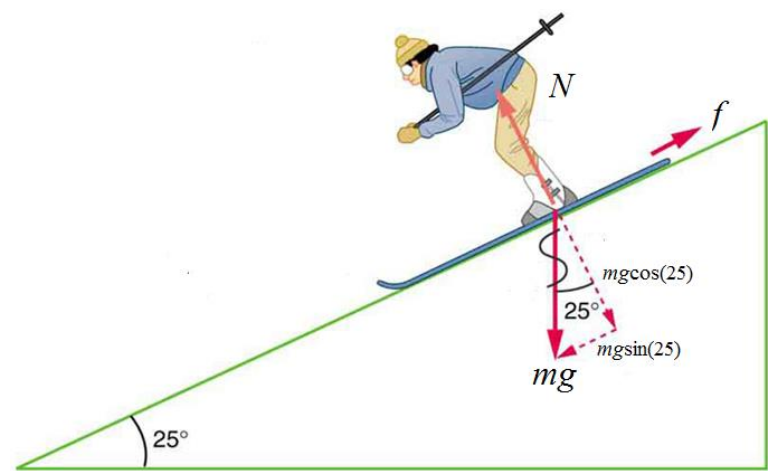


AP-1 Things on a Slope II (Dynamics)

The difference here is that forces are unbalanced – leading to the block accelerating. It may be pulled up the slope or allowed to slide down. As usual, friction may or may not be present. Generally easier to solve without!

Basic Situation – something (skier) on its own slides down a friction slope



Consider the forces shown above. What force (or component) of a force is accelerating the skier?

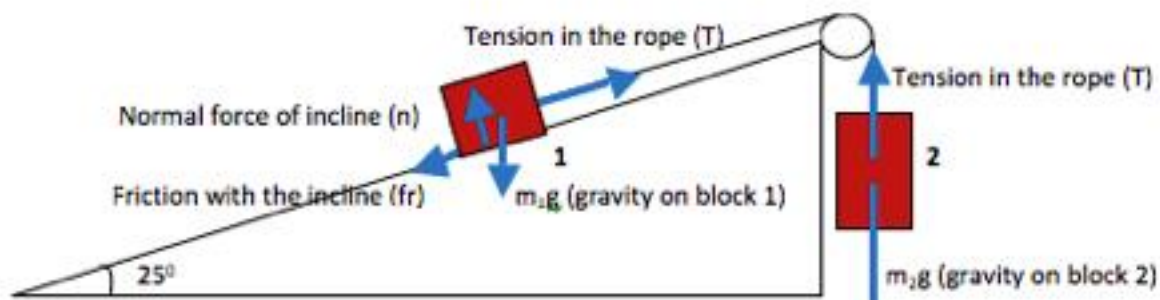
Is this force (or component) greater, smaller or equal to the frictional force? Explain how you know this answer.

What happens to a) the accelerating force (or component) and b) the friction as the angle of the slope increases?

- a) Accelerating force (or component)
- b) Frictional force.

What effect do these have on the acceleration of the skier?

More Complex Situation – Connected Blocks and Friction



The hard part in this situation is to actually figure out if the block on the slope accelerates up or down the slope. ACTUALLY IT DOES NOT MATTER! Use your best judgement and draw acceleration arrows on the diagram and run with it. If you ‘guessed’ wrong, you will simply get a negative acceleration at the end of your calculation.

The best method of solving is to draw TWO free-body diagrams and create the simultaneous equations.

(There is no need to solve them here as no data given)

FREE BODY DIAGRAMS	
EQUATIONS	
What happens to the direction that friction work in if you changed the direction of the acceleration?	