



S U S T A I N A B L E  
P I T T S B U R G H  
**C H A L L E N G E**

# **2018 K-12 Challenge Master Playbook**

Version 1

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Sustainable Pittsburgh K-12 Challenge

A Program of Sustainable Pittsburgh

307 Fourth Avenue, Suite 1500

Pittsburgh, PA 15222

tel: (412) 258-6642

[www.sustainablepittsburgh.org](http://www.sustainablepittsburgh.org)

[www.spchallenge.org](http://www.spchallenge.org)

[challenge@sustainablepittsburgh.org](mailto:challenge@sustainablepittsburgh.org)

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PRINT NOTICE: Sustainable Pittsburgh is dedicated to saving paper and reducing waste. Please use this Master Playbook in its digital state. This format allows us to offer useful resources as hyperlinks and release periodic updates as needed. Please consider forgoing the printer.

## THE 2018 SUSTAINABLE PITTSBURGH K-12 CHALLENGE

The 2018 Sustainable Pittsburgh K-12 Challenge is a brief 18-week challenge designed to fit within the school year. It is a friendly competition among schools aimed at helping teachers and students easily participate in sustainability actions. The K-12 Challenge Master Playbook provides teachers with resources, ideas, suggestions, and lesson plans to incorporate sustainability into student education both in and out of the classroom.

The Sustainable Pittsburgh (SP) Challenge is a free, yearlong, friendly competition that encourages universities, non-profit organizations, municipalities, and businesses in Southwestern Pennsylvania to adopt sustainable practices and policies. The program enables

organizations to track sustainability performance and receive positive recognition for their achievements.

Sustainability takes hold where Economic, social Equity, and Environmental needs are simultaneously addressed in decision-making. Using these “three E’s” as fundamental guides, the SP Challenge is organized around seven Sustainability Focus Areas: Social Equity, Engagement, Air Quality, Water, Energy, Transportation, and Materials Management. The Sustainable Pittsburgh K-12 Challenge applies these Focus Areas to the wide variety of school subjects and classroom experiences that students encounter.

The Sustainable Pittsburgh Challenge breaks sustainability down into small, actionable parts to allow organizations to take manageable steps toward becoming more sustainable. The K-12 Challenge awards points for specific actions taken within schools to advance sustainability education and leadership. Each action in the K-12

Master Playbook is worth points in the competition. Teachers may choose which actions to complete and when, allowing for full customization to individual classroom needs.

### *Mission*

The Sustainable Pittsburgh K-12 Challenge provides resources for teachers to guide students in becoming empowered leaders for sustainability.

### *Vision*

We envision a world where schools value sustainability education as an integral tool to engage students in actionable problem-solving to address regional stressors that obstruct the vitality of our economy, social equity, and the environment.

### *Benefits of Participation*

- Free tools: Sustainability lesson plans and classroom activities aligned to Common Core Standards
- Workshops: Network and share ideas during our fall workshops
- Impact: Track your school’s actions and impacts through the Challenge website
- Recognition: For your school’s sustainability efforts and impacts
- Leadership: Educating students to lead the way to a sustainable future

## HOW IT WORKS:

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At Sustainable Pittsburgh, we believe that every action makes a difference. That is why each action in the Sustainable Pittsburgh K-12 Challenge is rewarded with points. Each participating teacher can accumulate points for their school by completing any of the 60+ actions in the K-12 Master Playbook. Schools may have one or multiple teachers participating; there are no minimum or maximum teacher participant requirements.

### *SP K-12 Challenge Competition Dates*

Competition start date: October 1, 2018

Sign-up deadline: October 31, 2018

Competition end date: January 31, 2019

## COMPETITIVE DIVISIONS

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Similar to the year-long SP Challenge, schools will be placed into competitive divisions to ensure a fair and equitable comparison between schools. Divisions will be based on a combination of factors including number of teachers participating, student population, student to teacher ratio, the socio-economic range of the school zone, etc. There will be between two and four divisions ranging from “small” to “large” so that schools compete with others that are fairly similar to them. The SP Challenge team will release the final list of participating schools and their competitive divisions on Nov. 1, 2018, though teachers are welcome to begin submitting actions from Oct. 1.

## POINTS STRUCTURE

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Schools will earn points through their participating teachers for any new sustainability initiatives taken on during the competition, including lessons and projects. Schools can also earn points for sustainability initiatives already in place, if they are ongoing, kept up-to-date, well-maintained, and continue having impact on the students, teachers, school, and/or community. For example, the K-12 Master Playbook lists action *TSK2: Encourage students to start a sustainability club and function as their advisor*. If your school already has a group of students actively involved in such a club, you may submit the existing club’s mission and recent meeting minutes to fulfill the requirements for that action.

Points for actions are generally determined by the effort and engagement required to complete the action. A more challenging action will be worth more points. A higher number of points is also awarded for actions with outcomes that can be precisely quantified. Each action in the K-12 Master Playbook is completely voluntary and is meant to serve as inspiration for incorporating sustainability into varying classrooms. A modified action may be permissible with explanation or may be submitted as a new Innovative Action.

Actions in **the K-12 Master Playbook** are organized as follows:

- *Easy Plug-ins: Ideas to Incorporate Sustainability into Existing Lessons*

These actions are simple ways to create opportunity for sustainability education in the classroom. By tweaking activities as simply as switching out an example sentence, a math problem, or an

essay to one related to the seven Sustainability Focus Areas, we begin to expose students to the ideals of simultaneously improving equity, the economy, and the environment.

- *Classroom Exercises: Lesson Plans to Teach a Specific Aspect of Sustainability*

The provided lesson plans act as a framework for teachers to bring a more specific aspect of sustainability into their classrooms. Each lesson plan has a timeframe, materials needed, student knowledge pre-requisites, and a list of corresponding Common Core Standards/PA Standards Aligned System that the lesson addresses. The lesson procedure is customizable to student and teacher needs.

- *Tasks and Projects: Inspiring Sustainable Lifestyles*

This section is full of projects that are either longer-term or involve some extracurricular effort on the part of the students or teachers or both. These actions have tiers of points to distinguish the steps required to bring the project to completion.

All actions will be submitted through the SP Challenge [website](#).

## LEADERBOARDS

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Cumulative points earned from approved actions will be displayed publicly on the SP Challenge [leaderboards](#) for each competitive division. Leaderboards are updated in real time as action submissions are reviewed and approved during the competition. Leaderboards will not display specific actions, only the total points awarded. Through an account on the SP Challenge website, participants will be able to view the actions that they have submitted. Action submissions are completely confidential. Only the participating organization and the SP Challenge team will be able to view the specific action submissions, whether approved, disapproved, or pending.

## CONFIDENTIALITY STATEMENT

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The Sustainable Pittsburgh K-12 Challenge recognizes the paramount importance of maintaining the confidentiality of information from participating schools. Sustainable Pittsburgh will never share participant data; it will be used strictly for verification purposes, for the purposes of awarding points for the competition, and to aggregate program results, such as the overall total amount of projects completed and number of students involved across all participants in the program.

Only Sustainable Pittsburgh Challenge staff will be provided access to the information that is shared through the submission portal. Participating school verification documentation will never be shared with the public or any other entity outside of the Sustainable Pittsburgh Challenge Team and Oversight Committee.

On occasion, the SP Challenge team may request special permission from a participating organization to share inspirational stories, photos, or actions with the public or with other participants. The purpose of such a request is to highlight the achievements of the program's participants, to encourage other organizations to participate, and to inspire existing participants. Any request from the Challenge team to share information will include details about how the information will be shared, with whom, and for what purpose. No details related to action submissions are shared without written permission from the participant(s) and/or students' parents.

## RECOMMENDED: FIVE ACTIONS TO START WITH

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Unsure where to start? We suggest looking through the Master Playbook to find the actions that you've already implemented in your classroom or school. After that, you can start working on new goals. Below is a list of the top five actions to start earning points.

**EX1: What is sustainability? (25 to 150 points)**

**EX13: Collaboratively create a list of classroom expectations and behaviors (20 to 80 points)**

**TSK1: Create a Sustainability Squad (20 to 100 points)**

**PLG3: Use environmental texts for reading assignments or activities (5 to 20 points)**

**PLG9: Choose a sustainability-themed movie, clip, or video for downtime (1 to 5 points)**

## EASY PLUG-INS: IDEAS TO INCORPORATE SUSTAINABILITY INTO EXISTING LESSONS

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*Unless otherwise noted, all actions in this section may be completed by multiple teachers at a single school or by a single teacher of multiple classes. The point range indicates the points available if one teacher completes the action, and the maximum points available for that action at the school.*

**PLG1: Have students research a topic of sustainability that interests them (5 to 20 points per grade)**

Research skills are critical for students to develop in every subject. If students are assigned a research project during the school year, have them choose an element of sustainability to either research explicitly or to incorporate into their existing topic. For example, environmental justice during a particular moment in history, gender equity in music, how math helps us understand air quality, or any other intriguing nexus that might inspire students to dig into their research. Introducing these interconnected concepts will help students to further develop critical thinking skills.

 *Submit a list of students' chosen or assigned topics.*

 *For **bonus points**, compelling final essays may be submitted to the SP Challenge team.*

Points for this action will be awarded based on the percentage of participating students in the given grade level. This action may be repeated for each grade level.

1-20%	5 points
21-40%	10 points
41-70%	15 points
71%+	20 points

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Useful Links:

[5 Ways to Give Students Free Choice on Essay Topics and Still Save Your Sanity](#)

**PLG2: Hold a classroom debate on sustainability topics (5 to 20 points)**

Both with and without serious preparation, debate can be a way to get students to break out of preteen/teen apathy and express and defend their opinions. It can also be an exercise in understanding the opposite side of an argument. Introduce an aspect of sustainability to your classroom debates and see how students respond.

 *Submit a description of the debate including the topic, any misunderstandings, noteworthy arguments, and opportunities for growth (maximum 5 sentences). This summary may be written by (a) student(s).*

**PLG3: Use environmental texts for reading assignments or activities (5 to 20 points)**

Anytime you use a text for an exercise, you have an opportunity to incorporate environmental education into the classroom. Texts about social and environmental responsibility can be used in short activities like diagramming sentences, ordering sentences within a paragraph, or learning new literary devices. Environmental texts can also be assigned for longer exercises like studying prose, persuasion, or research.

 *Submit a copy of the excerpt OR title and author of the work used in your class.*

Potential authors:

K-5

Kate Messner  
Claire A. Nivola  
Ellie Patterson

6-8

Byrd Baylor  
Robert Burleigh  
Carl Hiaasen

9-12

Rachel Carson  
Aldo Leopold  
Naomi Klein

Useful Links:

[A Mighty Girl: Top Children's Books on the Environment](#)

**PLG4: Compare and contrast the potential benefits of a sustainable alternative (5 to 20 points)**

Compare and contrast exercises are ubiquitous as students go through school. If it's time for your students to complete a compare and contrast exercise, be it an essay, discussion, project, or quick warm-up, provide students with a sustainable option to compare. Topics could be transportation, renewable energy, home gardening, organic farming, frequency of showering, vegetarianism, fracking, minimum wage laws, e-books, or any issue that might relate to the lesson or interest your students.

