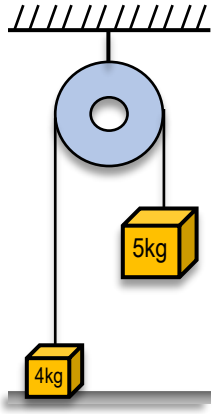
CONCEPT: SOLVING CONNECTED SYSTEMS OF OBJECTS WITH ENERGY CONSERVATION

- 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 $|\vec{v}|$!

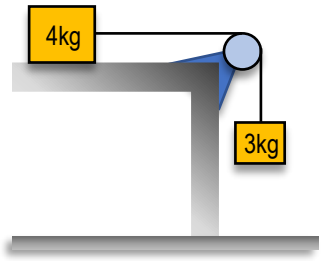
EXAMPLE: The system is released from rest. If the 5kg block is initially 3m above the floor, use **Energy Conservation** to calculate its speed just before hitting the ground. Ignore the effects of friction and any mass of the string and pulley.



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

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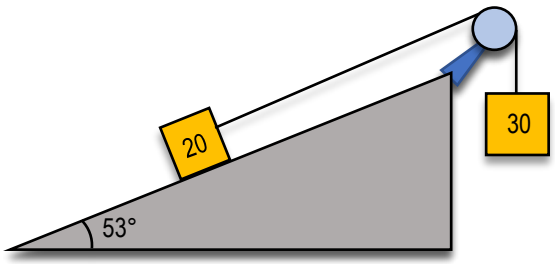
PROBLEM: A 30 kg block hangs above the floor, connected via cable & pulley to a 20 kg block on a smooth inclined plane angled 53° above the horizontal. If released from rest, calculate the speed of the system when the 30 kg has moved 1m.



CONSERVATION OF ENERGY

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