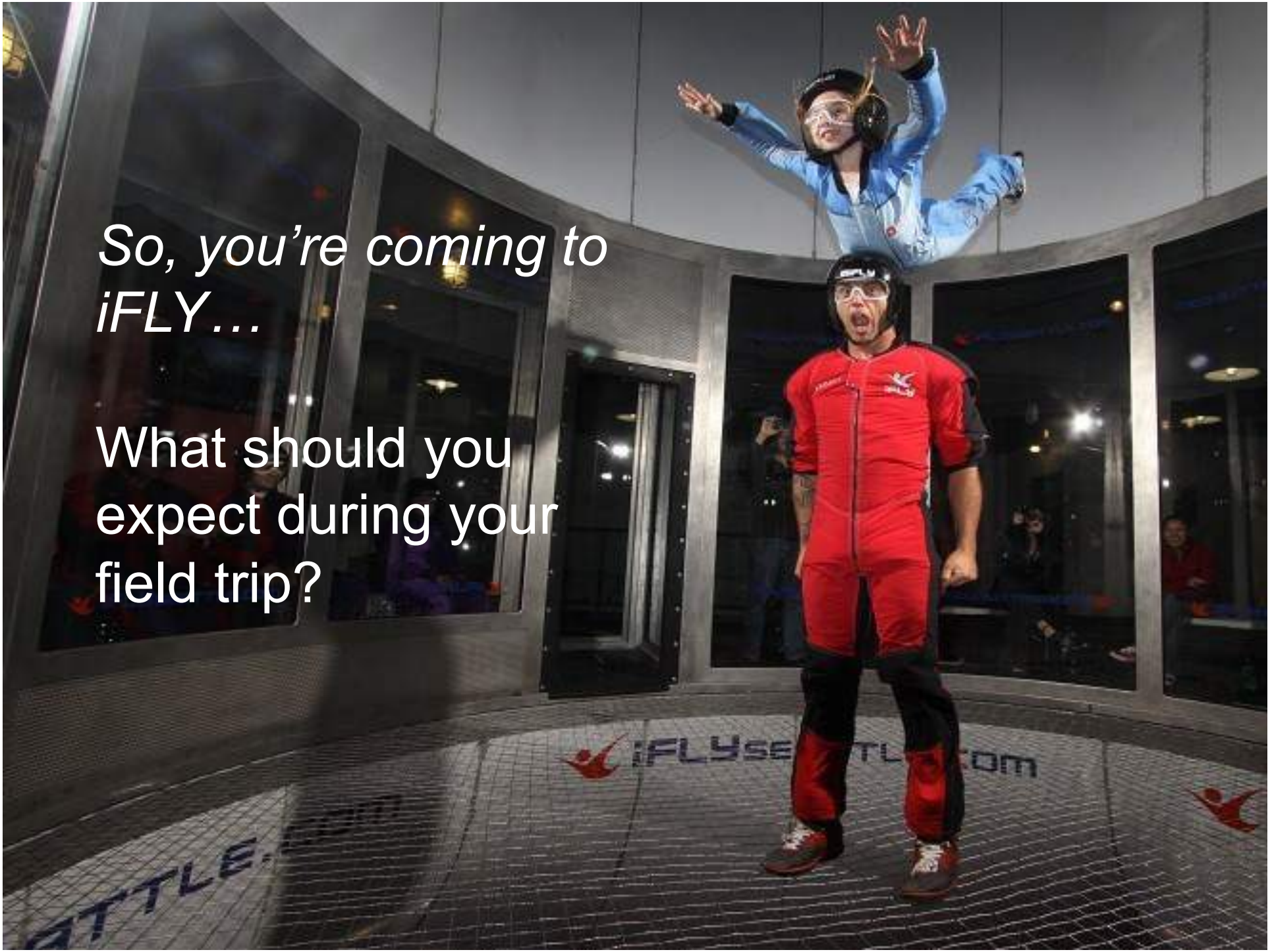
