SI Environmental Science - Full Discipline Demo

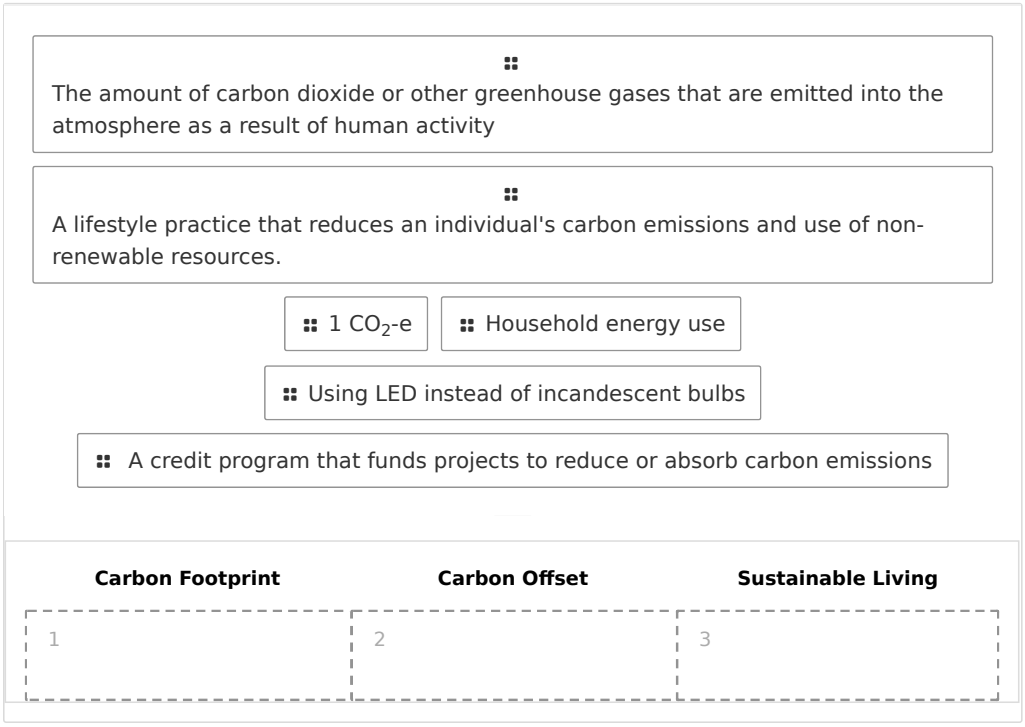
Carbon Footprint and Sustainable Living

Final Report - Answer Guide

Institution	Science Interactive University
Session	SI Environmental Science - Full Discipline Demo
Course	SI Environmental Science - Full Discipline Demo
Instructor	Sales SI Demo

Test Your Knowledge

Classify each phrase as associated with a carbon footprint, a carbon offset, or sustainable living.



Correct answers:

1

The amount of carbon dioxide or other greenhouse gases that are emitted into the atmosphere as a result of human activity

Household energy use

2 1 CO_2-e

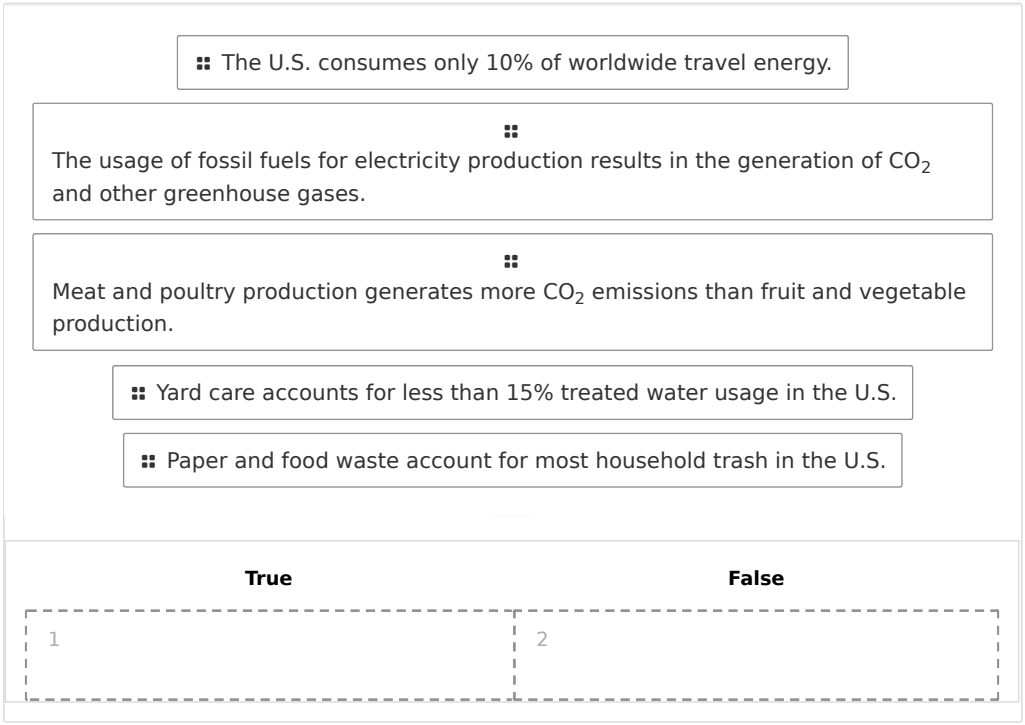
A credit program that funds projects to reduce or absorb carbon emissions

