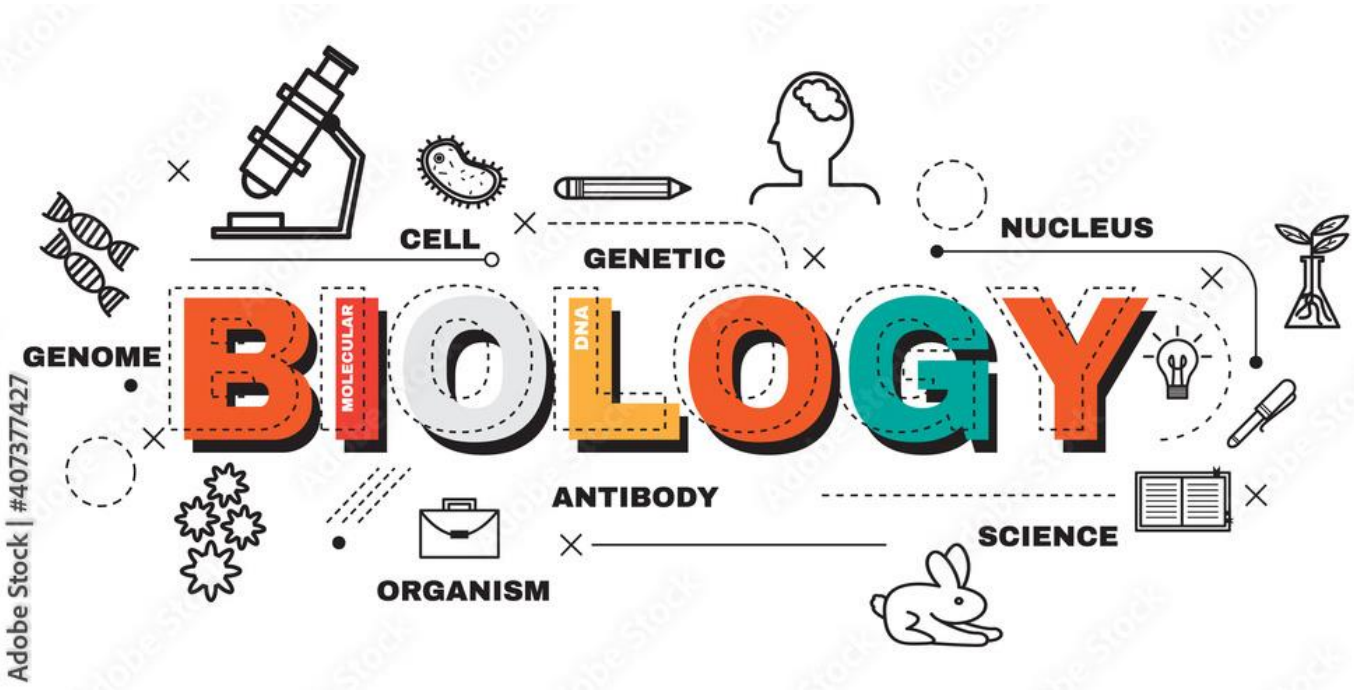
GRADE 8

NATURAL SCIENCES

BIOLOGY



TOPIC	CONTENT
1	**Photosynthesis** **Respiration**
2	**Interactions and interdependence within the environment** • **Introduction to Ecology** • **Ecosystems** • **Feeding relationships** • **Energy flow: Food chains and food webs** • **Balance in an ecosystem** • **Adaptations**
3	**Microorganisms** • **Types of microorganisms** • **Harmful microorganisms** • **Useful microorganisms**

1. PHOTOSYNTHESIS

PHOTOSYNTHESIS — **Is a process used by green plants to produce glucose from sunlight and water**

REQUIREMENTS — **The raw materials needed for this process are**

- Carbon dioxide gas absorbed from the atmosphere
- UV radiation from sunlight
- Water absorbed by the roots from the soil
- Chlorophyll in the chloroplast of the leaves to absorb the UV radiation

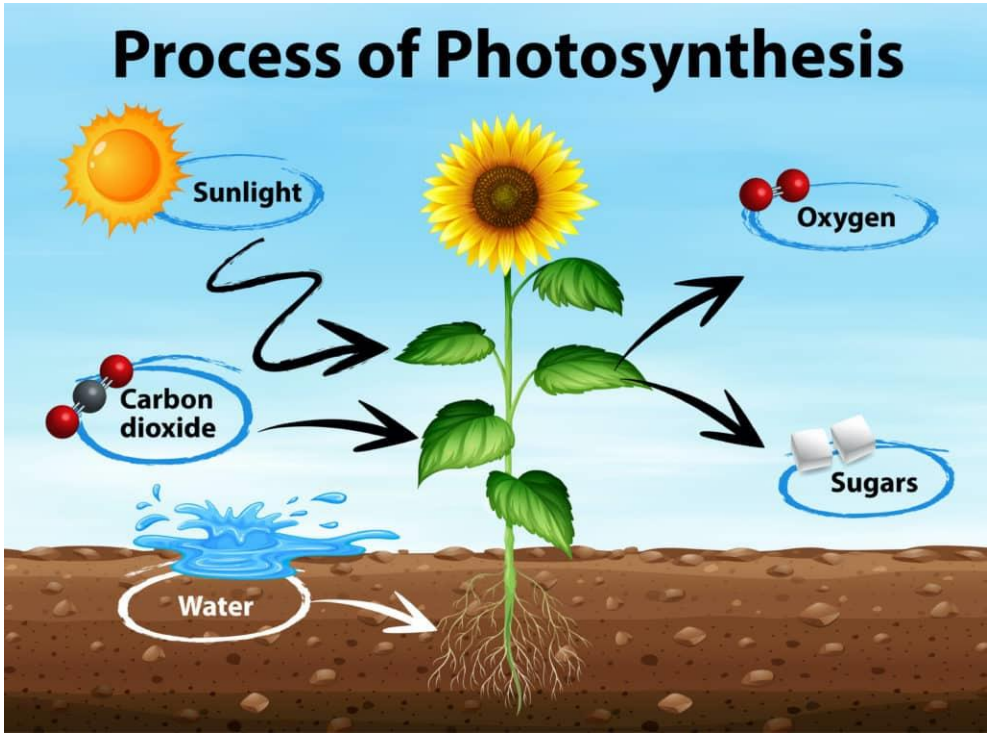
The products made are:

- Main product → glucose
- By-product → oxygen gas

GLUCOSE

Is a simple sugar that is made by plants
It is used by plants and animals for food
It is stored in plants as STARCH
Glucose can also be converted to cellulose (for structural support in the cell wall of a plant cell)

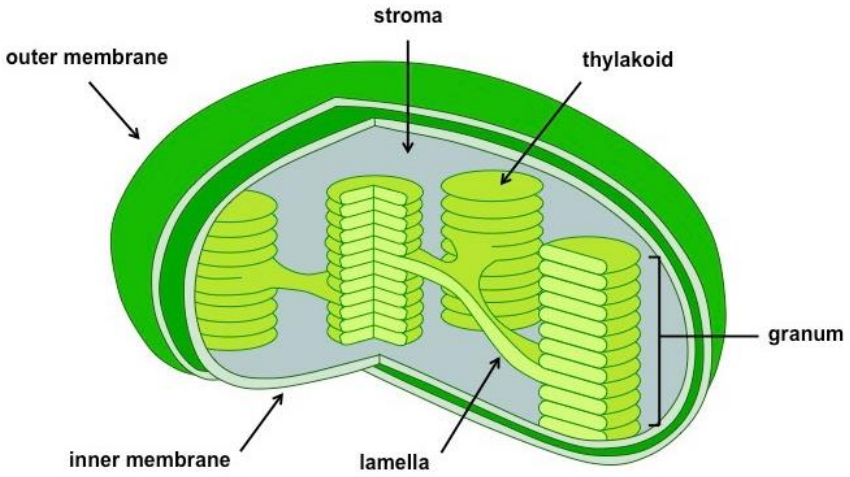
DIAGRAM



CHLOROPLAST Is the organelle in which photosynthesis takes place
It contains CHLOROPHYLL in the granum of the chloroplast