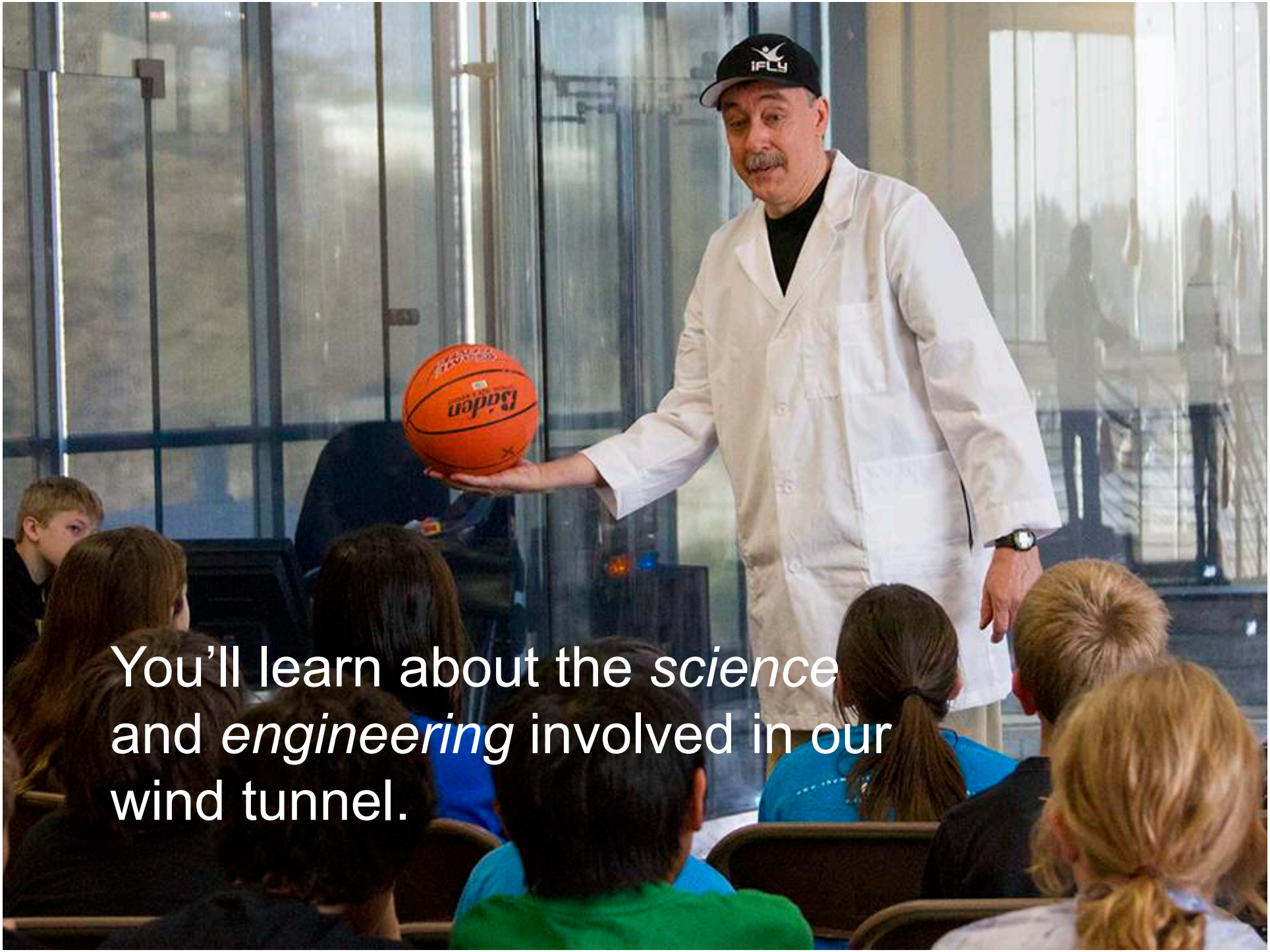
iFLY pre-Field Trip Introduction

