doing this, students were asked to use good-natured comedy, a mode of comedy that is environmental in focus and kind in intent. 'Drawdown' indicates the drawing down of carbon and other greenhouse gases to reverse global warming. The games physicalise the science behind each specific climate solution, and the accompanying skits contextualise solutions and demonstrate how to activate, or Act Up on, that solution in daily life. This work is framed as creative climate communication that explores the use of comedy in conveying climate issues, expanding beyond satire to a 'good-natured' mode of comedy. The target audience for this project was youth and their families visiting Rocky Mountain National Park. The research question guiding this report is: In what ways can good-natured comedy help students regulate hope and grow as climate communicators?

*Drawdown, Act Up!* was developed as part of Inside the Greenhouse, an initiative for creative climate communication co-directed by Beth Osnes, Max Boykoff, Rebecca Safran, and Phaedra Pezzullo at the University of Colorado (CU). Osnes co-taught the

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course (co-designed with Boykoff) in the spring semester of 2018 with Patrick Chandler, a graduate student in Environmental Studies. Of the 40 junior and senior students in the class, most were majoring in Environmental Studies. *Drawdown, Act Up!* was generated in partnership with the National Park Service for use at Rocky Mountain National Park for Discovery Days, which took place in the Discovery Center 10 and 11 July 2018. The National Park Service maintains and oversees the parks—as well as historical objects and monuments—and can be viewed as a highly trusted repository of our national story. *Drawdown, Act Up!* fits into the park's mandate to provide opportunities for people to gain intellectual and emotional connections and gain awareness, appreciation and understanding on park-related systems through learner-centered, place-based activities (United States Congress 2016, p. 1487). The fundamental assumption for having park guests as the target audience for *Drawdown, Act Up!* was that people who value the natural world enough to actively go to the effort of travelling to the parks would likely be receptive to this form of communication that requires active participation and has preservation of the natural environment at its core. Solutions for this project were drawn from the *New York Times* best-seller book, *Drawdown: The Most Comprehensive Plan Ever for Reversing Global Warming* (Hawken 2017). The organisation responsible for the book, Drawdown.org, was started by noted environmentalist Paul Hawken, who brought together a team of researchers to generate a list of the one hundred top solutions for reversing global warming.

### Rationale for study

The use of the phrase 'good-natured' to introduce the mode of comedy being employed has an intended double meaning. It connotes both a mode of comedy that is good for nature, and also good-natured, meaning kind in intent—not seeking to shame or expose in a cruel or demeaning manner. 'Good' as an adjective also implies that environmental comedy needs to be of superior quality in order to be effective. The comedy needs to be able to float to be funny, meaning that it needs to be unencumbered by excessive environmental messaging. Describing comedy as 'natured' also situates it in the phenomena of the physical world: as embodied, and as part of the Earth. It gets us out of our merely intellectual mode—where verbal forms of comedy (such as satire) largely reside—and into our physical bodies through which we both experience and impact the environment.

Inside the Greenhouse has a specific focus on the use of comedy for communicating climate. The majority of scholarly research on this topic focuses on satire (Brewer and McKnight 2015; Felman 2013; Kalviknes Bore and Reid 2014), which by definition has a target and often a pivotal element of cruelty. It could be that in this time of extreme political polarisation on the issue of climate change, satire may further divide and polarise, and it is imperative we come together in collective action to address global warming. Authors Inger-Lise Kalviknes Bore and Grace Reid state that 'while satire has long played a part in political, social, and cultural debates, other comedic modes and genres might also be useful devices in climate change communication (2014, 476)'.

## Background to study design

For the purposes of this report, humour is being defined as ‘everything that is actually or potentially funny, and the process by which this “funniness” occurs (Borum Chattoo 2017, 9)’ and comedy as a deliberate, public-facing performance, sharing or presentation attempting to be humorous. The article ‘Humour as emotion regulation: The differential consequences of negative versus positive humour’, reports on research conducted at Stanford University that shows that positive (good-natured) humour is more effective than negative (mean-spirited) humour in regulating negative emotional responses (i.e., increasing positive emotions and reducing negative emotions) (Samson and Gross 2012). Their findings also suggest ‘the important emotion-regulatory role positive emotion can play in shaping affective responses to negative situations (Samson and Gross 2012, 382)’. By surveying the students, it was confirmed they are cognizant of global warming and are worried how it will negatively impact their own lives as well as future generations. Their climate knowledge generates despair, but not necessarily empowered action. The hypothesis upon which this project is based is that bringing positive humour into conversations about climate can help students regulate their emotions, grow as climate communicators, and—critically—be sustained in their affective communication of climate solutions.

