Fall Protection: The Hazard

Gravity

The Nature of Gravity

Newton's 3 Laws of Motion

1. An object in motion tends to stay in motion and an object at rest stays at rest.

2. Force = Mass X Acceleration

3. For every action, there is an equal and opposite reaction.

Force = Weight (on Earth)

Weight is Relative – Mass is Not

On the Moon you would weigh about 1/6th your weight measured on Earth, but you have the same mass.

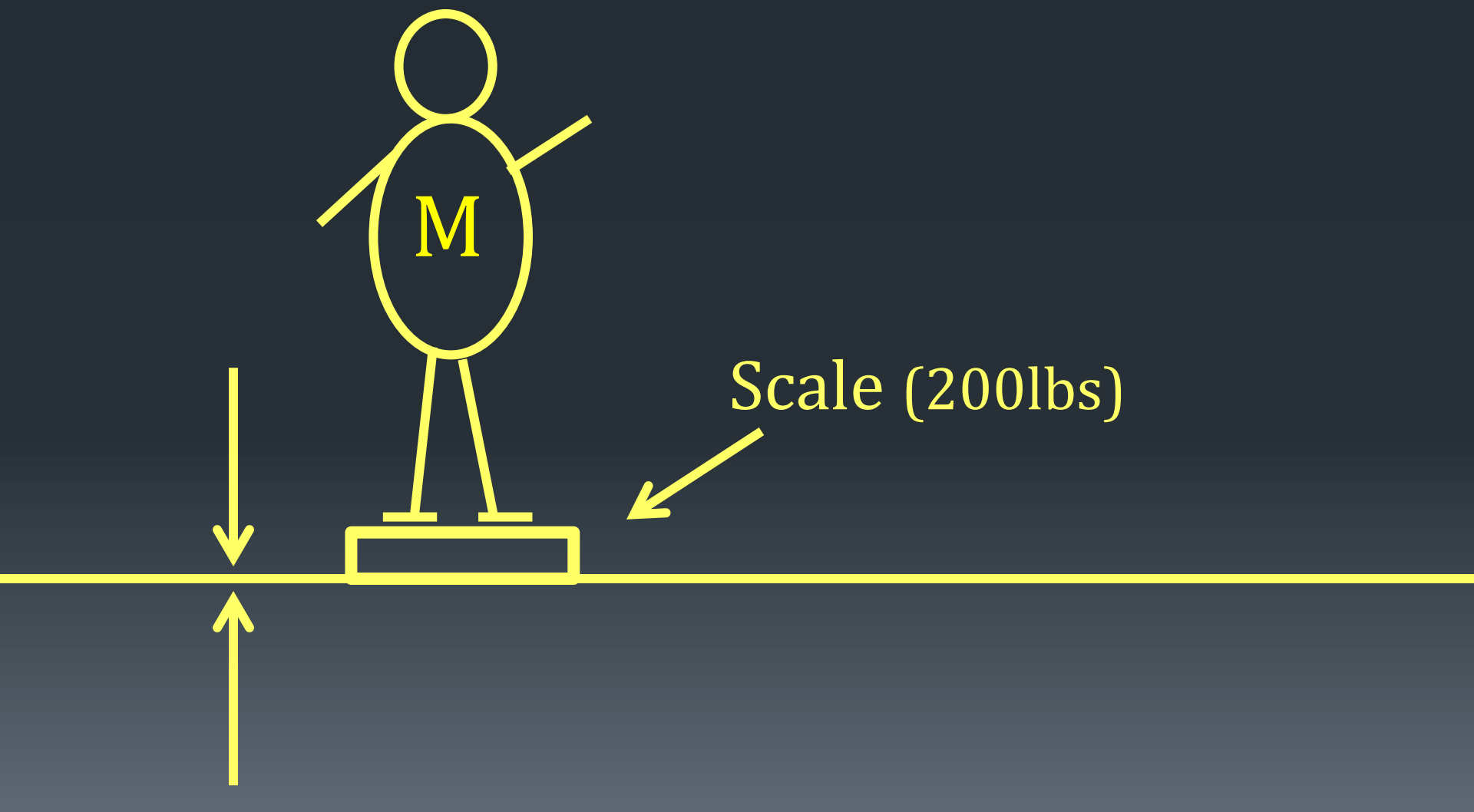
200lbs on Earth = 33lbs on The Moon

At a 10,000 foot Altitude You Weigh 1% Less
200lbs @ 10,000 feet 198lbs

Force = Mass x Acceleration

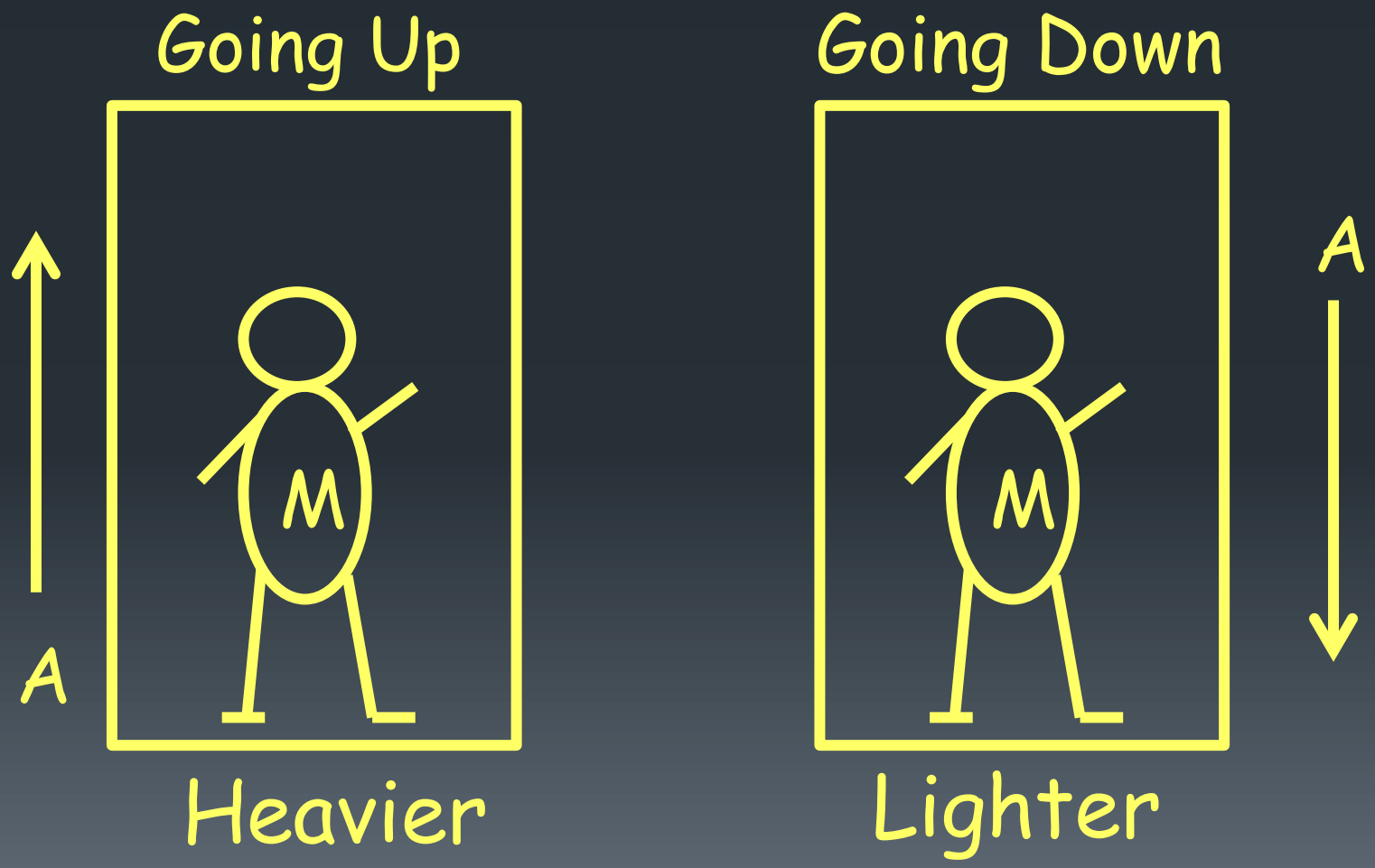
F=M A(A being Gravity)

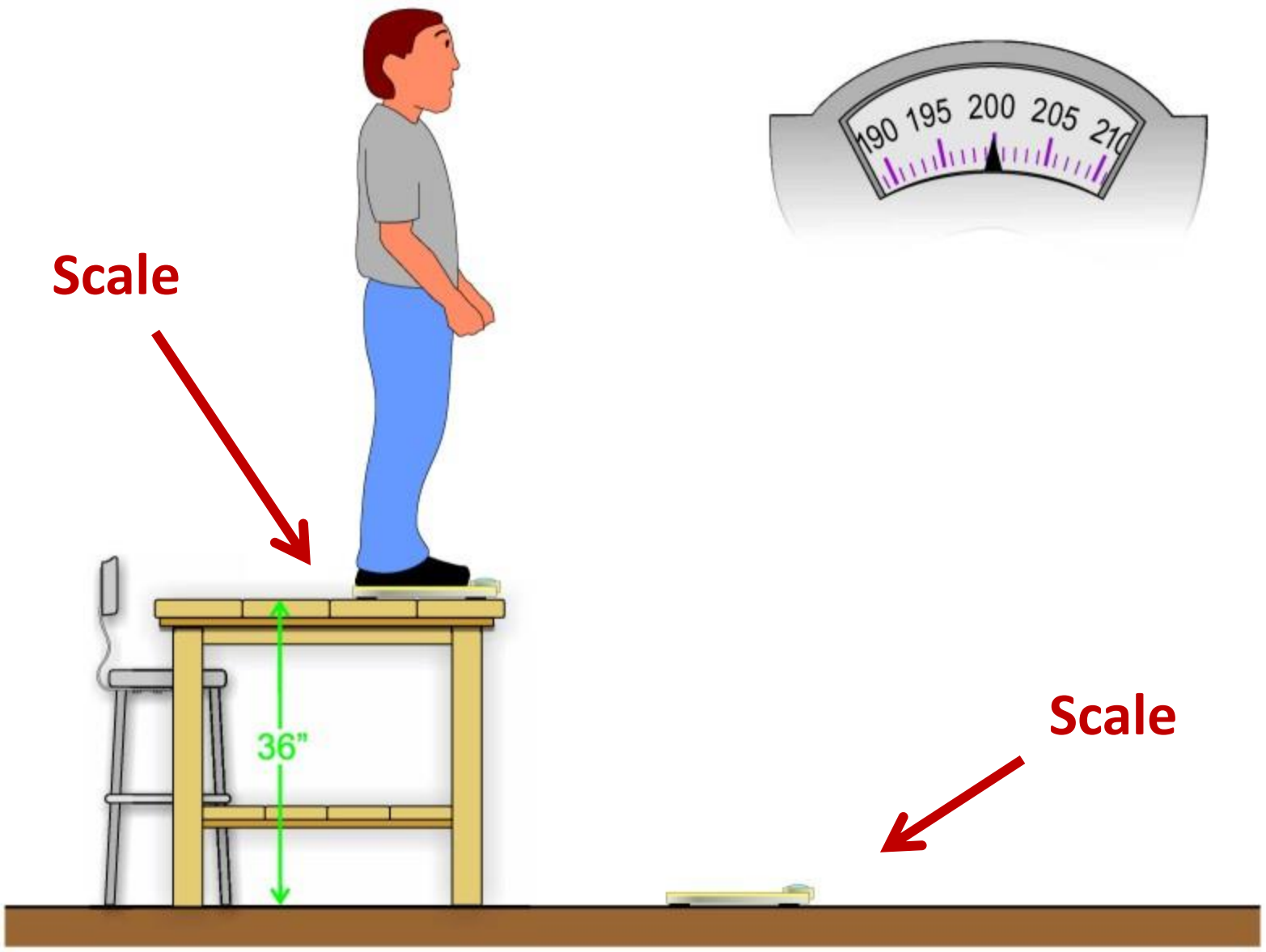
Force=Mg



Force = Mass x Acceleration

F=MA (In an Elevator standing on scale)