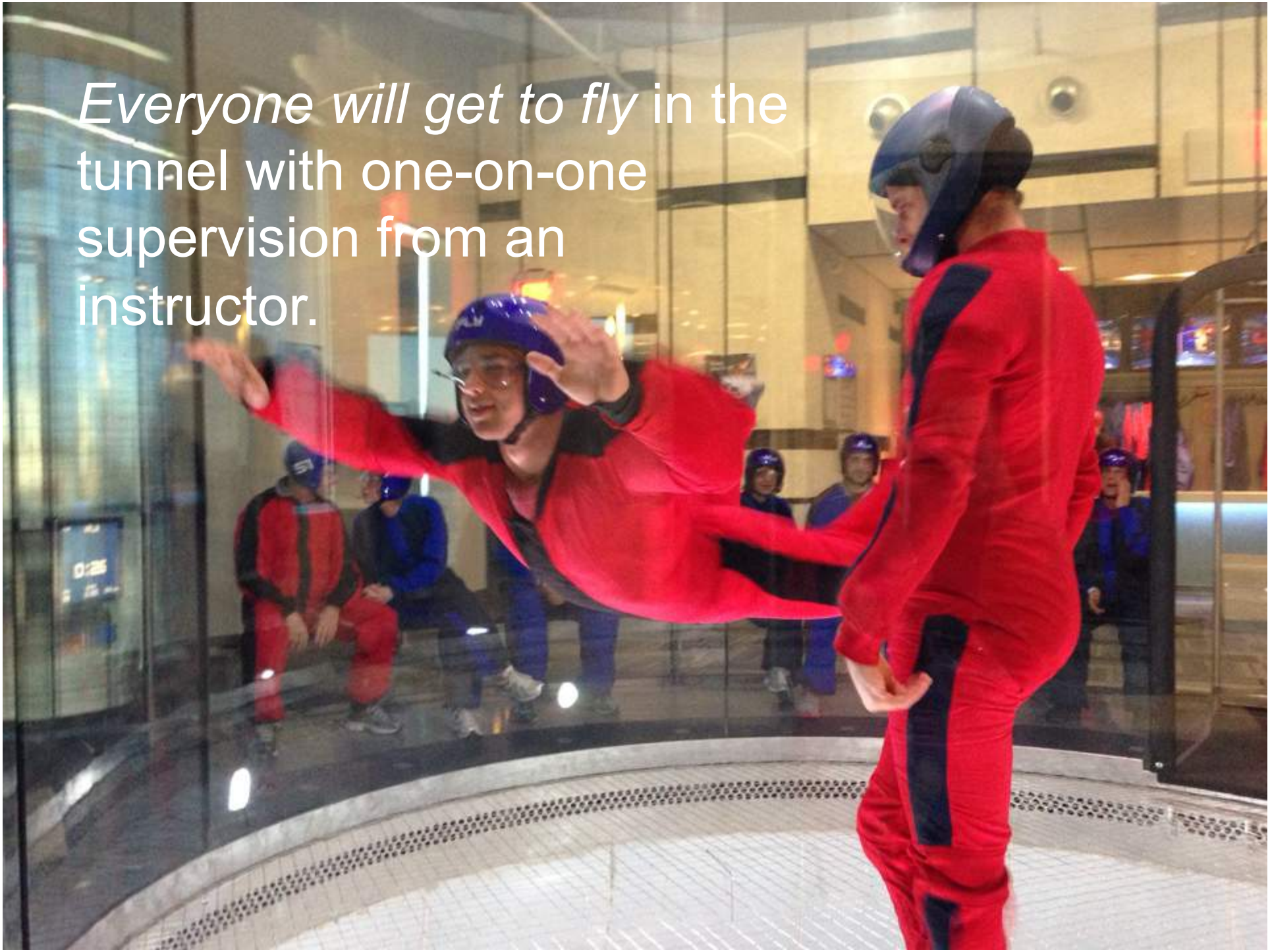

So, you're coming to iFLY…

What should you expect during your field trip?