 *Submit a brief description of the compare/contrast task and the aspect of sustainability that you included (maximum 5 sentences). This summary may be written by (a) student(s).*

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**PLG5: Create art out of recycled or found objects (5 to 20 points)**

Our homes, our city, our world is full of odds and ends that, with a bit of inspiration, we could find a new home for. Instead of buying a box of popsicle sticks for a student art project, have students bring in an old toy that they would donate, some junk mail their parents received, or some torn and tattered clothing they can't wear to repurpose the old into a work of art. Let students mix and match their old belongings, sharing and collaborating to create individual works or a class masterpiece.

 *Submit a photo of student art made of recycled materials AND*

 *Include in the submission notes box what was recycled.*

Useful Links:

[Found Object Art](#)

[Marine Debris Art](#)

[Crayola Activities](#)

[Pittsburgh Center for Creative Reuse](#)

**PLG6: Use recycled materials to create the set for a dramatic production (10 to 30 points)**

Inspire student creativity and save your school money by using upcycled materials for your set design. Teaching students not only about the value of reusing and recycling, but the knowledge for how to go about it can give them the confidence to upcycle things on their own, becoming sustainability leaders!

 *Submit before and after photos of your recycled/reused/repurposed set pieces.*

Points are awarded per production, up to 3 productions per competition cycle. Productions may be part of a class outside of a specific drama department (ex: in a history or literature section).

Useful Links:

[Construction Junction](#)

[Pittsburgh Center for Creative Reuse](#)

[Freecycle](#)

**PLG7: Have students design and present a product idea or invention that addresses sustainability issues (5 to 20 points)**

Product design for any number of issues is a popular creativity-driven activity in classrooms. If your students have a design-related assignment, challenge them to consider the environmental and equity impacts of their invention. This can include cost and accessibility, end-use, obsolescence, and/or the manufacturing process, among others. Encourage students to creatively tackle these critical questions.

 *Submit a photo of what your students have designed AND*

 *Have students write a brief description of the aspects of sustainability they accounted for.*

*NOTE: Group designs are acceptable.*

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Useful Links:

[Ted Talk by William McDonough - Cradle to Cradle Design](#)

[Design Thinking - Asking the Right Questions](#)

[Schoolchildren Redesign Their Milk Cartons](#)

**PLG8: Choose an environmentally-themed song for a music discussion/analysis (1 to 5 points)**

Whether analyzing the lyrics, melody, or composition of a song, you have the opportunity to expose students to an environmental message. For a lesson involving music, choose a related song that also addresses sustainability. Consider the 'Three Es' of Environment, Equity, and Economy and what message your chosen song could deliver.

 *Submit your song choice and a brief note on what sustainability message you encouraged students to listen for OR*

 *Submit student reflections on their take-aways.*

Points are awarded per song per class session. Songs used in foreign language lessons may be included if they contain a related message.

*NOTE: The song doesn't need to have an obvious sustainability message. By posing the question, see what things relating to equity, economy, and environment your students can tease out of a song.*

Useful Links:

[Earth Day Songs](#)

[15 Pro-Environment Songs](#)

**PLG9: Choose a sustainability-themed movie, clip, or video for downtime (1 to 5 points)**

Media can be a fun opportunity to introduce students to concepts of sustainability without telling them outright. Engage students with a range of videos on endangered species, other cultures, language learning, sustainable design, a Ted Talk, outdoor adventures, or other activities. Time for a movie or clip? Consider showing students one of the suggested films below.

 *Submit the name of the movie, clip, or video and the date it was used.*

Repeatable up to 5 times during the competition for one point per video session.

Suggested environmental films:

*Chasing Coral* (ocean-themed climate change documentary – 93 min)

*Mission Blue* (ocean-themed documentary about renowned scientist & advocate Sylvia Earle – 96 min)

*Planet Earth* (BBC Documentary series narrated by Sir David Attenborough – ~50 min/episode)

*Fern Gully* (20th Century Fox cartoon dealing with themes of deforestation – 76 min)

*The True Cost* (documentary addressing fast fashion – 92 min)

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*The Island President* (President Mohamed Nasheed of the Maldives addresses the difficulty of climate change negotiations from the perspective of a small island nation – 101 min)

*Chasing Ice* (Photographer James Balog depicts change in Arctic ice over time – 76 min)

*Under the Dome* (Chai Jing discusses raising her child under China’s heavy pollution – 103 min)

Useful Links:

[DC Environmental Film Festival Database](#)

[NatGeo Kids - Videos](#)

**PLG10: Use sustainable alternatives in math problems (1 to 10 points)**

We all know the classic mathematics examples of two trains heading in some direction or a girl named Susan with an absurd number of apples. In addition to the classics, use word problems that include more sustainable alternatives like electric cars or solar-powered planes. Perhaps Susan could have a cool set of pencil highlighters or lots of lively bees in her apiary. It might be a student’s first exposure to these possibilities!

 *Submit a copy of the math problem given to students.*

Repeatable up to 10 times during the competition for one point per math problem.

**PLG11: Hold your class using only natural light (2 to 14 points)**

Host your own version of Daylight Hour and turn off the lights for an hour or more. Save energy and see how the ambience in your classroom changes by just using natural lighting. Daylight Hour usually falls around the summer solstice, but you can turn off the lights anytime! According to Daylight Hour’s website, 2017 participants “turned off lights in 100 million square feet of office space, saving enough energy to power 9,400 homes for a day!”

 *Submit a creative photo of your naturally lit classroom.*

 *In the submission notes box, include the date and time you chose, the number of classrooms in your school and how many participated, and a sentence or two on student reactions.*

Points for this action will be awarded based on the percentage of participating classrooms. If your classroom has no windows, try holding a lesson outside.

1-20%	2 points
21-40%	6 points
41-70%	10 points
71%+	14 points

Useful Links:

[Daylight Hour](#)

[Health Benefits of Natural Light](#)

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## TASKS AND PROJECTS:

### INSPIRING SUSTAINABLE LIFESTYLES

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*Points for actions in this section may be awarded per school or per classroom. Maximum points are awarded per school unless otherwise noted.*

#### **TSK1: Create a Sustainability Squad (20 to 100 points)**

Engage fellow staff and faculty in the creation of a Sustainability Squad to maximize your participation in the Challenge and provide support for one another in incorporating sustainability education at your school. Sustainability Squads can include non-teaching staff. Your Squad should have a primary contact person and consist of at least 3 members. Through collaborative effort, your Sustainability Squad can have a broader impact on your school. Each person on the Squad should have a log-in to submit actions on the SP Challenge [website](#). The SP Challenge team can create log-ins on your behalf, or teachers can sign up on their own.

-  *Submit the names and email addresses for all members of the Sustainability Squad. State who the main contact will be (20 points).*
-  *Ensure each Sustainability Squad member has a log-in on [spchallenge.org](#) (20 points).*
-  *Submit a document outlining the Squad's goals and plan of action (20 points).*
-  *Submit your meeting minutes from three (3) recent meetings (20 points).*
-  *Submit a photo of your Sustainability Squad for use in SP Challenge promotional materials (20 points).*

#### **TSK2: Encourage students to start a sustainability club and function as their advisor (30 points)**

A school Sustainability Club is the perfect opportunity for students to show their gumption and creativity. It can also serve as a future resume builder! Help students get started by attending a couple of meetings and asking grounding questions to help them discover their mission as a group. This will vary by student ability, knowledge, resources, and school culture. Whatever students come up with is a step forward. Continue to be an advisor to them throughout the school year. Multiple teachers may be involved as desired/needed.

-  *Have students deliver a mission statement AND three (3) recent meeting minutes.*

#### Useful Links:

[Starting an Environmental Club \(Scientific American\)](#)

[Starting a Green Club \(Teacher Guide\)](#)

[Sustainability How-to Guide for Students](#)

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### **TSK3: Have students write a class sustainability pledge and guidelines (5 to 20 points)**

Developing new habits takes practice and regular reminders. Have students create their own sustainability pledge and guidelines for classroom maintenance and behavior. Students should include actions important to them that they want to change and/or improve. Habits may include properly recycling, bringing a reusable water bottle to class, reusing scrap paper, repurposing materials, being helpful to one another, turning off electronics at the end of the day, no food waste, or any number of sustainability behaviors.

 *Submit the class pledge with student signatures indicating their commitment.*

Points are awarded per class pledge up to 20 points.

### **TSK4: Incorporate club times into the normal school day (30 points)**

Providing time for students to meet during the school day allows students to participate who would otherwise be unable to stay late after school due to bus schedules or pick-up times. This also encourages more students to be involved in clubs, make friends, and engage creatively in group problem-solving for a cause that is meaningful to them. It is also an opportunity for students to begin building their resumes.

 *Submit the times allowed for club meetings during the school day.*

 *Submit a list of the clubs that meet during the day.*

### **TSK5: Join a ROCIS cohort and have students participate in monitoring classroom air quality (30 points)**

ROCIS (Reducing Outdoor Contaminants in Indoor Spaces) is a local non-profit that provides SP Challenge competitors the opportunity to participate in month-long cohorts to monitor indoor air quality for free. After you join a ROCIS cohort and attend a briefing, you will be given a kit containing a radon monitor, a carbon monoxide monitor, a carbon dioxide monitor, and 3 Dylos PM monitors. Each cohort monitoring period lasts around three weeks and has four meetings you should plan to attend. These include the kick-off meeting, a check-in meeting during the first week of monitoring, a virtual meeting to learn about data visualization tools, and a wrap-up meeting at the end of the three weeks when you will return the monitors.

The teacher should attend the required meetings, and the students can help record data on the log sheets and/or help interpret the data.

 *Submit copies of your log sheets AND*

 *Submit photos of the monitors around your classroom AND*

 *Submit a brief explanation of how students were involved OR submit student-written reports on the air quality data of the classroom.*

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Useful Links:

[ROCIS Homepage](#)

[Low Cost Monitoring Program](#)

[ROCIS: What I Learned \(Grounded Strategies\)](#)

[US EPA A Citizen's Guide to Radon](#)

**TSK6: Monitor your classroom energy usage (10 to 40 points)**

Using a simple power meter device, you can measure the electricity consumption of any appliance or gadget that is plugged in in your classroom. Instantly watch the watts used and cost per kilowatt hour. You may have younger students complete basic addition on watts used or have older students calculate kWh and compare that to their home energy usage. These [usage monitors](#) are relatively inexpensive (\$15-40) and could be purchased by a teacher or the school and held at the school's library for use by any class.

 *Submit a photo of the energy monitor in use.*

 *Submit a description of the assignment that students completed.*

Useful Links:

[Electricity Usage Monitor on Amazon](#)

[Power Consumption Meter](#)

[Activity: Home Energy Audit](#)

**TSK7: Make a rule to reduce vampire power in your classroom (5 points)**

Vampire power is energy consumed from the grid when appliances aren't in use, but are plugged in. By unplugging devices, you will save both energy and money. Suggested policy guidelines include: auto-shut off plans for computers and appliances, smart strips in lieu of standard power strips or plugs, unplugging appliances that are rarely used, and implementing a routine of checking these items at the end of the day.

