Student worksheet – activity on:
Closed-loop economy

Generic green skills

Cognitive competencies:

- Systems and risk analysis, skills to assess, interpret and understand both the need for change and the measures required
- Understand the complexity and interconnectedness of sustainable development issues and challenges

Intrapersonal competencies:

- Adaptability and transferable skills that help workers learn and apply the new technologies and processes required to green their jobs

Technological competencies:

- Management systems (waste, energy, water)

Learning objective

You will be able to:

1. Understand what a closed-loop economy is and think about how it works in different sectors
2. Reflect on 'cradle-to-cradle' design and redesign the suburban house based on it

Format

Small group work

Resources needed

A4 paper, A3 paper, pens, concept information sheet

Time required

1.5 hours

Assessment

You will be assessed based on:

Your redesigned suburban house and group presentation.

Part 1: Small group discussion (25 minutes)

1. Carefully look at **Diagram 1** and **Diagram 2**, which illustrate different designs for food and water cycles. Identify differences between the two diagrams. What did you find? Did you find any closed loops in the diagram? Can you reflect on similar issues that exist on campus or at your workplace?

2. Share your findings with the whole class.

Part 2: Small group work – substituting more 'closed loops' (40 minutes)

Sustainability is always achieved by design, not by accident. 'Cradle-to-cradle' design is based on the living model for sustainability – nature. The flow and cycling of matter in nature does not lead to waste and pollution, but to a dynamic balance of growth and change within ecological systems. The elements of cradle-to-cradle design are based on the principles that drive these systems in nature.

1. Read the concept information sheet to get a better understanding of the cradle-to-cradle design inspired by nature.

2. Use some, or all, design criteria below to **redesign the suburban house with a backyard** (**Diagram 3**) by including 'closed-loop' systems in your design. Think about waste produced by the household and how waste might be transformed into useful products.

3. Group presentation. Share your redesign of a suburban house and illustrate how the closed-loops work there.

Example design criteria:

1. Waste equals food
    - Design materials and products that are 'food' for other systems. This means designing materials and products that can be used over and over in either technical or biological systems.
    - Design materials and products that are safe. Design materials and products whose lifecycle leaves a beneficial legacy for human or ecological health.
    - Create and participate in systems to collect and recover the value of these materials and products
2. Use current solar income
    - The quality of energy matters. Use renewable energy.
3. Celebrate diversity
    - Water is vital for humans as well as all other organisms. Manage water use to maximize quality and promote healthy ecosystems while remaining respectful of the local impacts of water use.
    - Use social responsibility to guide a company's operations and stakeholder engagement.

