

WE ARE ALL CREW

**“There are no passengers on Spaceship Earth,
we are all crew.”**

Marshall McLuhan, “At the Moment of Sputnik” in *Journal of Communication*, Issue 24
(Winter 1974) © Estate of Marshall McLuhan, with permission.

This artist book is an extension of the Art for Science Mural project, located in Columbia, Missouri, and funded by the 2018 Art for Science Rising initiative of the Union of Concerned Scientists. The book consists of a recreation of the mural design in coloring book format, and a workbook which can be used to create an asset map of a given locale's sustainable resources so that readers can make conscious choices about how they use the assets within a given community. It is meant to be a decentralized, open source (with a copyleft license) educational and information-gathering tool.

The Marshall McLuhan quote featured in the mural suggests we must do the work, and be responsible, for our one and only home. One way that this work can be done is collating and sharing information about the available sustainable resources in a given area.

These two projects, the mural and artist book, were made possible through the sponsorship of Science Rising and the Union of Concerned Scientists. More information about this project can be found at: residentarts.org/we-are-all-crew.

#artliveshere

#artforscience

#artforsciencerising

#sciencerising

#comoclimateaction

#climateactionmap

#weareallcrew

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Why cities?

“Cities are poised to lead climate change efforts. Collectively, the world’s cities are responsible for 70% of GHG emissions.¹ Cities are also at the frontlines of bearing climate change impacts, such as urban heat islands, flooding, drought and risks to optimal public health.”

— Climate Action and Adaptation Plan (CAAP), Columbia, Missouri, 2019

This project was first prompted in mural form by the launch of a task force to create a Climate Action and Adaptation Plan in Columbia, Missouri (download the PDF document at <https://bit.ly/2x9NODI>).

Like Columbia, Missouri’s City Council, Resident Arts and the Union of Concerned Scientists believe that climate action is a priority for individuals and for legislative bodies. While the city identified vulnerabilities in key areas such as health, safety, and well-being, natural resources, the built environment, water supply and quality, and energy, materials and waste, for the specific climate make-up of Columbia, the actions presented in the plan are applicable to a wide range of ecological and economic systems.

“In general, children, older adults, women who are pregnant, outdoor workers, those with pre-existing illnesses, and those with weak social ties are more vulnerable to climate change related health impacts. Low-income communities may have fewer options to respond and prepare for impacts, and may not have access to quality healthcare.”

— CAAP, 2019

A central theme to the plan is equity and an understanding that not all actions are available to all people. For instance, not every family can install solar panels on their home. Perhaps they rent, or cannot afford the installation. This doesn’t mean that there isn’t anything they can do to reduce their energy consumption or improve their energy efficiency. Identifying that we have a choice, and then knowing what our choices are, is a way that we can overcome a barrier preventing us from taking action.

This book is designed to help the users, as a team, learn about what businesses in their city or town are doing to combat climate change, one recycled cup or energy-efficient light fixture at a time. And, to help the user of this book become a more informed individual who is empowered to make better choices with their purchases, and become an advocate for better practices within their own community.

While anyone can do this activity, it is designed especially with teen and young adult audiences in mind. They are tomorrow’s voters, and it’s their future that will be affected most greatly. We hope that high-school and college science and social studies classrooms, scout camps, youth groups, and other clubs will use this fun and proactive tool, to share their colorful interpretations of the design and their research findings, to build on the international movement in which we can all play a role.

We are all crew.

Reducing our carbon footprint

A carbon footprint is defined as the total amount of greenhouse gases produced to directly and indirectly support human activities, usually expressed in equivalent tons of carbon dioxide (CO₂).² Greenhouse gases are closely tied to the use of fuel, energy, and water systems and therefore almost every industry and household participates in their production. Each action that reduces our use and, ultimately, our dependence on these industries and products will have the most impact on our individual, local, national, and global carbon footprint.

AGRICULTURE AND INDUSTRY

Greenhouse gas emissions (GHGs) related to agriculture totaled 582 million metric tons in 2017, which represented about 9% of total GHGs. This combined with other industry (22%) equals 31% of total GHGs.