You'll learn about the *science* and *engineering* involved in our wind tunnel.

You'll make measurements and do calculations to see if you can predict how fast the wind has to blow for you to "fly" in the tunnel.

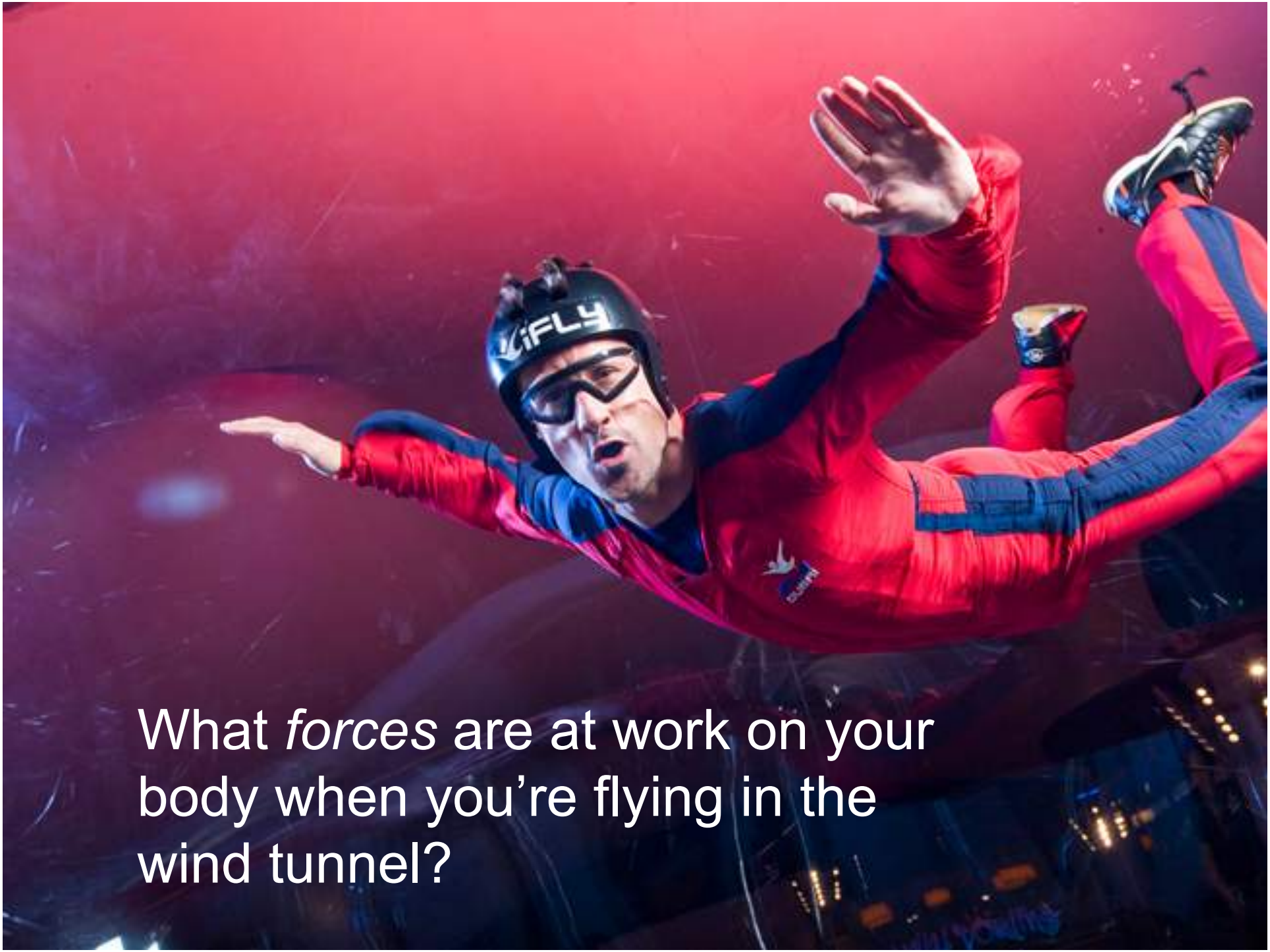
Our certified flight instructors will lead you through flight and safety training.


