

# Green Buildings Pre-Trip Activities

To prepare your students for the investigations they will do on site, we recommend doing these activities prior to your visit.

## Things are Heating Up: *An Urban Heat Island Experiment*

**Purpose:** To introduce students to the climatic concept of urban heat islands.

**Materials:**

- Pencil
- Paper
- Rulers
- Thermometers
- Data Collection Sheets

*Note: Students can work on this activity individually or in small groups.*

1. Take your class out to the schoolyard on a warm, sunny day. Have the students make predictions about which areas of the yard will be warmest, and which will be coolest.
2. Choose four of these areas (should include areas with both natural ground covering [plants, grasses] and asphalt) and have the students write down the location names on the top of their data collection sheets.
3. Hand out thermometers and rulers to each student or group.
4. Instruct the students to take 5 temperature measurements in each of the designated areas and fill out any other information required on the data collection sheet.
  - When taking temperatures, be sure the students record all temperatures at the same height off the ground to ensure comparable data. Use the rulers to determine this height. Be sure to shade the thermometer from direct sunlight when taking a measurement to ensure an accurate reading.
5. When back in the classroom, review the students' findings. Ask the students:
  - Are the results for each area what you predicted? Why or why not?
  - Which areas were warmest? Coolest? Why do you think so?
  - Based on your results, which do you think would be warmer: urban areas or rural areas?

*Source: Windows to the Universe "Feeling the Heat" by Lisa Gardiner*

## How Green is Your City?

**Purpose:** To familiarize students with current sustainable design efforts in their own city and around the country.

**Materials:**

- Computer with internet access or other city resource materials
- Green City Report Card handout (2-sided)

1. Have the students separate into pairs.
2. Assign each pair of students a city. One pair should be assigned the city your school is located in and the other pairs should be assigned cities of similar size either nearby or around the country.
3. Let the students know that they will be doing a mini-research project to determine how sustainable or "green" their assigned city is.
4. Have students research their city online or in another way. Instruct the pairs to grade their city based on the criteria listed on the "Green City Report Card" handout.
5. Once students have graded their city, bring the class back together in order to discuss research findings and compare/contrast the cities.
6. Ask the students:
  - Were you surprised by any of the findings? Why or why not?
  - What were the most common sustainable city initiatives? Least common?
  - What suggestions would you give your city's mayor in order to increase the city's overall "green" rating?

*Source: "Green City" criteria adapted from NRDC's "Smarter City" project—[smartercities.nrdc.org](http://smartercities.nrdc.org)*

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# Green Building Post-Trip Activities

These activities will build upon the learning experiences from the field trip. We recommend doing these activities after your visit.

## Building X Design Sketch

Purpose: For students to creatively apply the data collected during the field trip

Materials:

- Paper
- Pencils
- Crayons, Markers, Colored Pencils, etc.

1. Have the students get back into the same teams they worked in during their field trip and take out their field journals.
2. Ask the students to tell you what they remember about the principles of sustainable design.
3. Ask the students to recall the environmental benefits of a green roof.
4. Reread the scenario “The City of Chicago Needs Your Help” in the field journal.
5. Let the students know that they are now going to use all of the research information they collected in their field journals to sketch a design for Building X’s green roof. Students can work on the design in groups or individually.
6. Be sure to have the students label the materials they are including in their design

## Building X Green Roof Proposal

Purpose: For students to present their research findings and designs in a written format.

Materials:

- Pencil
- Paper
- Building X design drawing

Steps:

1. Now that the students have done their background research and sketched a design for Building X’s green roof, as urban planners they must now present their research and designs to Building X’s owners in the form of a proposal.
2. Let the students know that they can be creative in the format of their proposal. Suggested formats include: writing a letter, a slideshow presentation, designing display boards, etc.
3. Have the students work in their original groups in order to decide on a proposal format.
4. Though each group may choose a different format, each proposal must include the following information:
  - Positive Environmental Impacts of Green Roofs
  - A description of the building materials included in the roof design and why
  - Example graphs from the field journal and the labeled design sketch
5. Have the groups present their projects to the class.