CHLOROPHYLL Is the green pigment found in leaves or stems that make them green
Its function is to convert radiant energy into CHEMICAL POTENTIAL ENERGY (which is stored as glucose

DIAGRAM



EQUATION FOR PHOTOSYNTHESIS PROCESS

Sunlight

Carbon Dioxide + Water ---→ Glucose + Oxygen

Chlorophyll

BIOLOGICAL IMPORTANCE OF PHOTOSYNTHESIS

- Photosynthesis is a reaction that converts **radiant energy** (from the sun) into chemical potential energy (found in **glucose).**
- Photosynthesis releases **oxygen** as a product. The oxygen is important to organisms as it is required for **cellular respiration.**
- Glucose produced by photosynthesis can be converted to other compounds in plants.
- Glucose can be converted to **starch** (a storage form of glucose) in plants.
- Glucose can be converted into **cellulose** (a component of plant cell walls – i.e. becomes wood)

PRACTICAL DEMONSTRATION for SBA Marks

Determining whether Photosynthesis has occurred in a geranium leaf by testing for the presence of starch in the leaf.

We compare a leaf that has been exposed to sunlight (called the experiment) and one that has been cover by tin foil for a few days (called the control)

Task: Write up the investigation in the scientific format in notebook under the following headings

1. Aim

2. Investigation question.

3. Hypothesis

4. Method

5. Result and drawing

6. Conclusion

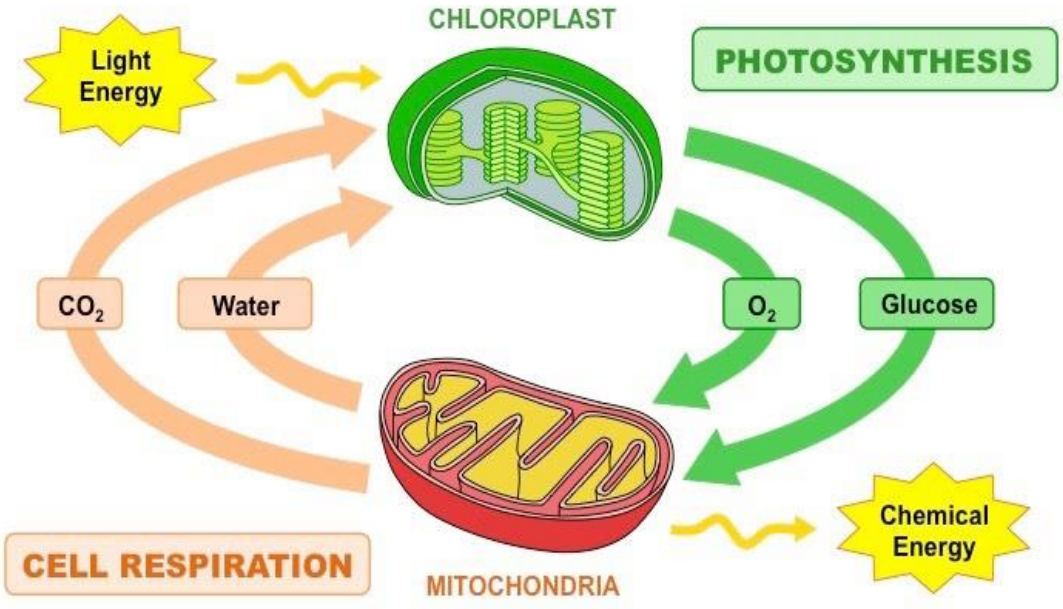
2. CELLULAR RESPIRATION

CELLULAR RESPIRATION	The process of glucose being broken down in the presence of oxygen to produce **ENERGY** that occurs in an organelle called the **MITOCHONDRIA**
ENERGY	▪ Is needed by living organisms to grow and survive ▪ This energy is first made by plants during photosynthesis in the form of **CHEMICAL POTENTIAL ENERGY** ▪ Living organisms then consume this food and the energy is released in a series of **CHEMICAL REACTIONS** ▪ In a process called **RESPIRATION**
REQUIREMENTS FOR CELLULAR RESPIRATION	Oxygen from the atmosphere is breathed/taken in by the living organisms Glucose is needed that is consumed from plants and animals

CHEMICAL EQUATION CELLULAR RESPIRATION

Glucose + Oxygen → Energy + Carbon Dioxide + Water

RELATIONSHIP BETWEEN PHOTOSYNTHESIS AND CELLULAR RESPIRATION



Relationship

One can see now that photosynthesis and respiration are opposite but equally important processes.
The **reagents / reactants** of the one process becomes the **products** of the other process

ACTIVITY	Complete activity 5 page 12 in your notebooks
CARBON DIOXIDE TEST	**CLEAR LIME WATER TEST** See information on page 13 Your teacher will DEMO the test for CARBON DIOXIDE
ACTIVITY	Complete activity 6 and 7 page 13 AND Topic 1 Revision page 14 – whole page

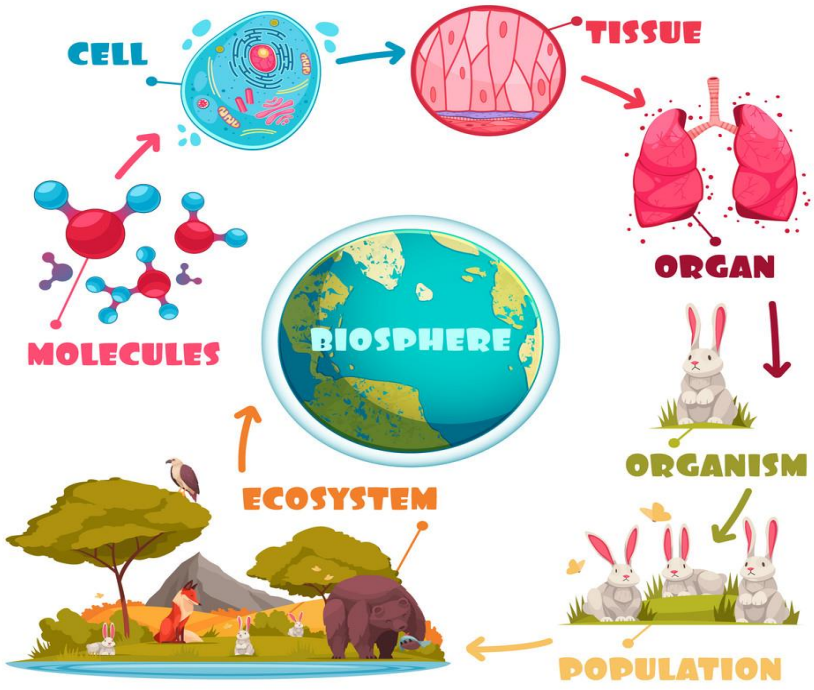
Practice Questions

1.1. Write a word equation for photosynthesis (2)
1.2. Explain what the reactants are for photosynthesis and where they come from. (4)
1.3. In what structure / organelle does photosynthesis take place? (1)
1.4. What is the green pigment called that is needed for photosynthesis? (1)
1.5. Why is photosynthesis important? (3)
2.1. Write a word equation for respiration (2)
2.2. Name 2 ways that respiration relies on photosynthesis to take place. (2)
3. Write **true or false** for the statements below:
3.1. Photosynthesis takes place 24hrs a day
3.2. Only animals respire.
3.3. Respiration is necessary to release energy from the food we eat
3.4. Respiration takes place 24hrs a day. (4)