Everyone will get to fly in the tunnel with one-on-one supervision from an instructor.

Here are a few things to think about before your field trip:

What are the differences between *solids* and *fluids*?

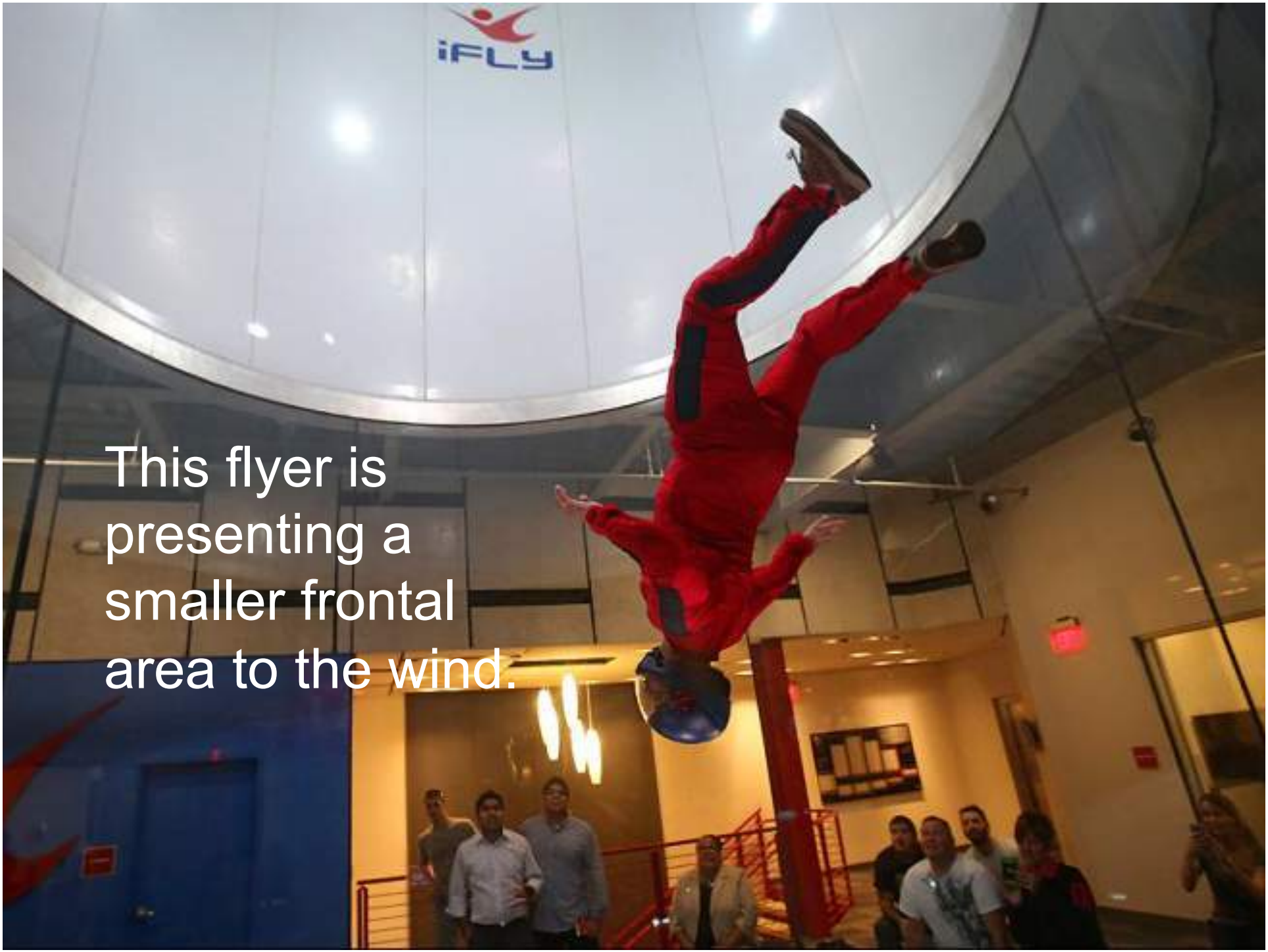
What are some examples of each?