3

A lifestyle practice that reduces an individual's carbon emissions and use of non-renewable resources.

Using LED instead of incandescent bulbs

Classify each statement as true or false.



Correct answers:

1

The usage of fossil fuels for electricity production results in the generation of CO_2 and other greenhouse gases.

Meat and poultry production generates more CO_2 emissions than fruit and vegetable production.

Paper and food waste account for most household trash in the U.S.

2 The U.S. consumes only 10% of worldwide travel energy.

Yard care accounts for less than 15% treated water usage in the U.S.

Exploration

Carbon footprints are typically measured in _____ generated per individual per year.

- [x] tons of CO_2
- [ ] pounds of NO_x
- [ ] pounds of CO_2
- [ ] tons of SO_2

_____ is a fossil fuel that produces greenhouse gases when burned.

- [ ] Gasoline
- [ ] Diesel
- [ ] Jet fuel
- [x] All of the above

_____ projects are the most common source of carbon offsets.

- [ ] Deforestation
- [ ] Coal mining
- [x] Renewable energy
- [ ] Oil pipeline

Sustainable living practices include _____.

- [ ] extensive jet travel
- [ ] red meat consumption
- [ ] irrigation-dependent landscaping
- [x] recycling household wastes

Exercise 1

How did your estimated carbon footprint compare to the averages posted on the website you utilized? Reference Photo 1 in your explanation.

Student answers will vary but should be supported by the image uploaded into Photo 1.

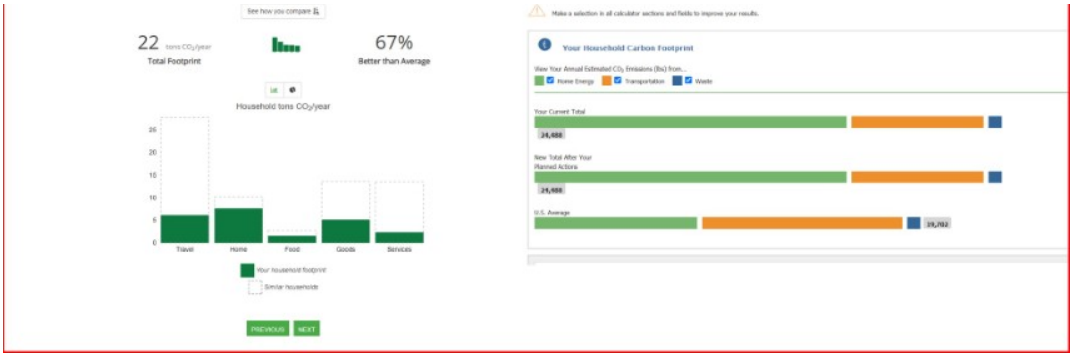
Which measured component had the most significant impacts on your personal carbon footprint? Reference Data Table 1 in your explanation.

Students answers will vary but should be supported to the data recorded in Data Table 1. Both trash production and home energy usage have significant impacts on personal carbon footprints.

Data Table 1: Consumption Summary
(SAMPLE ANSWER BELOW)

Component	48 hr consumption
Trash (volume produced)	Note to instructor: Student responses will vary but should reflect the volume of trash produced over 48 hrs.
Transportation (type, distance, fuel economy	Note to instructor: Student responses will vary but should reflect the types of transportation utilized over 48 hrs, distance traveled, and fuel economy of personal vehicle (if used).
Food (source and packaging)	Note to instructor: Student responses will vary but should reflect the source and packaging for all food consumed during 48 hrs.
Energy (thermostat settings, light bulb type, appliance usage)	Note to instructor: Student responses will vary but should reflect household thermostat settings, types of lighting in home, and appliance usage for 48 hrs.
Water (total time of water use)	Note to instructor: Student responses will vary but should reflect the total time water was running through faucets, dishwasher, and for laundry over 48 hrs.

