Life on Earth

1. Energy in Ecosystems

A Food Chains/Food Webs/Loss of Energy

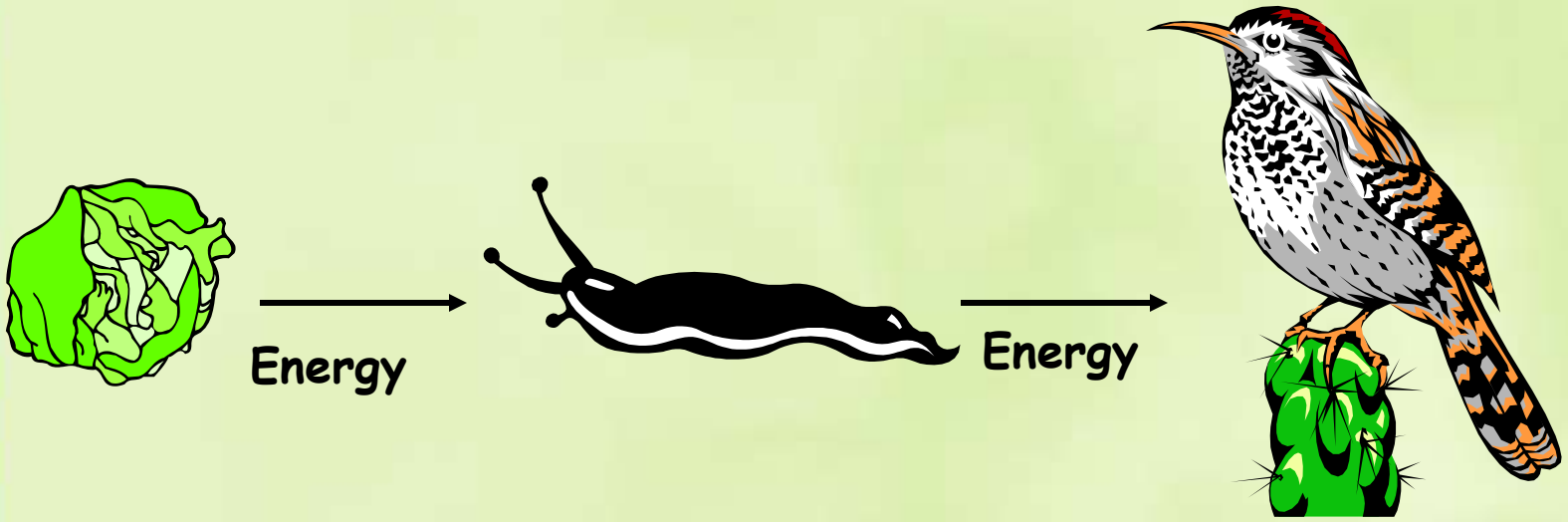
- Learning Outcomes:

1. To describe the role of producers and consumers in food webs and food chains;
2. To describe how energy flows in food webs and food chains;
3. To describe what happens to energy as it moves along a food chain.

Basic Food Chain

Producer → Primary Consumer → Secondary Consumer

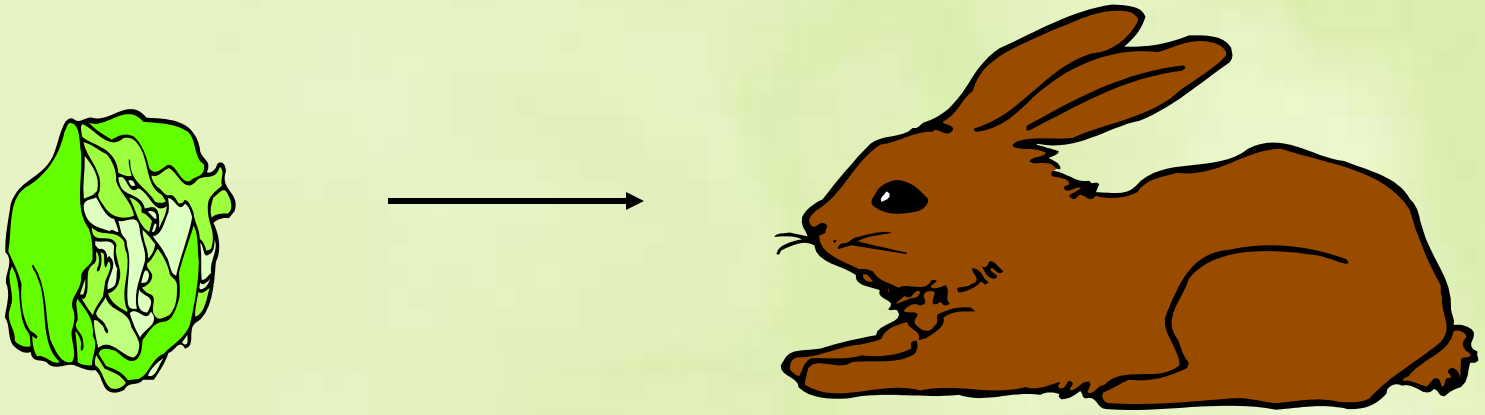
Food chains always start with a plant.