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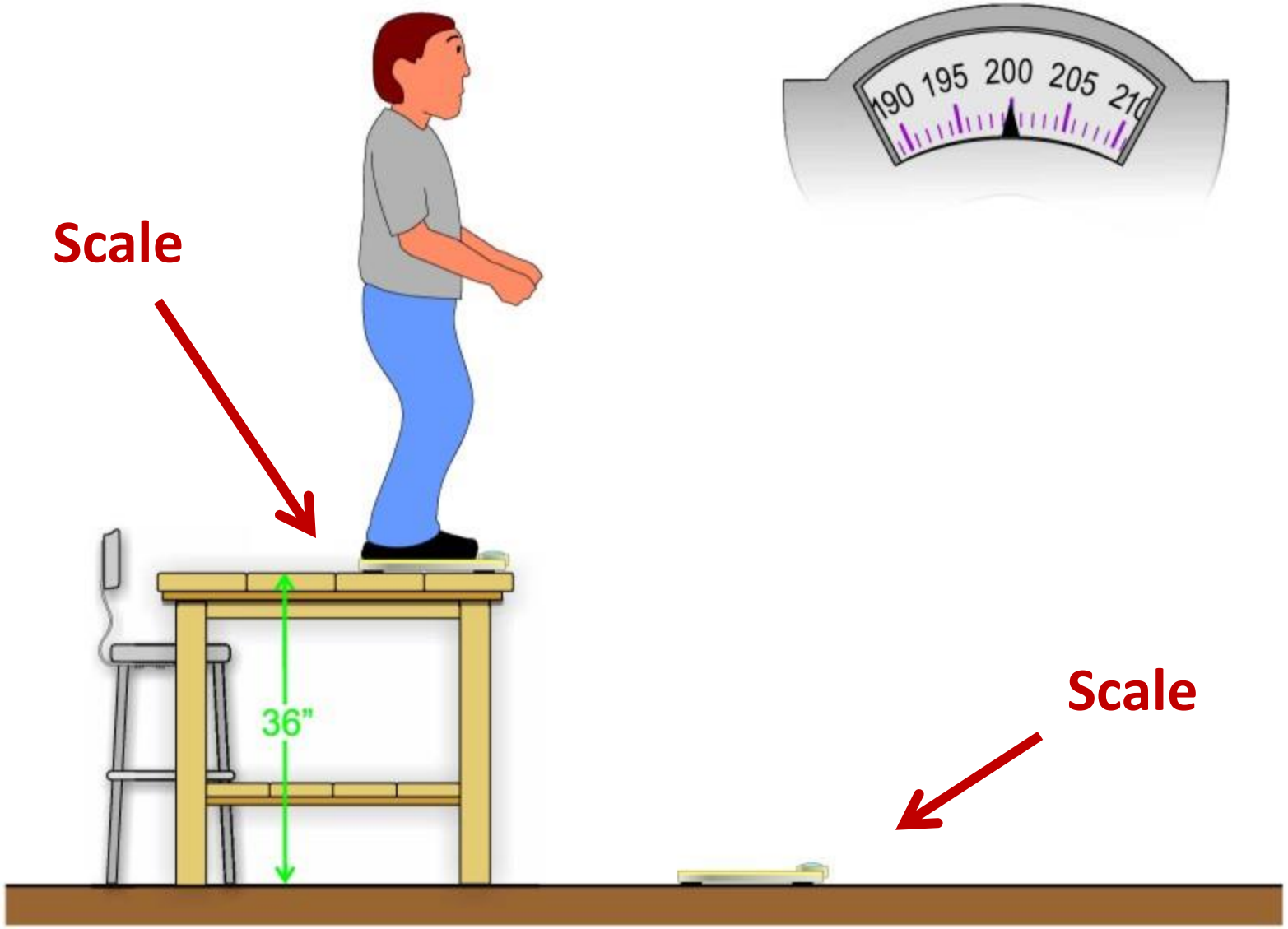
36"
Scale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36"
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