Photo 1: Carbon Footprint
(SAMPLE ANSWER BELOW)



Exercise 2

How do carbon offset programs function to reduce carbon emissions? Which programs are available in your area? Reference Panel 1 in your explanation.

Carbon offset programs are used to fund projects that reduce or absorb carbon emissions. Certificates or credits are issued to businesses and individuals for practices that reduce or store carbon emissions that can then be sold or transferred to other parties to compensate for their emissions. Students should reference programs available in their area that are supported by information recorded in Panel 1.

How did the garbage bag reserved from Exercise 1 compare to the garbage bag produced in this exercise? Do the differences support your sustainable living practices? Reference both the volume and contents of each bag in your explanation.

Student answers will vary but should indicate that the trash produced in the bag from Exercise 1 is both larger in volume and types of contents than the trash produced from the sustainable practices implemented in this exercise.

Which of the implemented sustainable living practices had the biggest impact on your carbon footprint components recorded in Data Table 3? How likely are you to maintain this practice in your daily lifestyle?

Student answers will vary but should correspond to the data reported in Data Table 3. Students are most likely to conclude that sustainable practices such as recycling and reducing meat consumption are easier to maintain in their daily lifestyles than practices such as using gray water for irrigation or carpooling and using public transportation.

Panel 1: Regional Carbon Offset Programs

(SAMPLE ANSWER BELOW)

Note to instructors: Student answers will vary but should reflect carbon offset programs available in their region. If none are available, students should include information about renewable energy programs through their energy provider.

Data Table 2: Sustainable Living Plan

(SAMPLE ANSWER BELOW)

Carbon Footprint Component	Plan for Reduced Consumption
Trash	Note to instructor: Student responses will vary but should include ideas related to usi
Transportation	Note to instructor: Student responses will vary but should include ideas related to dri

Food	Note to instructor: Student responses will vary but should include ideas related to rec
Energy	Note to instructor: Student responses will vary but should include ideas related to uti insulated, and utilizing programmable thermostats.
Water	Note to instructor: Student responses will vary but should include ideas related to usi toilet fixtures.

Data Table 3: Amended 48 hr Consumption
(SAMPLE ANSWER BELOW)

Component	48 hr consumption
Trash (volume produced)	Note to instructor: Student responses will vary but should reflect the volume of trash produced over 48 hrs.
Transportation (type, distance, fuel economy	Note to instructor: Student responses will vary but should reflect the types of transportation utilized over 48 hrs, distance traveled, and fuel economy of personal vehicle (if used).
Food (source and packaging)	Note to instructor: Student responses will vary but should reflect the source and packaging for all food consumed during 48 hrs.
Energy (thermostat settings, light bulb type, appliance usage)	Note to instructor: Student responses will vary but should reflect household thermostat settings, types of lighting in home, and appliance usage for 48 hrs.
Water (total time of water use)	Note to instructor: Student responses will vary but should reflect the total time water was running through faucets, dishwasher, and for laundry over 48 hrs.

Competency Review

Carbon footprints are determined by the amount of _____ emitted into the atmosphere by human activities.

- oxygen
- water vapor
- greenhouse gases ✔
- heat

Waste production, transportation, food consumption, household energy consumption, and water usage are the five major components used to calculate an individual's carbon footprint.

- True ✔
- False

Red meat production generates more CO_2 emissions than _____ production.

- egg
- rice
- bean
- All of the above ✔

Water for cooking, drinking, and laundry accounts for most of the clean water used in U.S. households.

- True
- False ✔

One carbon offset represents the reduction of one _____ of CO_2 or other greenhouse gases.

- pound
- liter
- ton ✔
- year

Only personal automobile travel distance should be noted when recording the transportation component for a carbon footprint.

- True
- False ✔

Home energy use is an important input function of online carbon footprint calculators.

- True ✔
- False

A _____ can become part of a sustainable lifestyle.

- reusable water bottle
- tote bag
- recycling bin
- All of the above ✔

Extension Questions

You have been hired to plan a new community that will have a low carbon footprint. Describe the housing, transportation, and commerce practices you would design for the new community. (SAMPLE ANSWER BELOW)

Houses would be designed with efficiency in mind and equipped with solar panels and large south facing windows for passive heating in winter. Houses would be clustered with ample bike/walking paths to nearby schools, parks, and businesses to reduce personal automobile usage. Gray water would be used to water all community green spaces and flowers/trees near businesses. The community would contain a collective gardening area to reduce carbon emission associated with transporting and packaging fresh foods.