Emissions from industry primarily come from burning fossil fuels for energy, as well as certain chemical reactions necessary to produce goods from raw materials. GHG emissions from agriculture come from livestock such as cows, agricultural soils, and rice production.

Restaurants, grocery stores, and other businesses who work with food can purchase raw materials from local farms that do not use chemical pesticides, and use sustainable practices. Other businesses can source their raw materials locally, and ensure their products do not include high-emissions materials.

ABOUT 9% OF U.S. GREENHOUSE GAS EMISSIONS RESULT FROM THE PRODUCTION OF FOOD. EATING LOCALLY GROWN FOOD CAN REDUCE EMISSIONS ASSOCIATED WITH TRANSPORTING THE FOOD YOU CONSUME FROM FIELD TO TABLE.

TRANSPORTATION

Transportation is the largest individual contributor of GHGs at 29% of the total. GHG emissions from transportation primarily come from burning fossil fuel for our cars, trucks, ships, trains, and planes. Over 90% of the fuel used for transportation is petroleum based, primarily gasoline and diesel.³

Businesses and individuals can use or encourage their employees to use alternative forms of transportation. Businesses can source products locally to reduce fossil fuels used to transport raw materials.

ENERGY

Energy consumption represents 28% of the United States' total GHG emissions. Approximately 62.9% of our electricity comes from burning fossil fuels, mostly coal and natural gas.⁴ There are many ways that we can reduce waste and increase efficiency of energy production, distribution and consumption, including investing in clean energy such as wind, hydro, and geothermal sources and using energy-efficient lighting, heating and cooling, and other appliances.

Businesses and homes can do this by using EnergyStar approved appliances, turning off computers and lights when they're not in use, closing shades and insulating windows to reduce usage of heating and cooling systems, and participating in other transportation, agriculture, industrial, human health, and water climate-conscious activities that conserve energy and cut waste.

INSTALLING SOLAR PANELS ON YOUR HOME CAN GREATLY REDUCE YOUR CARBON FOOTPRINT WITH LONG TERM COST SAVINGS. SOLAR PANELS CREATE ENERGY WHILE PRODUCING ZERO CARBON EMISSIONS.

HUMAN AND SOCIETAL HEALTH

Residential and commercial sectors combined represent 12% of GHGs. Emissions from businesses and homes arise primarily from fossil fuels burned for heat, the use of products containing GHGs, and the handling of waste.

Home and business owners can reduce their impact by recycling paper, plastic, metal and other materials. Reducing electricity use and dependence on fossil fuels also helps. Energy-efficient thermostats, irrigation systems, and alternative transportation methods will greatly reduce carbon footprints at home and at work.

WATER

Producing clean water is a fundamental human need, and water is required for most energy production. In fact, energy production in the U.S. requires more water than any other sector. According to the U.S. Geological Survey, 48% of water withdrawals in the United States are used for thermoelectric power production. Water is also used to grow biofuels and to extract coal, petroleum and natural gas.⁵

Businesses and individuals can reduce their carbon footprint by conserving water. They can do this by ensuring they don't waste water, and also by using energy-efficient appliances, heating and lighting. Businesses can source products locally to reduce their consumption of fossil fuels when transporting products and raw materials.

RAIN BARRELS AND RAIN GARDENS COLLECT RUNOFF FROM ROOFTOPS, DRIVEWAYS, AND SIDEWALKS. THIS RESULTS IN LESS WATER RUNNING INTO OUR STREAMS DURING A HEAVY RAIN, HELPING REDUCE THE POTENTIAL FOR FLOODING. AS A BONUS, WATER FROM RAIN BARRELS CAN BE USED TO WATER YOUR LAWN, SAVING YOU MONEY.

Research methods

Here is a suggested procedure for you to find out what businesses in your community are doing to reduce their GHGs.

ONLINE

Information like the business name, location and website can all be collected online before conducting further research.

IN-PERSON INTERVIEWS

Likely, you will need to speak with the staff or owner of the business in order to collect all the information on the checklist. A helpful script that you can read or revise and use to speak with businesses about their sustainable practices is below.

