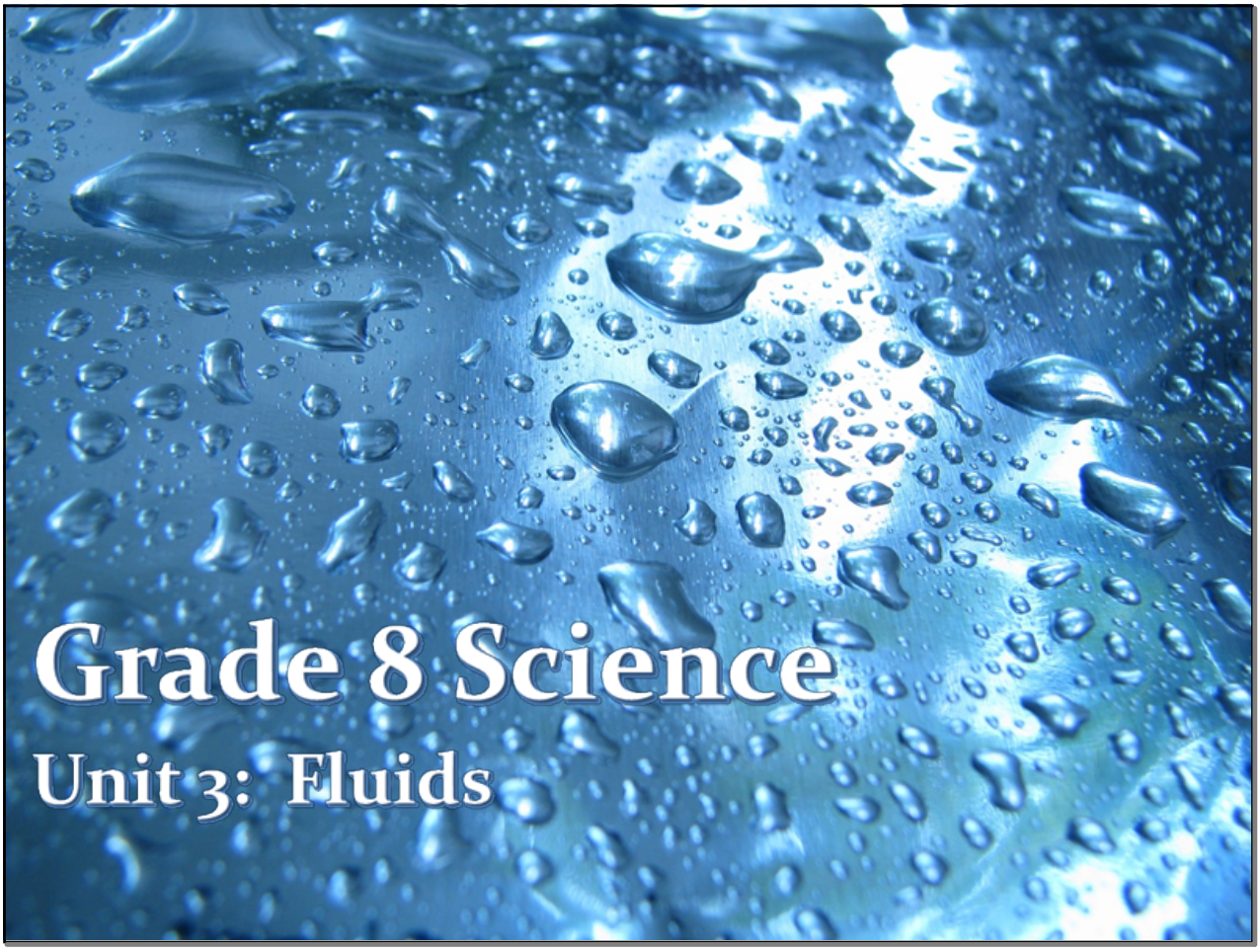
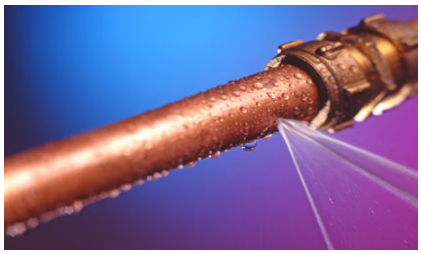


Pascal's Law

What is Pascal's Law? The pressure in an enclosed fluid is uniform throughout.

