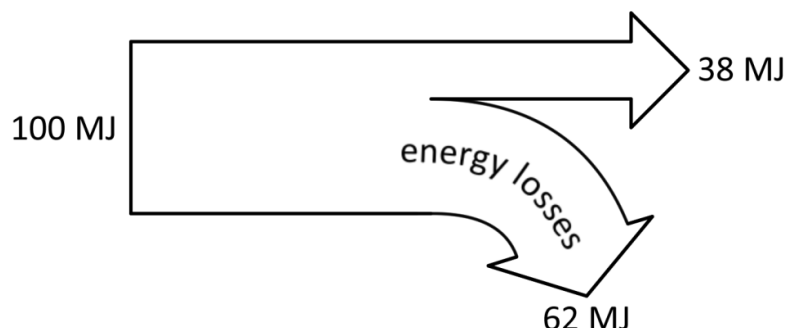


Name:

Class:



The Sankey diagram (energy flow diagram) shows the energy transferred by a power station from 100 MJ in the primary fuel.



Calculate the efficiency of the power station.

$$\text{Efficiency} = (\text{useful energy} \div \text{total energy}) \times 100$$

$$\text{Efficiency} = (38 \div 100) \times 100 = \mathbf{38\%}$$

$$\text{Efficiency} = \mathbf{38\%}$$

A worker is stacking shelves at the supermarket. She lifts boxes of tins from the floor to the shelves. Each tin weighs 5 N. An empty box weighs 2 N.

- i. What is the smallest force that the worker has to pull on a box of 4 tins when lifting it?

$$5\text{ N} \times 4 = 20\text{ N} + 2\text{ N} = 22\text{ N}$$

22 N upthrust will cancel out the weight of the box. But it doesn't move it. We need to put in more than 22 N. Accept any value between **22.01 N to 23 N**

$$\text{Force} = \mathbf{22\text{ N}}$$

- ii. The worker lifts a box of 4 tins from the floor to a shelf 0.5 m above the floor. Calculate how much gravitational potential energy the box gains. Include the correct unit in your answer.

$$\text{Work done} = \text{force} \times \text{distance}$$

$$\text{Work done} = 22 \times 0.5 = \mathbf{11.0\text{ J}}$$

$$\text{Gain in gravitational potential energy} = \mathbf{11.0\text{ unit} = \text{J}}$$

State the law of reflection.

The angle of incidence is equal to the angle of reflection.

State the equation to calculate the current in a wire when given the charge and time.

$$\text{Current} = \text{charge} \div \text{time}$$