3. INTERACTIONS AND INTERDEPENDENCE WITHIN THE ENVIRONMENT

3.1. INTRODUCTION TO ECOLOGY p17

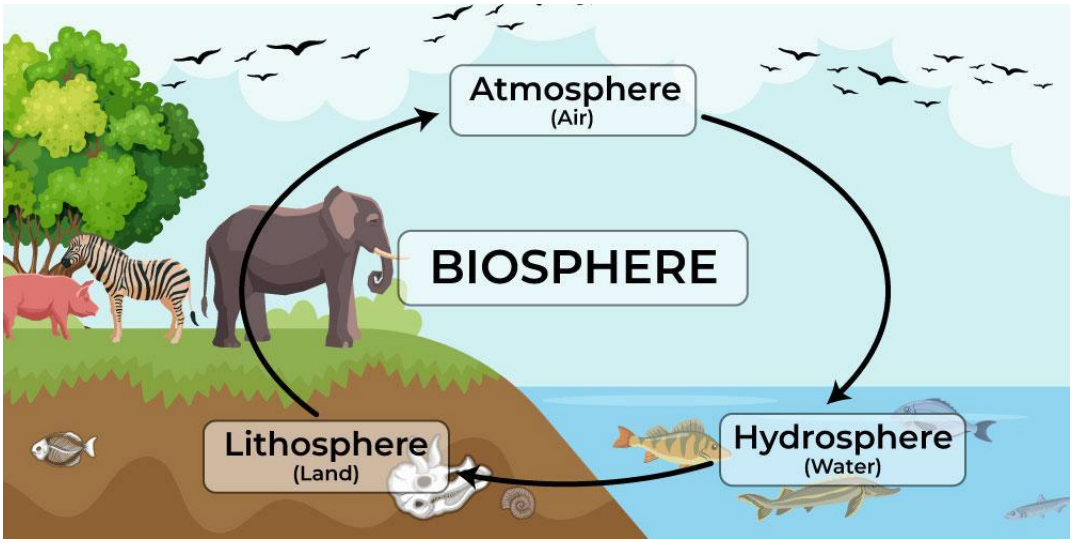
ECOSYSTEM	**All living and non-living things in an environment & the different ways they interact with each other.**
ECOLOGY	**is the study of the interaction between living organisms and the non-living aspects of their physical and chemical environment.**
LIVING ORGANISMS	**Includes:** plants, animals, bacteria, protists – single celled organisms that may live freely or in colonies, and fungi
NON-LIVING ORGANISMS	Includes: Light, water, temperature, air and **soil** .



LIVING ORGANISMS CATEGORIES

Ecologists classify interactions at 4 levels: populations, communities, ecosystems and the biosphere.

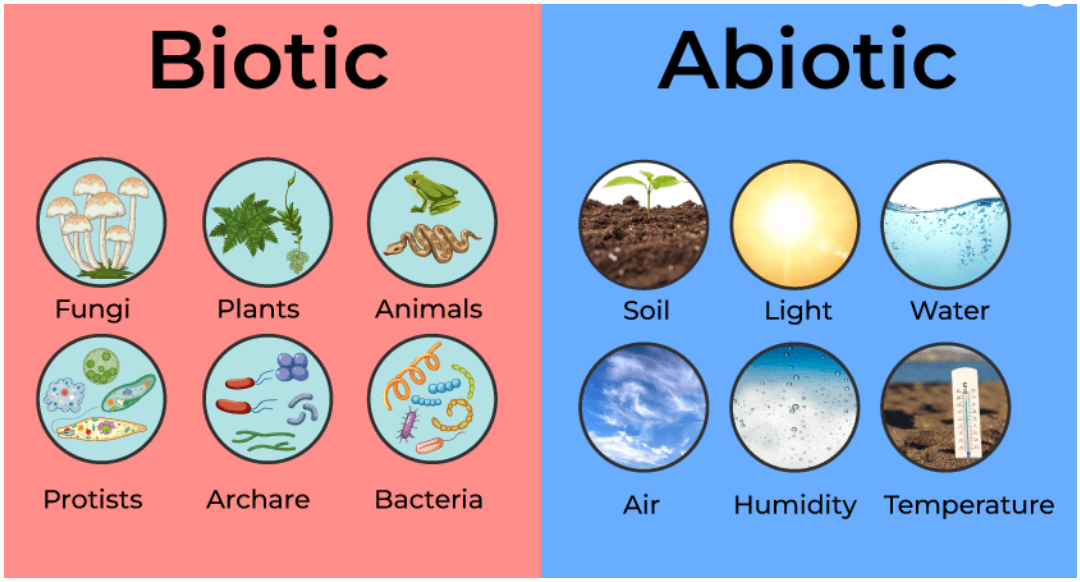
BIOSPHERE STRUCTURE



ACTIVITY	Using page 16 of your textbook provide the definitions of the following: ▪ Population ▪ Community ▪ Biosphere ▪ Habitat
ACTIVITY	Complete Activity 2 Page 17 in your workbooks

3.2. ECOSYSTEMS

BIOSPHERE	All the ecosystems on earth combined. The part of the earth and atmosphere where living things exist.
Biotic Factors	All **living** organisms and their interactions. Organisms will compete for resources like food, water, space, mates etc.
Abiotic Factors	**The non-living** things in an ecosystem decides e.g. temperature, wind, water, sunlight, soil, slope.
SIZE	▪ Varies from as small as a **puddle** to something as large as a **forest or grassland** ▪ Some ecologists regard the entire earth as an ecosystem.
FEEDING RELATIONSHIPS	▪ Different populations within a community rely on each other for **food**. ▪ Feeding relationships are often represented in a **food web** or **food chain.** ▪ If change occurs in even the smallest population, the whole food chain will be influenced.



More about **ABIOTIC FACTORS**

TEMPERATURE	Most organisms can only live in temperature ranges of between 0°C and 40^0C.
WIND	If wind speeds are too high it can stunt the growth of certain plants. Wind is necessary for plants to **spread their seeds** and for the pollination of some plants.
WATER	If water supply is limited plants and animals must adapt to conserve or reduce water loss. Flooding can also kill many plants and animals.
LIGHT	We know how important light is for the process of **photosynthesis .** Different plants require different levels of light.
SOIL	There are 3 categories of soil - **sand, loam and clay** . Different plants grow in different soil types.
SLOPE	Refers to how **steep** the land is. Not many plants can grow on slopes because water runs off slopes quickly and causes **soil erosion.**

ENVIRONMENTAL CHANGES AND EFFECTS

- Animals and plants need to be able to adapt to their habitat when change occurs in order to survive.
- Change can be sudden (like a **flood** or a fire) or **gradual** (like seasonal change or a drought).
- Some organisms are versatile in that they may feed on a large variety of foods or because they have a greater tolerance for different habitats.
- Such organisms include rats, starlings and weeds.

ACTIVITY	Complete Activity 3 on Page 19 of your textbook in your notebooks

3.3. FEEDING RELATIONSHIPS

ORGANISMS AND FEEDING RELATIONS

Organisms are often put into different categories according to what they eat.

Some categories are even split up into even more categories.
This helps us to determine the feeding relationships within an ecosystem.

PRODUCERS

Are green plants that make their own food.

(indicating that they have **chlorophyll** in their cells which is important for photosynthesis)
This food may be used by plants immediately or they might store it as **starch** to use later.

CONSUMERS

Are organisms that cannot make their own food and must therefore get their energy elsewhere.
This category consists of herbivores, omnivores carnivores and decomposers

HERBIVORES

Are animals that feed on plants only

(the "vegetarians" of the living organisms)
EXAMPLES include:
bucks, giraffes, sparrows, elephants.

