WHERE MATH AND SCIENCE TAKE FLIGHT

iFLY MAKES LEARNING FUN WITH STEM

The Science & Engineering of iFLY

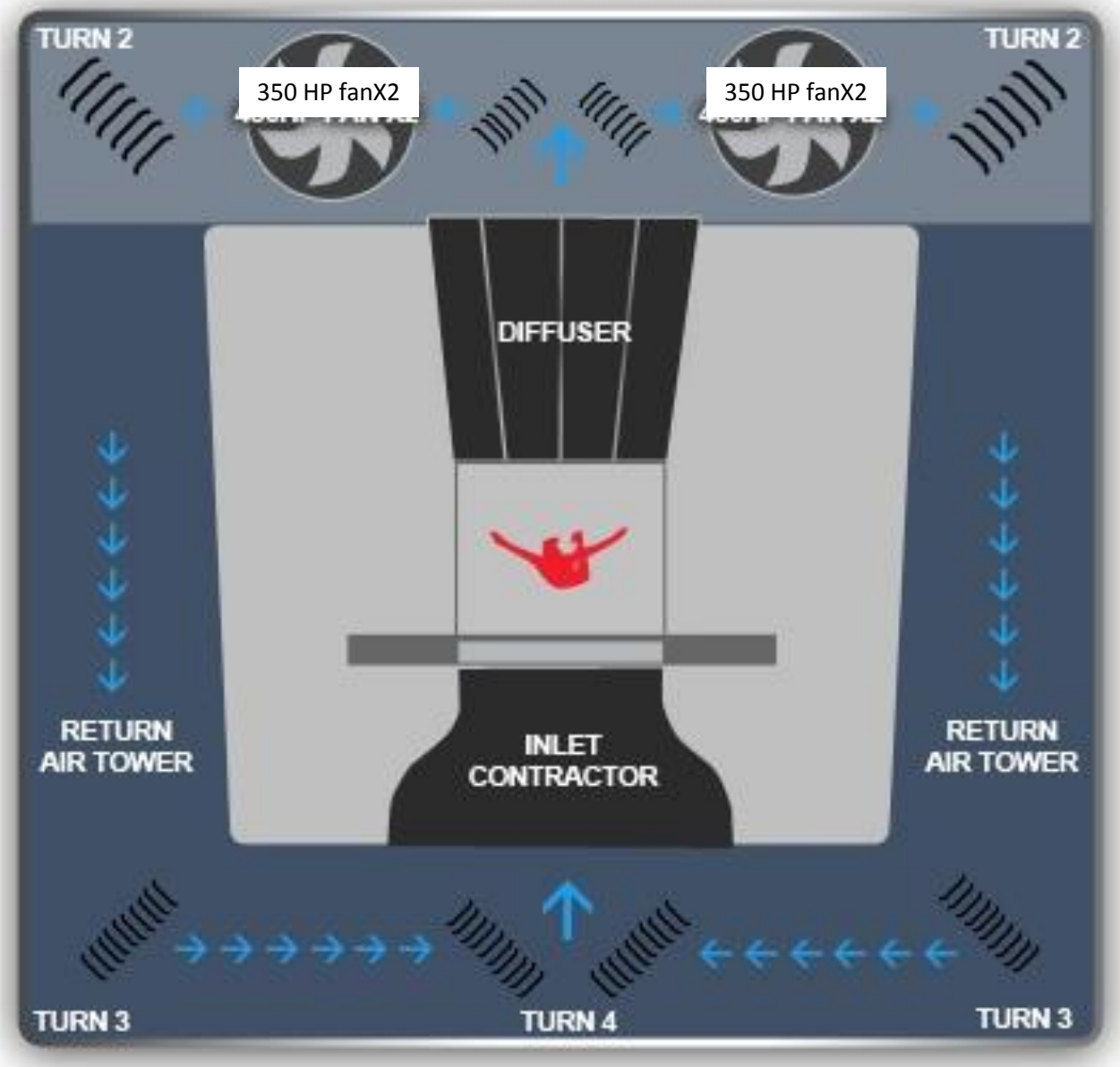
iFLY INDOOR SKYDIVING


STEM is fun!