Young people often grapple with feelings of despair and anxiety regarding global warming and its projected impact on our planet and can often feel helpless and pessimistic (Li and Monroe 2017, 1). Students, even those majoring in Environmental Studies, are not often invited to explore their feelings regarding climate change. The article, ‘Motivating climate action through fostering climate change hope and concern and avoiding despair among adolescents’ reveals that by giving youth a feeling that solutions to climate change are within their control, the resulting hope can motivate behaviour that benefits other people, their local community, and the world (Stevenson and Peterson). Actively involving adolescents while they are still relatively young is important regarding climate-related issues, since research reveals that pessimism about addressing climate change increases with age, particularly from early to late adolescence (Ojala 2012; Stevenson and Peterson 2016). The word hope here indicates a belief that your actions will make a difference. Hope is an inextricable link between that urge towards action and trust in the fulfilment of that action’s intention such that a person has the motivation to remain engaged (Snyder, Rand, and Sigmon 2002). This project addresses the need to develop appropriate methods for supporting youth in maintaining their feelings of hope for sustained action. Performance-based methods are uniquely well-suited to this need since it gives a context for exploring emotions and is rooted in action.

To support the students in being able to incorporate comedy into their work on this project, there was class discussion and active exploration into what is funny. Lining five students against one wall of the classroom cleared of desks and chairs, they were challenged to race to the other side of the room. The rules of this race were to run as slowly as possible and to reach forward with each step as far as one could reach without falling. The last one to the finish line won. Afterwards, we reflected on what was funny. One student said that the racers who didn’t laugh at themselves, but, instead, fully committed to the task, were the funniest. Another noted

that inverting the usual rules for a race made it funny. What follows is the list produced with class input of *what is funny*.

- fully committing
- exaggeration
- introducing one ridiculous idea into an otherwise logical world
- surprise
- clever recognition of a truth
- anthropomorphising ideas, forces, natural objects, animals ...
- imitation (such as the human being mechanical or the mechanical being human)
- when absurdism seems more logical than logic
- sexual innuendo
- scatology
- specificity in detail, not vague notions
- the body, its involuntary sounds, smells, protrusions, foibles, and failures
- honesty
- social inversion
- word play
- timing

This list proved useful to students as they considered how to tweak their decided content to pull out the funny in a wide variety of games and skits communicating Drawdown solutions.

### Experimental workshop 1 – games: *What’s so funny?*

The games that students were asked to create were intended to explain the science behind the Drawdown solution in an active, embodied, and funny manner. For Drawdown solution number 12—temperate forests, students created a version of the game ‘tag’ called *The Great Pine Dash*, that pitted the pine beetles against the pine trees. Some participants wore a leafy sash and were pine trees, others wore antennae and were pine beetles, and others wore a winter scarf around their necks and were protection for the trees (cold snaps that kill a portion of the pine beetle larvae so the trees don’t get overwhelmed each year). A student dressed as Old Man Winter with a white beard, a parka, and a cane served as the referee for the game. As the game progressed, Old Man Winter became slower and weaker because of warmer winters due to global warming. As he did, he didn’t catch the pine beetles who were cheating, which caused the protection of the trees to be ineffectual and for more pine trees to be put out of the game.

*The Omnivore Game* (described in full in [Appendix 1](#)) demonstrates how many resources it takes to eat a meat-based diet and the environmental impact of dietary choices, which communicates Drawdown solution number four—plant-based diet. In this relay race, two teams try and get as many balls into their bucket as possible, but not all balls are the same. The red balls (meat) are worth more points than green balls (plants) because they provide more calories and protein, but it takes getting blue balls (water) to grow the green balls which, in turn, feed the red balls. As the challenges

continue to compound each round, for the final round, participants must hold their breath when running with red balls to account for the smelly methane emissions of cows and pigs.