 *Submit a copy of your vampire power rule.*

Useful Links:

[Vampires in Your House!](#)

**TSK8: Have students download and use the Smell PGH app (1 to 10 points)**

Smell Pittsburgh is a smart phone app designed by CMU's Create Lab to engage Pittsburghers in tracking outdoor pollution odors in our region. It is available via Google Play and the Apple App Store. Once downloaded, users can report the time and location of a "smell event" when they experience an unusual odor. Users can then see a map of other reported odors in the area on a given day. This data is used to track odors and link them to areas of poor air quality and/or air pollution.

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 *Submit a screenshot of your submitted smell event (1 point per screenshot).*

Useful Links:

[Smell PGH](#)

[If You Smell Something, Say Something](#)

**TSK9: Have students complete a waste-tracking diary (10 to 40 points)**

This can be both a writing exercise and an awareness-building exercise. It may be a bit extreme for students to collect or wear all their waste for a period of time (as Rob Greenfield did, seen below in the Useful Links), so keeping a waste journal is a good alternative. Encourage students to track everything that they compost, recycle, and most importantly, send to landfill. The timeframe and level of detail required can vary by age group. For older students, have them write a note about why they threw an item away. This can be particularly helpful for stimulating discussions about food waste.

 *Submit the criteria that students should include in their waste diaries AND*

 *Submit the timeframe assigned for waste tracking.*

Useful Links:

[Rob Greenfield Wears His Trash](#)

[Food Waste Diary How-to](#)

**TSK10: Conduct a waste audit in your classroom (20 to 160 points)**

Waste audits are key tools in gaining a more accurate understanding and assessment of your waste production. In your classroom, collect all waste for a specified amount of time. Once collected, sort and weigh waste by category.

 *Submit a report on the results of your waste audit. This report can be student-written. Categories should include:*

- *Total Material Solid Waste Generated (includes recycling and compost)*
- *Total Material Solid Waste Recycled*
- *Total Material Solid Waste Composted*
- *Diversion Rate ((MSW Recycled + MSW Composted)/MSW Generated=Diversion Rate (%))*
- *Composition of Waste by Type. Include pounds of waste type found in both the landfill stream or the diversion stream (recycling, compost, or reuse):*
  - *Cans, Glass Jars & Metals*
  - *Plastics 1-5 & 7*
  - *Paper*
  - *Cardboard*
  - *Food Scraps*
  - *Paper Towels*
  - *Hazardous Materials (batteries, paint, cleaning materials, etc)*

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- *Other (K Cups, Toner Cartridges, any other significant item type for your waste stream that is not listed here)*

20 points are awarded for an initial waste audit and an additional 20 will be awarded for completing a follow-up waste audit. Points are awarded per classroom up to 160 points.

*NOTE: Be sure to check with your hauler to see what items are accepted for recycling.*

Useful Links:

[EPA Sample Waste Audit](#)

[Simple Waste Audit Calculator \(estimates and metric\)](#)

[NRDC Green Advisor Waste Audits](#)

**TSK11: Conduct a school-wide waste audit (50 to 100 points)**

Waste audits are key tools in gaining a more accurate understanding and assessment of your waste production. Waste audits can be conducted by your school, provided substantial documentation. Conducting your own waste audit will take at least half a day, depending on the size of the school, and will require coordination with custodial staff and administration. Self-conducted waste audits present an excellent educational and team-building opportunity for both students and school staff. There are useful guides available online (see Useful Links below) to aid in organizing your waste audit. There are also professional waste audit providers available locally and regionally (see Useful Links below) which can be contracted to conduct your waste audit at low cost.

 *Submit the results from your waste audit, which must include the following. All measurements should be reported in pounds unless otherwise specified.*

- *Total Material Solid Waste Generated (includes recycling and compost)*
- *Total Material Solid Waste Recycled*
- *Total Material Solid Waste Composted*
- *Diversion Rate ((MSW Recycled + MSW Composted)/MSW Generated=Diversion Rate (%))*
- *Composition of Waste by Type. Include pounds of waste type found in both the landfill stream or the diversion stream (recycling, compost, or reuse):*
  - *Cans, Glass Jars & Metals*
  - *Plastics 1-5 & 7*
  - *Mixed Paper*
  - *White Ledger Paper*
  - *Cardboard*
  - *Food Scraps*
  - *Paper Towels*
  - *Shredded Paper*
  - *Hazardous Materials (batteries, paint, cleaning materials, etc)*
  - *Other (K Cups, Toner Cartridges, any other significant item type for your waste stream that is not listed here)*

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 *If a professional audit is conducted: Submit an invoice from your third-party waste audit.*  
OR

 *If you conduct your own audit: Submit a description of your audit, the start and end dates, and photos of your auditing process.*

50 points are awarded for an initial waste audit and an additional 50 will be awarded for completing a follow-up waste audit.

Useful Links:

[Pennsylvania Resources Council \(PRC\) Waste Audits](#)

[Waste Audit Toolkit](#)

[EPA Sample Waste Audit](#)

[Simple Waste Audit Calculator \(estimates and metric\)](#)

[NRDC Green Advisor Waste Audits](#)

[Zero-waste Services](#)

**TSK12: Host a green holiday party (2 to 10 points)**

A number of holidays occur during the fall semester. If your class is planning a celebration, make your holiday party a sustainable one. Consider the impact of the aspects of your celebration, which could include décor, serving-ware, dining-ware, food, snack packaging, and gifts, among others.

 *Submit a list of sustainability issues you (or your students) took into account for the celebration. 2 points per action taken, up to 10 points.*

 **Bonus points** if students show that they used these habits at home, either a picture of themselves, their family, or the sustainable alternative that they used. Ex: wrapped gift with newspaper, recycled/handmade decorations, sweets not individually-packaged, etc.

Useful Links:

[The SCA Blog - Holidays, Sustainability, and You!](#)

[Reusable Dishware is More Sustainable](#)

[Holiday Decorating](#)

[Pennsylvania Resources Council - Zero Waste Kit](#)

**TSK13: Start a class, school, or community garden (20 points)**

Teach students to value the origins of their food through a gardening project. It can be as small as a classroom herb garden or as large as a community garden that students get involved in. During the winter months, indoor or greenhouse gardening can also fulfill this action. Encourage students to participate in garden maintenance and spend time outdoors. Spending time with the soil can improve a child's mood, decrease anxiety, and lead to better academic outcomes.

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 *Submit a photo of your garden efforts, including students at work if possible.*

 *Submit a description of how students are involved and taking ownership.*

#### Useful Links:

[Vegetables to Grow in Winter](#)

[How Gardening Affects Kids](#)

[Gardening – Resources for Teachers \(lesson plans, strategies, books, and more\)](#)

[Grow Pittsburgh - Community Garden Resources](#)

[Build a Sensory Garden for Everyone](#)

#### **TSK14: Start a classroom compost (15 points)**

Composting is a great way to turn fruit and vegetable remnants into useful soil again. Your students can learn about minimizing their food waste, the process of decomposition, and the carbon cycle. If you're a first-time composter, this is an opportunity to learn alongside students! Even if your compost batch fails, the class can investigate together and recommend tips for next time.

 *Submit a picture of your compost set-up.*

 *Submit a selection of students' work in relation to compost (drawings, essays, reflections, etc).*

#### Useful Links:

[NatGeo Kids - Creating Compost](#)

[Methods of Composting](#)

[The Takakura Method of Composting](#)

[Compost Stew by Mary McKenna Siddals](#)

#### **TSK15: Implement the Air Quality Flag Program in your hall (10 to 20 points)**

Make checking air quality part of your students' daily routine. You may assign a student to change the flag each morning. Use scrap fabric or colored paper to create an air quality board in your hallway. Display the color for your zipcode based on the AirNow website. Encourage students to investigate what they can do to improve local air quality.

 *Submit photos of your flag display on three (3) different days.*

Points are awarded per hall display up to two (2) halls.

#### Useful Links:

[AirNow Air Quality Flag Program](#)

[Outdoor Activity Guidance for Schools](#)

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### **TSK16: Participate in a learning collaborative with another school (50 points)**

An effective way to encourage long-term sustainability at your school is to discover what is working at other schools. Start a learning collaborative with a fellow participant from a different school and share your knowledge, experiences, and challenges. The journey toward sustainability can be tough for a variety of reasons. Reaching out to another school can be an opportunity for creative solutions and encouragement. The first meeting should be in person, while subsequent meetings can be held virtually.

 *Submit this action after having two (2) meetings with your partner school.*

 *Submit the names of your schools and your meeting notes.*

*NOTE: lingering questions can always be directed to [challenge@sustainablepittsburgh.org](mailto:challenge@sustainablepittsburgh.org).*

### **TSK17: Create an internal competition within your school (20 points)**

Host a short-term challenge between different classes to take one or more sustainable actions. Collaborate with your Sustainability Squad to design your competition. It may be among individual students and teachers, grades, halls, or classrooms. Even students VS. teachers! At least 2 classrooms must participate to earn points. Actions may include a particular behavior you want to incentivize or a number of behaviors to improve overall sustainability at your school. Decide the timeframe, actions, and awards, and start recruiting participants!

 *Submit a description of your internal competition including the timeframe, actions, and results.*

 *Submit a list of participants.*

#### Useful Links:

[I Am Sustainable Pittsburgh](#)

### **TSK18: Encourage students and fellow teachers to use alternative commuting methods (5 to 20 points)**

The most environmentally friendly commuting methods are walking and biking. However, there has been a huge drop in the number of kids who walk or bike to school regularly. According to the [National Center for Safe Routes to School](#), in 1969, 48 percent of K-8th grade students walked or bicycled to school. But by 2009, only 13 percent did. But according to a 2012 report from [Safe Kids USA](#), streets are actually getting safer for kids ([Care.com](#)). A walk-pool or [Walking Schoolbus](#) may be an option for students and teachers who live nearby. If walking is not feasible, encourage the use of bikes, buses, and vanpools. Regular carpooling can also help cut carbon emissions. Driving alone is the most carbon-intensive mode of transportation. Teachers may use [CommuterInfo](#) to arrange car or van-pools.

 *Submit your memo or notice to parents and teachers about using alternative modes of transportation (5 points).*

 *Submit proof of carpooling, walk-pooling, or bike-pooling groups (5 points per group).*

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Useful Links:

[CommuteInfo](#)

[The Walking Schoolbus](#)

[BikePGH Maps & Guides](#)

[Healthy Ride](#)

**TSK19: Take a sustainability field trip (10 to 40 points)**

Field trips create some of the most memorable moments students take with them when they finish school. Consider taking your students on a field trip to help sustainability lessons stick. Possibilities could include local farms, green infrastructure projects, LEED buildings, recycling facilities, the food bank, or the zoo, among others. Have students reflect on what they learned after the field trip.

 *Submit a description of the field trip or tour, including the date, location, and topics covered.*

 *Submit student reflections.*

*NOTE: Would you like someone from the SP Challenge team to join as a chaperone? Need some help facilitating a tour or field trip? We are happy to help make connections. Email us at [challenge@sustainablepittsburgh.org](mailto:challenge@sustainablepittsburgh.org).*

Useful Links:

[3 Rivers Wet Weather - Green Infrastructure Atlas](#)

[ALCOSAN's Free Tours](#)

**TSK20: Play the Climate Change Negotiations Game (10 to 40 points)**

Engage students in a role-playing game to conduct mock negotiations as delegates and stakeholders from different countries and organizations. Encourage students to research their roles and make their arguments as realistically as possible. Use past Nationally Determined Contributions (NDCs) to learn about how countries negotiate and commit (or not) to climate action.