STEM is used in the real world to solve problems and improve lives.

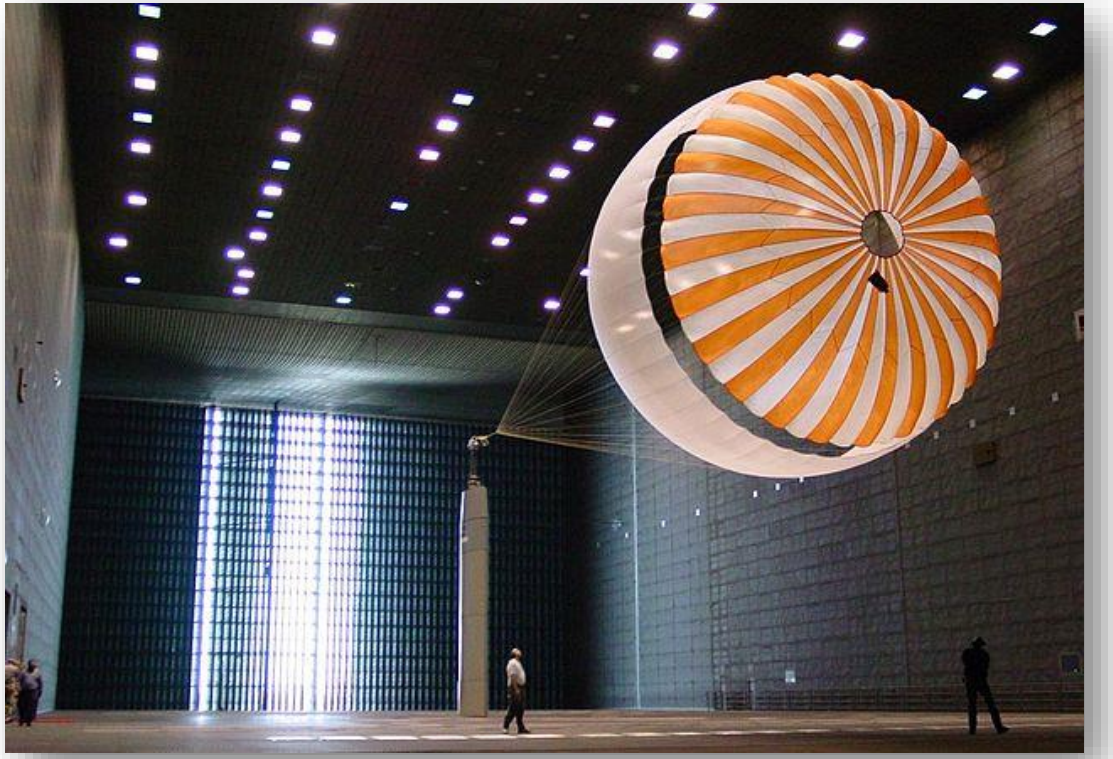
Exciting futures in STEM await you.

This is a Closed Loop Vertical Wind Tunnel.



Wind tunnel testing


By Ekrem Canli (Own work) [CC BY-SA 3.0 (http://creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons

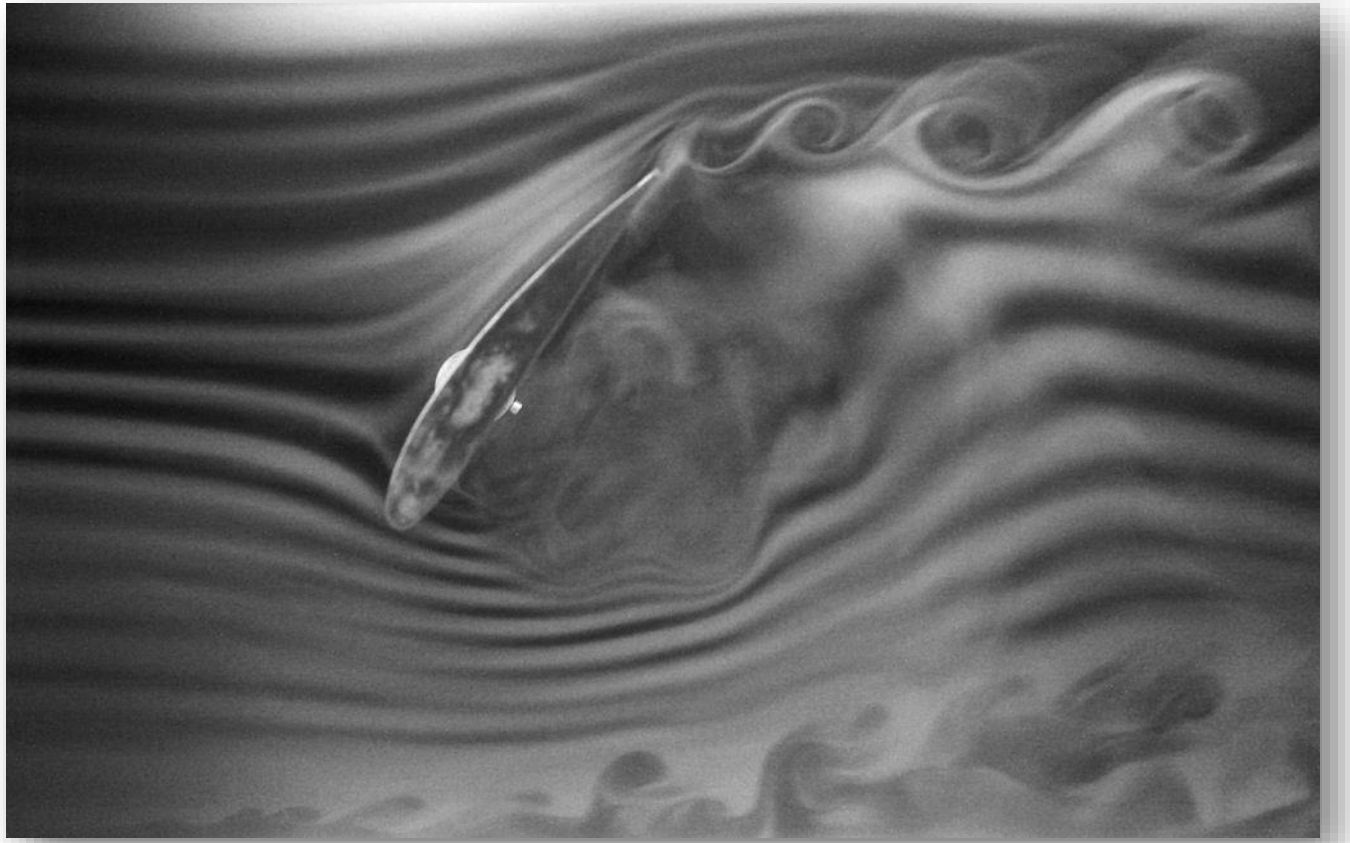


Fluids

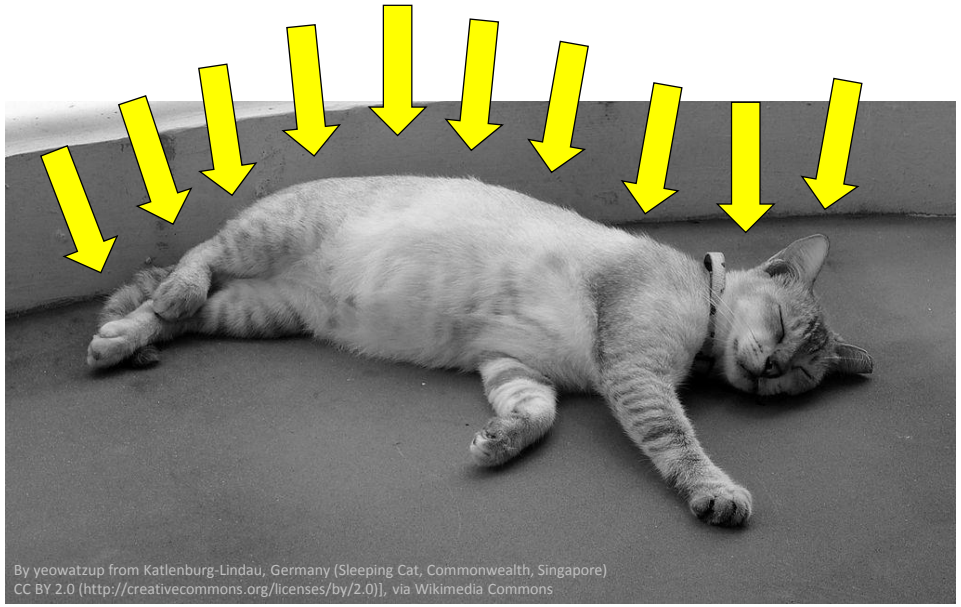
vs.