Please remember to be respectful of business operations, do not pop in during busy hours, and if possible call ahead to schedule an appointment. If a business does not want to participate, or does not participate in ANY of the checklist items, simply do not include them in the list.

SCRIPT: REQUESTING AN INTERVIEW

Hello, my name is [name], and I am a student at [school] (include a description of who you are). I am collecting information about local businesses for a project to map the sustainable practices in this area.

I would like to schedule an interview with you that will only take 5–10 minutes to go through a checklist consisting of about 30 yes or no questions.

The data collected in this project will be compiled and returned to Resident Arts (Columbia, Missouri). It will become a part of a national art project funded by the Union of Concerned Scientists, in which various groups can conduct this research and can aid in creating a map of the country's businesses and their environmentally sustainable practices.

SCRIPT: CONDUCTING AN INTERVIEW

Thank you for meeting with me today. I have a checklist I would like to go through with you to see what sustainable practices your business participates in. This checklist is part of an art and science collaborative project created by Resident Arts and funded by the Union of Concerned Scientists (both nonprofits). The information will be compiled along with information from businesses all over the country to make a map of sustainable business practices. Your business does not have to be a “Green” business to participate, you just have to answer a few questions. The goal of this project is to help consumers learn about the businesses in their area. If you are interested in learning more, you can contact info@residentarts.org.

Then ask them to respond to the checklist.

STEP BY STEP INSTRUCTIONS

(Use a pencil)

1. Choose the boundaries of the map.
Choose a commercial district. This may be a single downtown street, an entire downtown area, a neighborhood, or square block, depending on the size and density of your city/town. Use an area that will have a minimum of 10 businesses. We have provided room for 20 businesses, but you can download additional pages at residentarts.org/we-are-all-crew if you would like to do more.
2. Do a test run. Speaking to people can be intimidating, but it doesn't have to be. Visit a single business that you regularly frequent. Depending on the size of your group, you may choose to do this in teams of two or three or split up to cover more ground. One person can read through the checklist, while the other checks boxes, and a third can keep an eye on time and make sure you don't go over 10 minutes. Some staff may be chattier than others.

3. Conduct your research, collecting your responses in the checklist. First write the name of the business down as you approach, using the provided numbered list. The numbered list of businesses correspond with the numbered boxes on the provided checklist.

Check a box if the business DOES do the checklist item, leave the box blank if it does not or write “N/A” if the question is not applicable.

For example:

3. Name Resident Arts
Address 1023 E. Walnut St. #3
Website residentarts.org
Score 21/31

Does the business:

	1	2	3	4	5
Recycle paper?			X		

4. Compile your map. Put numbers down on the map where the businesses are located.
5. Score the businesses based on their responses. Count how many boxes were checked against how many were applicable. For instance, If 25 checklist items are applicable, and the business responded that they participate in 20 checklist items, their score is 20/25.
6. What did you discover? Read and respond to the discussion points at the end of the book.

BUSINESSES CAN SAVE ENERGY AND REDUCE THEIR CARBON FOOTPRINT BY RECYCLING AND COMPOSTING, USING RECYCLED PAPER FOR PRINTING, INSTALLING MOTION SENSORS ON LIGHTS, TURNING OFF COMPUTERS, AND OTHER ENERGY EFFICIENCY MEASURES.

COLOR!

The front of this book is the outline of the mural design, which was completed in Fall 2018 as part of the Art for Science Rising Project, funded by the Union of Concerned Scientists. You can see photos of the mural on our website:

residentarts.org/we-are-all-crew.

Coloring is fun and proven to be a calming activity, but more than that, colorful imagery is a great way to generate excitement and get people interested in participating in this project. This is a fun form of advocacy that people of any age or skill level can do. Color the design using paint, colored pencils, crayons, or markers and share it on social media, tagging @residentarts and using the hashtags: #artliveshere #artforscience #artforsciencerising #sciencerising #comoclimateaction #climateactionmap #weareallcrew

Images of completed books will be added to our website!

WEATHERIZING BY INSULATING AND SEALING IS A COST-EFFECTIVE WAY TO REDUCE YOUR HOME'S ENERGY USE, SAVE MONEY AND REDUCE CARBON EMISSIONS.

