

Part 1

Permaculture and the outdoor classroom

worksheet 1.1

About Permaculture

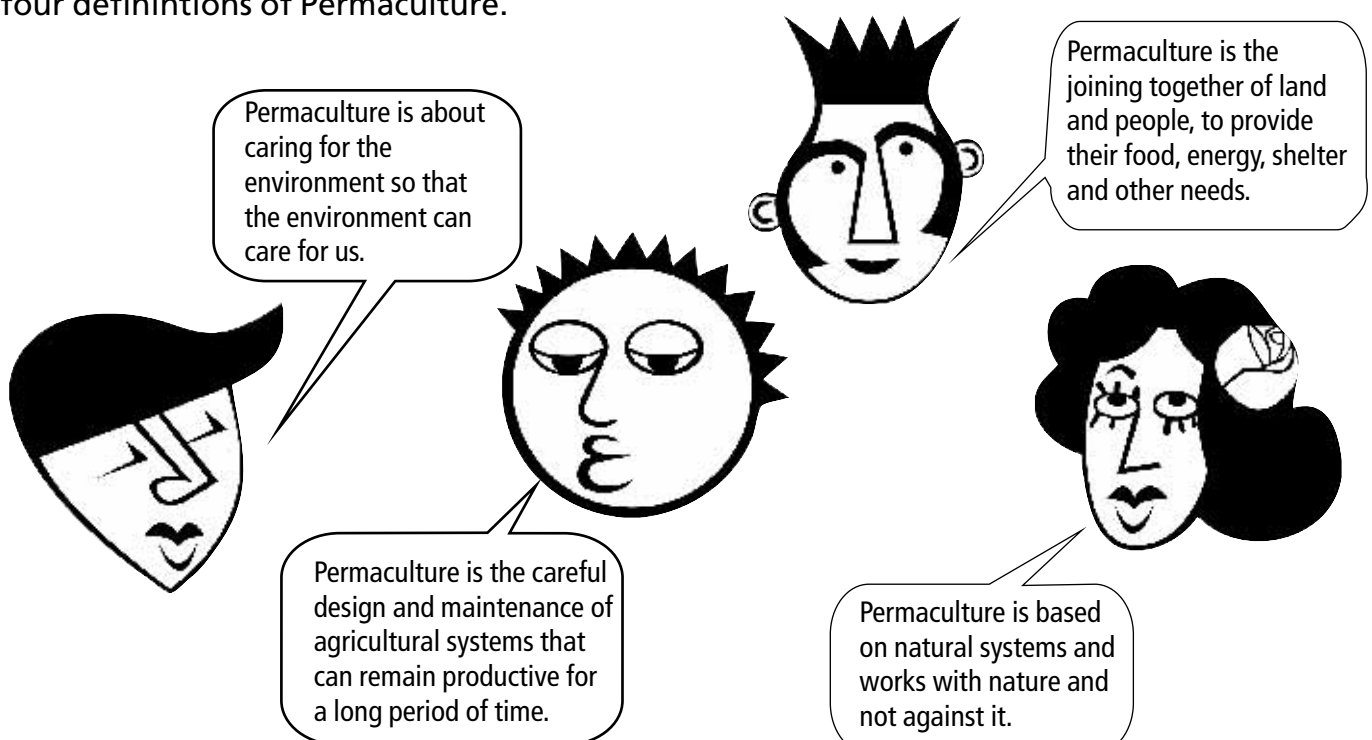
Why Permaculture?

A Permaculture garden can do many things for us. It can:

- 🌱 provide us with food
- 🌱 improve our water supplies
- 🌱 provide us with firewood, food for animals, building materials and herbs
- 🌱 provide ways of earning money
- 🌱 improve our quality of life
- 🌱 beautify our schools and homes
- 🌱 provide schools with a living laboratory where students from many different grades can learn about nature.

What is Permaculture?

The word "Permaculture" comes from the words PERMANent and agriCULTURE. Here are four definitions of Permaculture.