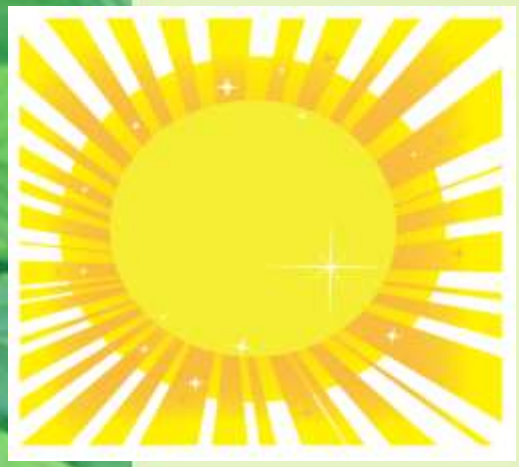
- The lettuce is eaten by the slug so the energy goes from the lettuce to the slug
- The slug is eaten by the bird so energy passes from the slug to the bird.

Food Chains

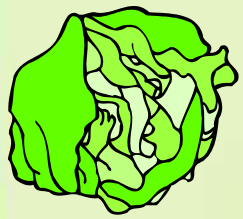
A food chain shows the direction of energy flow.



- The lettuce is eaten by the rabbit so the energy passes from the lettuce to the rabbit.



To Recap



Energy

Energy

Producer → Primary Consumer → Secondary Consumer

Where does this all really start from…what does a plant use to make food ?

The Arrows…

- Show the direction of energy flow
- Can energy be lost from a food chain?