### Findings from experimental workshop 1 – Games: *What’s so funny?*

*The Great Pine Dash* demonstrated how weak winters are giving the pine beetles an advantage over the trees and how the protection for the trees was less effective in defending the trees. The humour came from the exaggerated anthropomorphisation of Old Man Winter in both costume and his performance as hunched over and dotty. There was also a clever recognition of a truth that this game between pine beetles and pine trees has been going on for thousands of years, but that climate change gave one of the sides in this game a chance to gain an advantage. This came in the form of an active discovery. At first participants who were trees or protection were indignant when the pine beetles began cheating, and they told on the beetles to the referee, Old Man Winter. Through his exaggerated portrayal of a weakening old man, understanding dawned on them, that what was actually happening to them in the game is the same thing that is happening in Colorado forests. They understood that the beetles would continue to cheat because they could. When this realisation occurred, participants gave a groaning sort of chuckle as this truth settled in. They seemed to accept this reality with a sigh, resignation, and a sad laugh.

The humour from *The Omnivore Game* comes from having participants fully committing to the physical exertion it takes to get the necessary resources for a meat-based or plant-based diet. Humour also arises from physicalizing a food system in which the human participants are imitating the mechanics of generating food. Having to hold your breath to convey the emissions is funny in part because it draws attention to the fallibility of the body, which needs clean air to breathe. Recognition of a truth can be funny even when the actual content of that truth is sad, that our dietary choices are increasing global warming. Awareness of the unfortunate emission of methane by livestock is highlighted through the humorous reference to animals’ bodies and the unpleasant smell of animal farts, even though it is the sulfur-containing molecules—not the harmful greenhouse gas methane—that largely cause the bad smell (Wolf, Asrar, and West 2017). All of this demonstrates that youth can have fun and be funny while learning about and drawing attention to serious issues. And they can come to understand the complex dynamics at play by physicalising them in such a way that new considerations are introduced after each round as the portrayal of this food system becomes increasingly more accurate and complex. There is evidence that embodying concepts is beneficial to learners (Abrahamson 2004).

### Experimental workshop 2 – skits: *what’s so funny?*

The comedic skits that students were asked to create were intended to actively communicate one way to act locally on a Drawdown solution. For Drawdown solution number one—refrigerant management—a family is taking their aging grandmother, who is a refrigerator, to Rocky Mountain National Park for one last vacation before

recycling her in a skit entitled *Grandma Fridge Cools Off*. One of the parents asks a park guest to take their family photo in front of Bear Lake. The youngest sibling holds their pet toaster using the cord as a leash. Each time the park guest attempts to take the photo, grandma fridge, who is hard of hearing, misunderstands something and interrupts the taking of the photo. Throughout the skit, it is communicated that if you just leave your discarded refrigerator to be picked up by garbage disposal, the coils containing hydrofluorocarbons could be damaged, which would release this potent greenhouse gas into the atmosphere. What is ultimately conveyed is that affection for appliances and the environment is expressed by properly disposing of refrigerators through an Environmental Protection Agency-approved local program.

### Findings from experimental workshop 2 – skits: what’s so funny?

*Grandma Fridge Cools Off* dramatised both why it is important to dispose of aging refrigerators and how to do so properly. Part of the humour comes from anthropomorphizing an aged refrigerator who is hard of hearing but is still devoted to her family and protective of her family’s pet toaster. What is said versus what grandma hears and reacts to is funny because it relies on clever word play of rhyming phrases. Various styles of word play, including rhyming, can be funny. This skit introduces one ridiculous idea, that the family’s aging refrigerator is their grandmother, into an otherwise logical world, a family on vacation at Rocky Mountain National Park. The family does very ordinary things, such as posing for a family photo, which is a logical response to being together in such a beautiful place. The park guest’s questioning of the family’s intention to recycle their grandmother extends the ridiculousness of the premise, as does the park guest’s ultimate admiration for the attentiveness of the family for responsible disposal. The near ending of the skit gives a sense of completion and resolution as the park guest approves of the family and their actions regarding their grandmother. The final moment of humour arises as Grandma Fridge breaks out of the final family pose to offer a tasty fig, which makes this final attempt to take the actual family photo—the dramatic action of the entire skit—a failure. Continued failure at attempts to complete a seemingly simple task can be funny, especially if each attempt is thwarted in a slightly fresh and clever new way. This final nod to humour helps this skit float the comedy, rather than submerge it with environmental messaging.