WHILE AT WORK, EMPLOYEES CAN REDUCE WASTE BY BRINGING A FULL PLACE SETTING FROM HOME, SETTING COMPUTERS, MONITORS, AND PRINTERS TO SLEEP AFTER SHORT PERIODS OF INACTIVITY, AND BRINGING A SWEATER FROM HOME INSTEAD OF USING A SPACE HEATER.

BURNING ONE GALLON OF GASOLINE RELEASES 20 POUNDS OF CARBON POLLUTION INTO THE ATMOSPHERE. WALKING, CYCLING, OR TAKING TRANSIT TO WORK OR SCHOOL A FEW TIMES A WEEK CAN GREATLY REDUCE YOUR INDIVIDUAL CARBON FOOTPRINT.

A TREE CAN ABSORB 48 POUNDS OF CARBON EACH YEAR. THEY REMOVE CARBON DIOXIDE FROM THE ATMOSPHERE VIA PHOTOSYNTHESIS. PLANTING NEW TREES TO REPLACE THOSE CLEARED FOR INDUSTRY AND FARMING WILL HELP REDUCE ATMOSPHERIC CARBON LEVELS.

SHARE YOUR FINDINGS

Make sure you have drawn the map, collected the addresses and websites of businesses, and completed the checklist for at least 10 businesses. Once you have done this, you can scan and email the scanned document back to info@residentarts.org.

If you have colored in the front, please be sure to include images of the front. You can mail the entire completed book back to:

Attn: Madeleine LeMieux
Resident Arts
623 Bluffdale Dr.
Columbia, MO 65201

Books that are completed and collected will be made available to the public to view onsite at Resident Arts' studio, and/or may be featured in an exhibition at a future date.

Data compiled from this project will be entered into a database that can be accessed at: residentarts.org/we-are-all-crew.

What comes next

Now that you have completed this project, what's next? We hope that you and your team will use this information to make choices, advocate on behalf of sustainable practices, and share this project with other teams so that the impact of this project can continue to expand.

PURCHASING FOOD FROM SOURCES THAT USE SUSTAINABLE FARMING PRACTICES SUCH AS ORGANIC FARMING AND RESPONSIBLE IRRIGATION HELPS TO PROMOTE SOIL HEALTH AND REDUCES THE DISTRIBUTION OF POLLUTANTS INTO WATERSHEDS.

MAKING CHOICES

Use the information you collect in this book to make choices about where you spend your money. Choosing businesses that participate in more sustainable practices is one way that we can lessen our own impact on the changing climate, and is also a way to encourage less sustainable businesses to improve their sustainability practices to compete with other offerings in the area.

THE HEALTH OF A STREAM REFLECTS THE WATERSHED THAT FEEDS INTO IT, WITH HUMAN ACTIVITIES OFTEN RESULTING IN THE DEGRADATION OF A STREAM'S WATER QUALITY. MINIMIZING OUR IMPACTS IN THE WATERSHED IS THE BEST WAY TO HELP IMPROVE A STREAM'S WATER QUALITY.

ADVOCACY

You can share the compiled information with businesses you survey to show them how they stack up against other businesses in the area. If they are not participating in as many sustainable practices as their neighbors, you can encourage them to start. If they are participating in more sustainable practices than their neighbors, they can promote that information to their audience as a benefit of using their services or purchasing their goods.

You can also take this information to encourage local lawmakers to adopt plans similar to Columbia, Missouri's Climate Action and Adaptation Plan. Reaching out to your representatives with the information collected in this book can help them to understand the strengths and weaknesses of your locale.

You can find your legislators here:
www.votervoice.net/ARTSUSA/address.

