# Activity 1: Life's Cycle

**Introduction:** This is a paper-based activity to show how life processes, such as respiration, nutrition and photosynthesis, are linked with the cycling of materials such as carbon dioxide and oxygen. By matching the cards to the background paper, you will also find out which specialised cells carry out some of the processes involved.

**Key Stage:** Biology KS3

**National Curriculum Ref:** Sc2 1c, e; 2a, d, j, k; 3a-e; 5b

**Time:** 10-15 minutes for activity and 10 minutes for pupils to fill in blank worksheet and discuss findings

**Pupil learning outcomes:** Both plants and animals respire all the time. The cycles involved in life processes are interrelated

**Context:** Shows the inter-linking nature of life processes and cycling of materials such as carbon dioxide. Also links cycles to the cells that carry them out.

**Common misconceptions:** Pupils may not realise that respiration and breathing are not the same.

**Breathing** is a mechanical process. When we breathe in, our diaphragm contracts and pulls down the base of our lungs, and intercostal muscles move the ribs out, stretching and enlarging the lungs, so that air is sucked in down our windpipe (via our nose or mouth). As we breathe out, our diaphragm and chest muscles relax, the lungs are no longer stretched and air is pushed back out of the lungs.

**Respiration** involves the transfer of energy. The respiratory system is made up of the lungs and airways such as the windpipe, throat and nasal passages. Our lungs absorb oxygen from the air we breathe. The oxygen is transported around our body and used to 'burn up' the food we eat and convert it to energy. This results in the production of carbon dioxide, which is breathed out.

**Resource list:**

- One laminated empty worksheet frame per group on which to place the following:
- Photographs: grass, cow, mountain and water (reservoir, river, lake or sea)

Different coloured counters representing

- Processes: photosynthesis, animal respiration, plant respiration, rock breakdown (weathering and erosion), animal nutrition, plant ('mineral') nutrition, water absorption (7 in total)
- Molecules: two $CO_2$, two $H_2O$, one $O_2$ , one Calcium (6 in total),
- Cells: leaf palisade cell, red blood cell, root hair cell, ciliated epithelial cell (4 in total)

- One paper copy of empty worksheet per pupil (if time allows)

**Lead-in:** The characteristics of life (MRS GREN – **m**ovement, **r**eproduction, **s**ensitivity, **g**rowth, **r**espiration, **e**xcretion, **n**utrition). Discuss how some of these are inter-linked in plants and animals and how parts of plants and animals carry out these processes.

**Activity:** See participant card

**Follow-up:** If time allows, hand out paper copies of blank worksheets on which pupils may record their results.

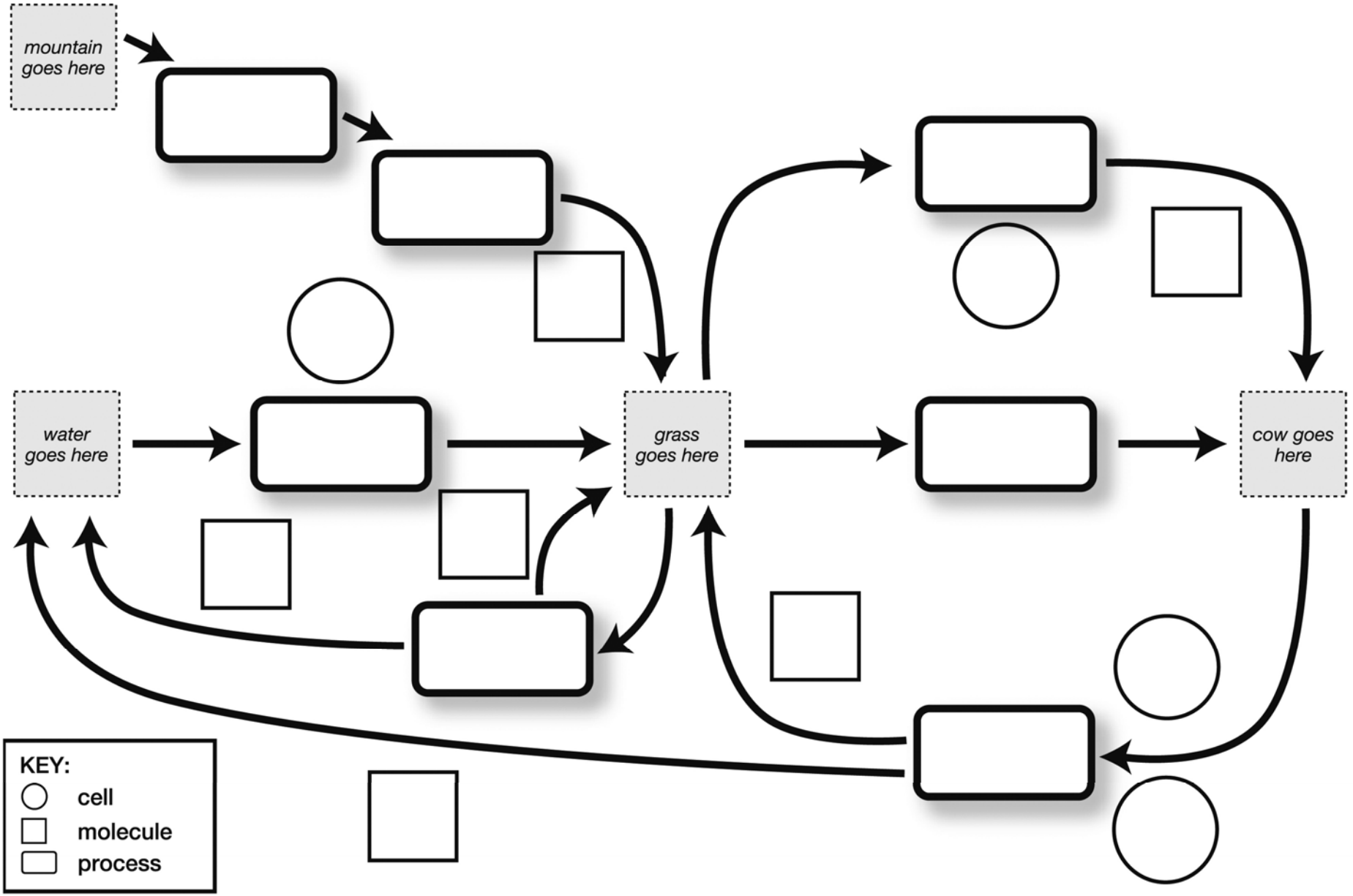
**Teacher extension:** Some paper counters and pictures may be replaced with the following:

- one small bottle labelled $O_2$
- two small bottles labelled $CO_2$
- two small bottles of $H_2O$
- small toy cow

In preparation for the activity, pupils may be asked to carry out a web search to find the photos needed for the activity

# Pictures for Activity 1



# Answers to activity 1