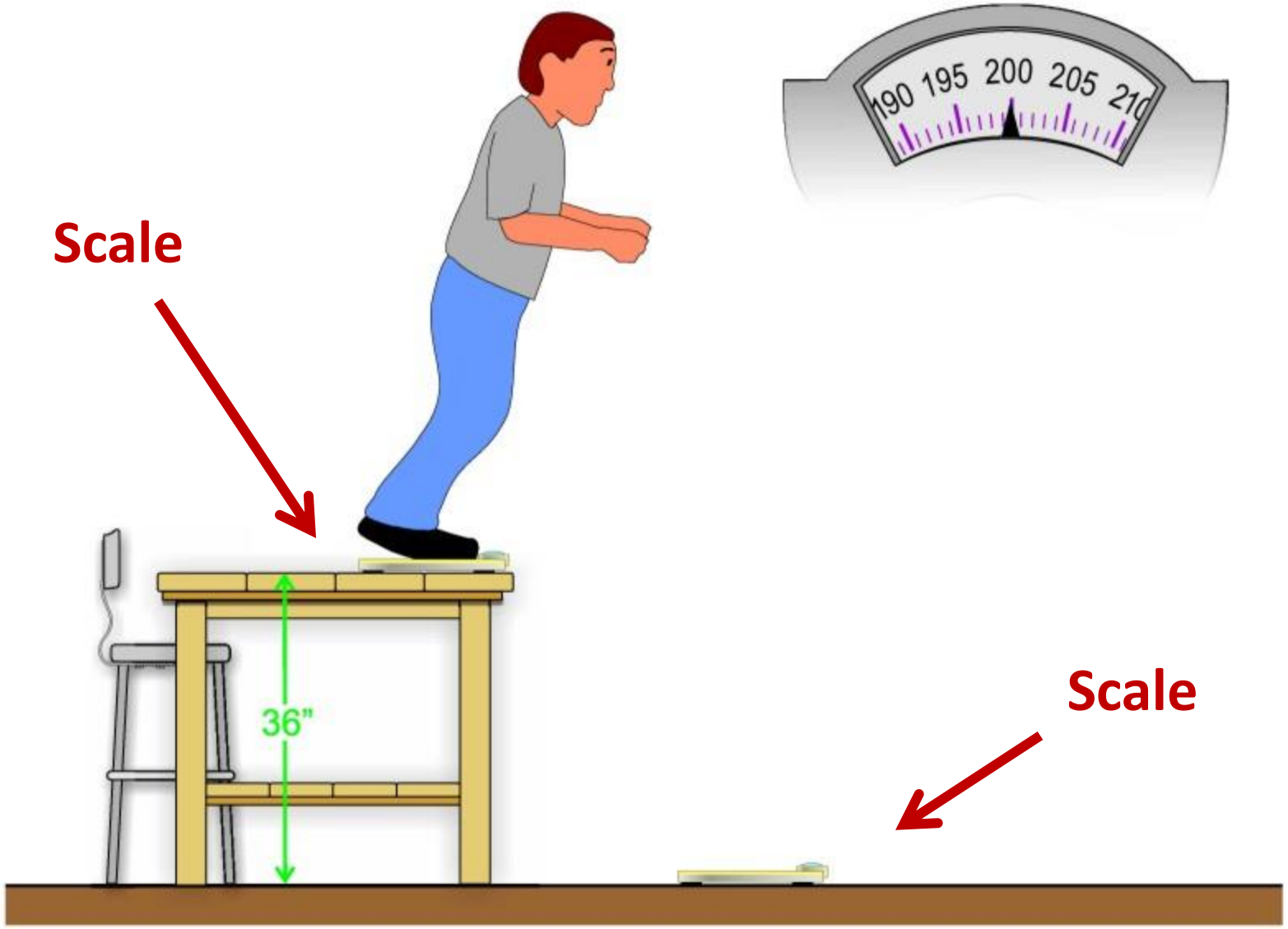
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36"
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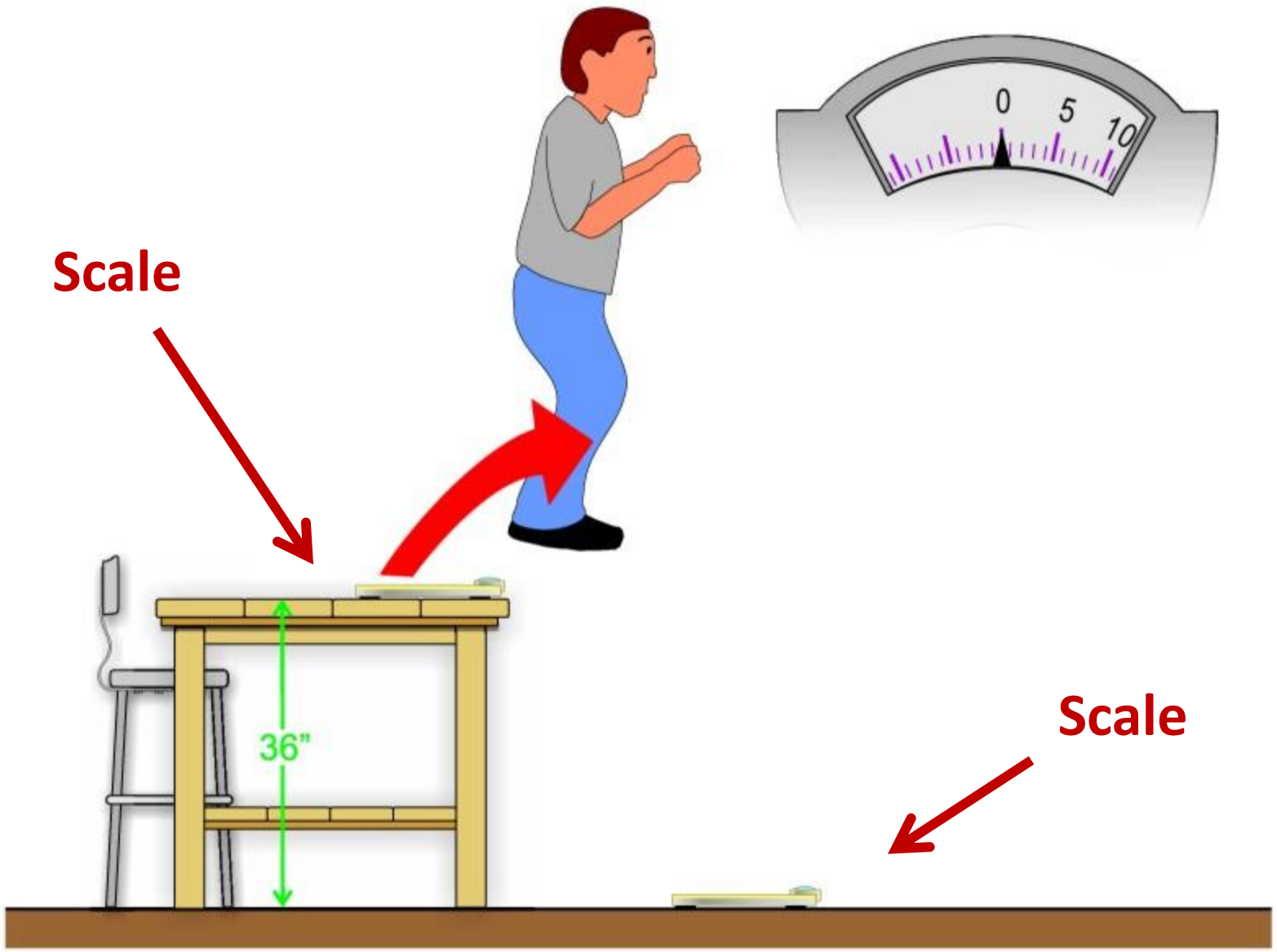
