Crate on a ramp

Draw a Free Body Diagram for a Crate on a ramp

- 1. mass of crate = 80 kg
- 2. g = - 9.8 m/s^2
- 3. ramp makes an angle of 30 degrees with the horizontal

Crate on a ramp

- $F_g = mg = 80 \times (-9.8) = -784$ N
- F_g perpendicular $= 784 \times \cos 30 = -679$ N
- $F_n = 679$ N
- F_g parallel $= -784 \times \sin 30 = -392$ N
- F_f static must be at least 392; otherwise it will slide down the ramp

Group Activity

- Given a crate with mass = 25 kg on a ramp at various angles above the horizontal. Determine the Fg perpendicular, Fn, and Fg parallel.
- 1. 25 degrees
- 2. 35 degrees
- 3. 45 degrees
- 4. 55 degrees

Answers for Group Activity

- Fg = 25 x 9.8 = - 245 N
- 1. 25 degrees: - 222 N, 222 N, - 104 N
- 2. 35 degrees: - 201 N, 201 N, - 141 N
- 3. 45 degrees: - 173 N, 173 N, - 173 N