

Checkups and follow-ups

CHAPTER 3 ANSWER KEY

ST

Questions 1–6 and E

Different forms of energy

Checkup

1 WHAT IS ENERGY? (pp. 70–78)

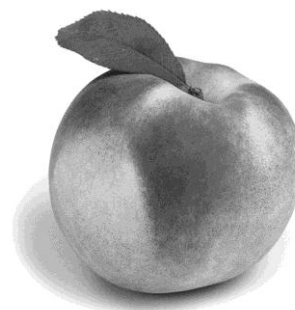
1. Name the form or forms of energy in each of the following energy sources.

A



Chemical energy

B



Chemical energy

C



Elastic energy

D



Radiation energy

2. In each of the following examples, is energy used to do work or to cause a change?

- a) a puddle of water evaporating in the sun A change
- b) a burning log A change
- c) a car moving along the road Work
- d) a person climbing a staircase Work

3. Why is the amount of energy in the universe said to be constant?

Because, according to the law of conservation of energy, energy is neither created nor destroyed. The total amount of energy therefore remains constant.

4. Does each of the following situations describe a transfer or a transformation of energy, or both?

a) Solar energy makes photosynthesis in plants possible.

A transformation of energy

b) Energy from a heating system warms the air in a home.

A transfer of energy

c) Power plants generate electricity that is then delivered to our homes.

A transformation and a transfer of energy

d) Food provides the energy we need to go about our daily lives.

A transformation of energy

5. To perform work equal to 2 400 J, a machine consumes 12 000 J. What is the energy efficiency of this machine?

$$\begin{aligned} \text{Energy efficiency} &= \frac{\text{Useful energy}}{\text{Energy consumed}} \times 100 \\ &= \frac{2\,400\text{ J}}{12\,000\text{ J}} \times 100 = 20\% \end{aligned}$$

6. Can a cup of boiling water contain more thermal energy than a bucket of water at 50°C? Explain your answer.

Not necessarily, because heat depends not only on the temperature but also on the amount of matter involved.

⇒ Questions 7 to 12 are not intended for students in the ST program.

2 MOTION AND FORCES (pp. 79–91)

⇒ The questions in this section are not intended for students in the ST program.

3 FORCES IN FLUIDS (pp. 92–98)

⇒ The questions in this section are not intended for students in the ST program.

REVIEW QUESTIONS

⇒ Questions A to D are not intended for students in the ST program.

E. Prepare your own summary of Chapter 3 by building a concept map.

See the Concept maps section in Guide B.

Follow-up

1. Why is it important to reduce energy consumption?

By reducing our energy consumption, we also reduce our impact on the environment. If we reduce our fossil fuel consumption, we generate less greenhouse gas. If we reduce our hydroelectric demands, we help prevent further flooding of land to build new dams.

2. Whether we own or rent our homes, we can all take steps to reduce our energy consumption. Give three examples of such steps.

Answers will vary. Examples: turning off the lights when we leave a room

– turning down the heating at night and when we are away from home

– using energy-efficient appliances

– insulating our homes better.