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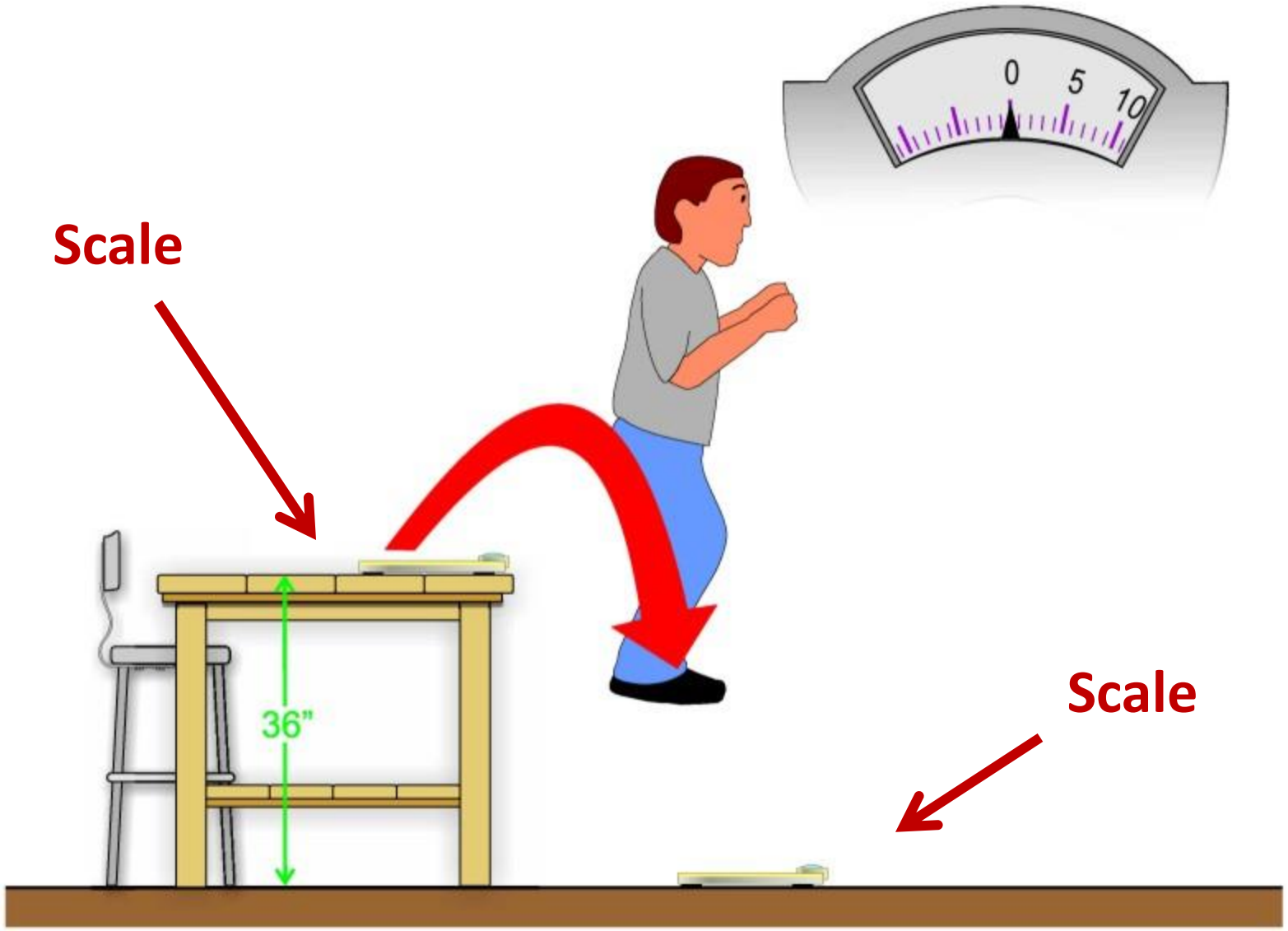
36”
Scale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Scale
36"
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