2020B F=ma Exam: Problem 1

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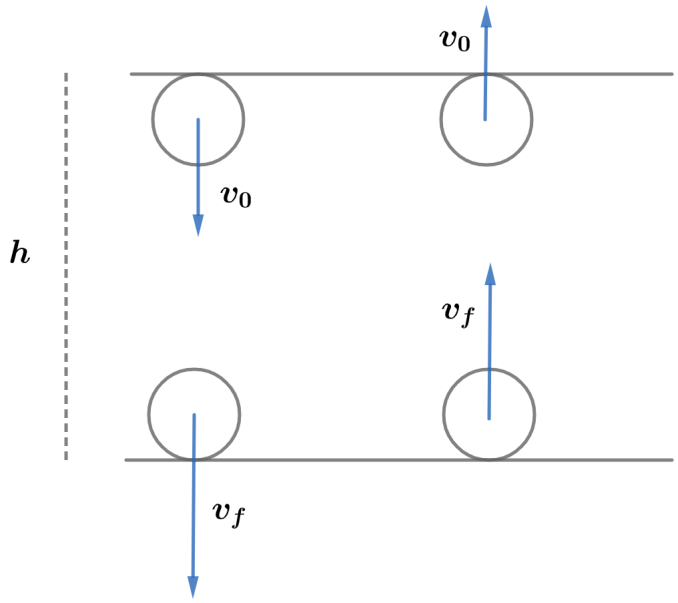

Using two kinematics equations, we have

$$v_0 + g(t/2) = v_f$$
$$v_0^2 + 2gh = v_f^2$$

where the time to go down is half the total time t by symmetry. Substituting the first equation into the second since we know v_f, we have

$$\left(v_f - \frac{gt}{2}\right)^2 = v_f^2 - 2gh$$
$$\frac{gt}{2} = v_f - \sqrt{v_f^2 - 2gh}$$
$$t = \frac{2}{g}\left(v_f - \sqrt{v_f^2 - 2gh}\right) = 0.8\,\text{s}$$

so the answer is $\boxed{\text{D}}$.