

## Review of Basic Newtonian Physics

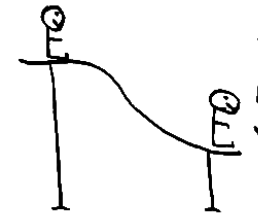
Slide 1

Lecture for Monday, September 10, 2007  
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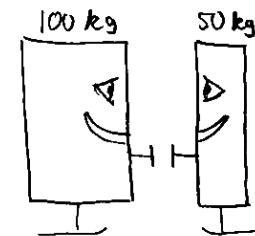
**Slide 2** A car accelerates from rest, with acceleration of  $a = 1 \text{ m s}^{-2}$ . After 10 s, how far has the car gone?

Slide 3



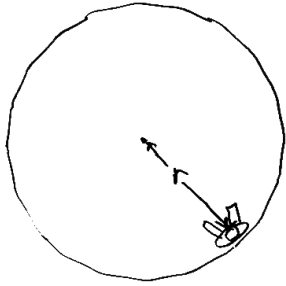
A child slides down a frictionless slide, decreasing in altitude by a distance  $h$ . What is the speed of the child at exit?

Slide 4



Two frictionless skaters push off each other. As a result, the 100 kg skater is moving at  $3 \text{ m s}^{-1}$ . How fast is the 50 kg skater moving?

Slide 5



A child sits at  $r = 3 \text{ m}$  from the center of a merry-go-round. The merry-go-round has an angular frequency of  $\omega = 2 \text{ rad s}^{-1}$ . What is the magnitude of the child's acceleration?

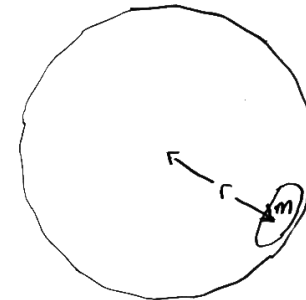
Slide 6

In the previous problem, what is the direction of the child's acceleration?

Slide 7

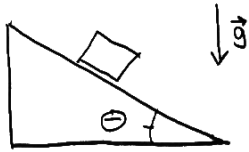
If the merry-go-round has an angular frequency of  $\omega = 2 \text{ rad s}^{-1}$ , what is the *period of rotation*?

Slide 8



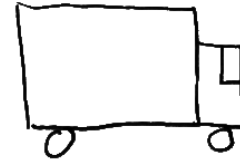
A wet towel of mass  $m$  is in the spin cycle of a washing machine, spinning with angular frequency  $\omega$ . The radius of the basin is  $r$ . What is the force of the basin on the wet towel?

Slide 9



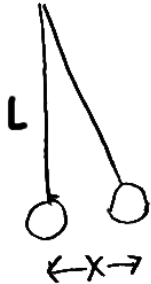
A block slides down a frictionless plane inclined at angle  $\theta$  from the horizontal. What is the magnitude of the acceleration?

Slide 11



A truck accelerates forward with acceleration  $\vec{a}$ . In the reference frame moving with the back of the truck, in what direction is the inertial force?

Slide 10



A pendulum of length  $L$  is displaced a distance  $x$  from the vertical. What is the magnitude of the acceleration? ( Assume  $|x| \ll L$  ).