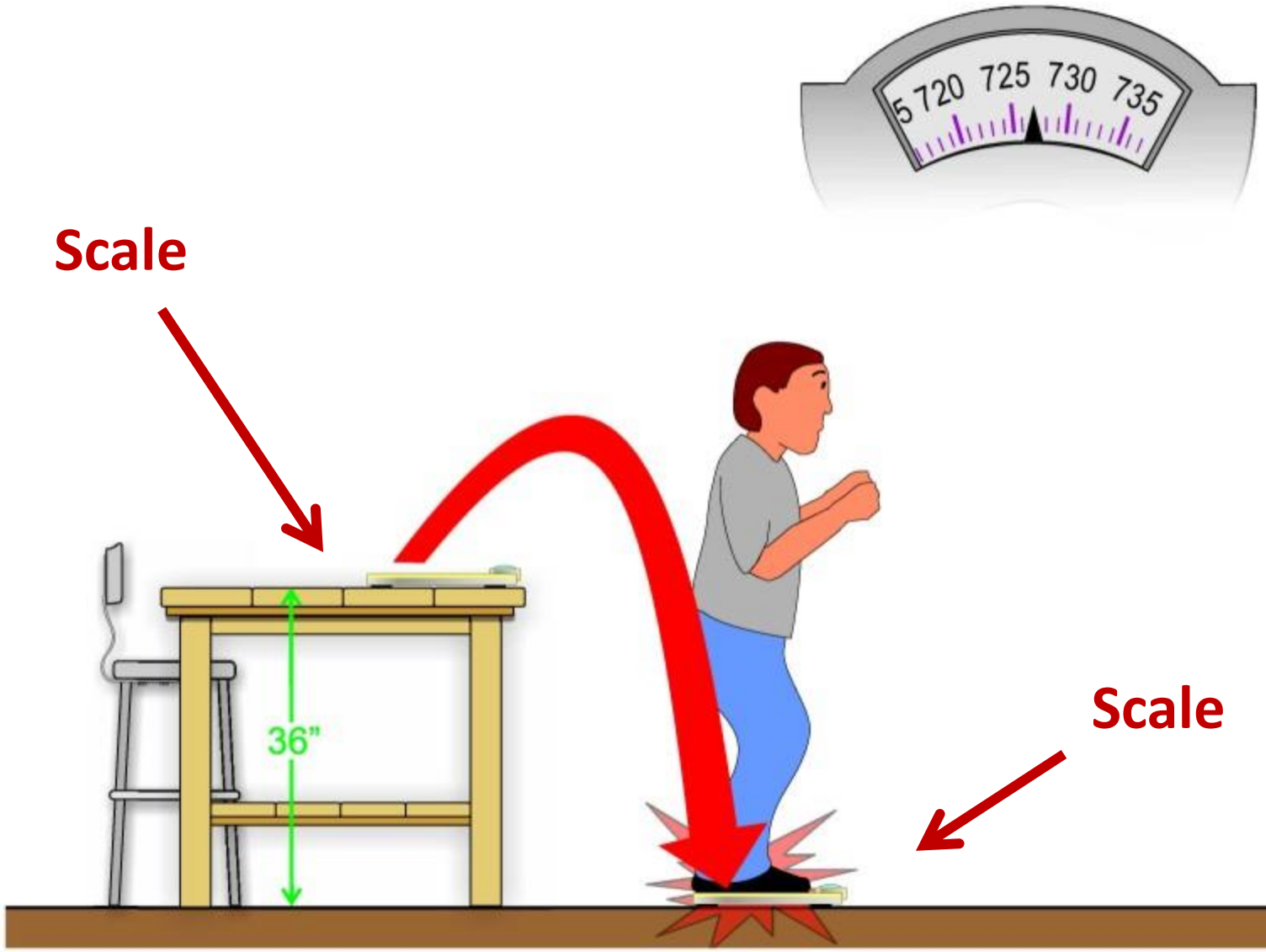
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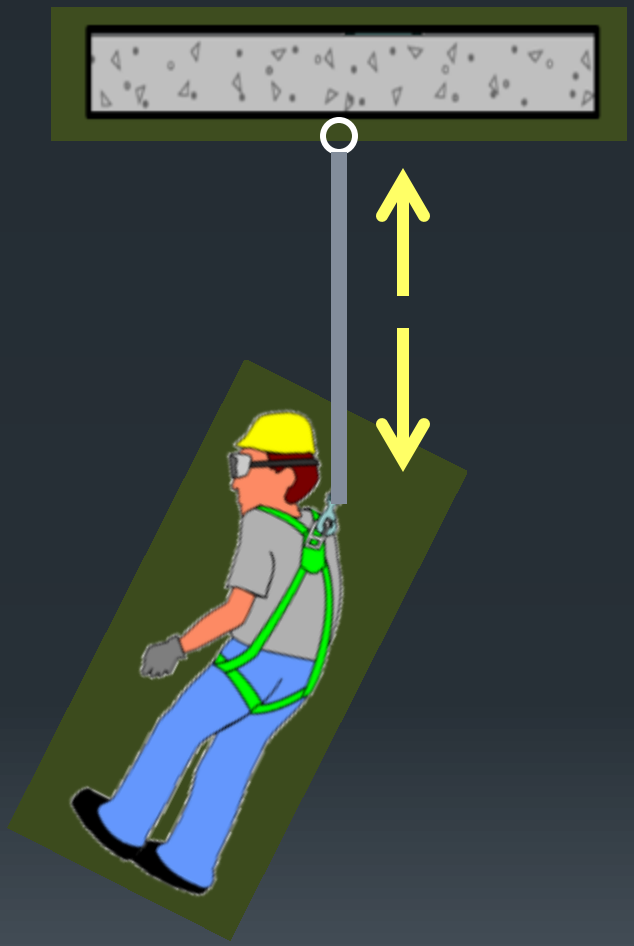
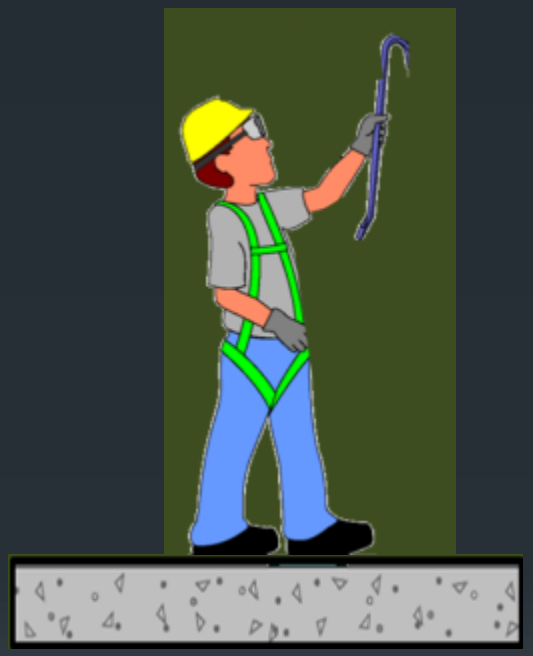
Scale
36”
Scale