Permaculture views any piece of land with people living or working on as a system. A system consists of two or more parts that work together or affect each other. The system you will work with is your school. It consists of land, buildings, and people that work together and affect each other.

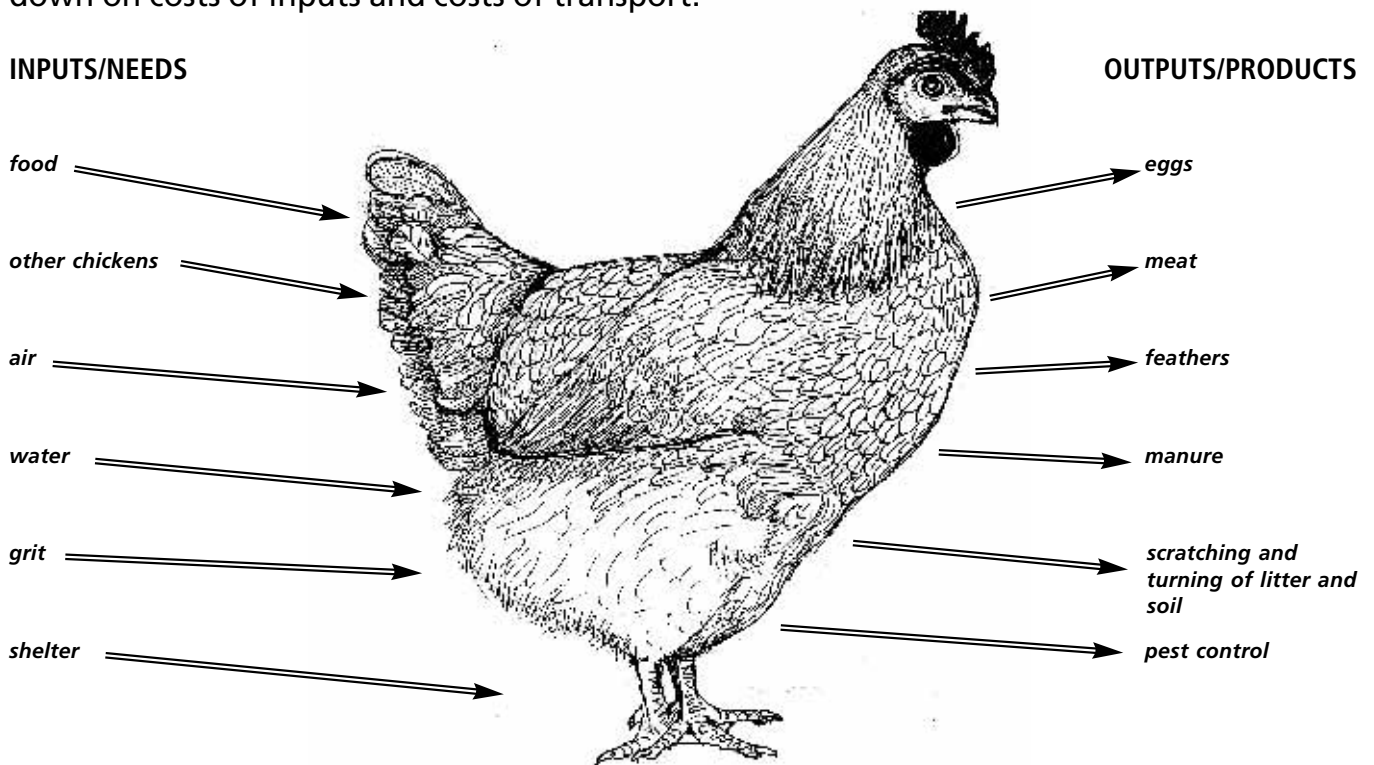
Inputs and outputs

Each element in a Permaculture system has **INPUTS** and **OUTPUTS**. Inputs are needs and outputs are products. With good Permaculture design, the products of some elements are linked to the needs of other elements. In this way, you have no wasted resources and no pollution.