Loss of Energy

Movement and the release of heat energy

Movement and the release of heat energy

2

Undigested Waste

2

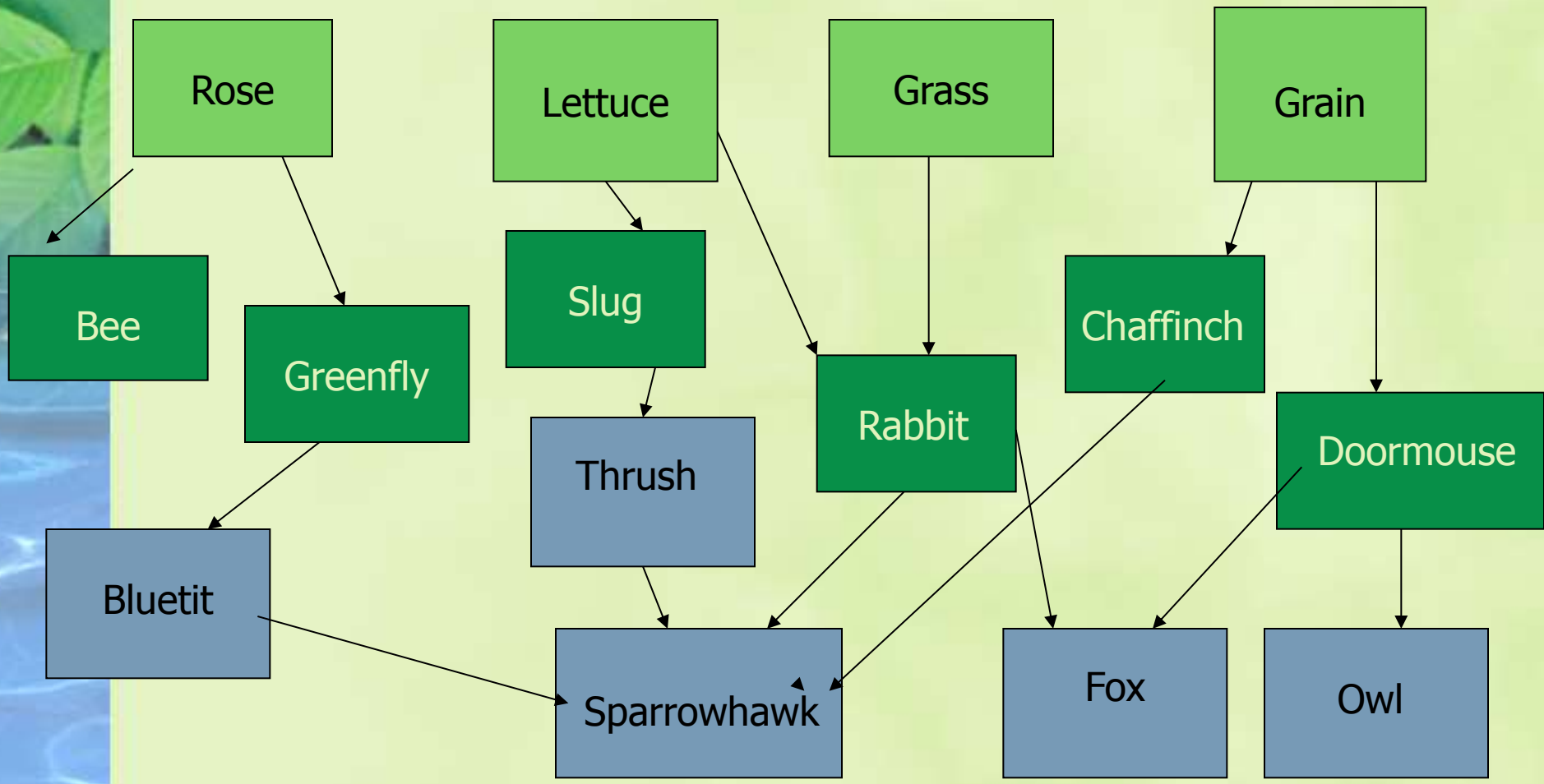
Undigested Waste

Fact : Only 10% of energy consumed by one organism gets passed on to the next organism in the food chain

Food Web

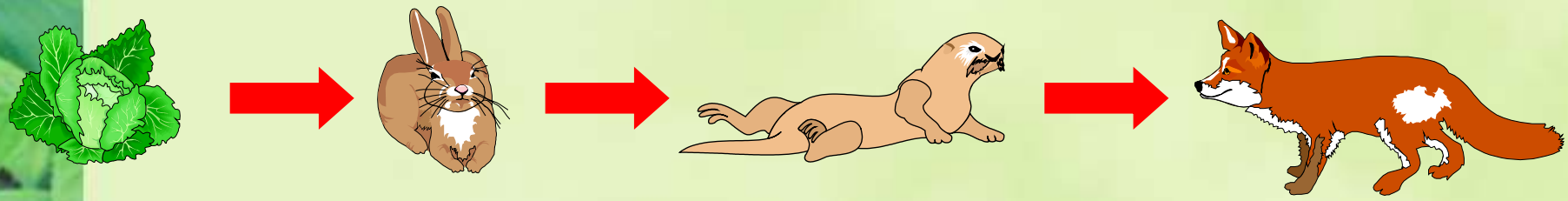
What If Thrushes are removed from the food web?

Discuss what affect this will have on the number of Snails, Lettuce, Chaffinch, Greenfly

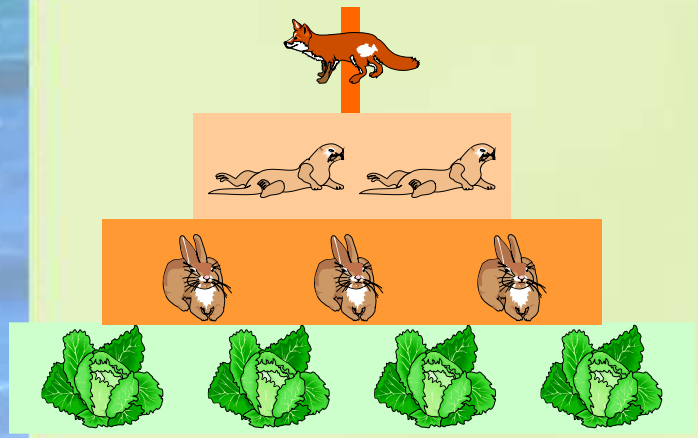


Pyramids of number

A food chain can be represented in a different way. Have a think about the number of organisms at each stage in the food chain below.



