

Visitor Consumption

The Park by the Numbers

Each year, the National Park Service provides outdoor experiences for millions of visitors. Using the numbers for the park you are at today, determine an estimate for the potential resource usage by these visitors. Remember, this number is only a small fraction of what is taking place beyond the parks.

Park Name: _____

Number of Visitors in 2018: _____

(You may want to round up)

1. If each visitor flushes a toilet with a 3 gallon tank, how many gallons of water would be used? (*Visitors x 3*) _____
2. If each visitor flushes a toilet with a 1.6 gallon tank, how many gallons of water would be used? (*Visitors x 1.6*) _____
3. If every visitor arrived in a car with four people total, how many cars would have been driven to the park? (*Visitors/4*) _____
4. If every visitor arrived by bus, with 25 people per bus, how many buses would have been driven to the park? (*Visitors/25*) _____
5. If every visitor used two paper towels after using the restroom, how many paper towels would be used? (*Visitors x 2*) _____
6. It costs about one Kilowatt Hour or 12 cents, to charge a cell phone. How much would it cost for all of those visitors to charge their phones before visiting the park? (*Visitors x 0.12*) _____



Bridging the Watershed

Sustainability

Date: _____

Teacher: _____

Park: _____

Study Site: _____

| |
|--|
| Park Rangers & Educators: (one per row) |
| |
| |
| |
| |
| |

| |
|-------------------------------------|
| Group Members: (one per row) |
| |
| |
| |
| |
| |

| | Yesterday | | | Today | | |
|-----------------|--------------------------------|--|---------------------------------|--------------------------------|--|---------------------------------|
| Air Temperature | _____ °C | | | _____ °C | | |
| Cloud Cover | <input type="checkbox"/> Clear | <input type="checkbox"/> Partly Cloudy | <input type="checkbox"/> Cloudy | <input type="checkbox"/> Clear | <input type="checkbox"/> Partly Cloudy | <input type="checkbox"/> Cloudy |
| Precipitation | <input type="checkbox"/> None | <input type="checkbox"/> Rain | <input type="checkbox"/> Other | <input type="checkbox"/> None | <input type="checkbox"/> Rain | <input type="checkbox"/> Other |

How could weather affect today's field study?

Solar Scavenger Hunt

Renewable Energy

Complete the chart below as you hunt for the best site for solar energy at this park.

| Location: | Time: | | Trial 1 | Trial 2 | Trial 3 |
|---|-------------------------|--|----------|---------|------------------|
| What impacts this location as a potential solar harvesting site? <i>[Examples: trees, clouds, historic site, pedestrian traffic]</i> | Angle of Panel: | | 0 (flat) | 45 | Optimal _____ |
| | Volts: (Record Highest) | | | | |
| Location: | Time: | | Trial 1 | Trial 2 | Trial 3 |
| What impacts this location as a potential solar harvesting site? | Angle of Panel: | | 0 (flat) | 45 | Optimal _____ |
| | Volts: (Record Highest) | | | | |
| Location: | Time: | | Trial 1 | Trial 2 | Trial 3 |
| What impacts this location as a potential solar harvesting site? | Angle of Panel: | | 0 (flat) | 45 | Optimal _____ |
| | Volts: (Record Highest) | | | | |

What factors could impact the effectiveness of solar energy harvesting? Why?

Water

Transportation

After completing your solar and wind tests, are either of these forms of energy a viable option for this park, and if so, where? Construct an argument based on evidence for why the park should pursue or not pursue this option.

Park Recommendations

Now that you have observed the resource usage and sustainability status of the park, use this space to make recommendations to improve sustainability. You should draw or write your suggestions for each of the four areas.

On which area do you think the park should focus? Why?

| | |
|--------|--|
| Energy | |
| Waste | |

Wind Energy Engineering

Renewable Energy

| | Trial 1 | Trial 2 | Trial 3 | Trial 4 |
|--|---------|---------|---------|---------|
| # of Blades | | | | |
| Blade Material | | | | |
| Shape of Blades | | | | |
| Angle of Blades | | | | |
| Volts Generated | | | | |
| Use the space below to describe/draw your most efficient design. | | | | |
| | | | | |

How does your device “capture” the renewable energy source?

