Stadium Seat Science
Contributed by: The Science Place & TI Founders IMAX Theater

Objective
Discover how pressure affects vacuums by drinking through a straw.

What You Need
• A cup with drinkable liquid
• Two soda straws

To Do and Observe
1. Place one straw in the liquid and drink.
2. Place two straws in the liquid and drink -- do you get more or less liquid?
3. Now, place one straw in the liquid and one straw outside the cup, and the other end of both in your mouth and drink.
4. What happens? Why can’t you always drink twice as much with two straws?
What's Going On
Reducing the pressure inside a machine causes suction. The pressure of outside air, which is created by the weight of the atmosphere, is greater than inside the machine. This difference in pressure can then be put to work. In a vacuum cleaner, the pressure of the outside air forces material into the cleaner. Power brakes may use suction to boost braking.
When you suck through a straw, the air in the atmosphere presses down on the drink and pushes it up into your mouth. Placing one straw outside the cup equalizes the pressure, so you don't get as much liquid through the straw in the cup.

Parent/Teacher Tips
Encourage your child to explain why a straw remains empty when you put your finger over it and reinsert it into the glass of liquid; then why it only goes up to the same level as the rest of the liquid in the glass when you take your finger off the top.
Explore other ways pressure is used to do work--the vacuum cleaner, for instance.

Cool Links
How Things Fly: Did You Know? @ The National Air and Space Museum
Evangelista Torricelli @ the Bloomfield Science Museum