Solids

Air
is a
fluid.



Fluids exert **pressure forces**



Static air pressure

Dynamic air pressure

force of air
pushing you up

gravity
pulling you down

force of air
pushing you up

gravity
pulling you down

force of air

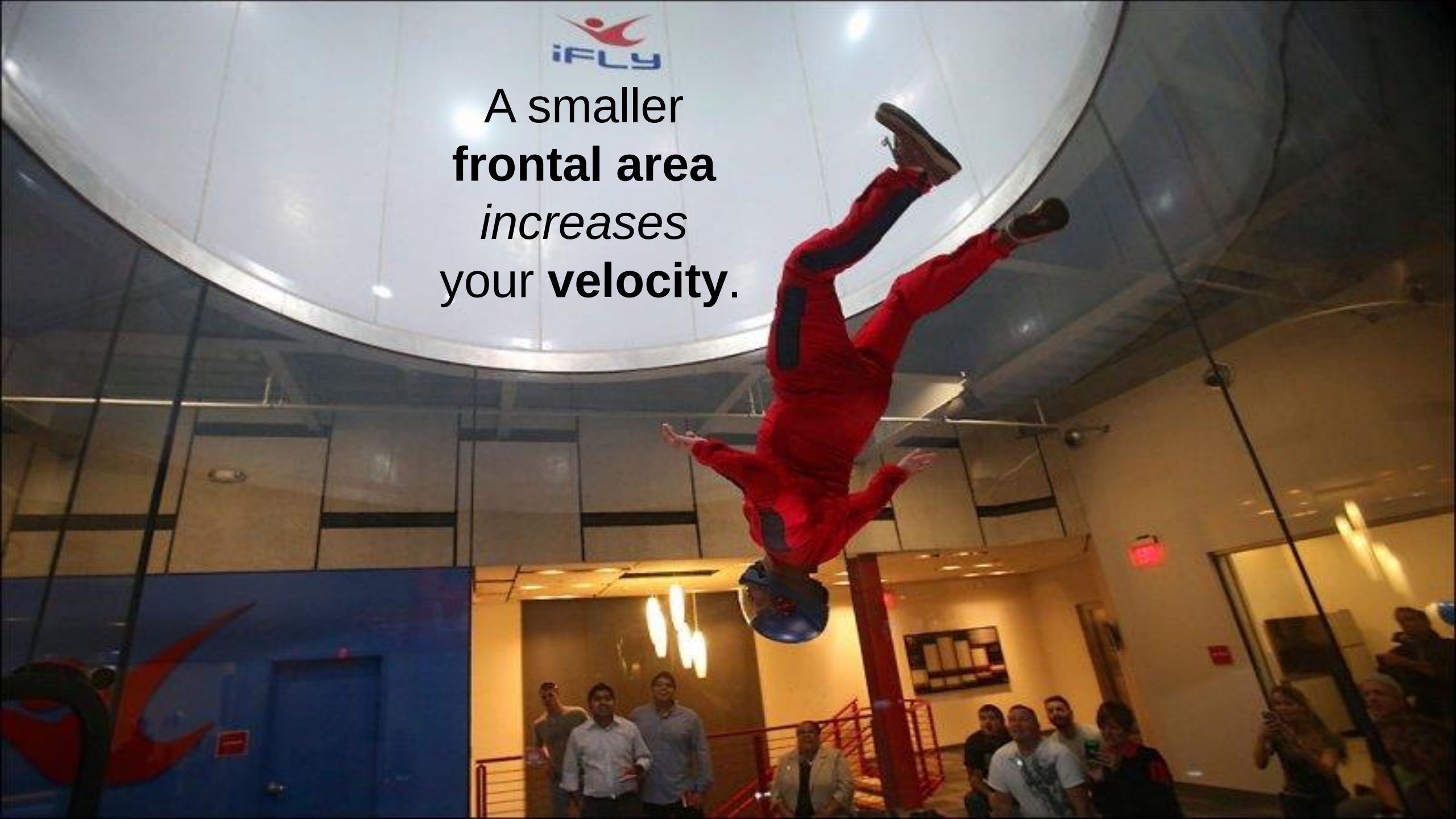
gravity

force of air

gravity

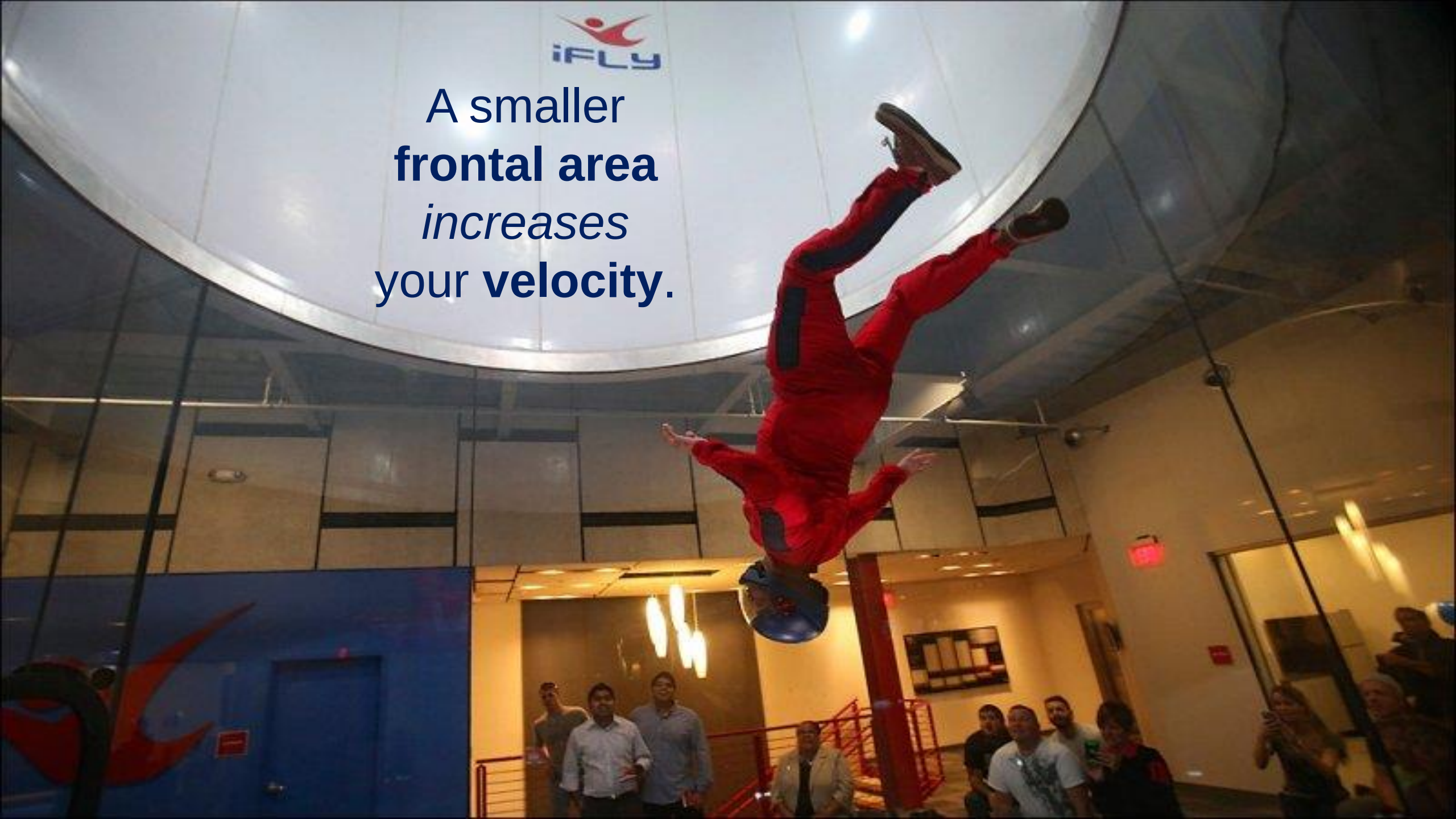
When **drag force = gravity**, you reach ***terminal velocity***.