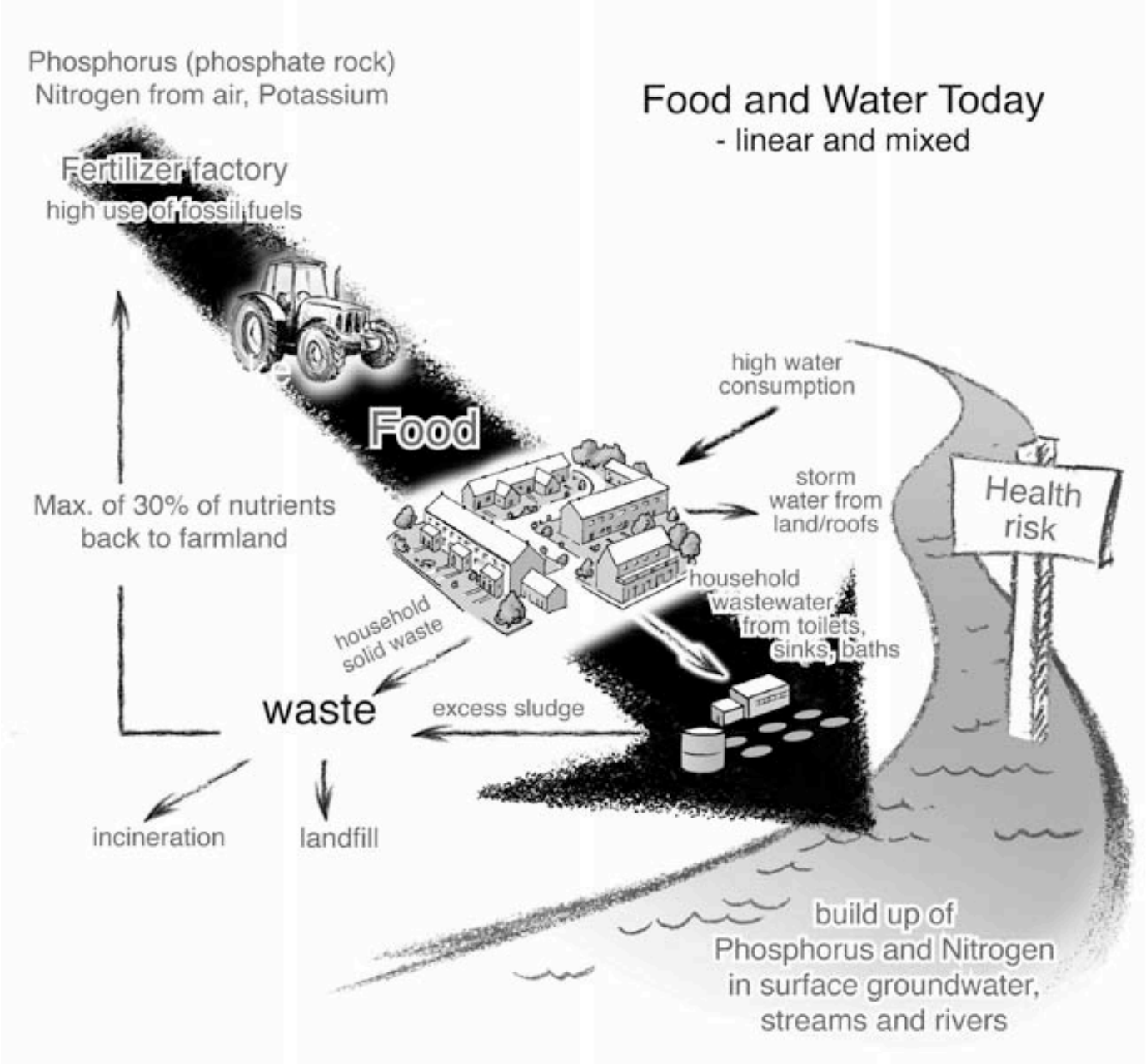

Diagram 1: Food and Water Today –– linear and mixed

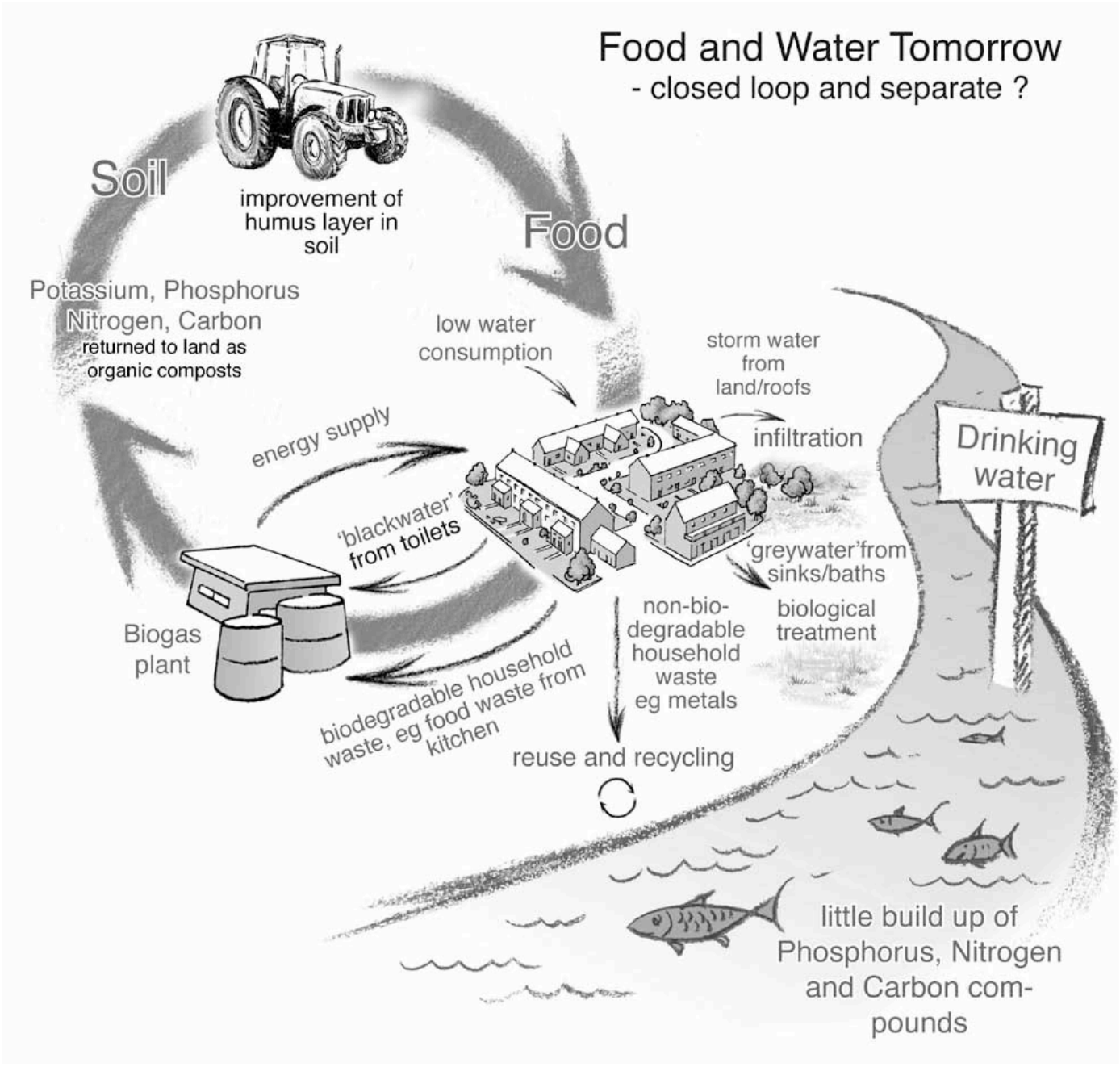

Diagram 2: Food and Water Tomorrow – closed loop and separate?