### Conclusion

The following analysis of the impact of *Drawdown, Act Up!* on students is based on research on student-perceptions of this experience conducted in collaboration with the Cooperative Institute for Research in Environmental Science at CU. All 40 students were invited to participate in the course evaluation. Thirty-five consented to participate; five declined. Of the 35 who consented, five did not complete the survey. Students completed the survey between May 7 and May 17, 2018.

For the question ‘*Did creatively communicating an embodied activity and skit for youth visiting Rocky Mountain National Park advance you as an effective climate*

*communicator?*' ( $n = 30$ ), 28 responded 'yes' (93%), and two responded 'no' (7%). Of the 23 open-ended responses to this question, most expressed a positive response to the newness of the experience, the aspect of fun, and to being challenged to reach a different audience—youth and their families. Several alluded to the difficulty and rigor of the challenge emphasising that they 'had to think', and that 'it was hard'. A student noted the value of partnering with Rocky Mountain National Park for this project: 'people going to a national park are obviously interested in a healthier lifestyle for themselves and nature so a good TARGET AUDIENCE'.

Of the 30 responses to the question '*Can you identify any approaches or techniques you developed while doing this composition that helped you succeed?*' ( $n = 30$ ), 27 replied 'yes' (90%), and three replied 'no' (10%). Of the 21 students who opted to explain their answers, the most commonly mentioned approaches or techniques included: use of humour; thorough research to feed creativity; identifying with the audience; working as a team and mixing fun with education. To identify with the intended audience, one student wrote that it helped to really 'think as a kid', and another student wrote that it helped to put 'myself in the shoes of my audience'. In regard to teamwork one student wrote that, 'Bouncing ideas off of each other helped us develop the best ideas'. One of the most challenging aspects of this project was striking a balance between 'making things fun while keeping it educational'.

To the question '*Does the experience of joy and/or fun increase your sense of hope in relation to climate change?*' ( $n = 30$ ), 27 students responded 'yes' (90%), and three responded 'no' (10%). Of the 21 open-ended responses, one student simply wrote 'a bit', but there was otherwise overwhelming affirmation that joy and fun increase hope, and thereby ability and willingness to engage with the issue of climate change. Several students noted how depressing and grim it can be to focus on climate and that focussing on joy and fun 'frames the issues of climate change in an entirely new light'. Several students noted that including joy and fun made them feel better. One student noted that joy and fun give climate communication a nicer tone and linked that to increased climate action.

To the question '*Does the experience of joy and/or fun increase your ability to sustain your commitment to climate change action?*' ( $n = 30$ ), 25 students responded 'yes' (83%), and five responded 'no' (17%). Of the 21 open-ended responses, one student who responded 'no' wrote 'fun or not, I think a person is either dedicated to climate change, or they are not'. This student seems to be inferring that a commitment to climate should come from a deeper or perhaps more substantial urge than a desire to amuse oneself. Another student commented that 'The usual dark message of climate change really takes its toll and gives the feeling of "why even try". So, fun is great in encouraging healthy, sustainable living in a way that is enjoyable'. One student wrote that, 'fun solutions rather than harsh statistics' help them sustain their commitment. Another student comment advocating for the inclusion of joy and fun noted that doing so 'keeps things fresh and exciting', and 'allows me to see climate change in a more positive way'. This student directly related the effect of joy and fun to regulating positive emotions in regard to climate.

A student in the class, Rose Briggs, wrote in an unsolicited email after the completion of this project—'It was truly a relief to finally have a professor who acknowledged the emotional burden of environmentalism and the importance of maintaining joy and hope. During my 4-year Environmental Studies degree, you are the first professor



who has even mentioned those things ... I really appreciate it (Briggs 2018)'. Based on survey responses and this email message, students primarily responded positively to the inclusion of emotions in considerations surrounding climate.