CARNIVORES **Feed on other animals (dead or alive) to get their energy**

(they are the "meat eaters" of living organisms).

THE THREE KINDS OF CARNIVORES

1.PREDATORS

Are carnivores that get their food by hunting other animals (called prey)

EXAMPLES include:
lions, leopards, eagles, and even ladybirds.

2.SCAVENGERS

Are carnivores that feed off dead or decaying animals (often the "leftovers")

Although sometimes predators may scavenge (like lions) and scavengers might hunt (like wild dogs).

3.INSECTIVORES

Are carnivores that feed on insects.

EXAMPLES include:

the aardwolf (who eats termites) and bat-eared foxes eat ants, grasshoppers, beetles and termites. Many birds are insectivores.

OTHER CONSUMERS ARE…

OMNIVORES

Eat both plants and animals.

EXAMPLES include:

humans, pigs, warthogs and baboons.

DECOMPOSERS

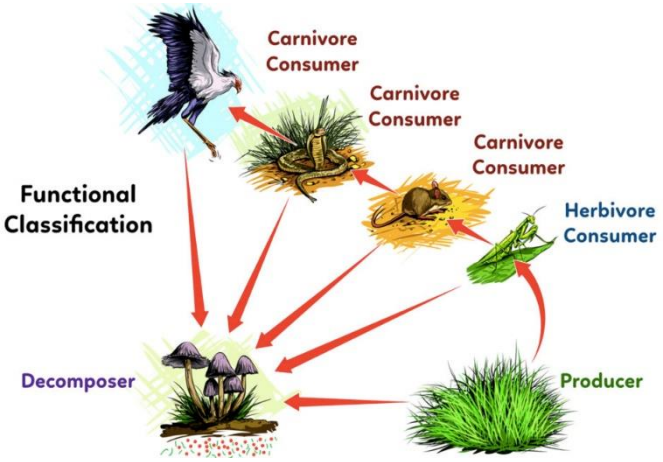
They break down dead organic matter (remains of dead plants and animals as well as their waste matter).

EXAMPLES include:

bacteria, fungi , beetles and earthworms.

They can be **microscopic** (can't see with a naked eye) or macroscopic / large.

They break down dead matter into simpler substances, which are released into the **soil**. These **nutrients** are absorbed by the roots of plants.



DECOMPOSER EXAMPLES

DUNG BEETLES

- Dung beetles feed on dung of elephants and large buck.
- They break the dung up into smaller pieces. These smaller pieces mix with soil and help **fertilise** the soil.
- They may also roll the dung into balls to lay their eggs.
- In the Addo Elephant Park cars may not drive over any dung in order to protect these beetles.

FUNGI

Fungi release digestive chemicals (**enzymes**) into dead matter. The enzymes break down dead plant or animal matter and nutrients are released back into the soil.
EXAMPLES include:
mushrooms and breadmould.
The threads of breadmould are called **hyphae**.

ACTIVITY	Compete Activity 5 on Page 25 in your workbooks
ACTIVITY	**Summarise the importance of decomposers into your notebook. Information on Page 27 of your textbook**
ENRICHMENT ACTIVITY	Follow the instruction in Activity 6 on Page 27 and complete once the mould it has grown.

3.4. ENERGY FLOW: FOOD CHAINS AND FOOD WEBS

PLANTS AND ALGAE

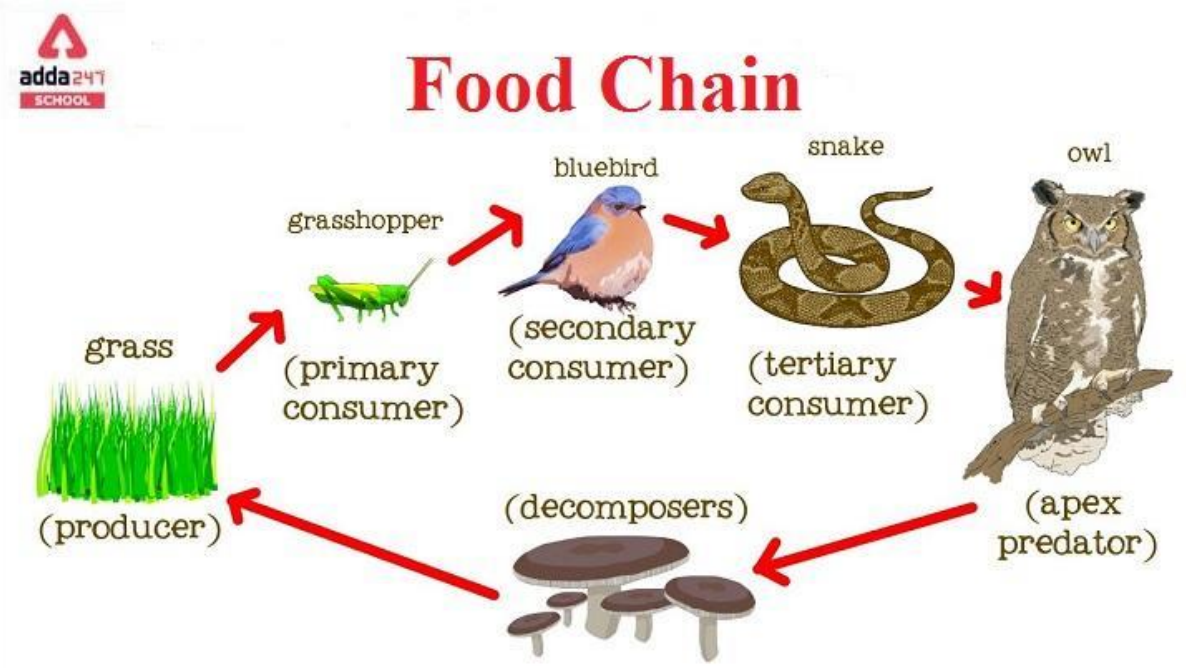
- **THEY ARE THE PRODUCERS**
- They play an important part in the ecosystem
- They capture light from the sun and use that energy to produce food during photosynthesis.
- This **energy** is then passed along in a food chain.

FOOD CHAIN

- Shows the feeding relationship between living organisms.
- **It always starts with the producer and ends with the top consumer.**

DECOMPOSERS Will be found at every level as all plants and animals die and decompose.