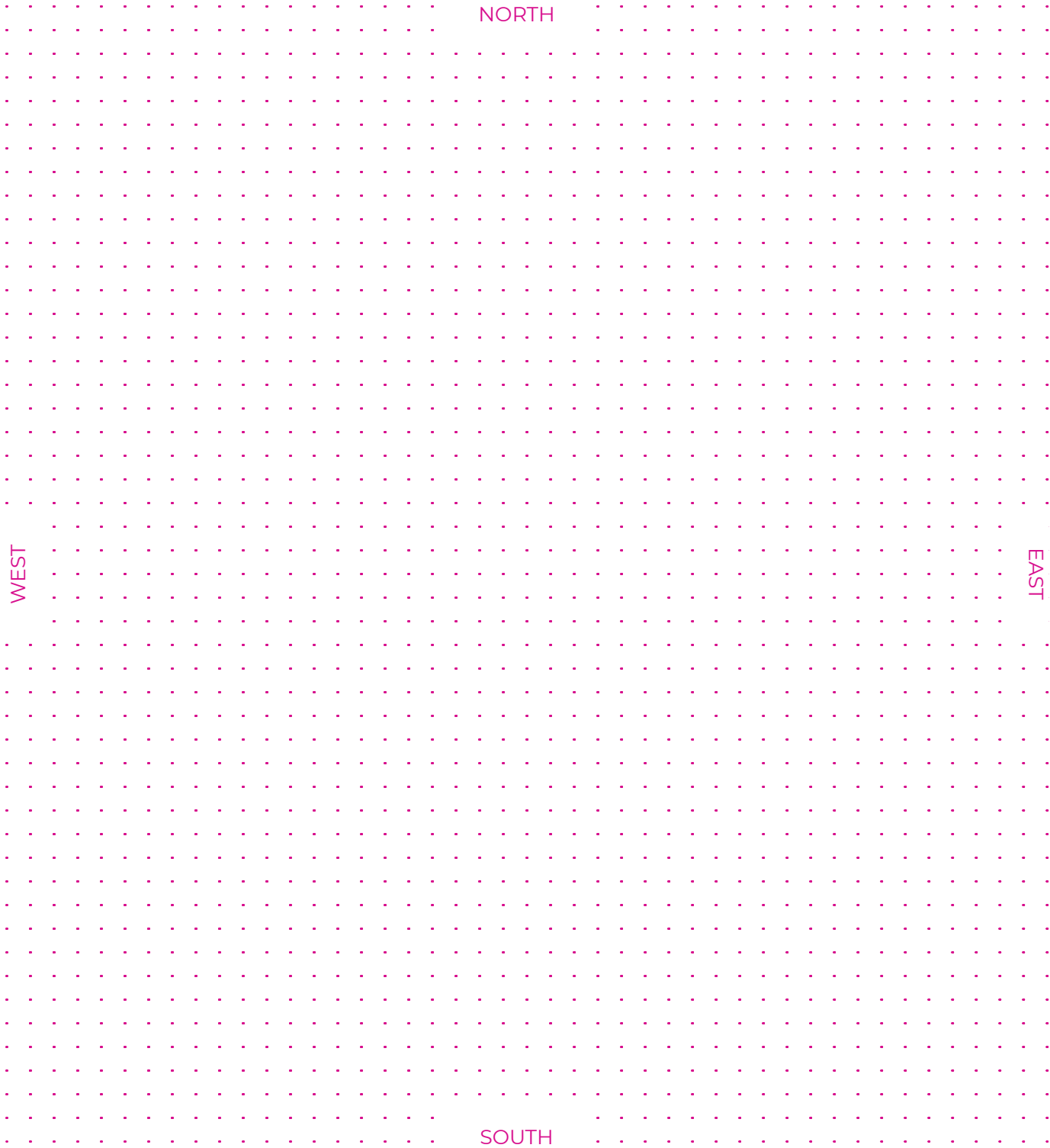
SHIFTING RELIANCE FROM GASOLINE TO ELECTRIC VEHICLES REDUCES AIR POLLUTION THAT HARMS OUR LUNGS AND WARMS OUR PLANET.

SHARE THIS PROJECT

Do you think other areas in your city, or neighboring cities may benefit from completing this project? Share it! You can reach out directly to friends or organizations that may also want to complete this project in their area or contact Resident Arts with their information, and we'll reach out on your behalf!

USING COMPOST INSTEAD OF CHEMICAL FERTILIZERS IN HOME AND COMMUNITY GARDENS CAN PROTECT SOIL HEALTH AND STREAM WATER QUALITY.