Two months following the completion of the university course in which this project was done, Osnes led one CU student from class and seven youth volunteers ranging in age 10–16 in presenting *Drawdown, Act Up!*, which was referred to as 'Good-Natured Fun', at Rocky Mountain National Park. Six complete runs of the skits and their accompanying games were presented for a broad range of visitors. Youth visitors participated in the interactive games, and audiences responded with jovial laughter at the silly antics of the skits. Even families with small children stayed for the entire program. Certainly, one of the most effective aspects of the performance was the inclusion of costumes, such as Grandma Fridge, the human wind turbines, and the human-sized hungry caterpillar. Audiences responded to the discussion questions following each section, indicating they had largely engaged with the intended environmental messaging. Clear and simple questions that were fun in and of themselves held the attention of the mostly young audience most effectively. The park staff responded positively to the offering and was pleased with the turnout.

Marda Kirn of EcoArts Connections brought a counsel of four environmentally concerned and active middle and high school aged girls to evaluate the program. They expressed wanting more explanation about the chemicals, such as hydrofluorocarbons (HFCs) that are mentioned in *Grandma Fridge Cools Off and* cautioned about assuming too much previous knowledge, especially from a young audience. They appreciated the silly aspects, such as a pet toaster and the dancing wind. They noted that the solutions should be something that youth can do themselves. They questioned what role youth could play in recycling refrigerators and recommended that this be addressed during the discussion questions after that skit. Overwhelmingly, they noted that the quality of the costumes and properties added to the appeal of the offering.

The most successful games and skits made the environmental lesson something that *happens*, more than something that is *talked* about, such as when the pine beetles take an unfair advantage over the trees when winters are warmer. The comedy should be allowed to float by not weighing it down with too heavy an environmental message. As a guide for this goal, this balance was effectively achieved in a skit entitled *Lettuce Plan A Head*, <https://vimeo.com/291062881/f10f1f0436> based on Drawdown solution number three—reducing food waste. Scientific accuracy in all aspects of the artistic process contributes to the integrity of the offering. For example, the caterpillar costume in *Lettuce Plan A Head* was based on the actual colours and markings of the most common type of butterfly in Rocky Mountain National Park region, the Western Tiger Swallowtail Butterfly.

During the semester of this project, lead author of the Drawdown book, Katharine Wilkinson, video conferenced with the class to discuss the Drawdown project with the students. Based on continued conversations with Wilkinson and the Drawdown team, Osnes was invited to present on this student work at their first conference, Drawdown Learn, held at the Omega Institute in New York 19–21 October 2018. In his opening plenary talk at the conference, Paul Hawkins shared a photo and the story of *Drawdown, Act Up!* and specifically emphasised the delight, joy, and fun it embodied.



Good natured comedy helps students regulate their negative emotions so as not to be overwhelmed or rendered inactive due to excessive amounts of despair surrounding the issue of global warming. The Drawdown skits give youth a feeling that solutions to climate change are within their control by enacting one simple local action towards an impactful solution. The 'peer to near peer' design of this project supported late adolescent university students in reaching back or regressing to a less cynical time in their development as they related to their target audience, youth visiting Rocky Mountain National Park. In doing so they potentially could replace pessimism with hope within themselves through the artistic process. Indeed, students self-reported that to do the assignment that they had to 'think like a kid', and that they overwhelmingly felt increased levels of hope.

Suggestions for further work include exploration of diverse informal learning hosting partners, beyond the national parks, who can be in a position to provide programming about climate change that won't potentially jeopardise national funding. When presenting at Rocky Mountain National Park, we referred to the program as *Good Natured Fun* and did not directly use the phrases global warming or climate change. Osnes led a group of students in presenting Drawdown, *Act Up!* at the CU Museum of Natural Science for their family day in March of 2019. Through this venue, youth facilitators were free to talk openly about how the games and skits related to climate change without fear of negatively impacting their host institution.