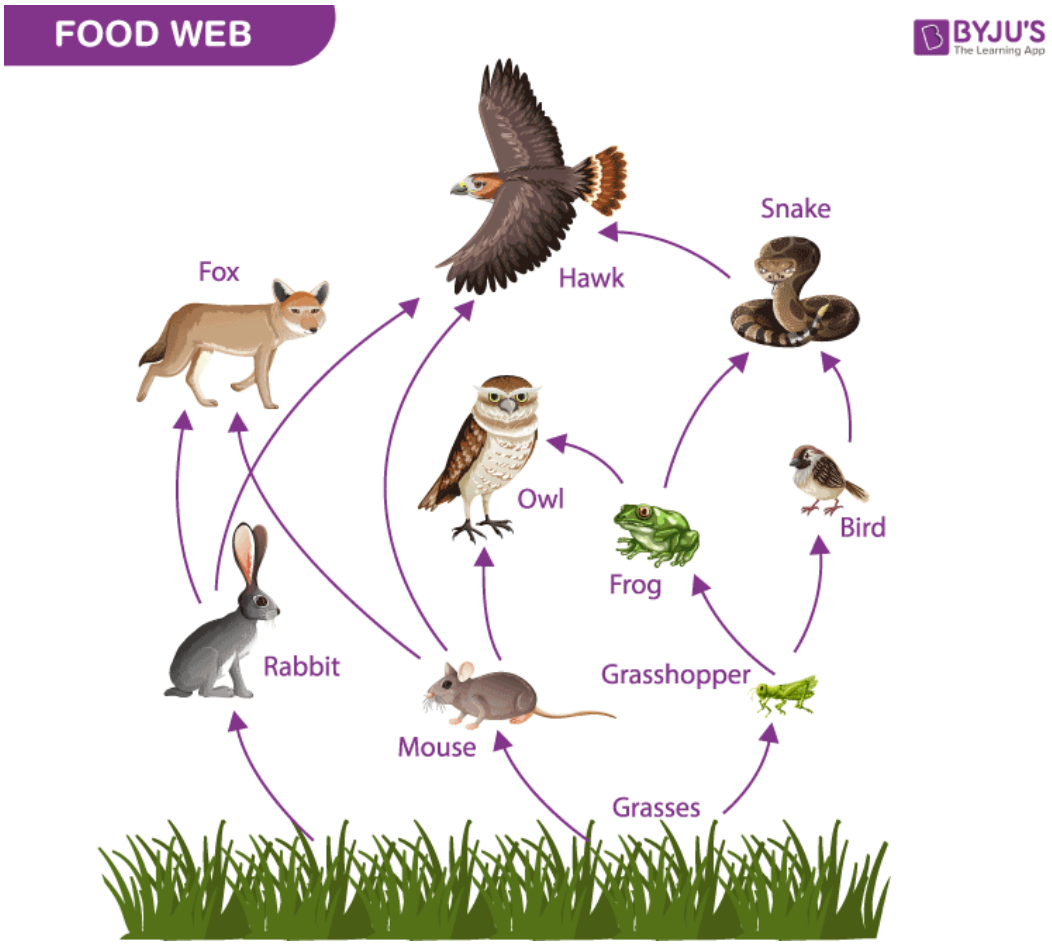
ARROWS IN A FOOD CHAIN Show the **direction** of the flow of energy from one organism to the next.



FOOD CHAINS There are many food chains in an ecosystem. Most animal do not eat only one kind of food

FOOD WEB A group of food chains connected together is called a **food web**.

DIAGRAM



ACTIVITY	Complete Activity 8 and 9 on Pages 31 and 32 from your textbook into your notebooks

TROPHIC LEVELS

Each stage in a food chain or food web is called a trophic level.

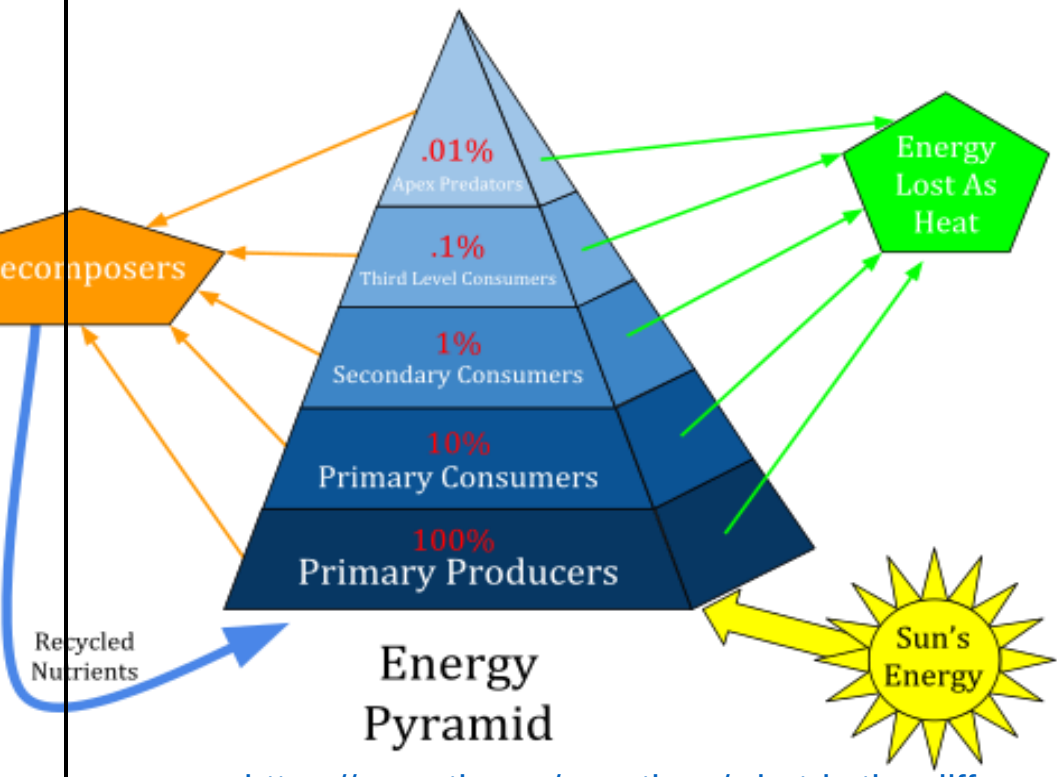
First level = **producers**
Second level = **herbivores** / primary consumers
Third level = **primary carnivores** / secondary consumers
Fourth level = secondary carnivore / tertiary consumers
Fifth level = top carnivores/ final consumers

ENERGY TRANSFER AND LOSS

- Most of the energy in each level is used up by the organisms for:

ENERGY TRANSFER AND LOSS

- **growth, reproduction, respiration and movement** .
- Some of the energy is **lost** in the form of heat or urine or faeces.
- Only **10% of the energy is available to be passed** on to the next trophic level.
- The transfer of energy is can presented in the form of an energy **pyramid** .



https://socratic.org/questions/what-is-the-difference-between-the-pyramid-of-numbers-pyramid-of-biomass-and-pyr

ENERGY PYRAMID

- The **base representing the producers** is broader as there is much energy produced (through photosynthesis).
- As the levels go up so the amount of energy **decreases**.
- Most pyramids will only show a maximum of **four** trophic levels – thereafter the amount of energy is too little.

ACTIVITY	Read through page 33 and answer Activity 10 on page 34 of your textbook in your workbooks

3.5. BALANCE IN AN ECOSYSTEM

LIVING ORGANISMS

- Live within a fine balance with the environment.
- **They depend on the environment for food, shelter and water.**
- If these resources are scarce then only small populations can be supported.
- The number of individuals that can survive in an ecosystem will depend of the **resources** available.

COMPETITION AND BALANCE

- **Lack of resources can lead to competition between organisms**
- i.e.the stronger one will survive (survival of the fittest).
- When there is a lot of resources then many organisms can be supported and **little** competition will occur.
- When the resources decrease then fewer organisms can be supported and competition for survival will increase.
- The ecosystem is therefore kept in balance.

EXAMPLE OF COMPETITION AND BALANCE

MICE IN THE WOODLANDS

- More mice lead to more **food** available for the owls.
- The owl population will **increase**.
- More owls will then lead to more mice being eaten resulting in the number of mice decreasing.
- Less mice therefore **reduces** food for the owls and the number of owls will decrease.
- The balance is maintained naturally through a **feeding** relationship.

DISRUPTIONS

Is something that interferes with the normal, orderly process of how an ecosystem functions.

If this balance is disrupted then the ecosystem can be temporarily or permanently affected.

These disruptions can be caused by:

natural factors or by human factors.

NATURAL FACTORS

- EXAMPLES:
- fires, drought , floods, temperature fluctuations

- Sometimes these changes can be too big and the ecosystem cannot cope.
- If the balance is disrupted over a **short time period**, then the ecosystem can **recover**.
- If the disruption is **lengthy** then the ecosystem can be damaged to the point of animals and plants being **permanently lost**.

HUMAN FACTORS
POLLUTION AND POACHING

POLLUTION

Pollution is harm done when toxic (poisonous)substances and materials are released into the environment.

EXAMPLE:

1. **Household and industrial waste** like plastic , toxic chemicals from factories , smoke and gases from burning **fossil fuels** (coal , petrol , oil) in power stations , factories and cars.