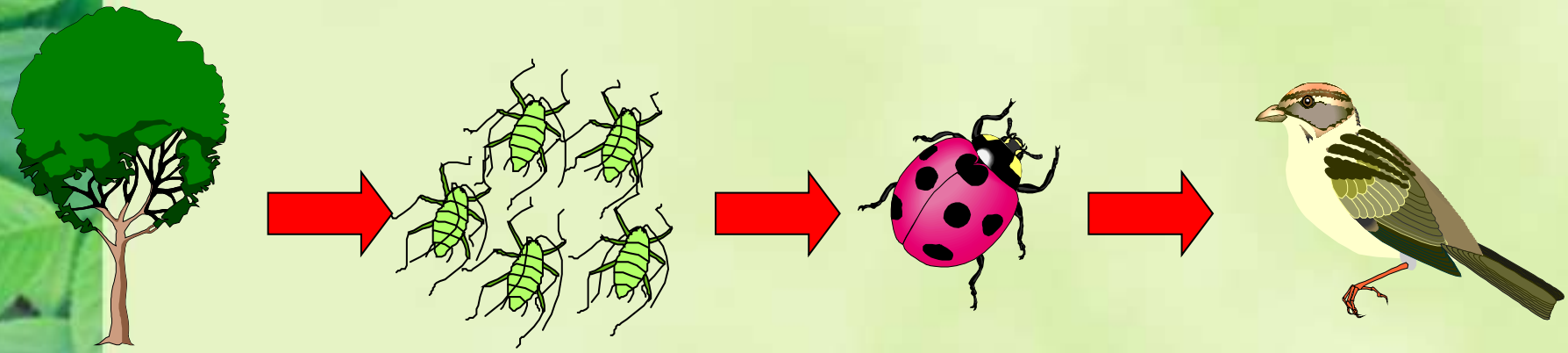
Cabbage	Rabbit	Stoat	Fox
100	40	15	5



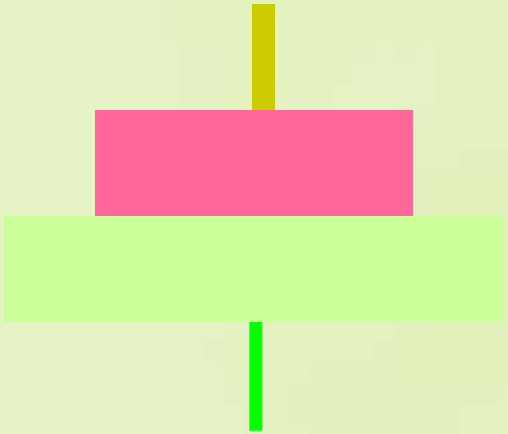
- 5 foxes
- 15 stoats
- 40 rabbits
- 100 cabbages

"Funny looking" pyramid of numbers

Consider this food chain instead:



Tree	Greenfly	Ladybird	Bird
1	2000	50	8



8 bird

50 ladybirds

2000 greenfly

ONE tree

Pyramid of Numbers

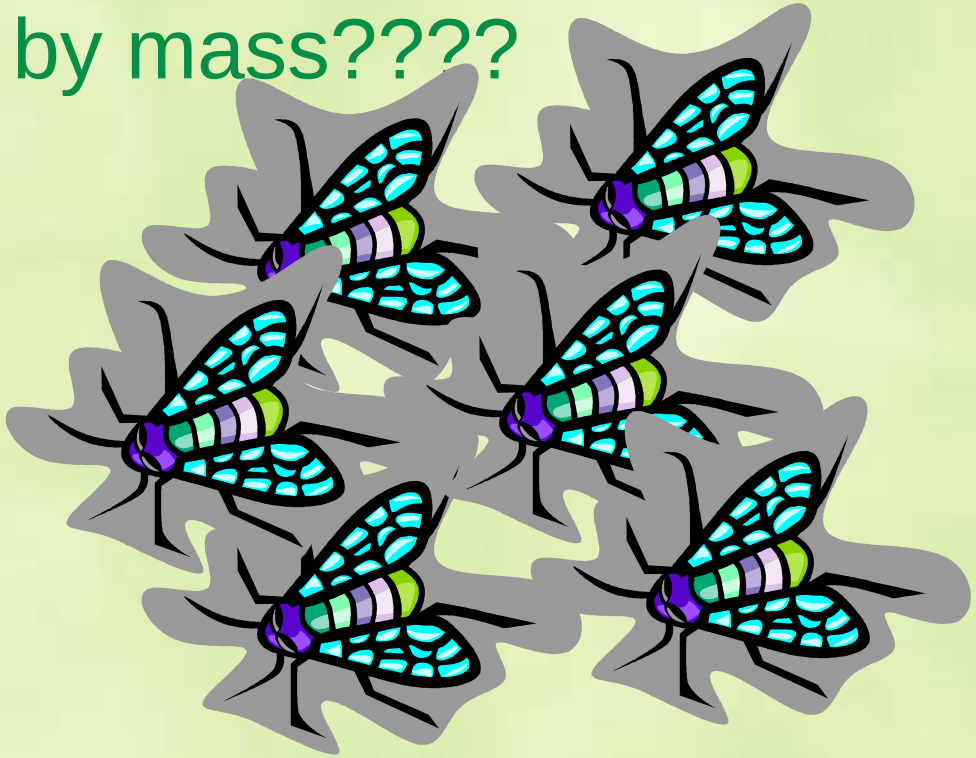
- a special kind of bar chart that shows the **total number** of different organisms living in an area