In an ideal project design, the university students who created Drawdown, *Act Up!* would have been the ones facilitating their activities in Rocky Mountain National Park. All of the students in our class were invited to present, and several expressed interest in doing so, but only one university student actually helped facilitate and perform in the park. To engage more students in publicly sharing material, it may be beneficial to run this project when the park is open for programming during a summer school course or to make this project a summer internship.

One of the goals of this project was to diversify the modes and genres of comedy that can be used in climate communication beyond satire to others that are possibly more healing and unifying. Climate communication is an action that can be difficult to sustain unless hope can be maintained. This experience and research demonstrate that good-natured comedy helped these students regulate their negative emotions regarding climate change and grow as climate communicators. Simply put, the use of good-natured comedy generates positive emotions such as joy, joy feeds hope and hope sustains climate action. At a time when even the vocabulary of climate change is polarising, good-natured comedy has proven to be an invaluable and effective tool for communicating a unifying message of hope. Good-natured comedy provides an alternative to the dominate conversation regarding climate change that tends to be dire and heavy. It does not make light of the seriousness of climate change, but rather, brings light and hope that is essential for sustained action on this vital issue.

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## Disclosure Statement

No potential conflict of interest was reported by the authors.

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## Appendix 1

Drawdown solution: #4 Plant Rich Diet

Name: *The Omnivore Game*

Created by: Rose Briggs and Audri Bobo

Learning Objective: to understand the environmental impact of eating either meat or a plant-based diet

Approximate time: 10–15 minutes

Materials needed: 10 green balls, 10 red balls and 10 blue balls, two medium-small buckets or cardboard boxes, some sort of distance markers (4 each side), timer.

Number of leaders needed: 1

Participants: 2–8

Recommended age range: 6+

Overview:

This is a race to show all the components that go into a meat-based diet, versus going straight to the source (plants). Red balls (meat) are worth more points than green balls (plants) because they provide more calories and protein. Green balls are worth 1 pt; red balls are worth 2 pts. The object of the game is to collect the most points in a given amount of time (20 seconds) by racing from the starting line to the balls and placing the balls in a bucket at the starting line. Kids are split into 2 teams, and 2 kids compete at the same time. Each player, when racing, has their own space and balls (they cannot interact with the other player). If there are 8 racers, they each participate in one round. Between every round, each team has time to talk about what they think their strategy should be.

Instructions:

First round: Kids race to red ball (5) and green ball (5), which are both placed 18 feet away. Kids grab one ball (most likely they will choose the red ball, since it is worth more points) and run back. In this game, every time you grab a ball you must run back to the starting line and put it into the container before running to get another ball. The facilitator times for 20 seconds, and only balls that have been placed in containers are counted at the end of the round. Scores for each team are recorded for the first round, and then the balls are taken out of the containers. This round introduces the concept but doesn't take into account the problems with a meat-based diet. It shows why many people choose to eat meat: they don't take into account the other factors.

Second round: Explain what you are doing as you introduce new factors. Green balls are placed at 6 feet (closer to the starting line) than red balls at 18 feet. This represents the fact that in order for us to eat a cow, the cow must first eat lots of plants, which are lower on the food chain (closer to us as consumers). Kids can still choose to get any ball they like, but now in order to get a red ball, you have to grab 2 green balls first and bring them back to your container one at a time. This shows that in order to make meat, lots of plants must be consumed by the animal to produce those calories. Each team discusses a strategy.

Third round: Blue balls are placed 6 feet from the starting line. To get red ball, you have to grab 2 blue balls and bring them back to the starting line, to get a green ball you have to grab one. Rules from Round 2 do NOT apply in this round (in order to grab a red ball, you must first grab 2 blue balls, but you do NOT have to grab 2 green balls additionally). Explain that the blue balls symbolise all the water that has to go into the system. It takes more water to produce meat than veggies. Blue balls are not worth any points. Each team discusses a strategy.

Fourth round: In this round, rules from rounds 2 and 3 DO apply. So, in order to grab a red ball, you must first grab 2 blue balls and then 2 green balls before collecting the red ball. Additionally, whenever holding a red ball, you must hold your breath. This introduces the emissions problem (animal flatulence!) caused by meat-based diets. Each team discusses a strategy.