2. Farmers add **fertilisers** (nutrients) rich in nitrogen, sulfate and phosphate, to the soil.
   Excess nutrients will be washed into rivers by rainfall and upset the balance of nature for the aquatic organisms.
3. **Burning fossil fuels release toxic gases into the air**
   Causes breathing problems and allergies to people.
   Gases include **carbon dioxide** which can dissolve in the rain causing **acid rain**.
   Acid rain damages buildings , crops and trees and can also cause rivers to become acidic killing fish and plants living in the water.
   The **biodiversity** of the river water decreases.

4. **Some factories release hot water** into dams and rivers causing the temperature of the water to increase – **thermal pollution.** This changes the amount of oxygen in the water and many organisms can die.
   Bacteria involved in decomposing the dead organisms use up the little oxygen available in the water.

POACHING

- **Poaching is the illegal removal of animals and plants from the wild .**
- Many plants are under threat because of poaching eg : orchids, cycads.
- Many animals like perlemoen, **rhino** (horns) , elephants (ivory tusks)
- Poaching can lead to the extinction of populations which will upset the balance in ecosystems.

3.6. ADAPTATIONS

ADAPTATION
is a characteristic that helps a living organism survive in its environment.

They occur when there is a change in the **structural**, **behavioural**, **functional** characteristics of an organism

STRUCTURAL/PHYSICAL

- is a special feature of the **body**
- eg : different birds have different shape and size beaks to eat different foods
- ie this reduces **competition** between the birds and ensures that there is enough food for all.

BEHAVIOURAL

- Many animals will avoid the heat of the day by resting under bushes of going underground where it is cooler.

FUNCTIONAL

- **relates to the way in which the body works.**
- eg: leaves of the Erica plant are rolled under at the edges to reduce water loss ;
- eg: people sweat to cool down when it is hot.

CHANGING ENVIRONMENTAL CONDITIONS & ADAPTATIONS

- The environment may become hotter and drier or there may be a change in the resources available.
- Plants and animals need to **adapt** to these changes to survive. Those organisms that can adapt have a better chance of **surviving** and **reproducing**.
- In any population, the individuals differ slightly from one another. This is determined by **genes** inherited from the parents, over many generations.
- These **variations** enable some individuals to survive in the changing environment.
- They will reproduce and pass on these **beneficial** characteristics to their offspring.
- Over time the whole population may have these characteristics.
- Sometimes variation can be harmful to an organism (diseases) or may have no effect at all.
- If an organism is not able to adapt in time to the changing environment, it can lead to a species becoming **extinct** eg: the dodo.

ACTIVITY	Write a short note yourself, in your notebook , as to why the dodo became extinct. Pg 41

ADAPTATIONS OF PLANTS

XEROPHYTES

- **Some plants are adapted to living in hot and dry conditions. These plants are called xerophytes**
- EXAMPLES
- Gazanias live in the **deserts**. They have grey **hairy** leaves to reflect sunlight. The hairs trap any moisture to reduce water loss. The yellow flowers attract insects for **pollination** .
- Cacti **store** water in their stems. They have **thorns** instead of leavINGes to reduce water loss.

HYDROPHYTES

- **Some plants are adapted to living in water. These plants are called hydrophytes** .
- EXAMPLES
- Water lilies have more **stomata** on the top side of the leaf than on the lower side.

ADAPTATIONS IN ANIMALS IN EXTREME CONDITIONS

ACTIVITY

Look at the two pictures of the camel and the polar, on page 42.
Copy and complete the table into your notebooks:

Camel – hot dry climate	
Body structure	**Function**
Thick eyelashes	
Nostrils close together	
Sand-coloured fur	
Concentrated urine	
Hairy ears	
Fat stored in hump	
Thick fur	
Broad flat pads	

Polar bear – icy Arctic	
Body structure	**Function**
Thick layer of body fat	
Large feet	
Fur on soles of feet	
Small ears	
Thick white fur	
Sharp claws	

PREDATOR ADAPTATIONS

CHEETAHS

- Have good **eyesight**,
- can run very fast for **short** distances
- Well **camouflaged** (blend in with their environment) so that they can get close to their prey.
- Strong **sharp claws** and teeth to hold onto their prey, kill and tear flesh.

SHARKS

- Have good sense of **smell**
- Can **swim** very fast to catch their prey.
- **Streamlined** shape and muscular tail to propel themselves through the water.
- **Sharp teeth** to hold their prey as they shake their head from side to side to rip the flesh into pieces.

CAMOUFLAGE AND MIMICRY

Animals use different methods to avoid predators – they keep very still or make it difficult to be see / be identified.

CAMOUFLAGE

Colours and shapes help animals blend in well with the environments.

EXAMPLE:

Chameleon changed colour depending on the environment which makes it difficult to see.

MIMICRY

Harmless / palatable species copies another poisonous or unpalatable species.

EXAMPLE:

The African monarch butterfly is unpalatable and is avoided by bird. A more palatable butterfly will resemble the Monarch butterfly in wing colour and patterns so to be avoided by birds as well.

Viceroy butterfly
(The mimic - palatable species)

Monarch butterfly
(The model - distasteful species)

3.7. CONSERVATION OF THE ECOSYSTEM

EXTINCTION

- Ecosystems can be destroyed as a result of people.
- As ecosystems are destroyed, **species become extinct.**
- Scientists note that the rate at which species are becoming extinct is increasing.

HUMAN ACTIVITIES CONTRIBUTING TO SPECIES EXTINCTION

MONOCULTURE

many species in an area are removed and replaced with a single crop

OVERHARVESTING

many plants (for medicinal reasons) and animals (food) are removed and their numbers never return back to normal. Over time they become extinct.

PESTICIDES

used to kill rats and mosquitos kill other species.

POLLUTION

in various forms (air, water, plastic, heavy metals, toxins) kill many animals.

ALIEN SPECIES

Introduction of **alien species** kills many indigenous (locally found) species. They compete for resources with indigenous species.

WHY DO WE NEED TO CONSERVE SPECIES?

- We conserve species to **maintain ecosystems**.

- Ecosystems carry out important natural processes.
- **These include:**
- Regulates the **atmosphere**
- Regulates temperature and **rainfall**
- Filters, cleans and retains water
- Provides **homes** to plant pollinators
- **Recycles** nutrients (eg. Decomposers)
- Produces wood, food and **fuel** that people use.

SUSTAINABLE USE OF NATURAL RESOURCES

- **Sustainable means using resources wisely so that they are not depleted.**

- **<u>Ensures that these resources:</u>**
- Remain **available** to future generations of people.
- EXAMPLE:
- Collecting medicinal plants or bark from trees.
- Also fishing in certain areas.

- **(Important!)**→ Enough of the resource needs to be maintained in order for the population to **regrow.**

HOW DO CONSERVATIONISTS CONSERVE ECOSYSTEMS?

- Identify large areas of land/ sea that is rich in **biodiversity** and set it aside for conservation. SA has some of best nature reserves in the world.
- No **harvesting of natural resources** (plant or animal species) are allowed in these areas.

- **BIODIVERSITY = total variety of species in a given area.**
- The higher the biodiversity, the **greater number of species**
- in a given area.

- Examples of conservation areas Kgalagadi Transfrontier park, **Kruger** national park, Addo national park and marine coastal parks

- **Laws** are usually put into place to stop poaching.
- These laws are often difficult to enforce.

HOW DO CONSERVATIONISTS CONTROL ALIEN VEGETATION?

- **Alien vegetation usually have no natural predators in our country.**
- They are tough, quick growing plants that take over an area very quickly.

