



# TERM 1: LIFE AND LIVING

## UNIT 1 PHOTOSYNTHESIS AND RESPIRATION

### Activity 1: Page 14

Do further research and write a short report on the requirements for photosynthesis, as well as the products that are produced during photosynthesis.

#### Requirements:

- **Green plants (plants containing chlorophyll) in the presence of:**
  - sufficient light energy.
  - sufficient water.
  - carbon dioxide.
  - soil rich in minerals.

#### Products that form:

- **Glucose (sugar) that is stored as starch, used to produce cellulose and other chemical compounds.**
- **Oxygen that is released into the atmosphere.**

### Practical investigation 1: Page 17

**Aim:** To prove that green plants produce starch when exposed to sunlight.

#### Investigative question:

**What do green plants produce when it is exposed to sunlight?**

#### Hypothesis:

**Green plants that are exposed to sunlight produce starch by means of photosynthesis.**

#### Questions:

1. Why do you have to boil the leaf in water first, before boiling it in alcohol/ethanol?

**The leaf is first boiled in water to soften the leaf tissue or to break the cell walls.**

2. Why do you have to heat alcohol/ethanol over water and not over an open flame?

**It is very dangerous to heat it over an open flame, because alcohol/ethanol is highly flammable.**

3. Why do you need to boil the leaf in alcohol/ethanol?

**Alcohol/ethanol dissolves the chlorophyll that is present in the green leaf.**

4. What do you observe after the leaf has been boiled in alcohol/ethanol?

**The green leaf becomes hard and turns yellow-white.**



5. Why do you have to boil the leaf in water the second time?

**To soften the leaf.**

6. What variables must remain constant during this practical investigation?

**Type of leaves; time leaves are boiled**

7. What is the difference in the results between the two different leaves that were tested?

**Leaf exposed to sunlight: turns blue-black.**

**Leaf not exposed to sunlight: a brown iodine colour.**

**Results:**

**After the leaf has been covered with iodine, it turned blue-black.**

**Conclusions:**

**Green plants that have been exposed to sunlight, photosynthesise and produce starch and turn blue-black in the presence of iodine solution.**

## Exercise 1: Page 20

1. Chlorophyll
2. Sugar (glucose) and oxygen (by-product).
3. During photosynthesis plants produce oxygen and starch.  
Humans and animals need oxygen to survive.  
Starch, that plants store, is a source of food for humans and animals.  
This process also maintains the balance between oxygen and carbon dioxide in the atmosphere.
4. Sunlight, water, carbon dioxide, chlorophyll, nutrients, minerals and enzymes
5. They take it in through the root hairs on their roots.
6. CO<sub>2</sub> enters the plant through the stomata on the aerial parts of the plant.
7. It is released through the stomata.
8. Plants shelter and protect other plants and animals.
  - Mosses and ferns grow abundantly in the shadows of tall trees.
  - Birds find shelter in trees at night which makes it more difficult for predators to catch them.
  - Animals use plants for camouflage, e.g. chameleons and praying mantises.

Plants serve as habitats for other plants and animals.

  - Fungi, like mushrooms, grow on the bark of trees.
  - Woodpeckers nest in tree trunks by hollowing the tree trunk.