 *Submit students' final debriefs on their negotiating strategy and outcomes.*

Useful Links:

[World Climate Negotiations Game - About and Resources](#)

**TSK21: Help students engage in public participation (1 to 50 points)**

Whether by helping them with voter registration or explaining the historical impact of peaceful protests, helping students understand public participation can give them the confidence to participate in the political process as informed citizens. Students may opt to attend or speak at a community hearing, write a letter to a public official, or help campaign for a representative they support, among other activities.

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 After a particular act of public participation, have students write a brief reflection on what they did and why they think it's important (1 point per student reflection).

Useful Links:

[PA Midterm Voting Guide](#)

[2018 Election Calendar](#)

[Protest is Democracy at Work](#)

[Writing Effective Letters to Congress](#)

**TSK22: Incorporate unstructured outdoor time into your class' routine (5 to 20 points)**

Outdoor play boosts students' creativity, cooperation, and problem-solving skills, along with health, mood, and ability to focus. Students of all ages benefit from time with nature, leading them to better observe changes and care for their environment. Help your students become sustainability leaders by providing them with technology-free time outdoors.

 Submit your unstructured outdoor time schedule. Outdoor days must be at least monthly to earn points.

Useful Links:

[The Discovery School - Nature Pre-K in Pittsburgh](#)

[Children Who Play Outdoors Are More Likely to Protect Nature as Adults](#)

[Why Kids Need Unstructured Outdoor Play](#)

[Learning Through Play is for Teenagers, Too](#)

**TSK23: Address anti-bullying and bystander actions in your classroom (20 to 80 points)**

Bullying has received national attention in recent years, with increasing resources available to teach students to confidently stand up for themselves and get help from adults. Trainings are also available for teachers and parents to intervene effectively. In classrooms, it's important to address what students should do if they are being bullied, and perhaps even more-so, teachers and parents must address bullying at the source. Fostering empathetic and inclusive students through discussion and role-play can help stop bullying before it starts.

 Submit the lesson plan or program used to address bullying in your classroom (10 points).

 Submit your written intervention strategy for dealing with bullying behavior (10 points).

Points are awarded per classroom up to 80 points. For this action, school assemblies do not count. If your school has a school-wide assembly discussing this issue, have a follow-up in your classroom to earn points for this action.

Useful Links:

[Let Me Be - Anti-Bullying Campaign Video](#)

[Unhealthy relationships #ThatsNotLove Video](#)

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[The Roles Kids Play in Bullying](#)  
[KidPower – Face Bullying with Confidence](#)  
[The Connection Between Peer Pressure and Bullying](#)  
[Steps to Unlearn Bullying Behavior](#)

**TSK24: Challenge students to practice one new sustainable habit (2 to 20 points)**

Older students may be able to sign on to the [I Am Sustainable Pittsburgh Pledge](#), while younger students may need more guidance. Teachers can look at the Pledge for inspiration. Students may choose one or more habit in any Sustainability Focus Area dealing with Equity, the Environment, and/or the Economy. Their new habit should be something that is or can be made meaningful for them.

 *Submit students’ written commitments to their new habits (2 to 10 points).*

 *Submit students’ follow-up reflections after 1 to 4 weeks (2 to 10 points).*

Points for this action will be awarded based on the percentage of participating students out of the whole grade. This action may be repeated for each grade level.

1-20%	2 points
21-40%	5 points
41-70%	7 points
71%+	10 points

Useful Links:

[What Kids Can Do to Stop Bullying](#)  
[Easy Swaps - My Plastic Free Life](#)

**TSK25: Facilitate a student volunteering event (5 to 20 points)**

Volunteering and community service can help build connections between students and their community. It can also improve student engagement, leadership, and enthusiasm. Volunteering may be as long as a semester commitment or as short as a litter pick-up during a class period. Ensure that students understand their impact and that each of their actions makes a difference.

 *Submit a list of the names of the students involved AND*

 *Submit a description of the volunteer event.*

Points for this action will be awarded based on the percentage of participating students out of the whole grade. This action may be repeated for each grade level.

1-20%	5 points
21-40%	10 points
41-70%	15 points
71%+	20 points

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Useful Links:

[Community Service with the Student Conservation Association](#)

[ALCOSAN's Storm Stenciling Program](#)

[Tree Pittsburgh](#)

**TSK26: Have students start a school-wide social media campaign for sustainability advocacy (25 points)**

Have students put their savvy social media skills to good use by creating an advocacy campaign for a sustainability issue that they would like to see improved on campus. They could work to improve water conservation, wasteful behaviors, inter-grade friendships, bullying problems, bike infrastructure, air quality, energy efficiency, or any other sustainability issue that compels students to speak up.

 *Have students tag the Sustainable Pittsburgh Challenge (@competesavewin; #competesavewin) in their campaign posts (1 point per discrete post).*

 *Share their campaign hashtags in the notes box (2 points).*

 *Have students measure and share the outcome of their advocacy campaign (10 points).*

**NOTE: Younger students or tech-free students can participate in Action EX10: Host a sustainability advocacy poster competition to create their campaign.**

Useful Links:

[Step by Step Guide to Create a Campaign](#)

**TSK27: Have plants in your classroom and encourage students to take an active role in caring for them (5 to 20 points)**

Potted plants make for a positive educational environment and can improve your classroom's indoor air quality. When plants photosynthesize, pores in the plant's surface absorb carbon dioxide along with volatile organic compounds (VOCs) such as benzene and formaldehyde, and capture particulate matter on the surface of their leaves, therefore removing them from the air. Beautify your school and breathe easy by placing plants throughout your facility. Classroom plants also provide a learning opportunity for students as they care for the plants and watch them grow.

 *Submit a photo of your classroom plants (up to 4 points).*

 *Submit a photo of a student participating in plant care (1 point).*

Useful Links:

[50 Plants That Clean the Air](#)

[How Plants Purify the Air](#)

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### **TSK28: Advocate for healthy lunches (2 to 10 points)**

Student health and wellness is a primary concern for any school. School lunches contribute substantially to student nutrition levels and thereby concentration and cognitive development. Ensure your students are eating well by helping them understand and advocate for healthy lunches. Some options include Meatless Mondays, greater vegetable varieties, and dropping sodas and juices.

 *Submit a description of your advocacy action (4 points).*

 *Submit a copy of your healthy lunch policy (2 points per policy item).*

*NOTE: Points will only be awarded for items that go above and beyond federal standards. Ex: Meatless Mondays, wholesome vegetarian and vegan options, locally sourced produce, no processed fruit juices, reduced plastic packaging, etc.*

#### Useful Links:

[Johns Hopkins Meatless Mondays](#)

[School Lunch Menu Ideas](#)

[Healthy Schools Campaign – What You Can Do](#)

[Study - Calories from Sweetened Beverages and 100% Juice](#)

[Nutrition Standards in the National School Lunch and Breakfast Programs](#)

### **TSK29: Advocate for reusable service-ware on campus (5 to 10 points)**

While disposables during lunch might seem more convenient, they add up to a massive environmental impact. All manufacturing consumes resources, but single-use products contribute significantly to both waste and lost potential as they are used for 15 minutes and sent to landfill. Food-contaminated items are not recyclable, further adding to the resource-sink. Durable dishware can be reused thousands of times, more than making up for the up-front energy and monetary costs.

 *Submit a description of your advocacy action (5 points).*

 *Submit a copy of your school's policy or memo on using reusable dishes (5 points).*

#### Useful Links:

[Reusable Dishware - Why Switch?](#)

[Minnetonka Middle Schools Switch to Reusables and Save](#)

### **TSK30: Advocate for a ban on bottled water on campus (2 to 10 points)**

Americans consume 29 billion water bottles a year, 80 percent of which ends up in landfills. Of the 13 percent that make it to recycling plants, each bottle requires the same amount of energy to be recycled as it takes to power a 60-watt light bulb for six hours. Be a part of the solution - ban the sale of bottled water on your school's campus. Encourage students to bring their reusable water bottles to class and refill them at water fountains or sinks.

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-  *Submit a description of your advocacy action (4 points).*
-  *Submit a copy of your school's policy or memo banning the sale or distribution of bottled water (6 points).*

Useful Links:

[Water Bottle Pollution](#)

[Bottled Water Facts](#)

[9 Ways to Reduce Plastic Bottle Use](#)

**TSK31: Test your classroom for lead paint (10 to 40 points)**

If dust from cracked or breaking lead paint becomes airborne, it can become a health hazard. In-tact and painted over, lead paint isn't a problem, but can be an interesting chemistry experiment for students.

-  *Submit a photo of your test and the results.*

Useful Links:

[How to Video - Test for Lead Paint](#)

[Instant Lead Test Kit](#)

**TSK32: Host a local chef for a classroom cooking class (2 to 10 points)**

Introduce students to different types of cuisine for a cultural class, discuss nutrition for a health class, talk about the importance of local produce in economics; food can play a role in any subject area! Invite a local chef to demonstrate a simple meal to your class to show off different ingredients and career opportunities. We encourage students to try a vegetarian or vegan dish to both eat healthy and reduce their carbon emissions!

-  *Submit the name of the chef, the restaurant they work with, and the meal prepared.*

Useful Links:

[Sustainable Pittsburgh Restaurant Finder](#)

**TSK33: Have school maintenance and/or janitorial staff speak to students (20 to 80 points)**

Encourage students to get to know the variety of people who help run a school. Maintenance staff can take the opportunity to speak to students about the ways they, too, can help take care of the school facilities. This can be done as part of a career day, engineering focus, or as an independent talk.

-  *Submit the name and title of the presenter AND*
-  *Submit a brief description of student questions and reactions (maximum 5 sentences).*

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### **TSK34: Participate in a local or regional sustainability initiative for schools (5 points each)**

Our region is host to a number of programs to improve schools, education, and equitable access to opportunities for students. Encourage your administrators and fellow teachers to take advantage of these great resources. See the Useful Links below for some such programs.

 *Submit proof of your school's participation in a local or regional sustainability program.*

#### Useful Links:

[Raise Your Hand for Health](#)

[Let's Move Pittsburgh Champion Schools](#)

[The Door Campaign - STEM and Aquaponics](#)

[The Fairchild Challenge](#)

[Ashoka Changemaker Schools](#)

[Green Schools Alliance](#)

[Green & Healthy Schools Academy](#)

[Live Well Allegheny Schools](#)

### **TSK35: Attend sustainability-related talks or trainings to broaden professional development (2 to 10 points)**

Sustainability-related events are hosted by a variety of organizations in the southwestern PA region. Networking with sustainability professionals and enthusiasts will expand your knowledge of sustainability efforts and provide insight into how other organizations and individuals implement sustainable practices.

 *Submit the name of the event and where it took place.*

 *Submit 1-3 sentences on what was presented and/or your takeaways.*

2 points per event, up to 5 events. Events may be attended by one or multiple teachers.