What *forces* are at work on your body when you're flying in the wind tunnel?

You'll learn about the term **frontal area.** This is the part of an object's surface area that the wind "sees".

Changing your frontal area in the wind tunnel will change how you fly.

This flyer is presenting a large frontal area to the wind.


iFLY
This flyer is presenting a smaller frontal area to the wind.

How would you find the *frontal area* of the basketball?

How is it different from the *surface area* of the entire basketball?


Now, think about what
questions you have
for *us!*

See you soon!

iFLY Pre-Field Trip Presentation script for teachers

1. *Title Slide*
2. Are you excited to visit iFLY? First, let's go over what to expect during your field trip.
3. You'll start off by sitting in front of our state-of-the-art wind tunnel. One of iFLY's science educators will give a brief introduction to the science and engineering concepts involved in the wind tunnel. They'll do a demonstration of how some everyday objects behave in the tunnel. Then a flight instructor will show you how they use fluid dynamics to do their expert moves. Prepare to see some cool tricks!
4. Our class will head to our "lab" to do an activity. Each object flies at a different velocity, or speed, in the wind tunnel. You and your team will measure some different objects and try to predict how fast each object will fly in the tunnel.
5. Highly-trained flight instructors will lead you through a flight and safety training. You'll learn all the basics that will allow you to have a safe and enjoyable flight. Next, it's time to gear up and get ready to fly.
6. Every student will have the chance to fly in the wind tunnel! Your flight instructor will stay right there with you to make sure you're safe and having the best flight possible. You'll be experiencing all the physics for yourself!
7. Here are a few STEM concepts to think about before you come…
8. *Read students the questions on this slide. The answers are given here:* Solids have a definite shape and volume. When you apply a force to a solid, it may change its volume, but usually only by a small amount. Examples of solids in this photo: the glass, the table, the ice cubes. Fluids don't have a definite shape….they take on whatever shape they are contained in. When you apply a force on a fluid it flows around the solid. Fluids may be liquid or gaseous. Examples of fluids in this photo: the air, the soda, the gas bubbles trapped in the soda.
9. *Read students the questions on this slide. The answers are given here:* The two main forces we are concerned with in the wind tunnel are GRAVITY and AIR DRAG. Gravity is the force pulling you down to earth. Drag is the force the moving air exerts on your body. Your size, shape, and the way you hold your body will affect your drag force.
10. In the demonstration portion of the field trip, you'll be learning about frontal area. This is different from the surface area.
11. A flyer can increase their frontal area by spreading out their bodies.
12. Leave this trick to the experts! This flight instructor has decreased his frontal area by pointing his body straight down.
13. Here's a quick activity to make sure you understand the difference between frontal area and total surface area. The frontal area of the basketball is (pi*r^2), where r is the radius of the basketball (This is also the area of a circle with radius, r). The surface area of the entire basketball is (4*pi*r^2).
14. What questions do you have about your upcoming field trip? What are you curious about? What do you wonder? Jot these down and the iFLY educators will do their best to answer them when you come!