Discussion Questions: When you don't have to think about consequences like water, emissions, etc., which ball do you want to choose? Did you want to choose the red balls *less* when you thought about having to go grab all the water balls, hold your breath, etc.? Do you think you could do a mix of these? Could you can eat meat sometimes, grab a red ball when you need it for points, but mostly grab green balls?

## Appendix 2

Title of Skit: *Grandma Fridge Cools Off*

Created by: Beth Osnes

Drawdown Solution: #1 Refrigerants

Learning Objective: to learn why and how to properly dispose of aging refrigerators

Characters:

Parent #1

Parent #2

Younger sibling

Older sibling

Grandma Fridge (old and hard of hearing)

Park Guest (wearing hat)

Toto (family pet—that is an electric toaster with the cord as a leash)

Properties or costumes needed to perform skit: cardboard box grandma/refrigerator costume, grey wig, glasses, toaster with cord, hat for Park Guest, cell phone as camera

Setting for skit: Rocky Mountain National Park, near Bear Lake.

Parent #1: Let's get a family photo. Get Toto.

Younger Sibling: (holding cord to toaster as a leash) Come here, Toto. Good dog, Toto (petting toaster).

Parent #1: Excuse me (to Park Guest). Do you mind taking our family photo?

Grandma: Take our family's Toto? You take our family's Toto and I'll knock your hat off (waves her cane at Park Guest's head).

Parent #2: No, Grandma, our FAMILY PHOTO. Sorry about that. (gets kids together for photo) Make sure you get Bear Lake in the background.

Park Guest: Okay, sure. (takes phone from Parent #1)

Parent #1: Kids, come on. Stand in front of Bear Lake. Grandma Fridge, get right here in the middle. This is your big vacation.

Park Guest: Say 'Cheese'.

Grandma: What's that? You want some cheese? I might have some in here, let me take a look (*opens her doors to check for food*).

Parent #1: Grandma, dear. We told you. You don't have any food anymore, remember? You're unplugged. You're retiring.

Grandma: I'm perspiring? Come to think of it, it is kind of warm in here (*waves her hand in her doors*).

Parent #2: No, you're RETIRING. And this is your big trip to Rocky Mountain National Park to celebrate all the food you've kept cold for this family.

Parent #1: And to express how grateful we all are.

Older Sibling: Yeah, before we take her away to recycle her.

Both Parents: SHHH!!!

Parent #1: Before we take grandma to a wonderful place. Right, Honey?

Parent #2: Oh yes! A totally rad place. Literally a RAD place, R-A-D, Responsible Appliance Disposal.

Parent #1: Yes, nothing but the best for grandma. RAD is an EPA program with a partner in our area. Grandma's going to love it. They will take such good care of her.

Park Guest: Wait a minute. You're taking your grandmother to get recycled?

Parent #2: (*defensively*) Yes, we are, and so should you when your refrigerator gets old.

Parent #1: Yeah, don't just leave your beloved refrigerator in some back ally for the garbage truck to pick up. That will likely damage it which could release hydrofluorocarbons into the atmosphere.

Older Sibling: We learned about hydrochloroflourbins, no, hydroflourbincorbles-, ugh, HFCs in school. They're potent greenhouse gases. Our teacher said they are 1000 times worse than carbon dioxide in causing global warming.

Younger Sibling: I don't care about that. I don't want to get rid of Grandma. Look, she still has my math test I got an 'A' on. (*Younger Sibling takes the test off Grandma's side*)

Parent #1: Dear, we talked about this. You know it is state law that we properly dispose of old refrigerators. We are doing the best we can by grandma, honey. This is hard for all of us.

Park Guest: Wow. I have to say, I'm impressed. You are a remarkable family and so attentive to your appliances. So, let me get this straight. When I get a new fridge, I should properly dispose of my aging one through whatever program my city has. Is that right.

Parent #1: You've got it.

Park Guest: Okay, ready for this photo? Smile really big! (*about to take photo*)

Grandma: (*opens her doors again*) You want a tasty fig?

The End

Discussion Questions:

Can your refrigerator talk? If it could, how would it ask to be disposed of when retiring?

Why is it important to dispose of old refrigerators properly?

How can you help people understand how to dispose of refrigerators?