- Activity 5, page 9pupil booklet

Pyramid of Biomass

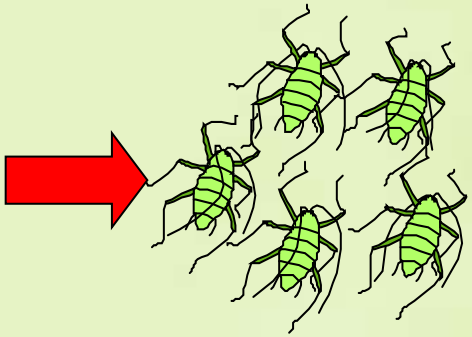
- A special kind of bar chart showing the **MASS** of living materials in a living area
- What do I mean by mass????

1 tree is heavier than lots of flies



Tree

1



Greenfly

2000

Ladybird

50

Bird

8

few bird

Some ladybirds

Many greenfly

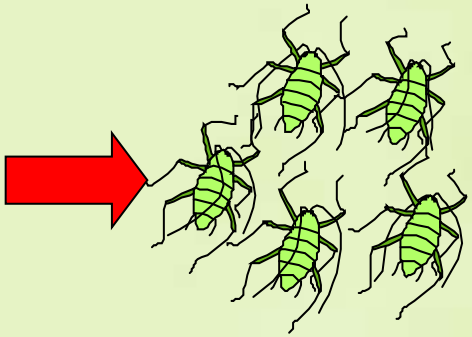
ONE tree

numbers

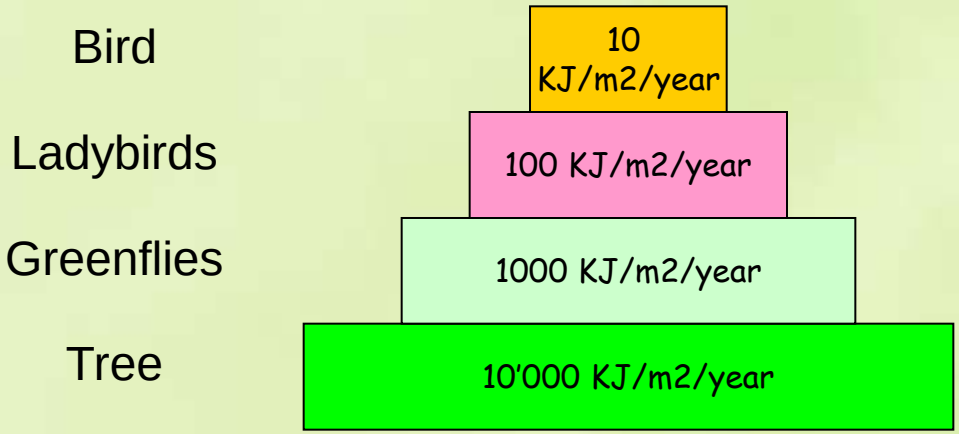
biomass

Pyramid of Energy

Activity 7, page 11



Tree Greenfly Ladybird Bird



An oak tree contains 10'000 KJ /m2/year of energy. Only 10 % of this energy is passed on at each stage of the food chain.