

Part 2 Activity Sheet: Hydraulics vs Pneumatics

Name:

Instructions

When should we use hydraulic systems vs. pneumatic systems? Use two syringes, tubing, and water to follow the steps below to find out!

Activity #1: Investigating Pneumatic Systems

Setup: Connect two empty syringes of the same size to both ends of the tubing. Make sure that the plunger of one syringe is out and the plunger of the other syringe is in before connecting the tubing.

1. Push the plunger in. Describe what happened.

When I push the plunger of one syringe, the other plunger...

2. Try pushing in the plunger of the second syringe. What happened to the first plunger?

When I push the second plunger, the first plunger...

3. Now pull the plunger back out. Describe what happened.

When I pull the plunger out, the other plunger...

4. Press both plungers down at the same time. Describe what happened.

When I push both plungers down at the same time...

5. Disconnect one syringe from the tubing, press both plungers in completely. Reconnect the tubing. Try pulling one plunger out and then let go. What happened?

When I pull one plunger out and let go...

Activity #2: Investigating Hydraulic Systems

Setup: Fill one syringe with water. Connect the tube to the water-filled syringe. Flush water through the tube by pushing all the way down on the syringe plunger. Place the open end of the tube in the water and draw water back in by pulling back on the plunger.

Connect the second syringe to the other end of the filled tube. Make sure the second syringe's plunger is pushed in all the way before connecting the tubing.

1. Push the plunger in. Describe what happened.

When I push the plunger in, the other plunger...

2. Try pushing in the plunger of the second syringe. What happened to the first plunger?

When I push the plunger of the second syringe, the first plunger...

3. Now pull the plunger back out. Describe what happened.

When I pull the plunger back out, the other plunger...

4. Press both plungers down at the same time. Describe what happened.

When I push both plungers down at the same time...

5. Which system (hydraulic or pneumatic) would be better for controlling a lever to lift a heavy object? Why?

The best system for controlling a lever to lift a heavy object is...

6. Based on your observations, when is one situation where you would want to use pneumatic systems instead of hydraulic systems? Why?

A situation where I would use a pneumatic system is...