INVESTIGATION SKILLS =FORCE TRANSFER

In this lesson you will compare force transfer between two syrings filled with compressed air(a pneumatic system).

In the picture A represents the inout syringe. This is the "master syringe." B is the output syringe, this is known as the "slave syringe."

Remember always use new syringes which you can buy from a pharmacy.

You will need:

- two 10 ml syringes
- one connecting tube, approximately 180 mm long.

Mark the one syringe A. This will be your master syringe. Mark the second syringe B. This will be your slave syringe.

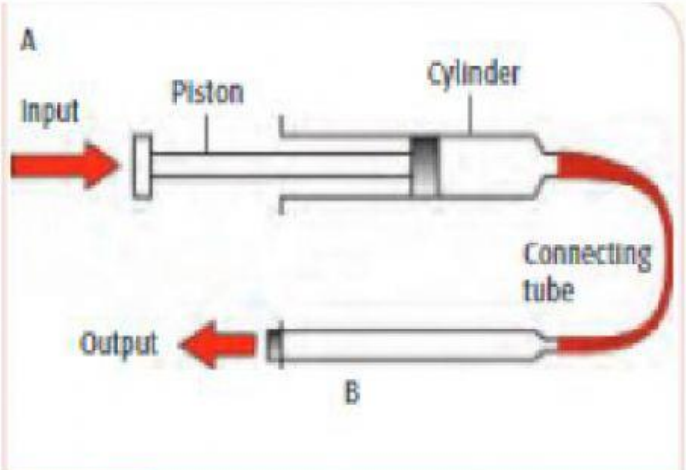

FIGURE 2 Pneumatic or hydraulic system

Activity 1 Force transfer between two equal syringes filled with air (pneumatic system) (continued)

Move the piston on syringe A to the 10 ml mark on the cylinder. The piston on syringe B should be on the 0 ml mark. Connect the two syringes with the connecting tube. Your syringe system should look like the system in FIGURE 3.

FIGURE 3 Make your own pneumatic system as shown in the photo.

Move the piston on syringe A from the 10 ml mark to the 0 ml mark. This will transfer the volume of air from syringe A to syringe B through the connecting tube. Record the readings on syringe B.

Draw the following table in your workbook and record your findings:

Displacement of air in syringe system		
Volume of air transferred from syringe A to syringe B was ___ ml		
Was the volume transferred to syringe B: Mark your answer with ✓	more	
	less	
	equal	

Activity 2 Force transfer between two equal syringes filled with water (hydraulic system)

In this activity you will do the same experiment as in Activity 1, but this time you will fill the syringe system with water.

Working in your groups, make up a syringe system as follows:

1. Fill the syringe with water. Remember to fill the master piston to the 10 ml mark with water and leave the slave piston at the 0 ml mark.
2. Connect the two syringes at the spout by fitting the tube securely between the two syringes.

3 Move the piston on syringe A from the 10 ml mark to the 0 ml mark. This will transfer the volume of water from syringe A to syringe B through the connecting tube. Record the reading on syringe B.

Draw the following table in your workbook to record your findings:

Displacement of water in syringe system		
The volume of water transferred from syringe A to syringe B was ____ ml.		
Was the volume transferred to syringe B: Mark your answer with ✓	more	
	less	
	equal	

1 Was the force transfer in the hydraulic system the same as the force transfer in the pneumatic system?

2 Write down this sentence and underline your answer.

> The force transfer in a hydraulic system is (greater than, less than or equal to) the force transfer in a pneumatic system.

3 Discuss your findings with your teacher. Ask your teacher to explain the properties of compressed air and water in a confined container.

4 What conclusions can you make from these two experiments?

5 When air is compressed in a closed container, the system is called a _____.

6 When liquid is compressed in a closed container, the system is called a _____.

7 Compressed air is (compressible/incompressible)?

8 Compressed liquid is (compressible/incompressible)?

Answers

1.

2.

3.

4.

5.

6.

7.

8.