#### Useful Links:

[Phipps Biophilia Network](#)

[Sustainable Pittsburgh Events](#)

[ALCOSAN's Professional Development Workshops](#)

[NAAEE Webinars](#)

[Inspire Speaker Series](#)

[Vibrant Pittsburgh Speaker Series](#)

[International Living Future Institute - Online Learning](#)

[Farm to Table Events](#)

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### **TSK36: Join a Terracycle Brigade (5 to 20 points)**

Terracycle offers a program that makes it easy to recycle formerly hard-to-recycle items. By partnering with mission-driven companies, Terracycle offers free collection of single kinds of hard-to-recycle items such as chip bags, Solo cups, pens, Tupperware, and Ziploc bags. If you notice that your school produces a lot of one kind of waste, join the appropriate Brigade on the Terracycle website, and start collecting! When your collection box is full, use the free shipping label to send your collection the nearest recycler, listed within the Brigade info.

 *Submit a screenshot of your Terracycle Brigade confirmation email.*

 *Submit a photo of your filled box with shipping label when it is ready to be mailed.*

Receive 5 points for each Terracycle brigade your school participates in, up to 20 points.

Useful Links:

[Terracycle Brigades](#)

### **TSK37: Be a Crayola ColorCycle Champion (20 points)**

Crayola has a free program to recycle all kinds of markers, not just Crayola brand. They even include dry erase markers and highlighters. Thousands of pounds of markers are used per year by students across the country, imagine if we could keep those old plastic tubes out of our landfills!

 *When you're ready to send a box to Crayola, submit a photo of your marker box and shipping label.*

Useful Links:

[ColorCycle FAQ](#)

[Sustainable classroom supplies](#)

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## CLASSROOM EXERCISES:

### LESSON PLANS TO TEACH A SPECIFIC ASPECT OF SUSTAINABILITY

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*Unless otherwise noted, all actions in this section may be completed by multiple teachers at a single school or by a single teacher to multiple classes. The point range indicates the points available if one teacher completes the action, and the maximum points available for that action at the school.*

#### **EX1: What is sustainability? (25 to 150 points)**

##### **RECOMMENDED FIRST LESSON**

*to give students a foundation for the context of sustainability in your classroom.*

<i>Students can already:</i> Make connections Repeat new words Express their thoughts	<i>Objective:</i> Help students understand the word sustainability as a foundation for the K-12 Challenge	<i>Students will:</i> Be able to associate the Seven Sustainability Focus Areas with the concept of sustainability
<i>Approximate lesson time:</i> 15-20 minutes, depending on depth of discussion	<i>Materials needed:</i> Photo or example to open the discussion (possibly environment-related, something that students are familiar with) A ball	<i>Related Common Core Standards:</i> 4.5 Environment and Ecology 6.1 Economics, Resources, & Scarcity 5.1.1-12.C Civics & Government – the role of equality ELP.4.R.1-3.3-5

 *Submit a description of your take on the lesson plan (maximum 5 sentences).*

 *Submit student takeaways from the lesson.*

#### TEACHER'S NOTE

Sustainable Pittsburgh defines sustainability through the intersection of Environment, Equity, and the Economy (the 3 Es), taking into account these seven Sustainability Focus Areas: Social Equity, Engagement, Air Quality, Water, Energy, Transportation, and Materials Management.

Sustainability ensures that today's actions do not take away from future generations, as discussed in depth in [the Brundtland Report](#), also known as *Our Common Future*. In preparation for this lesson, consider how your classroom affects the future and how your students interact with the Sustainability Focus Areas listed above.

Students of all ages can learn to embody the Sustainability Focus Areas in ways that correspond to their age and ability. Sustainability can cover varying levels of complexity from flowers to geoengineering (Environment); coins to Payment for Ecosystem Services (Economy); friendship to slavery (Equity).

## VOCABULARY

Sustainable, sustainability

## PROCEDURE

Sit in a circle for group discussion. Elicit from students what they might already know about an aspect of the environment, economy, and/or equity. You might show a picture of something like a national park. Try an Ansel Adams photo for classic natural wonder. Environment is usually the easiest connection to make, with equitable access to natural spaces and resource consumption as themes to follow. If students can conceptualize the future, ask them if they would want that park to exist in the future for their great-grandchildren (and beyond).

Connect their thoughts with the word “sustainable” – something that lasts/can continue forever. Other possible connection words could be renewable, reuse, remake, take care of. Drill the word if necessary.

Introduce students to the Seven Sustainability Focus Areas as being parts of sustainability. **For younger students**, some basic explanation and gesture association is suggested (see below). **For older students**, elicit what comes to mind for them when they see each Focus Area.

*Suggested gestures:* Air quality: show a big inhale and exhale; Transportation: drive a race car; Equity: give yourself or a friend a hug to show friendship; Engagement: use hands as puppets to show talking to someone and/or a round of applause for your best effort; Water: use fingers to show rain falling, or take a big gulp of an imaginary glass of water; Energy: make a buzz for electricity; Materials Management: a big X for refuse (of the 4 Rs – refuse, reduce, reuse, recycle).

GAME – pass the ball

**For younger students**, the vocabulary words sustainable and sustainability can be drilled by passing the ball in a circle, with each student saying a syllable. Try to have students move quickly! Once they’ve gone around the circle a couple of times, have each student say the word independently. Students can also say the Seven Sustainability Focus Areas. Use the gestures as above to associate concepts with familiar activities. See if they can get completely around the circle in under a minute!

**For older students**, have them toss the ball to a classmate in the circle, saying something that comes to mind when they hear “sustainable.” See if students can think of as many distinct things as there are students. Use the Sustainability Focus Areas as a guide – Ex: Air Quality “We want to have good air quality now, and in the future, so we’re healthy.” “Driving cars pollutes the air.” “Burning coal for energy pollutes the air.” “Plants help clean the air.” Etc.

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## EX2: Who is the most sustainable? A five-finger elimination game (5 to 30 points)

<i>Students can already:</i> <i>List a few sustainable practices</i> <i>Answer True/False questions</i> <i>Self-reflect</i>	<i>Objective:</i> <i>Engage students in a fun</i> <i>sustainability ice-breaker to get</i> <i>them thinking about their habits</i>	<i>Students will:</i> <i>Receive explanations to</i> <i>statements, improving overall</i> <i>knowledge of sustainable practices</i> <i>and reflect on their own habits</i>
<i>Approximate lesson time:</i> <i>10 minutes</i>	<i>Materials needed:</i> <i>Prepared questions</i>	<i>Related Common Core Standard:</i> <i>4.5 Environment and Ecology</i> <i>6.1 Economics, Resources, &amp;</i> <i>Scarcity</i> <i>Others if teacher creates relevant</i> <i>statements for the game</i>

 *Submit the selection of questions used AND the name of the student(s) who won.*

### TEACHER'S NOTE

This game functions like “Never have I ever.” These statements can jumpstart a conversation about what it means to be sustainable, even a lively debate about what “counts” or doesn’t. This activity can also be used as an ice-breaker for meetings between teachers, such as in the first Sustainability Squad meeting.

### VOCABULARY

Recycling, conserve, transportation, pollution

### PROCEDURE

Students should raise their hand with five fingers extended. They will hear a series of sentences saying things they haven’t done (never, or in the past month, or the past week, as determined by teacher). If the answer is TRUE they leave their fingers up. If the answer is FALSE they must put one finger down. The winning student(s) is the last one with a finger up or the student(s) with the most remaining after all statements have been answered.

Example sentences:

1. I have not used a single-use plastic water bottle in the last month (like Dasani, Deer Park, Fiji, etc.).
  - a. Explanation: single-use plastics are rarely recycled and are choking the landfills, city streets, and oceans. Water bottles are one of the more easily-avoidable problematic items. Under 30% of plastic bottles are recycled in the US.
2. I have not taken a shower longer than 5 minutes in the past week.
  - a. Explanation: short showers are an easy way to save water. An average 10 minute shower will use about 20 gallons of water.
3. I have not ridden in a car in the past week.

- a. Explanation: emissions from transportation account for 28% of US emissions, the majority of which come from our regular commutes in cars. Public transportation, biking, and walking are significantly better for the environment.
4. I have not eaten meat in the past week.
  - a. Explanation: Beef, specifically, is a huge source of GHG emissions and water usage. Meat more generally is land and water-intensive as compared to vegetarian diets. Half of all agricultural emissions are just from livestock.
5. I have never thrown away something that I knew should go in the recycling.
  - a. Explanation: the US waste management system makes it feel like our trash “goes away,” but it doesn’t. Putting a recyclable in the trash bin wastes the energy potential of that item to be reused and become something new.
6. I have not bought or received any new clothes or shoes in the past month.
  - a. Explanation: “Fast Fashion” – the constant seasonal changes and advertising to buy ever cheaper and lower quality clothing is creating a clothing pollution crisis. Second-hand shopping and clothing exchanges are great ways to refresh your wardrobe rather than buying new.
7. I have not had any dairy in the past week.
  - a. Explanation: Similar to the beef issue, cows for dairy also contribute to global climate change. A total 2.7% of global GHG emissions is from milk production. Cheese, eggs, cream, butter, and other dairy products add even more.
8. I have never littered.
  - a. Explanation: littering contributes to environmental degradation and poor neighborhood morale. Have students really think about it. There are obvious things like chip bags and drink bottles (they’re on the street everywhere! Who is throwing these on the ground??), but throwing your gum on the ground is also littering. Throwing your apple core on the ground is littering.

Teachers may use these examples or add statements and timeframes relevant to student abilities. We recommended having 10-12 statements on hand so that you have the option to skip some if there are too many hard ones. We don’t want to eliminate all students in five questions! Also suggested is to have a “did you know?” moment between each statement, to provide the explanation and address any questions or disputed points.

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### EX3: How long until it breaks down? A sorting activity (20 to 80 points)

<i>Students can already:</i> Make comparisons Understand numbers in the thousands	<i>Objective:</i> Help students understand that different materials degrade at different rates in different environments	<i>Students will:</i> Gain understanding of material decomposition over time Understand the difference between degrade and biodegrade
<i>Approximate lesson time:</i> 10-30 minutes, depending on depth of discussion	<i>Materials needed:</i> Realia or print-outs of commonly thrown away items (multiple sets if students will be in teams or pairs). Ex: soda bottle, snack bag, fruit peel, newspaper, etc.	<i>Related Common Core Standards:</i> CC.2.4.K-3.A.4; CC.2.1.6-7.D.1 CC.2.1.HS.F.3-5; S3.3.8.A1 S3.4.8.B1; S4.5.8.A S8.A.3.2.3; S8.B.3.3.3 ELP.4.R.6-8.5

 Submit a photo of the items you used for this lesson.

 Submit a few sentences in the comment box about what students learned or found surprising (maximum five (5) sentences).

#### TEACHER'S NOTE

A key point to make in this lesson is the distinction between degrade and biodegrade. Decompose & biodegrade indicate a material that will rot or break down to become inert natural elements once again. Ex: a banana peel. Degrade means break down, but it can be into smaller and smaller pieces, which are still dangerous to the small animals that eat it. Ex: a plastic bottle. In other words, everything degrades, but not everything biodegrades.

#### VOCABULARY

Rot, break down, decompose, degrade, biodegrade (younger students might not be ready for larger words, up to teacher discretion).

#### PROCEDURE

Introduction/Assess students' prior knowledge: Ask students, do they know where their trash goes after it gets picked up? What do they think happens to it? Is it different if it's littered on the street? What about composted? Details will vary based on student knowledge.

