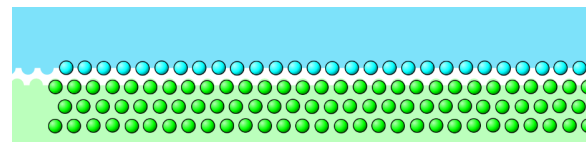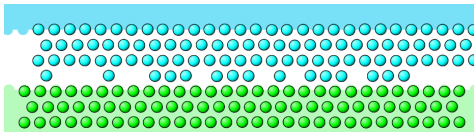Factors affecting Frictional force:
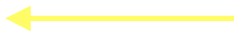
Two things on the top of each other.

If the frictional force is strong. It is hard to move or slide the object.

What makes frictional force big?
1)   More atoms in contact
2)   More weight

Y axis +

Which one is harder to slide? (more static friction)

Gravitational acceleration
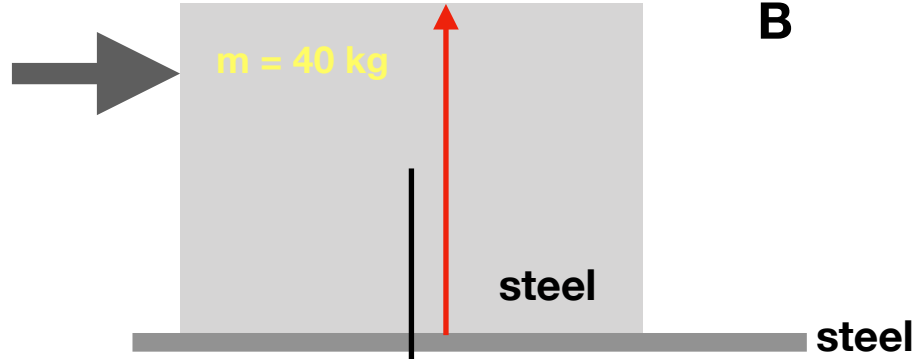$g = -9.8 \text{ m/s}^2 = -9.8 \text{ N/kg}$

A

$F_N = -W = 392 \text{ N}$

B

m = 20 kg

m = 40 kg

$F_N = -W = 196 \text{ N}$

steel

steel

$W = F_{gravity} = m.g$
$\quad = 20 \times (-9.8)$
$\quad = -196 \text{ N}$

$W = F_{gravity} = m.g$
$\quad = 40 \times (-9.8)$
$\quad = -392 \text{ N}$

B (steel on ice)

$$f_s = \mu_s F_N$$

$$f_s = \mu_s m.g$$

$$f_s = 0.1 \times 40 \times 9.8$$

$$= 0.1 \times 392$$

$$= 39.2 \ N$$

$$f_s = \quad W$$

$$f_s = \quad F_N$$

$$f_s = \quad m.g$$

$$f_s = (\text{surface of contact}) \, F_N$$

$$f_s = (\text{coefficient of static friction}) \, F_N$$

$$f_s = \mu_s \, F_N$$

$$f_s = \mu_s \, m.g$$

Frictional force is directly proportional to the weight.
If the weight increases, the frictional force increases.
If the weight decreases, the frictional force decreases.

I can use Normal Force in the place of weight, because normal force equals weight.

The contact surface:

Ice,
Carpet
oil, butter,

Road
Wet road
Icy road