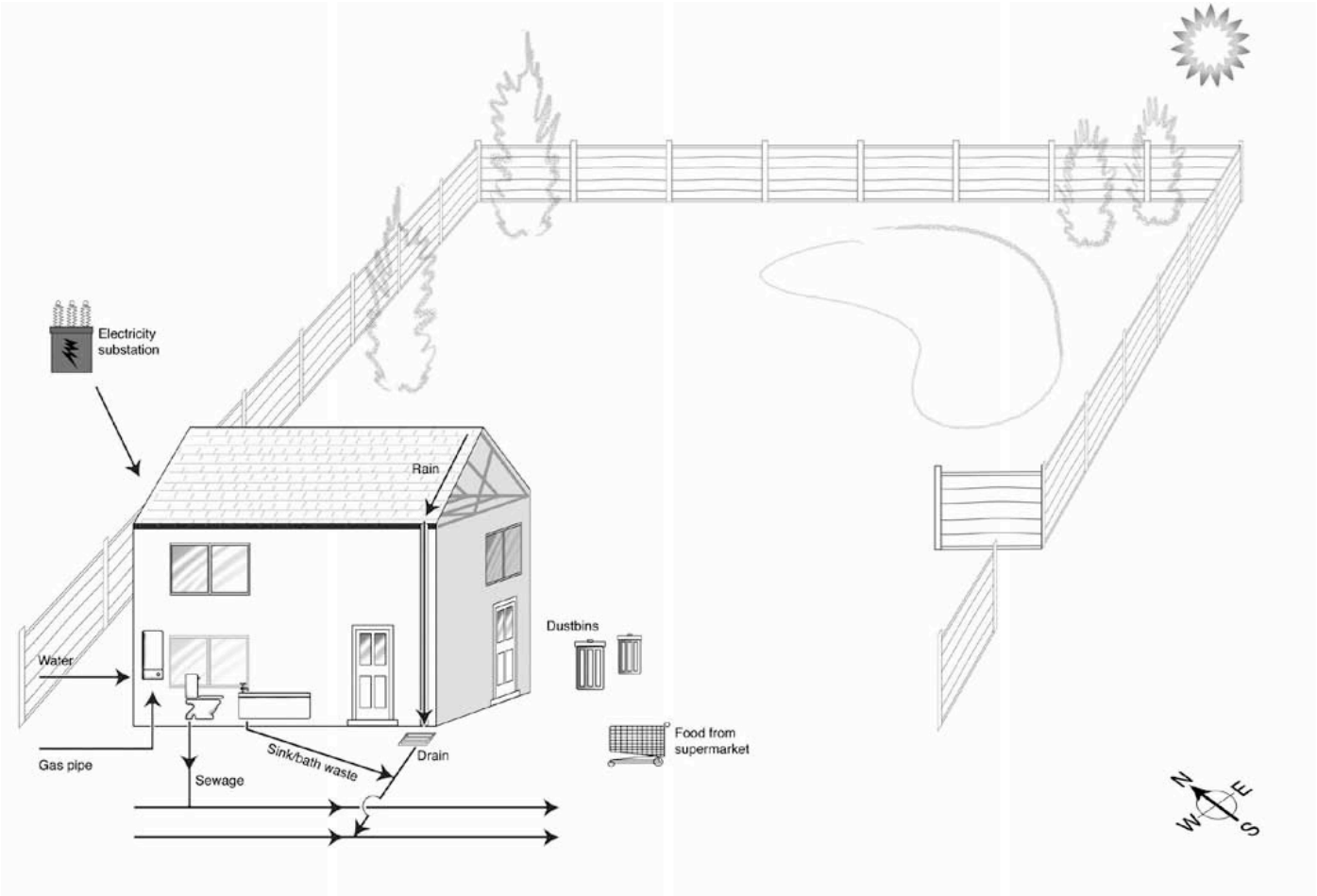

Diagram 3: Ground plan of suburban house

Reference:

Webster, K., & Johnson, C. (2010). *Sense & Sustainability Educating for a circular economy* (2nd ed.).