Video intro (optional):

[decomposition video](#)

Show students 1-3 of the items they're going to sort. Will it decompose, degrade, or both? How long do they think it will take? Explain that students will see an assortment of items that they will have to order based on how long they will take to break down. Teachers will place the example 2-3 items in the correct order. (The teacher can put conditions on the items such as how long it would take if exposed to the elements vs. how long it would take in a landfill-- if the students are capable).

Split students into pairs or small groups, giving each pair/group a set of materials to line up in order. Allow 2-5 minutes to sort depending on the array of items and speed of students. Encourage debate and ask questions as students go.

When time is up, reveal the answers (depending on items that are common or amusing to your classroom, a google search can reveal a range of answers with some confusion on degrade vs. decompose. The exact numbers are less important than understanding that petroleum-based products do not biodegrade). Some numbers can be found [here](#) and [here](#).

Reward students (in your classroom management style) who are closest to the correct answers. Respond to any student questions or debated orders.

If time allows, mix student groups up and see how fast they can sort the items from memory for a second time. Award winning groups accordingly.

Useful Links:

[Material Decomposition Rates](#)

[Marine Debris Degradation Rates](#)

[Garbage Degradation Rates](#)

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**EX4: Have students calculate their carbon footprint (20 to 80 points)**

<i>Students can already:</i> Use a calculator Understand the Greenhouse Effect Use context clues for new words	<i>Objective:</i> Learn about resource consumption and how your personal footprint contributes to climate change	<i>Students will:</i> Understand that their activities have emissions Calculate and compare emissions Understand how to reduce carbon footprint/individual impact
<i>Approximate lesson time:</i> 30-40 minutes	<i>Materials needed:</i> Computers/tablets OR printed handout Drawing paper Markers, pencils, writing utensils	<i>Related Common Core Standard:</i> 3.3.5.A3-5; 3.3.6.A5 3.3.10.A7; 3.3.12.A6 4.1.10.B; 4.1.12.C 4.5.4,7.C; 7.3.1.A

 Collect students' footprints to share with the SP Challenge team via scan or photo.

VOCABULARY

Consume, emissions, carbon dioxide (CO<sub>2</sub>), climate change, footprint (environmental), greenhouse effect

Related Video (optional): [Climate Change 101 with Bill Nye](#), National Geographic

PROCEDURE

Introduction/Assess students' prior knowledge: Ask students to think about where carbon dioxide comes from. Elicit a few answers. Ask students if they know how much carbon dioxide they produce as individuals. Tell them in this activity, we will find out for sure.

Have students calculate their individual Ecological Footprint by using the calculator at <https://islandwood.org/footprint-calculator/> (recommended for grades 4-8) or at <https://www.footprintcalculator.org/> (recommended for grades 9-12).

This can be completed in pairs or groups of 3-4 if technology is limited. Students can watch their friends answer and compare their results.

It is also possible to conduct the calculator portion as a group by using a projector, creating a "class average" or a high range by going with the highest answers given among the group. It can also be done a second time in a "what if" scenario, encouraging students to think about which behaviours they would be willing to change and how they might go about it.

**If you do not have computer/tablet access**, use the [Ecological Footprint Calculator handout](#) (click on the link and scroll to Appendix 5) provided by The Global Goals for Sustainable Development. Students will need to calculate their scores independently by adding their points up for each category.

Have students discuss the results in pairs for 3-4 minutes. How many Earths do you need to support your lifestyle? Why? Did anything surprise you? Let a few students share their thoughts to the group.

Now knowing how many earths we need to support us; how can we reduce our consumption to get down to just one earth? Or even less!

Have the class brainstorm solutions to mitigate their contributions to the Greenhouse Effect. Write their suggestions in a word cloud on the board. Choose a few that you would be willing to do and demonstrate how to draw your footprint solutions (Draw a footprint, color a few sections, and write your commitments in each section. Examples [here](#)).

Have students draw a footprint (or trace their own!) and write in at least three things they will try to do to reduce their carbon footprint.

Respond to any student feedback or questions.

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### EX5: Have students calculate their water footprint (20 to 80 points)

<i>Students can already:</i> Use a calculator Identify water resource strains and issues Use context clues for new words	<i>Objective:</i> Learn about wasteful water usage and how they can conserve water through individual action; Learn about water use inside and outside of the home, in the food we eat, the products we buy, and the energy we use	<i>Students will:</i> See the impact of their actions on water scarcity and pollution Calculate and compare their water footprints Understand how to reduce individual impact and apply water conservation techniques
<i>Approximate lesson time:</i> 30-40 minutes	<i>Materials needed:</i> Computers/tablets OR printed handout Drawing paper Markers, pencils, writing utensils	<i>Related Common Core Standard:</i> 3.3.4.A4 4.5.8.A; 2.2.3.A; 2.4.5.A.5; 2.3.6.A.1 4.5; 6.1

 Collect students' water use tables to share with the SP Challenge team via scan or photo.

#### VOCABULARY

Consume, reduce, virtual water, agriculture, potable, efficient, water footprint, blue water footprint, green water footprint, grey water footprint

#### PROCEDURE

Introduction/Assess students' prior knowledge: Ask students to think about activities they do every day that consumes water. Which one consumes the most water? Elicit a few answers. Ask students if they know how much water they use as individuals or as a household.

Have students calculate their individual Water Footprint by using the calculator at <https://www.watercalculator.org/> (recommended for grades K-12).

This can be completed in pairs or groups of 3-4 if technology is limited. Students can watch their friends answer and compare their results. It is also possible to conduct the calculator portion as a group by using a projector, creating a "class average" or by going with the highest answers given among the group. It can also be done a second time in a "what if" scenario, encouraging students to think about which behaviours they would be willing to change and how they might go about it.

**If you do not have computer/tablet access**, use the [Water Footprint Calculator handout](#) provided by [Grace Communication Foundation](#). Students will need to calculate their scores independently by adding their points up for each category.

Have students discuss the results in pairs for 3-4 minutes. How much water do you individually use in your household? Which activity caused the highest consumption of water? Let a few students share their thoughts to the group.

Taking the average of water consumption per household, talk about which behaviours were the most wasteful and what surprised them most. As a group, address food's water footprint, indoor water use at

home, outdoor water use, water to make energy, and the hidden water in our everyday products we buy.

Have the class brainstorm solutions to reduce their water usage. Write their suggestions in a word cloud on the board.

Have students draw a water use table or have a [printout](#) ready. Students will write down three activities they will try to reduce and track their usage at home. You can hold a contest and see who reduces their water footprint the most after a week. Award the student accordingly.

Respond to any student feedback or questions.

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## EX6: Practice sorting recycling (10 to 40 points)

<i>Students can already: Understand the concept of recycling and reuse, and have some familiarity with distinguishing types of materials</i>	<i>Objective: Students will understand the recycling market, recyclability of items and what is/isn't accepted in local bins</i>	<i>Students will: Be able to recycle correctly and help contribute to a higher diversion rate</i>
<i>Approximate lesson time: 15-25 minutes</i>	<i>Materials needed: website projection or handout (1 per 3-4 students), PPT of trash/recycled items (for optional warmup), recycling and trash bins for each group OR blue poster-board to set recycling items on, a bag of mixed trash and recycling for each group</i>	<i>Related Common Core Standard: 5.2.K-12.D; 5.3.K-12.F 15.7.2-12.K; ELP.4.R.4-5.1 ELP.4.W.1-3.3; 3.4.3.B2</i>

 *Submit the link to your local recycling guidelines.*

 *Submit a photo of the items your students sorted.*

### TEACHER'S NOTE

Some key points and things to consider: Dirty items can't be recycled properly. Why are we recycling? To make something new/different out of those materials. Oil and food contaminate our potential to recycle. If we had to reuse and recreate art or something out of a container, we wouldn't want it to be dirty either. Emphasize clean items, in good condition, and only items listed as accepted per the local hauler.

### VOCABULARY

Recycle, reuse, plastic, glass, aluminum, cardboard, contamination

### PROCEDURE

Show students a recycling bin (photo or physical) and elicit existing knowledge. What is it? What is it used for? Why? Do students have one at home? Etc.

*Optional active warm-up: Yes/no game*

*Materials: realia, photos, or PPT of items often found in trash & recycling (~15 items).*

*Have students stand in the middle of the classroom. The wall to their left will be "yes." The wall to their right, "no." Show students the PPT of waste items. Students must guess if the item is recyclable by choosing the appropriate wall, "yes" or "no."*

*NOTE: Things that can throw students off (which may be used purposefully or avoided, depending on student attitudes): food contaminated items should not be placed in the recycling,*

even if the container is generally recyclable. Ex: a pasta sauce jar with some leftover sauce in it. Pizza boxes are another food-contaminated item commonly thought recyclable.

Have students move quickly and once at their chosen wall, give the correct answer. Award students who guessed correctly as aligns with your classroom management method. When all items have been shown, conduct a brief discussion with students. What surprised them? What did they already know and why?

What goes in the bin?

Show students (via projector or group handout, as needed) the regional website that lists accepted items for recycling. Ex: [City of Pittsburgh residential recycling](#). Give students time to read and consider for 1-2 minutes, then take away the list and tell them they will now practice what they've read.

Sorting

Split students into groups of 3-4 and give each group either a recycling bin or a blue poster-board to represent their recycling pile. Give students a time limit (~3 minutes). Once finished, assess the sort without giving students answers, but award the best group. Then, show students the accepted items list again and allow them 1 minute to correct their sort.

Discuss any debated items or items that many groups confused.

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## EX7: Find the leaks (20 to 80 points)

<i>Students can already:</i> Multiply and divide in word problems Keep time / use a timer Use context clues for new words	<i>Objective:</i> Learn why it is important to conserve water and fix leaks Learn to write persuasive letters to administrators for change	<i>Students will:</i> See and quantify water lost from leaking faucets Understand how to make the case for water conservation
<i>Approximate lesson time:</i> 30-50 minutes	<i>Materials needed:</i> Watch or clock with a second hand Calculator Handout or printed materials Markers, pencils, writing utensils	<i>Related Common Core Standard:</i> 4.5.3.D; 3.3.4.A4 4.5.8.A; 2.2.3.A.1-3; 2.4.5.A.5; 2.3.6.A.1

 Submit the number of gallons lost per year based on student findings.

 Submit a selection of letters that students wrote.

### VOCABULARY

Gallons, efficiency, water-efficient, upgrades, maintenance, conservation

### PROCEDURE

Introduction/Assess students' prior knowledge: Ask students if they have ever found leaks or drips. Where did they find leaks or drips? Why do they think fixing a leak important? How much water (in gallons) do they think can be wasted from a leak?

Find the leaks in your school

Students will become leak detectives! Have students investigate the school for about 10 minutes in pairs with a checklist of areas to check for. (You can print the [handout](#), provided by EPA WaterSense, and follow along with Lesson 3: Do a Drip Scavenger Hunt, or make your own simplified checklist).

Ensure student safety by indicating clear boundaries and places they will be checking. Split students into pairs or groups so that each section of the school with potential leaks is identified.

When students find a leak or drip, use a watch or count how many times it drips in one minute. If they find a pipe that is not dripping, but is wet, make a note where it was found.