How does Pascal's law help us explain what happens when there is a leak in a pipe? At what point does the fluid stop leaking from a pipe?

When a pipe is punctured, or if it is not sealed properly, the fluid will rush out of the pipe. This is because the fluid is under pressure, and so is pushing outwards on the pipe. With no pipe wall there to hold it back, it exits.



The leak would stop if the pressure inside the pipe was lowered to match the air pressure on the outside. However, often times (as would be the case to the right) there is more fluid constantly being pushed through the pipe, so it will leak until the source is cut off.

Pumps

In the case of a water line, like the copper pipe shown on the previous slide, water is constantly "pumped" through the line.

A pump is a device that forces fluids into an area. By forcing the fluid into an area it creates pressure in the fluid.

The water in your home is an example of this. Water is pumped through the city water lines, putting it under pressure. When your faucet is closed, the water is blocked from escaping. Once you open the faucet, the water is pushed out of the tap by the pump. As more and more faucets are opened, more water is released. This means the pump has to supply more water. If the pump can not keep up, you will lose "water pressure." The water will not come out as quickly, as there is not as much pressure in it.

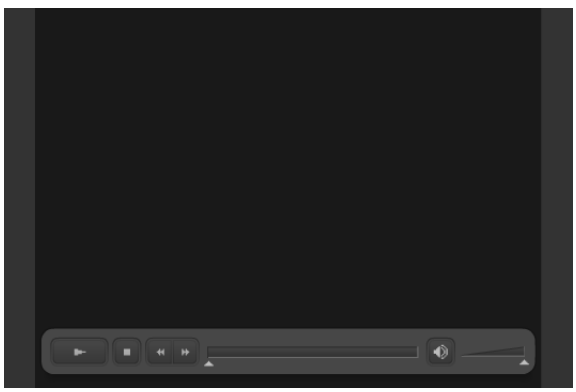
Hydraulics

Fluids under pressure are not just used to supply things like water. We can use the force created by this pressure to make powerful tools.

Hydraulics	The study of pressure in liquids
Hydraulic System	A device that transmits a force through a liquid by using Pascal's law of constant pressure

Here is a video that discusses an example of a hydraulic system, "The Jaws of Life."

Fluid, under pressure, is used to move a pair of metal arms.



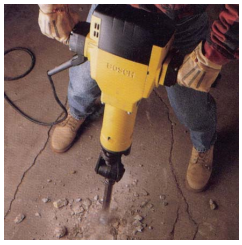
YouTube Link

Pneumatics

Although liquids do not compress as easily, sometimes gases are more practical to use. These systems are called pneumatic systems.

Pneumatics	The study of pressure in gases
Pneumatic System	A device that transmits a force by releasing a gas that is stored under pressure

Here are a few examples of things that use pneumatic principles.

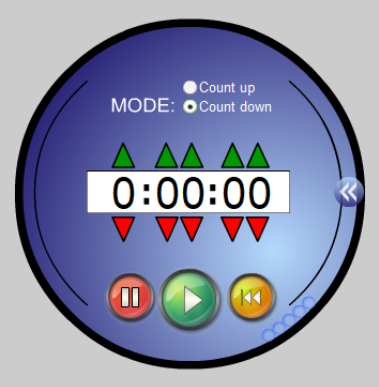


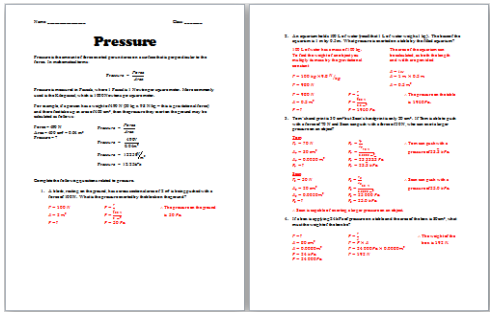
Pressure

Please use the remaining time to complete the following list of work:

1. Fluids Math (should be done and checked by now)
2. Pressure Questions (answer key available)
3. Compressibility Questions (discuss answers with a peer)

If all of this is complete, you may use any remaining time to work on your hydrometer project or other work.





Attachments

3-13 Pressure Answers.pdf