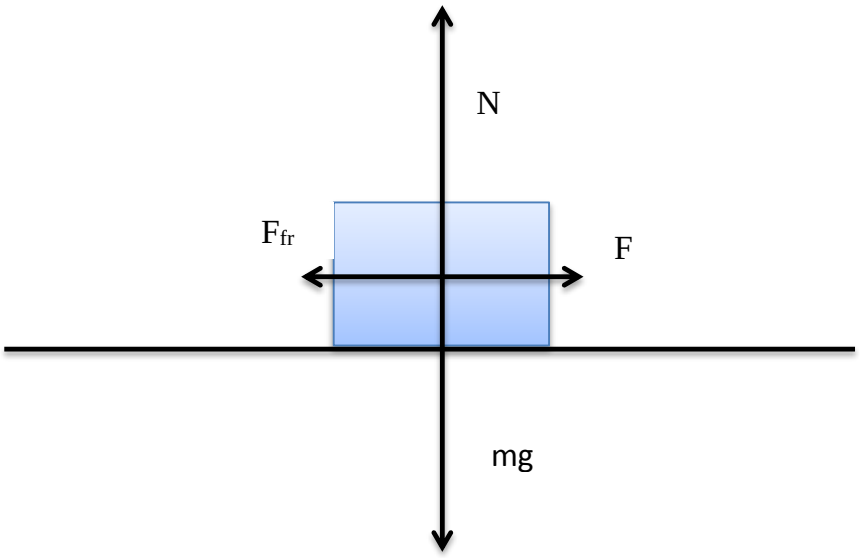
A block A of mass 5 kg is placed on a rough table. The coefficient of static and kinetic friction between surfaces of block and table be 0.4 and 0.3 respectively. If the force F exerted on the block is 10 N (g = 10 ms–2) the force of friction between block and table is



N – normal force, F_{fr} – friction force, F – applied force.

Newton's second law: $mg = N$

The force of static friction (F_{fr}) cancels out the applied force F right up to and including when static friction reaches its maximum (F_{max}). For applied forces greater than the maximum force of static friction the block starts to slip and then the value for friction becomes kinetic friction and the box is then under a net force so it accelerates to the right.

So, applied force $F = 10\ N$ and maximum static friction force equals $F_{max} = 5 * 10 * 0.4 = 20\ N > 10\ N$. Therefore, force of friction equals applied force.

Answer: 10 N