iFLY



A smaller
frontal area
increases
your **velocity**.


iFLY



A smaller
frontal area
increases
your **velocity**.


iFLY

A larger
frontal area
decreases
your **velocity**.

How fast
does the air have
to move
to support
your weight ?

Engineers and scientists use mathematics to ***quantify*** physical principles
…because…
we want to be able to ***predict*** what's going to happen.

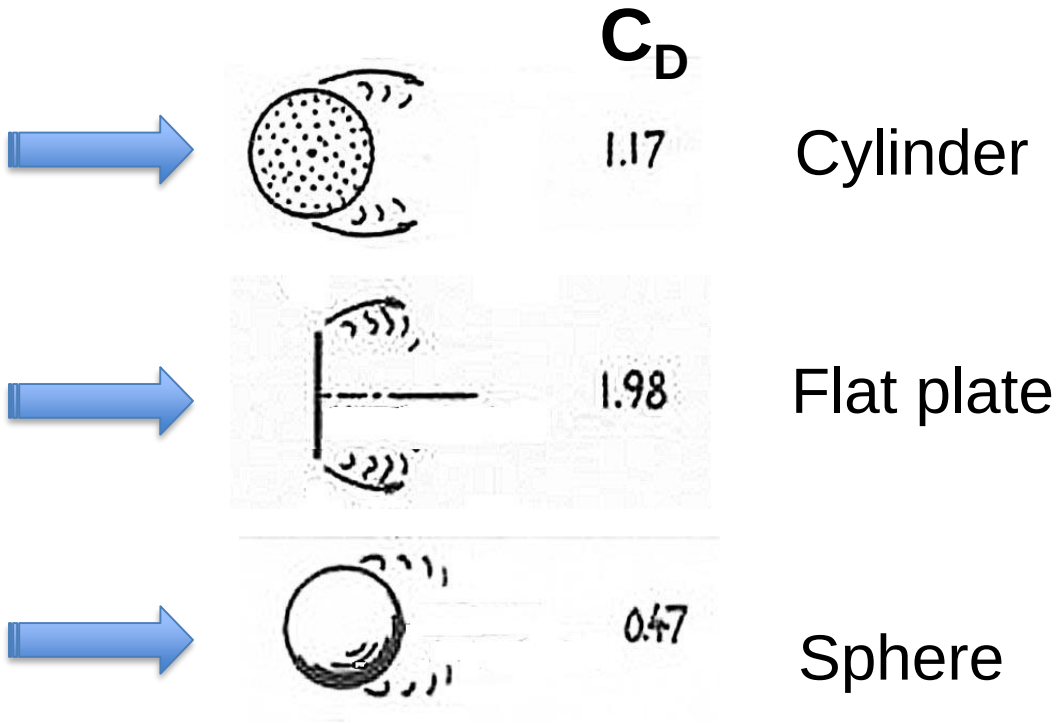
Now lets go flying!