Think of a big pile of chicken manure. Oh the flies! What a stink!

Think of an area of vegetables growing in poor soil.

Bring the two together, and the manure becomes a valuable resource for improving the soil and yielding better vegetables. Using one element's outputs for another's inputs cuts down on costs of inputs and costs of transport.



Activity 1.1

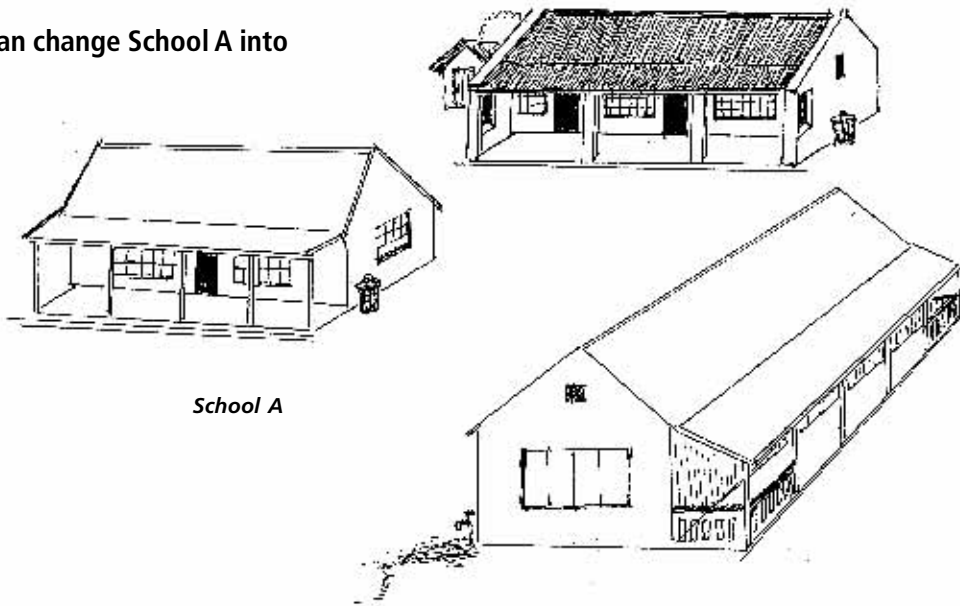


Group work

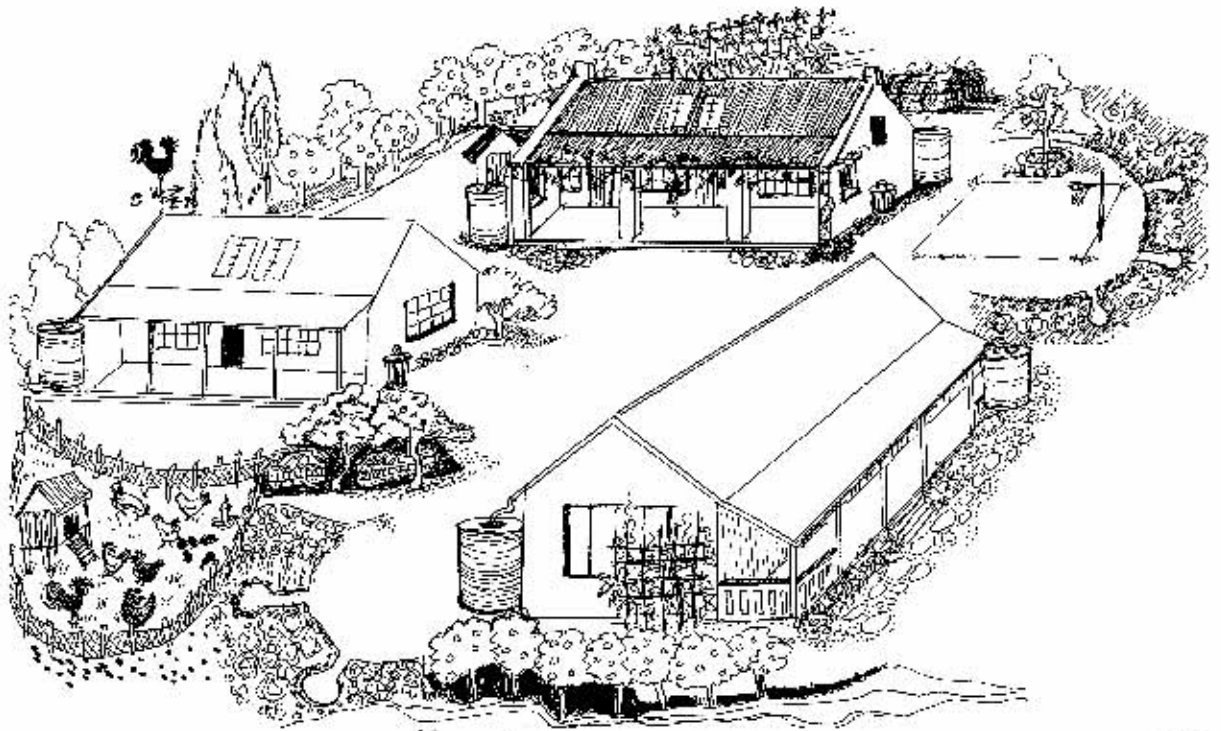
Analyse inputs and outputs

- Each group should analyse the inputs and outputs of one of the following elements:
 - Bees
 - Windbreaks
 - Herb and vegetable gardens
 - Nurseries
 - School building with learners and teachers in it
- Choose one person in your group to explain your ideas to the rest of the class.

Permaculture can change School A into School B



School A



School B

Activity 1.2



Class work

Think about what Permaculture can do for us

1. Discuss the following questions with the rest of your class, then write down your answers.
 - a. Look at the drawings of School A and School B above. List the ways that you think Permaculture has improved life at School B.
 - b. List the ways that you think Permaculture could improve life at your school.
 - c. List the problems that you think will stop you from changing your school into one like School B.
2. For every problem you listed above, write below how your school can possibly change that problem into a solution.

What are the principles of Permaculture?

Permaculture has a number of basic rules or principles. These are rules for good design.

1. Work with, rather than against, nature. For example, encourage earthworms in the soil as they loosen it and add plant food through their faeces.
2. The problem is the solution. For example, 'weeds' can become chicken food or compost for feeding the soil.
