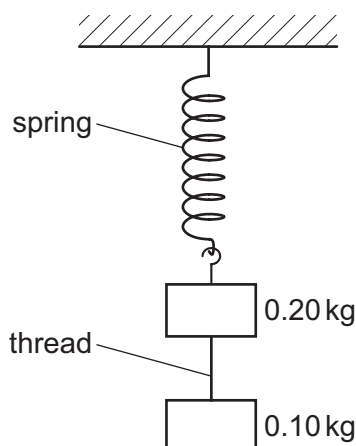


- 12 A mass of 0.20 kg is suspended from the lower end of a light spring. A second mass of 0.10 kg is suspended from the first mass by a thread. The arrangement is allowed to come into static equilibrium and then the thread is burned through.



At this instant, what is the upward acceleration of the 0.20 kg mass? (Assume $g = 10 \text{ m s}^{-2}$.)

- A 5.0 m s^{-2} B 6.7 m s^{-2} C 10 m s^{-2} D 15 m s^{-2}
- 13 An object of mass m travelling with speed v has a head-on collision with another object of mass m travelling with speed v in the opposite direction. The two objects stick together after the collision.

What is the total loss of kinetic energy in the collision?

- A 0 B $\frac{1}{2}mv^2$ C mv^2 D $2mv^2$
- 14 Two identical spheres X and Y approach each other with the speeds shown and undergo a head-on elastic collision.



What are the velocities of the spheres after the collision?

	sphere X	sphere Y
A	0 m s^{-1}	2 m s^{-1} →
B	2 m s^{-1} →	4 m s^{-1} →
C	2 m s^{-1} ←	4 m s^{-1} →
D	4 m s^{-1} ←	2 m s^{-1} →