After returning to the classroom, ask students what they found.

*NOTE: If no leaks are found, have students complete "what if" mathematical scenarios and send thank you letters to administration/maintenance for keeping their school leak-free!*

Have students, in their pairs, calculate their findings. Students will use the conversion equation  $10,000 \text{ drips} = 1 \text{ gallon}$ . The formula is  $\# \text{ drips} \times 60 \text{ minutes} \times 24 \text{ hours} \times 365 \text{ days}$  divided by 10,000 drips equaling the number of gallons wasted per year. Have some facts handy for what that lost water could

be used for. Ex: 8 drips per minute leads to about 420 gallons lost per year, which is about enough drinking water for three students for a whole year.

In a group, ask students what was most surprising about their findings? How much water is being wasted for each leak? What do they think can be done to fix the leaks? Why do they think the leaks or drips should be fixed? On the board, brainstorm constructive persuasive pieces of information to use as a reference for writing letters to School Administration and Maintenance.

Respond to any student feedback or questions.

#### Write Letters

Individually or in groups, give students materials to write their letters. Tell them to remember what you talked about and to use the brainstormed information on the board. If students need it, use the board to create a letter formula. Include the greeting, the data they found, and reasoning for why this is important.

When completed, send the letters to the administration and/or maintenance to have the leaks and drips fixed.

Take it Home! Find the leaks around your house, too.

Students can use [this](#) worksheet at home with their families, as well as in school. Or take home the [family fact sheet](#) on leaks in your home to tell parents how they can save water and money.

#### Useful Links:

[EPA Fix a Leak Week!](#)

[EPA Saving Water in Educational Facilities](#)

[10 Myths That Stop Us From Saving Water](#)

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**EX8: Conduct a transportation survey and have students discuss the carbon impacts (20 to 80 points)**

<p><i>Students can already:</i>  <i>Use multiplication in word problems</i>  <i>Understand Greenhouse Gases</i>  <i>Use context clues for new words</i></p>	<p><i>Objective:</i>  <i>Learn how different modes of transportation can affect carbon emissions</i></p>	<p><i>Students will:</i>  <i>Calculate and compare emission output by mode of transportation</i>  <i>Understand how to reduce individual carbon emissions</i></p>
<p><i>Approximate lesson time:</i>  <i>30-40 minutes</i></p>	<p><i>Materials needed:</i>  <i>Calculator</i>  <i>Handout materials</i>  <i>Markers, pencils, writing utensils</i></p>	<p><i>Related Common Core Standard:</i>  <i>2.1.5.B.2; 2.2.7.B.3</i>  <i>2.2.HS.D.9; 2.4.4.A.1</i>  <i>14.1.CE.B; 3.4.4.B2</i>  <i>S8.D.1.2.2; 3.4.3-12.E5</i></p>

 *Submit a photo of the student-created emissions table with all data in numerical order.*

**VOCABULARY**

Carbon emissions, metric tons (vs. imperial tons), diesel, gasoline, fossil fuels, alternative transportation, air pollution, carpooling, sequestration

**PROCEDURE**

Introduction/Assess students' prior knowledge: Ask students how they get to school. Do they ride the bus? Do they walk? After discussing as a group, ask students which mode of transportation they think is the most sustainable.

Students will individually answer two questions to prepare them for calculating their Carbon Emission related to their mode of transportation.

Transportation survey questions:

1. Which mode of transportation do you take to school?
2. How many miles do you travel from where you live?

Table to calculate carbon emissions in Metric Tons

Mode	CO <sub>2</sub> e per Mile in Metric Tons	CO <sub>2</sub> e per Mile in Pounds
Drive Alone (Diesel)	0.0004536	1
Drive Alone (Gasoline)	0.000394	0.87
Drive Alone (Hybrid)	0.0003425	0.76
Drive Alone (Electric)	0.0001975	0.44
Public Transit	0.000197	0.43
Carpool	0.0001703	0.38
Vanpool	0.0000985	0.22
Bike	2.4494E-05	0.054
Walk	8.16466E-06	0.018

Have students calculate their Carbon Emissions in Metric Tons per day. Multiply the number of miles by the CO<sub>2</sub>e per Mile in Metric Tons corresponding with mode of transportation shown above. Ex: I walk 4 miles to school every day. Multiplying 4 x .00000816466 = 0000326 Metric Tons of CO<sub>2</sub> per day, or 0.72 pounds of CO<sub>2</sub> per day of walking to school, or 129.6 pounds of CO<sub>2</sub> per school year.

This can be completed in pairs or groups of 3-4 if calculators are limited. Students can compare their results. It is also possible to conduct the calculator portion as a group by using a projector, creating a “class average” based on a few answers, or by going with the highest answers given among the group.

Have some carbon emission and sequestration facts on hand to help students understand quantities of CO<sub>2</sub>. Ex: a tree can absorb between 25 and 50 pounds of CO<sub>2</sub> per year, depending on species and age.

Have students stand up and arrange themselves in numerical order based on their emissions per year. Then, have students write their emissions from lowest to highest on the board. Discuss how the class can decrease their carbon emissions via transportation.

Pose a challenge for students to change their mode of transportation, if they are able, to a more sustainable option for a week.

Useful Links:

[EPA Greenhouse Gas Equivalencies Calculator](#)  
[Picturing a ton of CO<sub>2</sub>](#)

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### EX9: Have students match countries to their Greenhouse Gas output (20 to 80 points)

<i>Students can already:</i> <i>Identify some countries</i> <i>Use basic geography skills</i> <i>Understand the connection between GHG emissions and climate warming</i>	<i>Objective:</i> <i>Show students which countries are contributing to climate change most. Could be scaffolding for lessons on International Organizations, international cooperation, and/or national policy</i>	<i>Students will:</i> <i>Gain an understanding of major emitters</i> <i>Older students may discuss the link between emissions and economy/GDP</i>
<i>Approximate lesson time:</i> <i>15-30 minutes, depending on depth of discussion</i>	<i>Materials needed:</i> <i>Printouts of country outlines/shapes</i> <i>Printouts of CO2 amounts (between 10-20 countries, depending on student ability)</i> <i>Multiple sets if students will be working in groups</i>	<i>Related Common Core Standard:</i> <i>8.4.W; 8.4.C.A</i> <i>3.3.10.A2; 4.5.4-8.C</i> <i>3.3.5-6.A5; 4.3.12.A</i> <i>6.4.12.B; 8.3.12.C</i>

 *Submit the list of countries used.*

 *Submit a brief description of the discussion (maximum 5 sentences).*

#### TEACHER'S NOTE

Teachers may choose countries relevant to student knowledge/interest, select from the top emitters, or choose a random selection. Be sure to include the US in your selection. It is recommended that data be taken from WRI's CAIT Climate Data Explorer, which shows historical to 2014 emissions, along with the mitigation pledges that countries have submitted to the United Nations Framework Convention on Climate Change (UNFCCC). Data can be found via [Climate Watch](#).

#### VOCABULARY

Greenhouse gases, carbon dioxide, climate change, emissions, emitters

#### PROCEDURE

*Optional intro:* Show students geographical outlines of the chosen countries and ask if anyone can identify at least one. Some students may struggle depending on their prior geographical knowledge. Ask students if someone would like to take a hint by looking at a globe or map. Allow students to look and match the shapes for 2-4 minutes, at least figuring out 80% of the provided countries. The teacher can help with remaining countries, demonstrating mnemonic devices to help students connect the shape to the name to the geographical area.

Elicit from students the similarities and differences between the countries. This may be as simple as size or continent, or as complex as GDP or governance. After a few answers, ask how those differences may affect the environment.

Bring student conversation around to climate impacts and carbon emissions. Tell students they will match each country to their carbon output (could be annual or historical, based on teacher choice). Have students split into groups or work as a whole class. Have students explain their reasoning for their matches.

Share the correct answers and explain and discuss international emissions as time and student capabilities allow.

Useful Links:

[Top 10 Emitters](#)

[Climate Watch Data](#)

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## EX10: Host a sustainability advocacy poster competition (20 to 80 points)

<i>Students can already:</i> Understand the impact of their behavior Draw and write or copy	<i>Objective:</i> Students will create advocacy posters for a specific behavior related to sustainability	<i>Students will:</i> Refine their arguments for use on a poster and be able to explain to others why and how to change their behavior
<i>Approximate lesson time:</i> 30-45 minutes	<i>Materials needed:</i> Poster paper/poster board Markers, crayons, pencils	<i>Related Common Core Standard:</i> ELP.4.S.9-12.3-5; ELP.1.S.1-3.4 1.4.9-10; ELP.2.S.9-12.4 1.2.5-7.I; 3.6.9-12.E; 9.3.K-12.G1

 *Submit a photo of the winning poster(s).*

 *Submit a photo of the posters placed around the school.*

### VOCABULARY

Advocacy, argument, behavior change, encourage

### PROCEDURE

Ask students if there is anything about student or teacher behavior at school that they would like to change. Older students may also be able to ponder larger societal changes. Guide student conversation by drawing on previous lessons about sustainability-related topics.

Narrow down issues that have come up to 3-5 topics and have the class vote for the issue that they would like to advocate for. Possible issues could be: straws, air quality, endangered species, bullying, gender bias, racism, single-use plastic, public transportation, biking, “let it mellow”, food waste, ugly CSA; water conservation while hand-washing, brushing teeth, cleaning paint palettes; turning off lights when leaving a room, vampire power, etc.

Have students work in groups or a class circle to discuss how they could talk to people about making a change in their behavior/choices. What would be convincing? What would turn people away? Do the students always choose the most sustainable behavior? Why or why not? Have them think about barriers and messaging to the best of their ability.

Have students return to their desks to work individually to create a poster using the ideas that they just discussed. Each student should create a unique poster addressing the sustainability issue. Provide some class time for them to work, and if necessary, allow them to finish at home.

Students will then vote for their favorite finished poster. This can be facilitated by having students write their vote on a piece of scrap paper and putting it in a bowl/hat to be counted, or by giving students a sticker which they can put on the back of their chosen poster to represent their vote.

*Optional:* allow more students to vote by hanging all posters in the hall with a voting box and simple instructions.

Once a winner has been selected, award a prize as fits with your classroom management style. The winning poster can be copied and hung around the school campus in a variety of locations to push the new advocacy campaign. The remaining posters may be hung in the hall or cafeteria.

*NOTE: For an extra creativity and design challenge, have students make their posters using cutouts from old magazines or newspapers (This way, this action can do double duty with PLG: Create art out of recycled or found objects).*

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**EX11: Introduce students to an endangered species – listening comprehension and drawing (10 to 40 points)**

<p><i>Students can already:</i>  <i>Listen for specific information</i>  <i>Comfortably hold a pencil or pen</i>  <i>Describe visual characteristics of plants and animals</i></p>	<p><i>Objective:</i>  <i>Students will further their knowledge of biodiversity</i></p>	<p><i>Students will:</i>  <i>Learn the specific characteristics of an endangered species (as chosen by the teacher)</i></p>
<p><i>Approximate lesson time:</i>  <i>20 minutes</i></p>	<p><i>Materials needed:</i>  <i>Chosen animal/plant photo, video, book, or essay</i>  <i>An animal/plant photo for each pair or students</i>  <i>A timer</i></p>	<p><i>Related Common Core Standard:</i>  <i>ELP.4.S.9-12.3-5</i>  <i>4.1.1-12.D; 4.1.10.A</i></p>

 *Submit a list of the animals used in the lesson.*

 *Submit a selection of the drawings students completed.*

**VOCABULARY**

Endangered, threatened, habitat, conservation

**PROCEDURE**

The world is filled with an impressive array of biodiversity. Introduce your students to the weird and wonderful creatures of our planet, with a particular focus on endangered species.