Additional Slides

The experiment plan: predict your terminal velocity

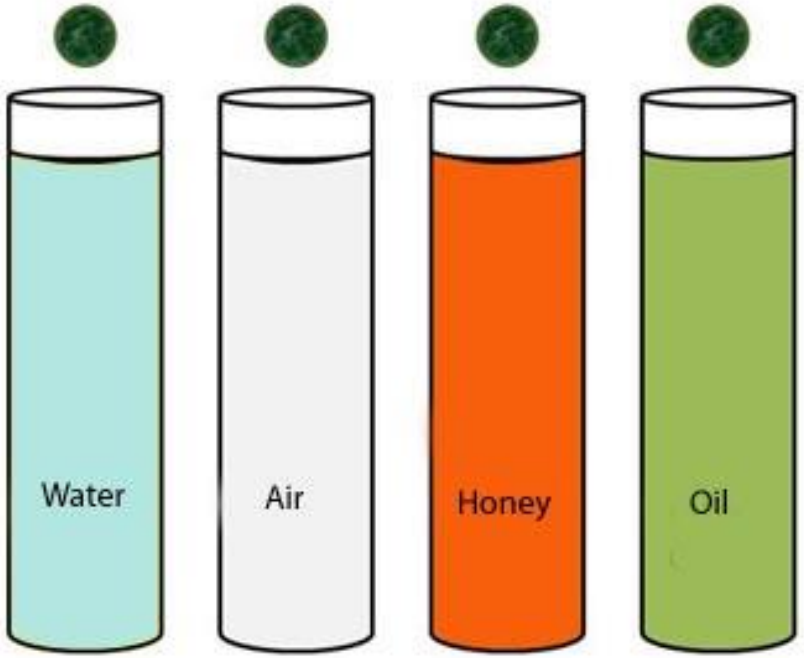
$$v = \sqrt{\frac{2mg}{A_f C_D \rho}}$$

Drag coefficients for simple objects



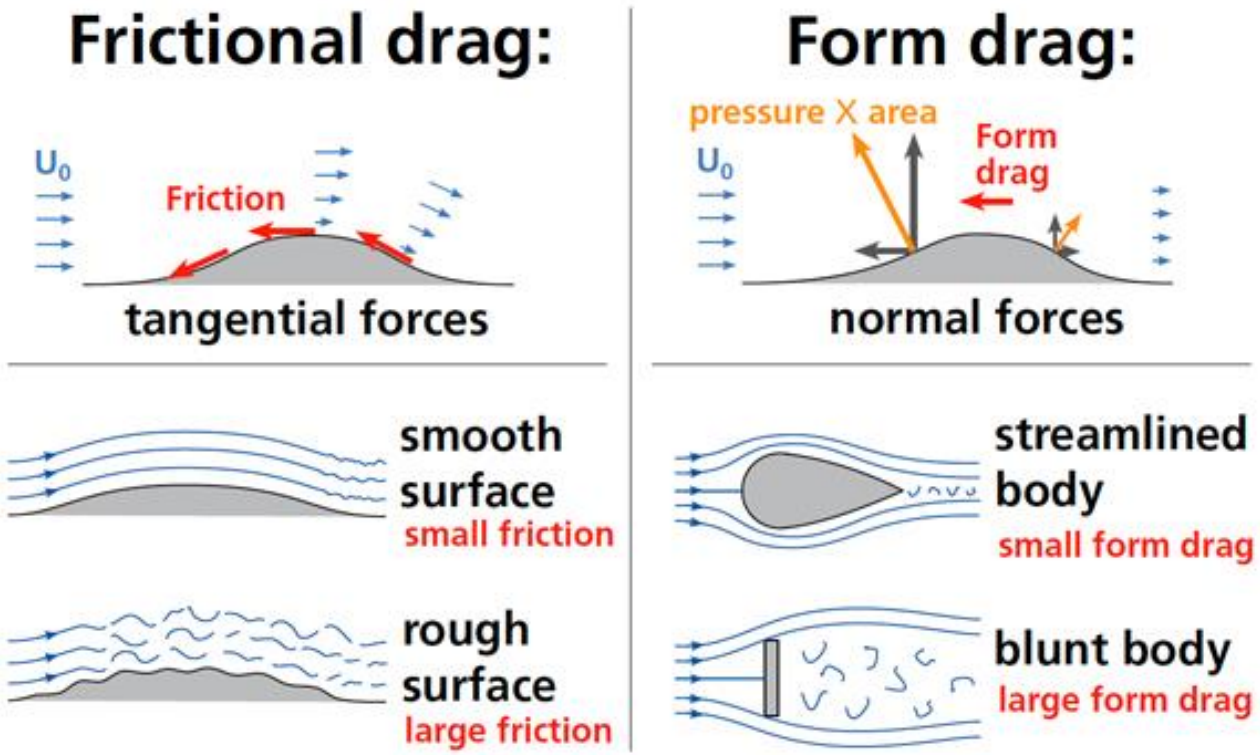
What would you guess the drag coefficient of your body is in free flight?