3. Everything works in at least two ways. For example, chickens can eat plant pests, produce eggs, meat and feathers, dig and add manure to the soil. A structure to shade seedlings can also be used to grow vines like granadillas or grapes.
4. Bring food production back into cities.
5. Use natural, rather than man-made, resources. For example, to keep the soil fertile, use compost, mulch and earthworms rather than fertiliser. Use chickens to dig and weed rather than tractors and hoes.
6. Recycle resources on site. For example, recycle plant waste such as vegetable peels, pulled weeds and grass mowings by using it as mulch, to make compost or feeding it to chickens.
7. Save energy. For example, plant directly into the soil instead of first digging or ploughing the soil. Place the food garden close to the home, so energy is not wasted walking and carrying to and from the garden.
8. Encourage diversity of living organisms. For example, grow many different kinds of plants that will encourage many different wild animals such as birds, frogs, bees and butterflies.
9. Help your community to become more self-reliant. For example, by growing food plants, saving water, saving energy, producing food or other products to sell.
10. Start small because small gardens are easier to look after and they save energy and resources.
11. Use patterns. Patterns improve the systems by creating more surface area on which to grow.
12. Use intensity. Intensify to make the best use of time and space. For example grow plants vertically to improve the use of space and grow fast-growing plants under slow-growing bushes to improve the use of time.



As you go on to develop your Permaculture system, you will see how these principles work.