Prepare a few species of plants and animals to share with students based on their interests. Species could include types of birds, fish, trees, small mammals, reptiles, insects, etc.

Students can either use a reference photo or a descriptive paragraph of the animal/plant to complete a comprehension drawing activity. If a description is provided, the teacher should have a photo of the species on hand to show students after the activity is completed.

Split students into pairs. One student will describe, and the other student will draw. They can't look at each other's paper!

To facilitate this, teachers may have students sit 5-10 feet away from each other, or put their desks back to back. Without providing any background information about the species, hand out the description/photo and have students start describing and drawing. Set a timer for five (5) minutes.

Compare students' drawings to the original and praise those who were close and/or particularly creative or hilarious. Ask students what characteristic stood out to them and other thoughts about their plant/animal.

Share with students the name, habitat, and threatened status of the plants/animals they drew. If students are able, discuss why those species are threatened.

Let students choose the one they're most interested in and give them some additional information through video, book, essay, more photos, or oral descriptions. Give students some independent time with the material.

Useful Links:

[US Fish & Wildlife Service - Endangered & Threatened Animals Listed Species in Pennsylvania](#)

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## EX12: Have students interview small business owners (20 to 80 points)

<i>Students can already:</i> Complete tasks independently Understand sequencing Create effective WH questions	<i>Objective:</i> Students will learn about their community and begin to understand what goes into running a business.	<i>Students will:</i> Prepare interview questions Practice interviewing Interview a small business owner Create a final interview article/piece
<i>Approximate lesson time:</i> 3-4 days 30-40 minutes each	<i>Materials needed:</i> Prepare by asking business owners to participate	<i>Related Common Core Standard:</i> 13.2.8.A; 13.2.11.A 15.2.5-12.H; ELP.1.W.9-12.3 15.5.2.D; 1.4.3-12.D; 6.1.12.C 6.2.1-7.E; 6.5.2.F; 15.1.2.N; 15.1.5.I,N; 15.7.8.C

 Submit a copy of the finalized interview articles that students have written.

### TEACHER'S NOTE

This lesson can be adapted to any classroom subject by selectively choosing the businesses and the interview questions. Teachers should contact potential interview candidates in advance to request participation and inform them of the project. If you'd like help getting connected with a local small business owner, contact us at [challenge@sustainablepittsburgh.org](mailto:challenge@sustainablepittsburgh.org) for an introduction.

This lesson will need to be conducted over a few days so that students have time to practice, interview, write, edit, turn in, and optionally, put together the class Small Business Journal.

### VOCABULARY

Economy, small business, employer/employee, interview etiquette

### PROCEDURE

Begin by introducing the idea of owning a small business. Ask students if they would like to have a business. Some might be enticed by the idea of being their own boss. Ask students if they know what kinds of responsibilities they might have if they owned their own business. Brainstorm business needs as a class.

Inform students they will be conducting interviews with small business owners. Students may complete interviews individually or in small groups.

Based on the available candidates you've already spoken to, have students choose which business owner they will interview, either by seeing and choosing the name of the business or by pulling a name out of a hat.

Once they have their interviewee, have students brainstorm questions. What would they want to ask? Guide students to ask a variety of questions related to each of the Three Es: Equity, Environment, and Economy.

Introduce interview techniques and follow-up questions. Ex: wording questions to get more than yes/no answers; listening skills, note-taking, recording etiquette, etc. Provide a few examples based on students' questions, then have students practice in pairs.

The interviews themselves can be conducted during class time by inviting small business owners to the school or by have students make a phone call or video chat to the interviewee. They may also be assigned as homework.

Optional: Have students consolidate their interviews by creating a Small Business Journal as a class, either in writing or digitally. This can include articles, quotes, images, and even video.

Useful Links:

[SP Designated Sustainable Small Businesses](#)

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**EX13: Collaboratively create a list of classroom expectations and behaviors (20 to 80 points)**

<i>Students can already: Understand expectations Know what they should/shouldn't do in class</i>	<i>Objective: Students engaged in creating the expectations for their learning environment will be more invested in following through</i>	<i>Students will: Engage in collaborative decision- making Create collective goals</i>
<i>Approximate lesson time: 30-40 minutes</i>	<i>Materials needed: Paper, markers, poster board for final list</i>	<i>Related Common Core Standard: PA SAS Safe &amp; Supportive Schools – Engagement &amp; Environment 5.2.K-12.D; 5.3.K-4.F</i>

 *Submit a photo of the list of rules you and your students came up with.*

**TEACHER'S NOTE**

Think about the goals you have for your class, the things your students want to accomplish, and how to ensure everyone reaches the finish line. Often, the teacher sets expectations for learning and behavior. Including students in creating a collaborative list of rules can give students ownership of classroom procedures and student interactions, along with agreed-upon accountability for their own behavior.

**VOCABULARY**

Empathy, inclusion, behavior

**PROCEDURE**

Have students brainstorm things people do that make others feel good and things that might make others feel bad (practicing empathy). Ask students to think about the classroom as a place to learn and grow. What kinds of behaviors can help make that growth happen?

For younger students, the teacher may consolidate and write down students' ideas. For older students, they might break out into groups to brainstorm their "good" and "bad" words.

As a group, encourage students to come up with their rules and expectations for classroom behavior. Try to distill ideas down to as few rules as possible so that they are easy to reference and remember.

Students will likely need guidance throughout the process, so teacher may ask questions to build empathetic thinking. Aim for positive student interactions like ability to ask questions without embarrassment, speaking up even if thoughts aren't perfectly formed, seeing the teacher as an ally, full participation, helping each other understand concepts, a culture of honesty, kindness, etc.

Once students have agreed upon collective behaviors, have students create a poster (or two) with ground rules to hang in the classroom for the duration of the year/semester. Be sure to reflect upon the ground rules regularly and as needed for activities or discussions.

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**EX14: Have students participate in a sharing circle (20 to 80 points)**

<i>Students can already: Verbally express feelings Listen in a group setting Empathize (beginning)</i>	<i>Objective: To have students share positive and negative feelings or experiences in a group setting in order to build trust and practice empathy</i>	<i>Students will: Learn that they are not alone Improve empathy and acceptance Practice expressing themselves</i>
<i>Approximate lesson time: 30-45 minutes</i>	<i>Materials needed: Index cards or scrap paper Writing utensils A hat/bowl/collection point</i>	<i>Related Common Core Standard: PA SAS Safe &amp; Supportive Schools – Engagement &amp; Environment 5.2.K-12.D; 11.2.3.H; 1.5.K.D 10.4.3-12.F</i>

 *Submit a brief reflection on how students engaged with each other (maximum 6 sentences).*

**TEACHER'S NOTE**

This lesson is an exercise that requires students to practice being empathetic listeners. Ideally, your students already have some practice with empathy skills and a foundation to build on. If your class needs to create a foundation, *EX13: Collaboratively create a list of classroom expectations and behaviors* is recommended as a first step before completing this lesson.

This lesson can have students share either positive or negative feelings, or both. The teacher can decide which direction to take the activity and what students are capable of at the time.

This lesson may require some trust in your students. Undoubtedly, someone will feel uncomfortable and a range of emotional reactions are possible. It is important to know your students and anticipate, to the best of your ability, what their actions and answers might be so that you are prepared to address any scenario.

**VOCABULARY**

Empathy, kindness, active listening

**PROCEDURE**

Have students sit in a circle. Review empathy skills – active listening, kindness, putting yourself in another person's shoes, checking your reactions, etc. Encourage students to practice these skills throughout this activity. Remind students that we aren't all perfect at these, so if someone makes a mistake, be patient and kind.

As a warm-up, have students complete a brief empathy-building exercise such as holding hands, maintaining eye contact with the person next to them, checking in, sharing compliments, or any other exercise that helps your students bond.

When you feel they're ready, ask them to think about something that's been bothering them lately. It can be big or small, whether they feel it's important or not, at home or at school. Teachers may provide

a more targeted or less intimidating question if student needs dictate. Ex: Write down something that has made you sad before. Teachers may also choose to begin with positive experiences. Ex: Write down something that you're proud of.

Explain the procedure: Students will take an index card/paper/scrap and write down their answer anonymously. All thoughts will be placed into a bowl/hat/receptacle and mixed up. Then they will be read aloud, either by the teacher or the bowl may be passed around the circle for students to choose a random thought to read aloud.

Before reading, it is important to emphasize that students should practice being empathetic. It may help to be explicit about some rules, such as not making fun of other answers, not automatically guessing whose paper it might be, thinking about how they might feel if they were in that situation, etc.

Read aloud or have students read aloud the slips of paper and discuss. Ask questions to guide them, asking for their opinions, advice, and help if it's a problem that students can solve together.

Close by thanking students for sharing and encourage them to confide in each other, their friends, family, or even you as their teacher.

Useful Links:

[The Psychology of Emotional and Cognitive Empathy](#)

[Building Empathy in Schools](#)

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## INNOVATION

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### **INK12: Innovate your own action (points determined by SP Challenge team)**

Has your school or classroom implemented a sustainable policy, program, or taken a sustainable action not covered in the SP K-12 Challenge? Submit your action description to the SP team for points, and we may create a new action for any participant to take. By submitting a new and innovative action, you can help our region stay at the forefront of sustainability while gaining points and recognition for your school.

 *Submit a description of your action, along with any photo, receipts, documents, policies, or proof necessary to validate the completion of your action.*

Innovation points will be awarded on the same scale and structure used to determine the points for existing actions in the SP Challenge. *See the Points Structure explanation in the Introduction for more information.*

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## READINGS FOR TEACHERS

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### **Critical Thinking**

[10 Tips for Teaching Kids to be Awesome Critical Thinkers](#)  
[Teach All Students to Think Critically](#)

### **More Lesson Plans, Activities, and Games**

[Crayola ColorCycle Lesson Plans](#)  
[VA SEA - Scientists and Educators Alliance - Lesson Plans](#)  
[Start Empathy Toolkit - Lesson Plans](#)  
[Air Quality Lesson from Healthy Schools PA](#)  
[PBS Kids Apps](#)  
[National Education Association Activities & Resources](#)  
[ALCOSAN Scholastic Outreach](#)  
[Pennsylvania Resources Council School Programs](#)

### **Classroom Supplies**

[Wisdom Supply Co. Products](#)  
[Wisdom Supply Co. Zero Waste Classrooms](#)  
[The Education Partnership](#)

### **Administrative Resources**

[Reuse Central](#)  
[Green and Healthy Schools Academy](#)

[Healthy Schools PA](#)

[Raise Your Hand for Health Guide](#)

**[Empathy and Inclusion](#)**

[Start Empathy Toolkit](#)

[Strategies for Increasing Emotional Intelligence](#)

[Kindness Activities and Empathy Worksheets](#)

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