Fluids also have *viscosity*, which produces *friction* forces



Which type of fluid has the higher viscosity, liquids or gases?

Drag is the combination of friction and pressure forces



Which kind of drag do you think is more important for air flows?

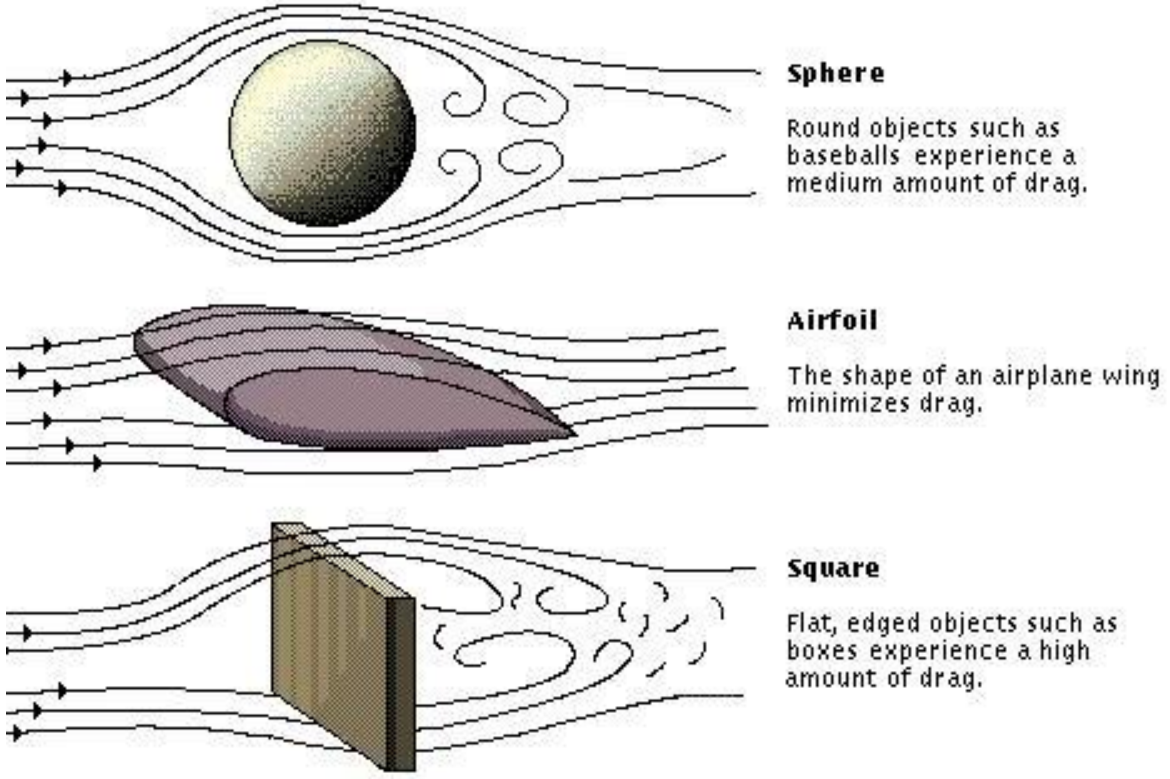
How do we know the air speed? …we measure it…

…with a Pitot Static Tube.

Can you find them in our wind tunnel?

Drag of an object depends on its shape, its size, and the velocity of the air stream

Shape:



WHERE MATH AND SCIENCE TAKE FLIGHT

iFLY MAKES LEARNING FUN WITH STEM

The Science & Engineering of iFLY

iFLY INDOOR SKYDIVING