## Things Are Heating Up—Data Collection Table

	<u>Location 1:</u>	<u>Location 2:</u>	<u>Location 3:</u>	<u>Location 4:</u>
<b>Ground Cover Description</b>				
<b>Sun or Shade?</b>				
<b>Predicted Temperature</b>				
<b>Actual Temperature Recordings</b>	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.
<b>Average Temperature</b>				

# Green City Report Card

Use the following criteria, outlined by the National Resources Defense Council's *Smarter Cities* project, to help highlight your city's positive environmental initiatives and determine opportunities for sustainable policy expansion.

**CITY NAME AND LOCATION:** \_\_\_\_\_

## **Renewable Energy**

- If your city uses renewable energy sources, assign 1 point per source for each of the following:
  - Hydroelectric energy, solar energy, wind energy, and geothermal energy
- If power companies in your city give residents the opportunity to choose renewable energy sources to power their homes, give your city an additional 3 points.

RENEWABLE ENERGY POINT TOTAL: \_\_\_\_\_

## **City-wide Environmental Standards**

*Note: These standards must demonstrate the city's clear long-term commitment to achieving environmental performance.*

- Assign your city 1 point for having each of the following environmental standards/initiatives:
  - Electric car charging stations, Recycling program, Public transit options, Integrated Pest Management, Sustainable sewage policies (grey water usage, environmentally-friendly treatment plants, etc.)

ENVIRONMENTAL STANDARDS TOTAL: \_\_\_\_\_

## **Opportunities for Citizen Participation**

- If your city provides its residents with the opportunity to actively participate in achieving its environmental standards, assign 1 point per opportunity. Potential opportunities include:
  - Community environment days, plastic-bag initiatives, providing free or discounted compost and/or recycling bins, providing free or discounted low-flow shower heads, providing tax-breaks for native landscaping, community garden program, etc.

CITIZEN PARTICIPATION TOTAL: \_\_\_\_\_

## **Green Buildings**

- Assign your city 1 point for each of its LEED certified, silver and gold buildings.
- Assign your city 2 points for each of its LEED platinum buildings.

GREEN BUILDINGS TOTAL: \_\_\_\_\_

# Green City Report Card

## Green Space

- **Small City (less than 50,000 residents):** Assign 1 pt. for each park or community gardens
- **Medium City (between 50,000 residents to 100,000 residents):** Assign 1 pt. for every 10 parks or community gardens.
- **Large City (more than 100,000 residents):** 1 pt. for every 100 parks or community gardens.

GREEN SPACE TOTAL: \_\_\_\_\_

## Recycling and Compost Programs

- If offered, assign your city 1 point for each of the following recycling programs:
  - Curbside pick-up (home pick-up)
  - Public bins (presence of recycling bins in public places)
- If offered, assign the following points for each of the following compost programs:
  - Yard waste (home pick-up): 2 points
  - Food waste (home pick-up): 5 points
  - Food waste (public bins): 5 points

RECYCLING AND COMPOST PROGRAMS TOTAL: \_\_\_\_\_

## Transportation

- Assign your city 1 point for using each of the following modes of environmentally-friendly transportation:
  - Public buses, trolleys, trains/subways, carpool freeway lanes, ride share programs, bicycle lanes

TRANSPORTATION TOTAL: \_\_\_\_\_

## Water Quality

- Go to [www.epa.gov/enviro/facts/sdwis/search.html](http://www.epa.gov/enviro/facts/sdwis/search.html)
- Use the Environmental Protection Agencies “Safe Drinking Water Information System” in order to look up any water quality violations your city may have had in the past 10 years. **Deduct** 1 point for each violation over the past decade.

WATER QUALITY DEDUCTIONS TOTAL: \_\_\_\_\_

- If offered, assign your city one point for each of the following:
  - Water conservation efforts (grey water systems, rain barrels, rain gardens, low-flow systems, etc.), Aquatic ecosystem restoration/clean-up projects

WATER QUALITY EFFORTS TOTAL: \_\_\_\_\_

**GREEN CITY REPORT CARD TOTAL: \_\_\_\_\_**