INVESTIGATION SKILLS =FORCE TRANSFER Part 2

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

In this experiment, you will experience force transfer with force multiplication between two unequal syringes.

You will need:

- one 10 ml syringe
- one 20 ml syringe
- one connecting tube approximately 180 mm long.

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

1. Mark the smaller syringe A and the larger syringe B.
2. Fill the syringe system by putting everything under water. This will prevent air bubbles in the system.
3. Fill syringe A with water up to the 5 ml mark. Leave syringe B at the 0 ml mark.
4. Connect the two syringes at the spout by fitting the tube securely between them.
5. Mount the syringe system on a stand as shown in FIGURE 4. If you do not have a stand, you may place the syringe system on your desk.
6. Make sure that the piston is on the 5 ml mark in syringe A. The piston should be on the 0 ml mark in syringe B.
7. Push the piston on syringe A until all the water is transferred to syringe B.
8. Measure how far piston A has moved.
9. Now measure how far the piston in syringe B has been displaced.

FIGURE 4 Make your own hydraulic system as shown in the photo.

Compare the volume of liquid transferred to the distances the piston moved.

Copy this table into your workbook and record your findings:

Distance moved by piston A	_____ mm
Distance moved by piston B	_____ mm
Volume transferred by piston A	_____ ml
Volume displaced by piston B	_____ ml

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Move the piston on syringe B back to the zero mark on the syringe. This will transfer the liquid back to syringe A, and to the 5 ml mark.

While you do this, feel the force output on piston A.

Now move the piston on syringe A from 5 ml to 0 ml. Liquid will transfer from syringe A to syringe B. Feel the force transfer from syringe A to syringe B. Compare the force transfer from syringe B to syringe A and from syringe A to syringe B.

Record your findings in your workbook: Mark your answer with ✓

Force transfer from the smaller syringe A to the bigger syringe B was:	
equal	
more	
less	

1 In a hydraulic system with two equal syringes, we get _____ distance and _____ force between the two syringes.

2 In a hydraulic system where the movement is from a small syringe to a larger syringe, the output distance is _____ and the output force is _____.

3 When the output force is increased by the force transfer from the input force, we call this _____ _____.

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