Objectives

To understand the mechanics that control food webs and ecosystems

To appreciate the interdependency that exists between the different parts of any ecosystem

To be able to quantify elements of Gersmehl’s model and interpret the relative sizes of nutrient flows and stores
Food webs are an important part of ecosystems.

What is a food web?

What might it tell us about the relationships between plants and animals?
Introducing Ecosystems

Food Web: A system of linked organisms that depend on each other for sources of energy.
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Ecosystem
Introducing Ecosystems

Ecosystem

A network of biotic and abiotic elements interacting with each other and their physical environment
Introducing Ecosystems

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Biome

This project was funded by the Nuffield Foundation, but the views expressed are those of the authors and not necessarily those of the Foundation.
Introducing Ecosystems

**Ecosystem**
A network of biotic and abiotic elements interacting with each other and their physical environment

**Biome**
A large geographical area of distinctive vegetation and animal groups
Introducing Ecosystems
Introducing Ecosystems

Food Web
Introducing Ecosystems

Food Web

A system of interconnected food chains
Introducing Ecosystems

- **Food Web**: A system of interconnected food chains
- **Food Chain**
Introducing Ecosystems

**Food Web**
A system of interconnected food chains

**Food Chain**
A series of organisms that depend on each other for a source of food
Introducing Ecosystems
Introducing Ecosystems

Primary Producer
Introducing Ecosystems

Primary Producer

An organism that converts solar energy into mass
Introducing Ecosystems

Primary Producer
An organism that converts solar energy into mass

Primary Consumer
Introducing Ecosystems

**Primary Producer**
An organism that converts solar energy into mass

**Primary Consumer**
An organism that gains energy by eating a primary producer
Introducing Ecosystems
Introducing Ecosystems

Secondary Consumer
Secondary Consumer

An organism that gains energy by eating a primary consumer
Introducing Ecosystems

Secondary Consumer: An organism that gains energy by eating a primary consumer.

Decomposer
Introducing Ecosystems

Secondary Consumer

An organism that gains energy by eating a primary consumer

Decomposer

An organism that breaks down other organisms into nutrient matter
Introducing Ecosystems
Introducing Ecosystems

Herbivore
Introducing Ecosystems

Herbivore

An organism that only feeds on vegetation
Introducing Ecosystems

Herbivore
An organism that only feeds on vegetation

Carnivore
Introducing Ecosystems

Herbivore
An organism that only feeds on vegetation

Carnivore
An organism that only feeds on animals
Introducing Ecosystems
Introducing Ecosystems

Omnivore
Introducing Ecosystems

Omnivore
An organism that eats both vegetation and animals
Introducing Ecosystems

Omnivore
An organism that eats both vegetation and animals

Tropic Level
Introducing Ecosystems

Omnivore
An organism that eats both vegetation and animals

Tropic Level
The position an organism occupies in a food chain
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Introducing Ecosystems

Biotic
Introducing Ecosystems

Biotic

Living organisms within an ecosystem
Introducing Ecosystems

Biotic

Living organisms within an ecosystem

Abiotic
Introducing Ecosystems

**Biotic**
Living organisms within an ecosystem

**Abiotic**
Non-living components in an ecosystem
On your sheet, draw arrows that show the different of energy flow from one organism to another.

**HINT:** The arrow always starts at the organism that is providing the energy.
Introducing Ecosystems

- Sun
- Sparrow
- Dandelion
- Snail
- Hedgehog
- Fox
- Peregrine Falcon
- Rabbit
Another way of representing food webs on paper is through **Gersmehl’s Model**. This model looks at the relative value of nutrients that are flowing around a food web (the arrows) as well as the places in which they are stored (the circles).

Rather than name particular species, Gersmehl referred to the three main stores of nutrients found in any ecosystem:

- the living **biomass** (B)
- organic matter in leaf **litter** (L)
- and the **soil** (S)

The size of the arrows and the circles is proportional to the amounts of nutrients flowing or stored.
In this example, which is greater:

- Nutrients gained by the soil through weathering or by decomposition?

- Nutrients lost from the biomass through leaf loss or gained through uptake from the soil?

- Nutrients stored in the trees or in the soil?
Introducing Ecosystems

In this example, which is greater:

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Which description matches the model shown?

a) Coniferous forest in Scandinavia
b) Tropical rainforest in Brazil
c) Grasslands of Central USA
d) None of the above
Introducing Ecosystems

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Introducing Ecosystems

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Which description matches the model shown?

b) Tropical rainforest in Brazil
What would a Gersmehl Model look like for a temperate woodland in the UK?
Ecosystems: Key Definitions
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Food Webs and Energy Flows
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Introducing Ecosystems

- Sun
- Peregrine Falcon
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Introducing Ecosystems
Gersmehl’s Model
Introducing Ecosystems

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Match the Biome
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Introducing Ecosystems

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Introducing Ecosystems

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