

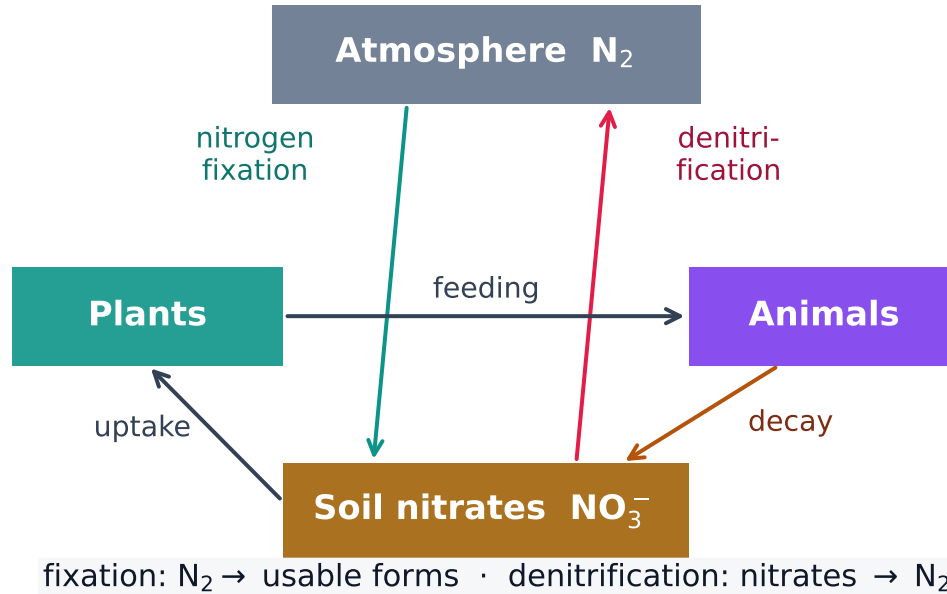
Exercise walk-through

1.9

Trophic Levels

AP Environmental Science

Nitrogen and phosphorus, in detail



Nitrogen cycles through the **air**, phosphorus only through **rock** and water. An excess of either causes **eutrophication**.

Energy flow and the 10% rule, in detail

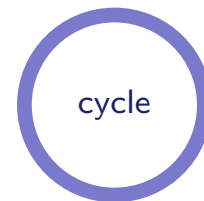


Energy flows *one way* up the **trophic levels**

and is lost as heat.

Check yourself

- 1 Which two abiotic factors define a terrestrial biome?
- 2 Which nutrient cycle has no gas phase?
- 3 Write the equation linking NPP, GPP, and R.
- 4 About what fraction of energy passes up one trophic level?



Answers 1. temperature and precipitation 2. phosphorus 3. $\text{NPP} = \text{GPP} - R$
4. about 10%

Exercises 2.1-2.3

2.1 What is a producer?

[1]

2.2 Classify a rabbit that eats grass.

[1]

2.3 What is the role of decomposers?

[1]

Exercises 2.1-2.3

2.1 What is a producer?

[1]

2.1

- An organism that makes its own food (e.g. by photosynthesis)
-

2.2 Classify a rabbit that eats grass.

[1]

2.2

- Primary consumer (herbivore)
-

2.3 What is the role of decomposers?

[1]

2.3

- They break down dead matter and recycle nutrients back to the environment

Exercise 3.1

3.1 An organism that breaks down dead matter and recycles nutrients is a [1]

☐

A producer

B primary consumer

C decomposer

D tertiary consumer

Exercise 3.1

3.1 An organism that breaks down dead matter and recycles nutrients is a [1]

☐

A producer

B primary consumer

C decomposer

D tertiary consumer

3.1 C

- decomposer

Exercise 3.2 (a)

3.2 In the chain grass $\rightarrow$ grasshopper $\rightarrow$ frog $\rightarrow$ snake:

(a) Identify the producer and the secondary consumer.

[2]

Exercise 3.2 (a)

3.2 In the chain grass → grasshopper → frog → snake:

(a) Identify the producer and the secondary consumer.

[2]

(a)

- Producer: grass; secondary consumer: frog

Exercise 3.2 (b)

3.2 In the chain grass $\rightarrow$ grasshopper $\rightarrow$ frog $\rightarrow$ snake:

(b) State the trophic level of the snake.

[1]

Exercise 3.2 (b)

3.2 In the chain grass $\rightarrow$ grasshopper $\rightarrow$ frog $\rightarrow$ snake:

(b) State the trophic level of the snake.

[1]

(b)

- Tertiary consumer

Exercise 3.3

3.3 Explain why decomposers are essential for nutrient cycling.

[2]

Exercise 3.3

3.3 Explain why decomposers are essential for nutrient cycling. [2]

3.3

- They release the nutrients locked in dead organisms back into the soil/water, making them available to producers again, so the cycle continues