Pressure in a fluid

James Stewart: Pressure in a fluid is the reason you might feel your ears pop when you dive into a swimming pool.

Take this diver.

The deeper they go, the greater the pressure.

Imagine the water above, while the weight of the fluid increases as the diver goes down.

At a particular point in a fluid, we can calculate the pressure, measured in Pascals, with the equation p equals h rho g, where p is the pressure, h is the depth, or the height measured from the surface of the point in question, rho is the density of the fluid, and g is the gravitational field strength.

On Earth, the gravitational field strength is about 9.8 newtons per kilogram, and the density of the water is about 1000 kilograms per metre cubed.

If a diver in the ocean is 10 metres below the surface, then h is 10 metres.

So, multiply 10 by 9.8 by 1000, which equals 98,000 pascals.

1 pascal is the same as 1 newton per square metre.

The diver will also feel the pressure on their body.

Eardrums are especially sensitive.

Molecules in a liquid are in constant random motion.

Pressure in a fluid is the result of the many collisions of these molecules against a surface, in this case, the diver's body and pressure acts equally in all directions.

Remember, when using the equation p equals h rho g, make sure to measure depth (h), in metres from the surface, and density (rho), in kilograms per metre cubed.