They can be controlled by the following 3 methods:

1. Biological control:

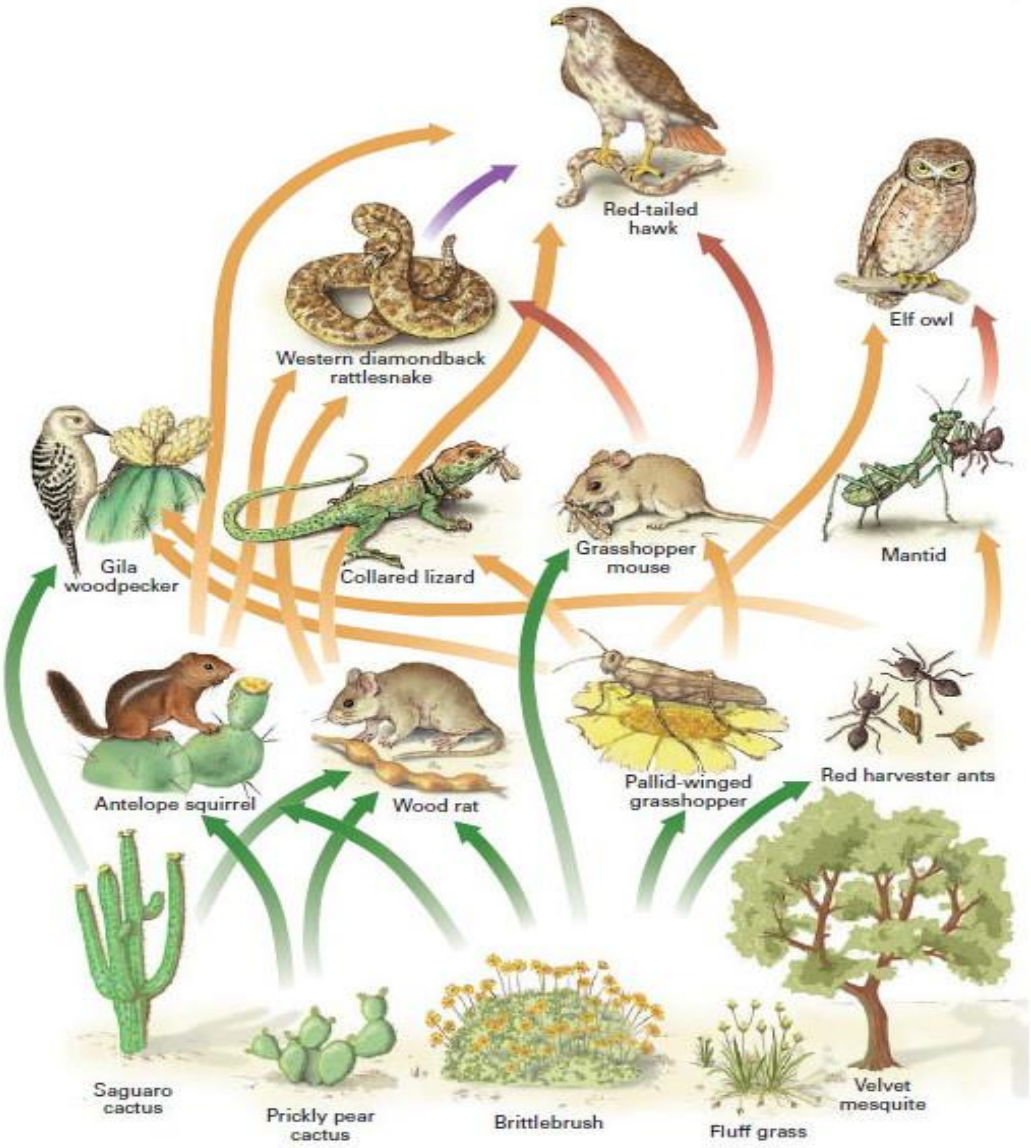
- This involves using a living organism to control the alien vegetation.
- The natural enemy of the plant in its native country is used to control the plant in South Africa.
- Example: a **weevil** that feeds on SESBANIA (alien plant) was introduced.

- **2. Chemical control:**
  chemical poisons (called **herbicides**) are sprayed on the plants to kill them.

- **3. Mechanical control**:
- this involves physically removing the plants by **cutting** them down or by **uprooting** them (pulling them out) this needs to be repeated yearly.

ACTIVITY	Complete topic 2 revision on page 50

REVISION QUESTIONS WORKSHEET 1



https://www2.nau.edu/lrm22/lessons/food_chain/food_chain.html

1. Provide a suitable heading for this diagram.
2. What do the arrows indicate?
3. From this picture, draw 2 single, separate food chains
4. Add to your food chains another 2 food chains in order to make a food web.
5. Name 2 producers
6. Name 3 primary consumers
7. Name 3 carnivores
8. Name the apex predator

9. Draw a neat, labelled energy pyramid using one example for each trophic level.

REVISION QUESTIONS WORKSHEET 2

Instructions

- **The question paper consists of 4 questions, 6 pages**
- **Answer all the questions**
- **Number the answers correctly according to the numbering system used on this question paper.**

1.1 **MULTIPLE CHOICE**. Choose the correct answer and write down just the letter.

1.1.1 The ultimate source of energy comes from :
a. Plants
b. The sun
c. Photosynthesis
d. Respiration

1.1.2 Which of the following is an abiotic factor?
a. Micro-organisms
b. Leaves
c. Soil
d. Ants

1.1.3 The threads that make up the structure in breadmould are called…
a. hyphae
b. enzymes
c. decomposers
d. nutrients

1.1.4 The illegal removal of animals and plants from the wild is called…
a. pollution
b. fossil fuels
c. poaching
d. hunting

1.1.5 A group of populations interacting with each other in the same area is called a …
a. community
b. specie

c. ecosystem
d. biosphere (5)

1.2 Give the correct **TERMINOLOGY** for each the following statements /descriptions.

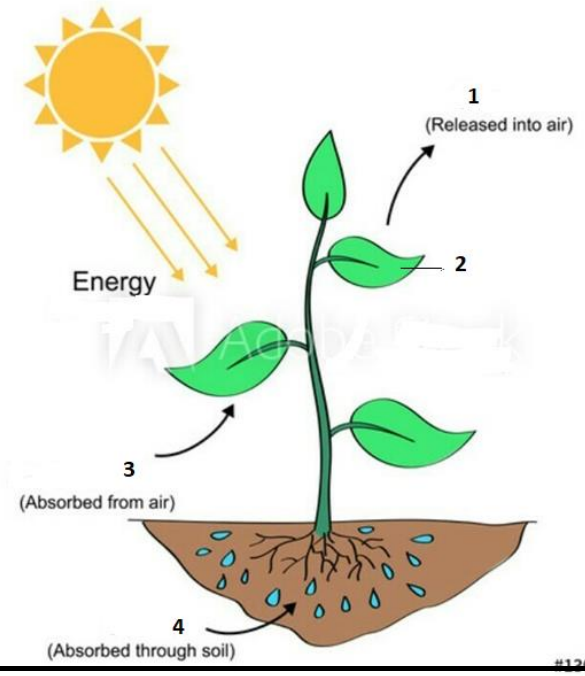
1.2.1 The form in which glucose is stored in the leaves.
1.2.2 Organisms that eat both plant and animal matter.
1.2.3 The transfer of energy between organisms in an ecosystem.
1.2.4 Energy-containing compounds such as coal and oil formed millions of years ago.
1.2.5 The type of graph to be drawn when the independent variable is a word, category of group. (5)

1.3 MATCHING COLUMNS : Write next to the number of the term in column A, the letter of the description in column B which best fits the term in column A.

