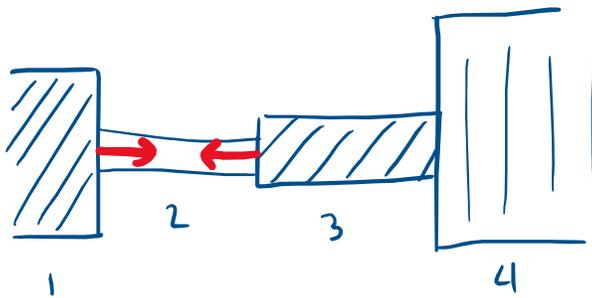


Review: Newton's Laws in static situations

For thermodynamics problems in which mechanical forces are involved, we will often need to remember how Newton's Laws allow us to relate various forces. First, Newton's second law ($F_{\text{NET}} = ma$) implies that:

- 1) For an object which is not accelerating, the net force on the object is zero.**

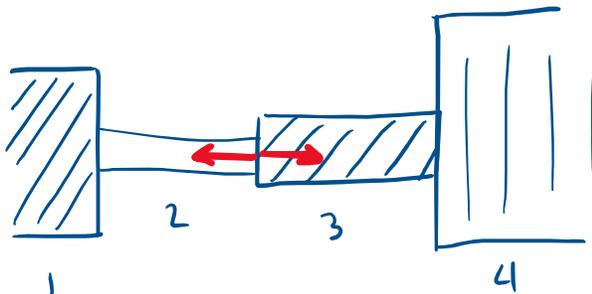
Example: in the static configuration below, the horizontal force on object 2 from object 1 must be the same magnitude and in the opposite direction to the horizontal force from object 3 on object 2. (i.e. F



Next, Newton's Third Law tells us that:

- 2) The force from an object A on an object B is of the same magnitude and in the opposite direction to the force from the object B on the object A.**

Example: in the static configuration below, the horizontal force on object 2 from object 3 must be the same magnitude and in the opposite direction to the horizontal force on object 2 from object 3.



Applying these for each object/pair we can show that all the horizontal forces from objects on adjacent objects in the situation shown are equal in magnitude.