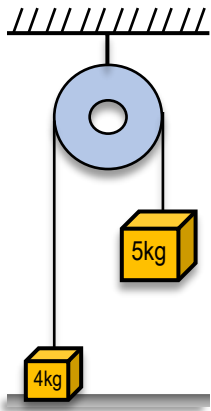


CONCEPT: SOLVING CONNECTED SYSTEMS OF OBJECTS WITH ENERGY CONSERVATION

- You can often solve problems with multiple objects using Energy, but you must consider the energies of EACH object.
 - Remember: Connected objects move together with the same $\vec{a}$ and $|\vec{v}|$!

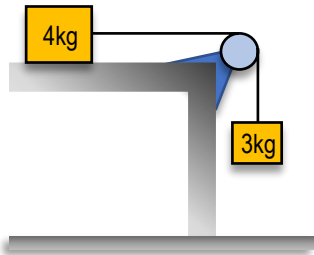
EXAMPLE: The system is released from rest. If the 5kg block is initially 3m above the floor, use **Energy Conservation** to calculate its speed just before hitting the ground. Ignore the effects of friction and any mass of the string and pulley.



CONSERVATION OF ENERGY

- 1) Draw Diagram
- 2) Write Cons. of Energy EQ
- 3) Eliminate & expand terms
- 4) Solve

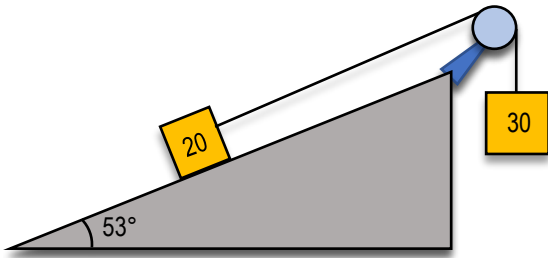
PROBLEM: A 3-kg block hangs 2m above the floor. It is connected via cable & pulley to a 4-kg block on a rough table with a coefficient of friction $\mu_k = 0.5$. If the system is released from rest, find the speed of the 3-kg block just before hitting the floor.



CONSERVATION OF ENERGY

- 1) Draw Diagram
- 2) Write Cons. of Energy EQ
- 3) Eliminate & expand terms
- 4) Solve

PROBLEM: A 30 kg block hangs above the floor, connected via cable & pulley to a 20 kg block on a smooth inclined plane angled 53° above the horizontal. If released from rest, calculate the speed of the system when the 30 kg has moved 1m.



CONSERVATION OF ENERGY

- 1) Draw Diagram
- 2) Write Cons. of Energy EQ
- 3) Eliminate & expand terms
- 4) Solve