

Name _____

Class _____

Date _____

By the end of this worksheet I can...

- ☐ identify the energy forms going into and out of a product
- ☐ draw universal system and sub-system diagrams
- ☐ describe closed loop control using SET - ACTION - FEEDBACK - COMPARE - ADJUST
- ☐ calculate work done and rearrange to find a mass

I DO

Key ideas

You will need these

$E_w = Fd$ and $F = mg$

Work done = force $\times$ distance; weight = mass $\times$ 9.8 N/kg

- $g = 9.8 \text{ N/kg}$

Remember

Describe a control system in order: SET - ACTION - FEEDBACK - COMPARE - ADJUST.

YOU DO

Tasks

Show your working for calculations.

Toast

1 State the energy forms for the input and output of a kettle.

2 Draw a universal system diagram for a toaster.

Input	Process	Output

3 A toaster weighs 15 N. Calculate the work done carrying it up a staircase with a vertical height of 4.2 m.

Tea

4 Draw a sub-system diagram for an automatic kettle. Include the feedback loop and the system boundary.

5 Describe, with reference to your sub-system diagram, the operation of the kettle.

6 It takes 58.7 J of work to carry the empty kettle up to the Art department, 7.68 m higher. Calculate the mass of the kettle. (3 marks)

7 Describe how the kettle could be made more energy efficient.

Check and reflect

Mark your answers with the answer sheet. Which “I can” statement above still needs work? Look back at the notes for that topic on the site.
