

Exercise 1.28

For each of the following processes, does the potential energy of the object(s) increase or decrease? (a) The distance between two oppositely charged particles is increased. (b) Water is pumped from ground level to the reservoir of a water tower 30 m above the ground. (c) The bond in a chlorine molecule, Cl_2 , is broken to form two chlorine atoms.

Solution

Part (a)

The electrostatic potential energy of two oppositely charged particles increases as the distance between them increases (opposite of what's said on page 16).

Part (b)

The gravitational potential energy of the water increases as it's pumped higher up the tower.

Part (c)

The chemical potential energy decreases (gets consumed) when bonds between atoms are broken.