

## **Draw A System**

One way to understand a system is to make a model or a drawing of it. In Part 1, you will start by making a very simple drawing to get some ideas on paper. In Part 2, you will make a more detailed drawing of this system on a larger piece of chart paper.

### Part 1

Working with a partner, pick one of the following systems to draw (a school, a garden or a community). The instructor may ask you to choose a different system to make sure that all three systems are being done in the class.

Here are some hints:

Make sure that it is clear what the boundaries of the system are. It helps to know what is inside the system and what is outside the system. If the borders of a system are not clear, you can draw a box around the system.

Include all the important parts of the system, and label each one.

Draw arrows to show where matter comes into or leaves the system. Also use a different kind of arrow to show that energy comes into and leaves the system.

### Part 2

Look at the example of a "Home and Garden System". Join any other people who are working on the same system as you are. Now work together to make a larger, more detailed drawing of your system.

Remember to clearly indicate the parts of the system, the inputs and the outputs.

Indicate at least one place where a part of the system interacts with another part of the system.

Somewhere on the drawing write at least one important property that the whole system has that is different than the properties of its parts.

## **For Instructor: Talking About the Three Different Charts of a System**

There are many ways to describe systems. The words below are some suggestions for guiding the work in developing the charts and talking about the charts.

### School

Examples of parts of the school: building, play area, eating area, chairs, boards to write on, computers, books, etc. You can also describe the teachers and students as being important parts of the school system that leave and enter the physical system. Examples of interactions include student-student, student-teacher, fixing the building, reading a book.

Inputs: food, water, new teaching materials, sunlight, rain, electricity, instructions from the Ministry of Education (inputs can be ideas, not just physical materials), money

Outputs: garbage, waste water, old books, heat energy from buildings,

System Property: learning, school atmosphere (is it a happy school?), school energy efficiency (how much electricity it uses or its carbon footprint).

### Taro Patch/Garden

Examples of parts of the taro patch/garden: taro plants, ground, water under the ground, oxygen and carbon dioxide in the air, animals that live there, weeds. Examples of interactions include planting, weeding, harvesting, insect or animal eating plants.

Inputs: sunlight, rain, any fertilizer, carbon dioxide from air outside the system, energy from people who work in the taro patch, any pollution.

Outputs: taro for food, oxygen from photosynthesis, waste that is removed (weeds?), heat energy that leaves the taro patch (radiates away)

System Property: food productivity (how much food it produces per square foot)

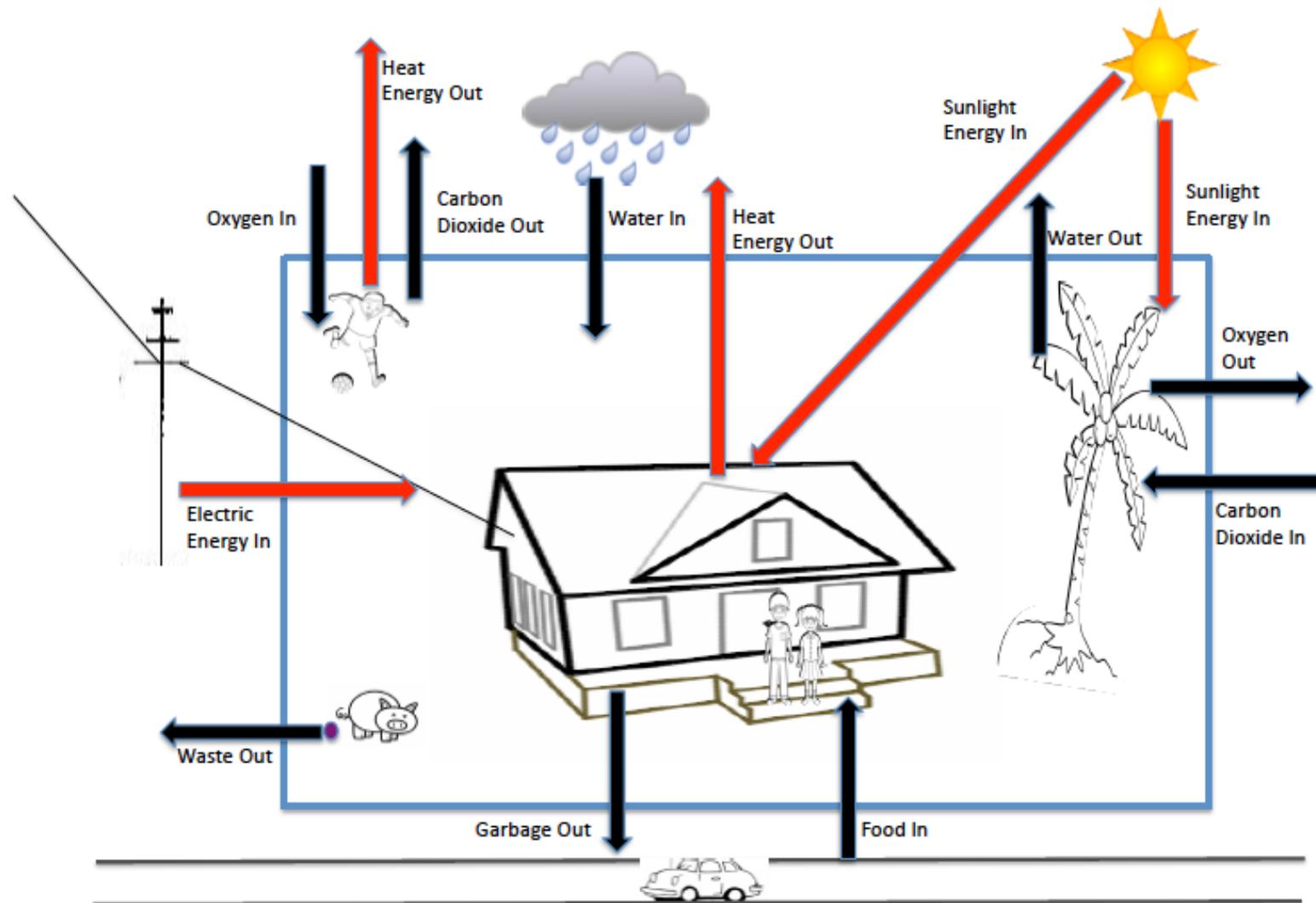
### Community

Examples of parts of the community: homes, school, stores, gardens, church, roads, vehicles, people who live there, ground, air, electric wires, water storage. Examples of interactions include people going from one location to another, water or electricity going to buildings, fixing a road, praying in a church, people riding in a vehicle.

Inputs: sunlight, rain, electricity, instructions from the government (inputs can be ideas, not just physical materials), visitors, money

Outputs: garbage, waste water, pollution, heat energy from ground and buildings, money

System Property: community health (is it a healthy community or one that has many problems?), community energy efficiency



A Home and Garden System

Some System Properties: A Happy Family; Energy Efficiency or Carbon Footprint of Home