Column A	Column B
1.3.1 Pollution	a. Animals hunted and killed by a predator
1.3.2 Final consumer	b. Carnivores that feed on dead or decaying animals
1.3.3 Prey	c. The factor that will purposefully change
1.3.4 Scavenger	d. The factor that will be measured at the end of an investigation.
1.3.5 Dependant variable	e. Human factor that causes disruption to an ecosystem.
	f. Last trophic level in a food chain
	g. Hunts and kills its food

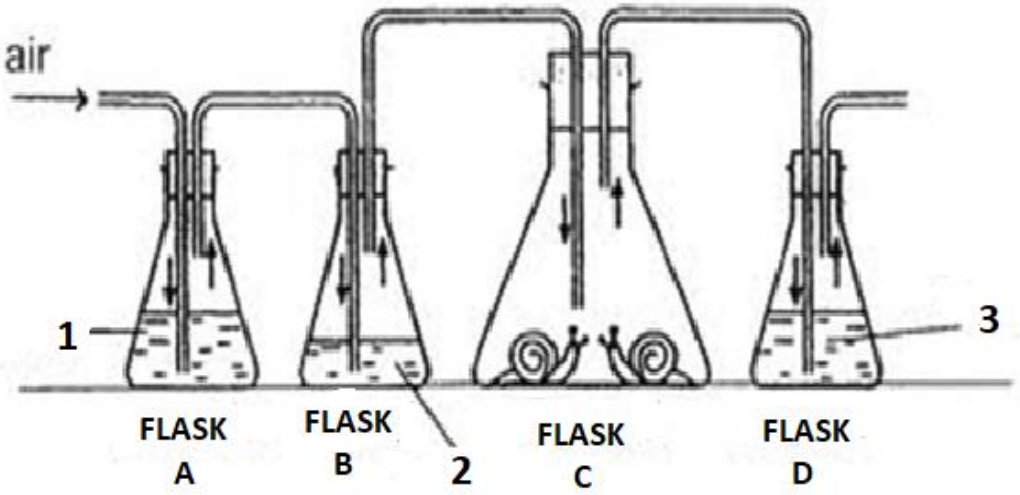
(5)

2.1 Study the diagram below and answer the following questions:



2.1.1 What process is the diagram representing? (1)
2.1.2 Identify the gases involved in the labels numbered 1 and 3. (2)
2.1.3 Name the abiotic factor absorbed at part numbered 4. (1)
2.1.4 What pigment is found in the leaf at 2? (2)
2.1.5 What is the biological importance of this process to all living organisms? (3)
[9]

2.2 Study the diagram below and answer the following questions :



https://www.saburchill.com/lab/experiments/expt18.html

2.2.1 Identify which process is being investigation in this diagram. (1)

2.2.2 Write the word equation for this process. (2)

2.2.3 Name the solution 2 and 3 ? (1)

2.2.4 What will the result be in flask B? (1)

2.2.5 What would happen in flask D if the snails were dead? (1)

[6]

3.1 Explain the meaning of the following terms:

3.1.1 Microscopic

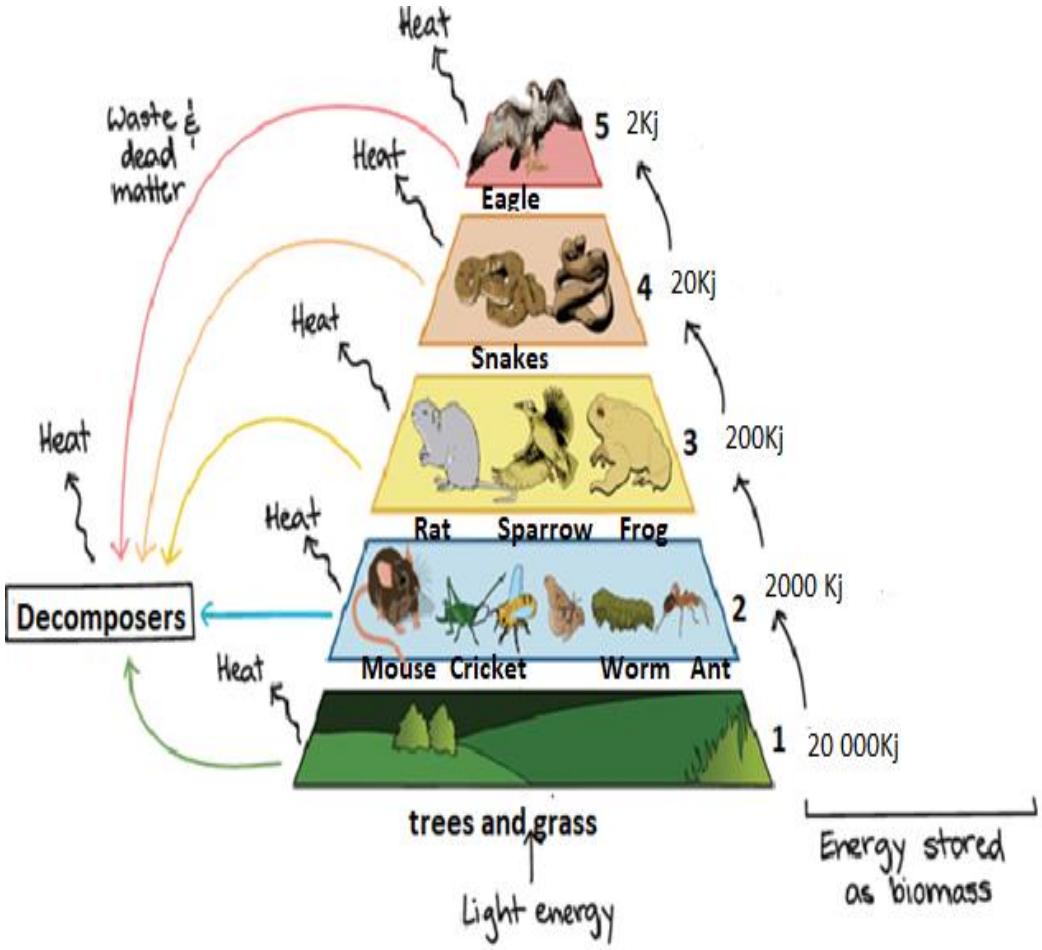
3.1.2 Enzymes

3.1.3 Biotic factors

3.1.4 Omnivores (4)

3.2 Name any 3 abiotic factors in a desert and explain how they will affect the living organisms found there. 3 x 2 = (6)

3.3 Study the diagram below and answer the following questions: Note that only some of the organisms have been labelled.



https://www.khanacademy.org/science/biology/ecology/intro-to-ecosystems/a/food-chains-food-webs

3.3.1. Identify which feeding level is represented at 2 and 5. (2)
3.3.2 Identify two visible examples of primary carnivores. (2)
3.3.3 From this pyramid draw one food chain. (2)
3.3.4 Explain why decomposers are so important in an ecosystem. (2)
3.3.5 Give two reasons why the amount of energy is decreasing from feeding level 2 to feeding level 3 (2)
[10]

REVISION QUESTIONS WORKSHEET 3

1.1 Name ONE human factor that you have studied, that causes disruption in an ecosystem. (1)

1.2 Name and briefly explain 2 methods used to control unwanted plants (non-South African) growing in South Africa. (2)

1.3 What will happen to an organism if it is not able to adapt to the changing environmental conditions. (1)

1.4 Explain adaptations for …

1.4.1 a plant living in a desert. 1 x 1 = (1)

1.4.2 a camel living in a desert. 2 x 1 = (2)

1.4.3 a polar bear living in the Arctic 2 x 1 = (2)

[9]

2 Micro-organisms can be used to cure diseases.

2.1 Name the scientist who discovered that milk can be boiled to prevent it from causing illness in humans. (1)

2.2 Name the modern medicine used to prevent humans from being infected from diseases like measles and polio. (1)

2.3 Draw a neat labelled diagram of breadmould / filamentous fungi. (5)

[7]