

Momentum

FORCE BUILDING with movement
speed + energy

IRRESISTABLE FORCE PARADOX

Form of movement

FORCES gained by an object w/mass
IN MOTION

HARD TO STOP when motion

Momentum - Something that is hard to Stop.

$$P = m v$$

Diagram illustrating the components of the momentum equation $P = m v$:

- P points to Momentum
- m points to mass
- v points to velocity

$$P = m \vec{v}$$

vector
x
scalar
⇓
vector

momentum HAS A DIRECTION

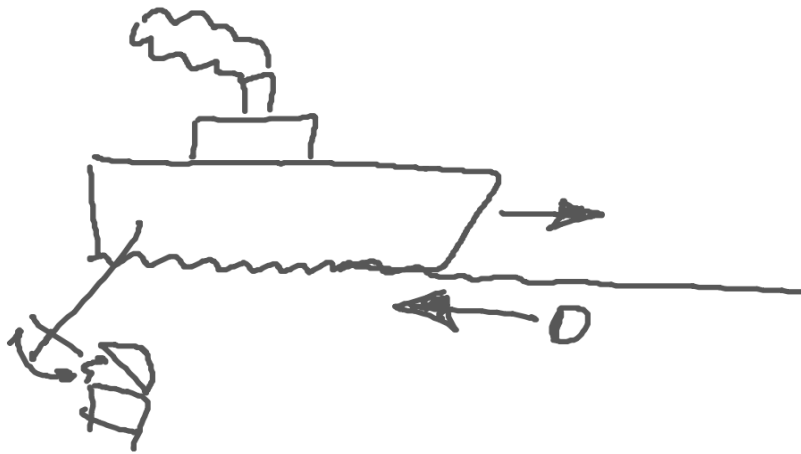
$$p = mv$$

$p = (kg) m/s$

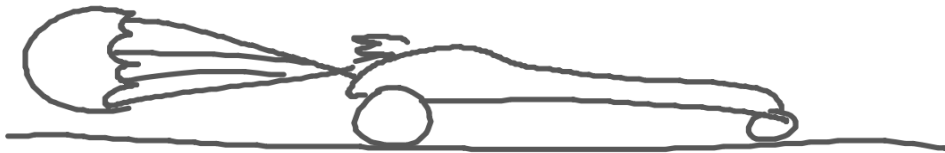
 UNITS FOR momentum

$$(kg)(m/s^2) = \text{Newton}$$
$$F = m a = \text{Newtons}$$

Why are oil tankers
so hard to stop?



How DO DRAGSTERS
STOP?



Which has more momentum
A FLYING BUG +
A STOPPED TRAIN?

FLYING BUG $m v = p$
STOPPED TRAIN $m \cancel{v}^0 = p = 0$

Momentum

A FORCE That has to get going

2x FORCE \leftarrow Acceleration on an object

FORCE That keeps AN OBJECT MOVING

Acceleration \leftarrow weight

The FORCE behind AN OBJECT
Will to win

Speed
motion | HARD to STOP.