What factors impacted the effectiveness of your design?

Park Sustainability

Sustainability Data Collection

Directions: As you visit the park, observe the sustainability efforts in the areas of Energy, Water, Waste, and Transportation. For each observation, decide on the score most closely reflects what you see or learn about the park's practices. Suggestions are provided within each area of observation, however, **you may decide as a group the score that is deserved.** The indicators listed are suggestions only. Items with an asterisk(*) may require information from a Park Ranger.

| | | Indicators of Resource Consumption | | | Score |
|--------------|---------------------------|------------------------------------|-------------------------|-------------------|-------|
| Observations | | (-1) High Consumption | (0) Minimal Impact | (+1) Sustainable | |
| Energy | Park Owned Vehicles | Mostly Gas-Powered | Some Hybrid/Electric | Electric Vehicles | |
| | Appliances* | No Energy Star Label | | Energy Star Label | |
| | Energy Source* | Standard Grid Electricity | | Renewable Energy | |
| | Light Bulbs* | Incandescent/Flourescent | CFL | LED | |
| | Light Switches | On/off switches | On/off switches w/signs | Motion Activated | |
| | Hand Drying | Paper Towels | Hand Dryers | Air Blade Model | |
| | Total Energy Score | | | | |

| | | Indicators of Resource Consumption | | | Score |
|--------------|--------------------------|------------------------------------|--------------------------|-----------------------|-------|
| Observations | | (-1) High Consumption | (0) Minimal Impact | (+1) Sustainable | |
| Water | Irrigation Management | Automatic Sprinklers | Maintenance Plan | Low demand for water | |
| | Drinking Water | Water Bottles for Sale | Water Fountain | Bottle Refill Station | |
| | Toilets* | >3.5 gal. toilet | 3.5-.1 gal toilet | Waterless toilet | |
| | Stormwater* | | No Stormwater Management | Stormwater Management | |
| | Sinks | Traditional Faucets | Timer Faucets | Sensor Faucets | |
| | Total Water Score | | | | |

| | | Indicators of Resource Consumption | | | Score |
|--------------|-------------------------------|------------------------------------|------------------------------|-----------------------------|-------|
| Observations | | (-1) High Consumption | (0) Minimal Impact | (+1) Sustainable | |
| Waste | Concessions | Single Use Packaging | Recyclable Packaging | Reusable drink containers | |
| | Directions for Trash Disposal | No Directions Given | Ranger gave directions | Signage or clear directions | |
| | Trash | Trash cans only | Trash and recycling | Trash free park | |
| | Hand Drying | Paper Towels | Recycled paper towels | Hand Dryers | |
| | Education | | No signs or info about waste | Signs or info about waste | |
| | Total Waste Score | | | | |

| | | Indicators of Resource Consumption | | | Score |
|------------------------|-----------------------------------|------------------------------------|--------------------------------|-------------------------------------|-------|
| Observations | | (-1) High Consumption | (0) Minimal Impact | (+1) Sustainable | |
| Visitor Transportation | Public Transportation | No Public Transportation | Accessible by bus | Accessible by Metro/Train | |
| | Bicycles | Bike Racks absent | Bike racks present, empty | Bike racks in use/Capital Bikeshare | |
| | Vehicles | < 50% of cars hybrid/electric | 50-75% of cars hybrid/electric | >75% cars hybrid/electric | |
| | Vehicle Plug-In | | No Station | Plug-In Station | |
| | Total Transportation Score | | | | |

If you found other areas of sustainability or impact, provide that information.

| Observation | Score |
|------------------------------|-------|
| | |
| | |
| | |
| Total Score | |
| Sustainability Rating | |

Directions: Find the total score for all of the sustainability areas and then an overall total. Use the scale below to assign a Sustainability Rating.

| Heavy Impact | Average Impact | | | Minimal Impact | | | Mildly Sustainable | | | Highly Sustainable |
|--------------|----------------|----|----|----------------|---|---|--------------------|---|---|--------------------|
| ≤ -10 | -8 | -6 | -4 | -2 | 0 | 2 | 4 | 6 | 8 | ≥ 10 |