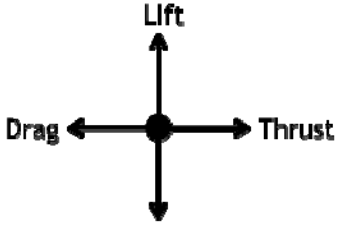
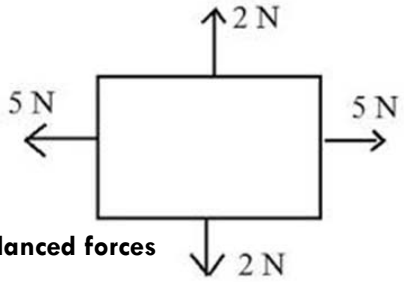
Year 7 Mastery — Forces and Energy (part 2)

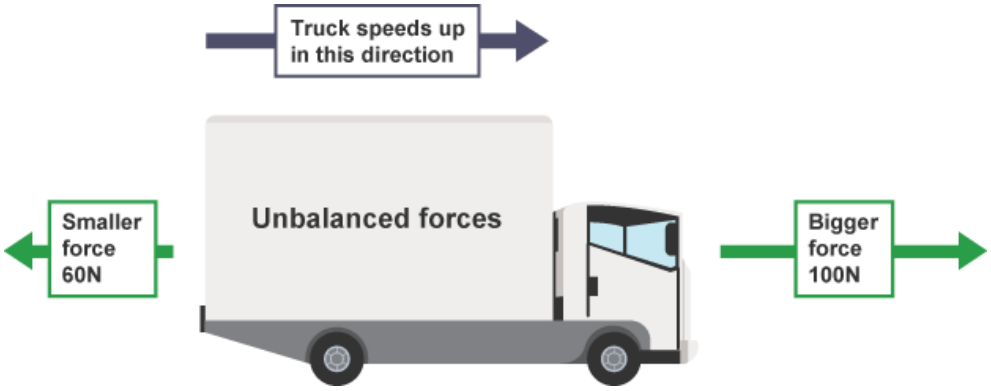
Free body diagram	Free body diagrams show the size and direction a force acts on an object.
Force arrows	Show the direction a force is acting.
Newtons (N)	Unit of force named after British scientist Isaac Newton (1642-1727). Eg, the frictional force on the boat is 20,000 N.
Resultant force	The single force that could replace all the forces acting on an object, found by adding these together. If all the forces are balanced, the resultant force is zero.
Unbalanced forces	When two forces working in opposite directions on an object are not the same strength. Unbalanced forces change motion of objects.
Balanced forces	When two forces on an object are the same strength but in opposite directions.
Light	Energy that moves in transverse waves.
Thermal	Heat energy.
Kinetic	Movement energy.
Sound	Energy that moves through a sound (longitudinal) wave.
Gravitational potential energy	The energy stored by an object lifted up against the force of gravity. Also know as GPE.
Chemical potential energy	Stored energy in fuel, foods and batteries.
Elastic potential energy	Energy stored in squashed, stretched or twisted materials
First Law of Thermodynamics	Energy is never created or destroyed only transferred.
Energy transfer	Different forms of energy can be transferred from one form to another.
Joule	A unit of measuring energy.
Efficiency	A way of saying how much energy something wastes.

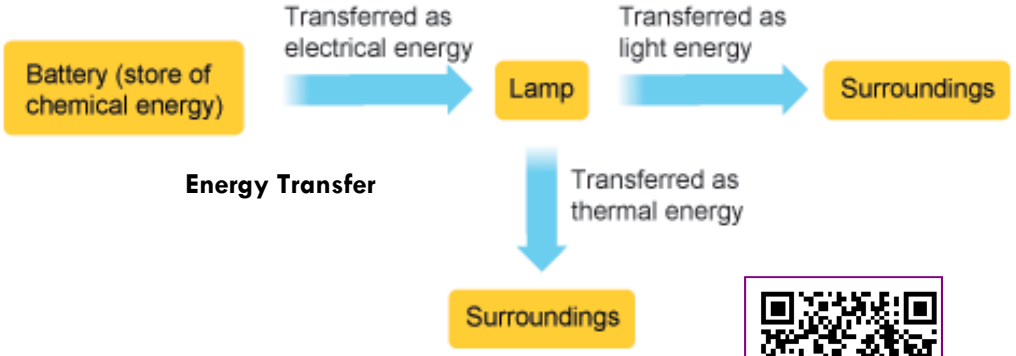


Free body diagram



Balanced forces





Energy Transfer

BBC Bitesize energy

BBC Bitesize forces

BBC Bitesize GCSE resultant forces

PRIDE THROUGH SUCCESS

Year 7– Forces and Energy (part 2)

Learning Outcome	Strengthen	PQ- Extend
2.7	1. Produce a free body diagram of sitting on a chair. 2. Produce a free body diagram of a car moving forwards. 3. List 2 forces acting in opposite directions.	4. Draw a free body diagram showing a arrow in flight. 5. Produce two free body diagrams showing a training crashing into another train.
2.8, 2.9	1. Show balanced forces acting on a car. 2. Show unbalanced forces slowing down a car. 3. Show a resultant force of 2N up.	4. Draw a free body diagram of a skydiver at terminal velocity. 5. What is the resultant force of a tank moving forward with 20000N of thrust, 40N of air resistance, 5000N of Friction and a weight of 48000N. Produce a diagram to support this.
3.1	1. List 5 different energies. 2. Give examples of each of these energies. 3. Name an appliance that gives off heat, light and sound.	4. Which energy do you associate with food? 5. Describe the conversion of energy from a battery to light in a torch. 6. Explain the energy transfer from wind to electricity in a wind-farm.
3.2	1. List 3 types of stored energy. 2. How can you maximise GPE? 3. Which has the great CPE: wood or petrol?	4. How is the energy released in a hydroelectric dam? 5. How does a PowerStation convert coal to electricity?
3.3, 3.4	1. Give two examples simple energy transfer. 2. What is usually wasted energy? 3. Recall the first law of thermodynamics.	4. Describe the energy transfers involved in petrol burning . 5. Explain the energy transfer involved in an arrow being shot from a bow.