Contact Forces: Tension and Compression



Tension
(Responsive-Repulsive force)
(T=Mg or MA)

Equilibrium



Compression
(Normal Force)
C=Mg

Gravity pushes down

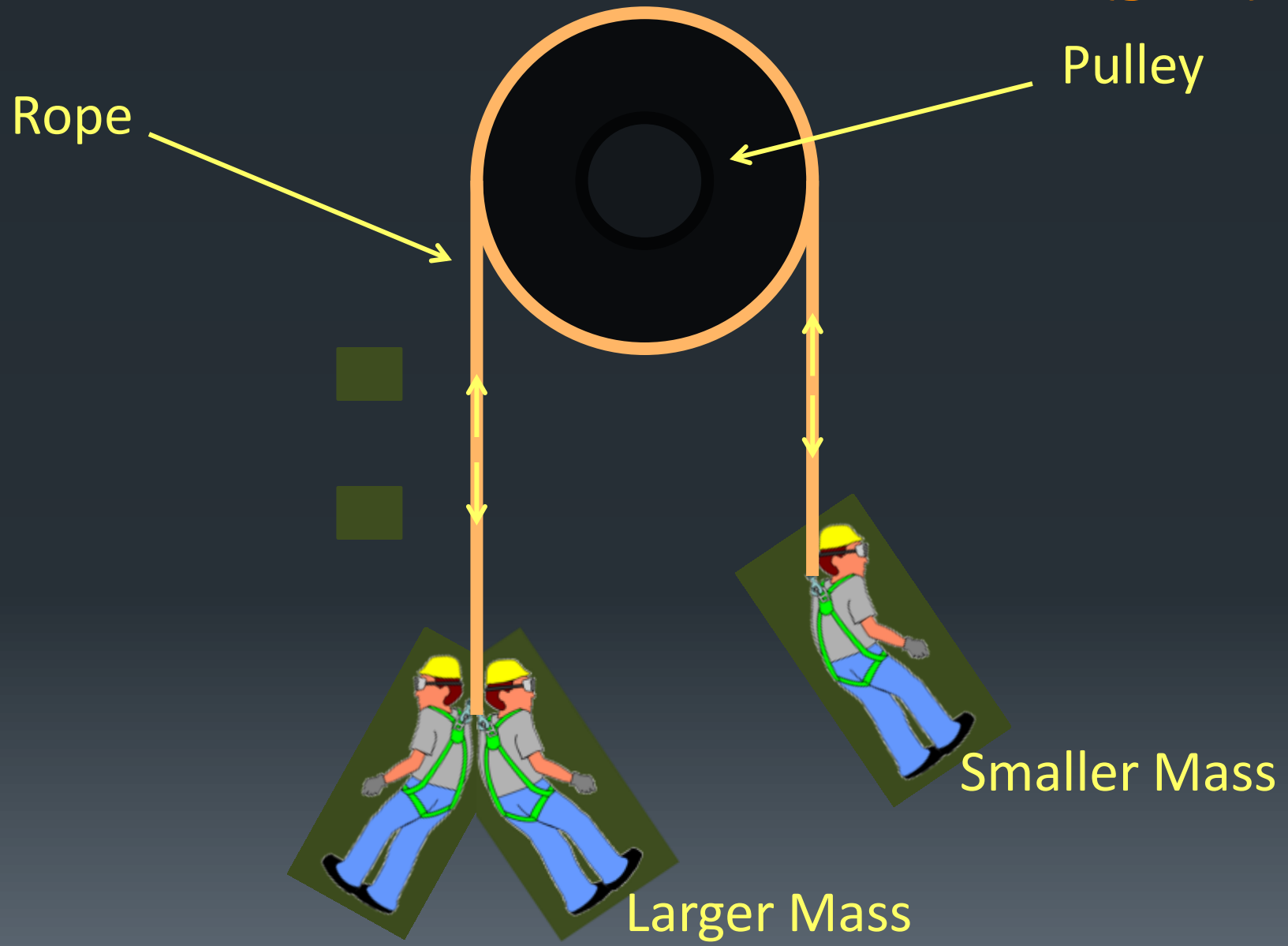
Earth pushes up

Tension Force

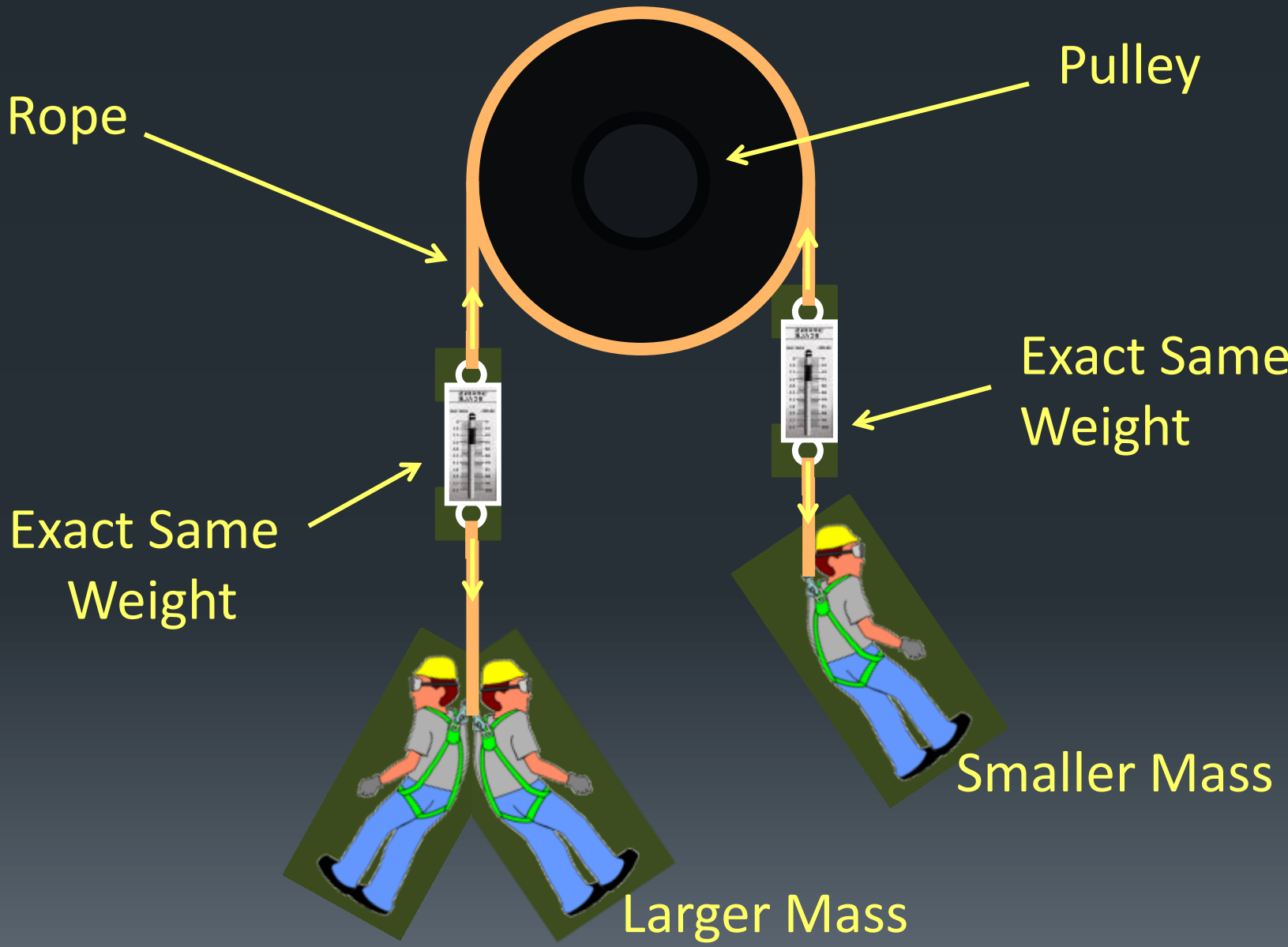
The tension force is the force that is transmitted through a string, rope, cable or wire when it is pulled tight by forces acting from opposite ends.