Teacher's notes

Part 1: Permaculture and the outdoor classroom

worksheet 1.1 About Permaculture

Activity 1.1 Analyse inputs and outputs

Group work

Give each group one of the elements to analyse in terms of inputs and outputs or needs and products. Encourage them to produce large diagrams similar to the one of the chicken inputs and outputs.

Learners have not yet learned the details of these different elements, so do not be too strict on them getting the exact answers. The activity should serve more to illustrate the input/output principle of Permaculture.

Answers to questions

Bees: Inputs – garden flowers, hives. Outputs – honey, pollination.

Windbreaks: Inputs – plants, water, pests and disease control, care. Outputs – wind protection, shade, fruit, timber, wildlife habitats, nectar for bees.

Herb and vegetable gardens: Inputs – plants, soil fertility improvement, water, pest and disease control, care. Outputs – food, medicine, dyes, material for soil fertility.

Nurseries: Inputs – plants, water, structures, good soil, pest and disease control, labelling. Outputs – plants for school and sale.

School building with learners and teachers in it: Inputs – electricity, water, cleaning. Outputs – sewerage, waste, dirty water.

Curriculum links

Core knowledge and content

SS Geography

Grade 4: Resources and services within a settlement (including land, water, sewerage, waste removal, green/open spaces) and difficulties faced by those without these services.

Outcomes

SS Geog LO2: Learners demonstrate geographical and environmental knowledge and understanding.

CO 1: Identify and solve problems and make decisions using critical and creative thinking.

Activity 1.2 Thinking about what Permaculture can do for us

Class discussion

Work through the text before doing Activity 1 with the class. Make it clear to them that there are many definitions of Permaculture and that the actual meaning of what Permaculture encompasses will become clearer to them once they start to work in a Permaculture garden.

The drawings of School A (before Permaculture) and School B (after Permaculture) show learners the type of improved school environment that Permaculture can provide.

Then move onto the questions of Activity 1. Ask each question to the whole class. Encourage discussion. The answers to all four of the questions involve lists, so list your learners' ideas on the chalkboard as they arise. Tell them to write down the

answers as you go along. Let them complete the written work for homework and then take it in.

Answers to questions

1. a) Permaculture has improved life at School B by providing: shade, food, improved water supplies, firewood, food for animals, building materials and herbs, ways of earning money, a beautiful school environment, a living laboratory.
 - b) This list will probably be similar to that of Question 1a, though there may be a few improvements that are particular to your school.
 - c) These problems can include lack of fencing, space, tools, seeds, fertilisers, etc. There are no right or wrong answers to this question. The aim is to get learners into thinking of themselves as problem solvers.
2. Changing problems into solutions can include planting living fences from thorny plants; using organic matter and compost for soil fertility, making tools or bringing from home or using tillage methods that do not need tools; collecting seeds from fruit that has been eaten; etc.

Curriculum links

Outcomes

CO 1: Identify and solve problems and make decisions using critical and creative thinking.

Part 2: Our school environment – getting to know our site

The Curriculum links and Assessment suggestions are given for all the activities in this part after the individual activity descriptions. Take in the written work for assessment once all four activities have been completed. Assess the work individually, so each learner should have his or her own copy of the work.

worksheet 2.1 Working with climate

Activity 2.1 Think about the climate of your school

Pair work

This is an elicitation activity to find out what learner's already know about their local climate. Encourage discussion. There are no right or wrong answers to these questions. You can walk around and listen to the discussions and correct any misconceptions that you notice.

Instruct the learners to either copy the table into their exercise books for completion or to complete the table on the worksheet.

worksheet 2.2 Temperature

Activity 2.2 Choose which plants are suited to the temperatures of your area

Pair work

To do this activity, learners need to make observations while they walk around the school area. You can give them school time to do this or expect them to do it for homework. The activity can alternatively be done at home if the homes of most learners are in a similar climatic area to the school.

Before they begin the activity, instruct the learners to either copy the table into their exercise books for completion or to complete the table on the worksheet. Similarly, they can answer Question 3 on the worksheet, or they can write their choice of answers in their exercise books.