Draw the boundaries



Boundary to North _____ Boundary to East _____

Boundary to South _____ Boundary to West _____

Resource list

1. Name _____
Address _____
Website _____
Score _____

2. Name _____
Address _____
Website _____
Score _____

3. Name _____
Address _____
Website _____
Score _____

4. Name _____
Address _____
Website _____
Score _____

5. Name _____
Address _____
Website _____
Score _____

6. Name _____
Address _____
Website _____
Score _____

7. Name _____
Address _____
Website _____
Score _____

8. Name _____
Address _____
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Score _____

9. Name _____
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10. Name _____
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11. Name _____
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12. Name _____
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13. Name _____
Address _____
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Score _____

14. Name _____
Address _____
Website _____
Score _____

15. Name _____
Address _____
Website _____
Score _____

16. Name _____
Address _____
Website _____
Score _____

17. Name _____
Address _____
Website _____
Score _____

18. Name _____
Address _____
Website _____
Score _____

19. Name _____
Address _____
Website _____
Score _____

20. Name _____
Address _____
Website _____
Score _____

Sustainability checklist

Does the business...	Number corresponds to map and resource list >
1. Recycle paper?	
2. Recycle plastic?	
3. Recycle metal?	
4. Recycle printer ink?	
5. Recycle other materials?	
6. Use recycled materials for packing?	
7. Ask customers if they need a receipt before printing it?	
8. Reuse packaging from suppliers?	
9. Minimize unnecessary packaging on products?	
10. Compost food waste?	
11. Have a trash can or cigarette butt extinguisher outside their establishment?	
12. Clean up litter left around the outside of their establishment?	
13. Have a water bottle refill station?	
14. Source products locally?	
15. Use products made from recycled material? (i.e., office paper, disposable cutlery, etc.)	
16. Have energy-efficient lighting?	
17. Limit the usage of air conditioning and heating?	
18. Turn off lights/set computers to sleep when the business is closed?	
19. Use green cleaning products?	
20. Use window shades, insulation, etc. to reduce energy consumption?	
21. Encourage/incentivize employees to walk or bike to work?	
22. Use a non-traditional water heating system, like tankless, electric, or solar water heaters?	
23. Have water-conserving toilets?	
24. Use smart thermostats? (Detect temperature and other factors and adjust accordingly.)	
25. Use smart irrigation systems? (Determine factors like soil wetness and irrigate accordingly.)	
26. Use smart electrical systems? (Motion sensors or timers shut off electronics when not in use.)	
27. Host or participate in community gardening?	
28. Wash any dishes and/or laundry in full loads?	
29. Use energy-efficient appliances?	
30. Only provide water to customers if they ask?	
31. Not provide single-use straws to customers?	
32. Not provide single-use, disposable styrofoam containers?	
33. Advocate to their customers, staff, and/or local legislators for climate action?	

Discussion

What did you and your group gain from completing this research? Consider these questions and use them as prompts for discussion among group participants. Try writing on your own first, and sharing once you have collected your thoughts. If you use a separate sheet of paper to write your answers, please include it when you return your completed book to Resident Arts.

1. How receptive were business owners/staff while talking to you about their sustainability practices? Did they seem excited? Indifferent? Defensive? Why do you think that is? What conversations do you think would get more businesses excited about reducing their impact on the environment?
2. Generally speaking, were the businesses you interviewed engaging in sustainable practices? Looking back at your checklist and scores are there some actions that many of the businesses are not taking? What could you do to encourage them to take those actions? If not you, who else could influence their actions?
3. Who is most affected by climate change in your area? What kinds of things can they do to reduce their carbon footprint? How do the actions you take to reduce your own carbon footprint affect the most vulnerable populations?
4. What does your city do to encourage climate action? Are there any strategic plans in place to adopt sustainable practices at a city level? If not, what would it take to implement something similar to Columbia's Climate Action and Adaptation Plan in your area? If so, take a look at it — how can you help encourage sustainability with the knowledge you've gained from this exercise?
5. What is the most important thing you've learned by doing this exercise? How will what you've learned change your behavior or help you to make choices in the future? How will you use this information to affect the behavior of others, whether friends and family or local and state legislators?