The tension force is directed along the length of the wire and pulls equally on the objects on the opposite ends of the wire

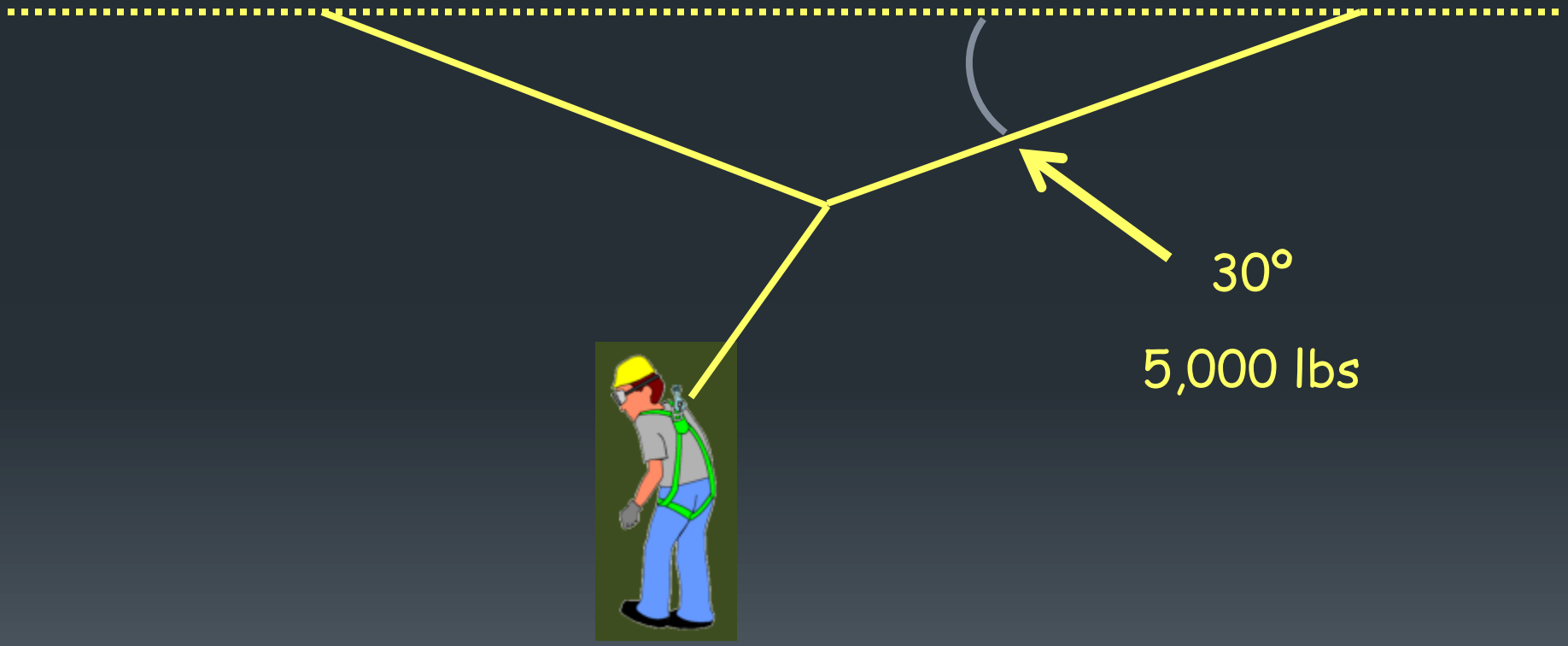
Contact Forces: Tension $T = W + ma = m(g + a)$



Contact Forces: Tension T = W + ma = m(g + a)



Sag Angle (horizontal lifelines)
Angle Tension



Sag Angle (horizontal lifelines) Angle Tension