

# Energy

## Energy stores and systems

### NAILIT!



It is always better to say **dissipated energy** instead of wasted energy.

Energy is **not** an object. Never use the word 'heat' as a noun. For example, say 'The energy is dissipated to the surroundings by work done against friction', not 'Heat is produced by friction'.

A **system** is an object or a group of objects.

The **energy** in a system informs us whether changes in the system can or cannot happen.

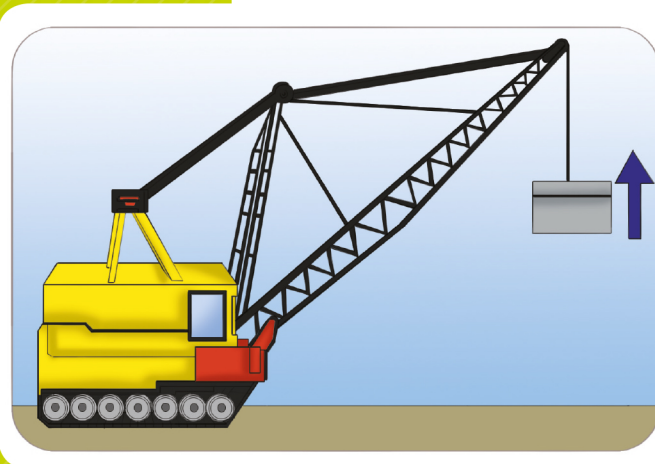
No matter what changes happen in a system, the total amount of energy in the system always stays the same. However, the energy can be transferred around different parts of the system.

We can think of these different parts of a system as **energy stores** (for example, gravitational energy stores and thermal energy stores).

Energy cannot be created or destroyed – it can only be transferred to different stores within the system.

When you describe a change in a system:

- choose the start point and end point of the change
- identify the energy stores at those points
- consider which stores empty out and which stores fill up.



A crane lifts an object from the ground to its highest point. As it lifts the object, the chemical energy store in the fuel of the crane empties a little, and the gravitational energy store of the crane fills. Parts of the crane also heat themselves and their surroundings by work being done against **friction**, filling the thermal store and 'wasting' some energy (dissipating it to the surrounding air).

