



Principle models activities

The principle models show you how pneumatics work in a simple and hands-on way. Use the building instructions to build the model, investigate what happens when you do as instructed and then explain why it happens. You can also use the words presented at the top of each page as you write your findings.

Next, make a minor change as shown in the illustration and you are ready for new learning.

There are five principle models and 14 steps. When you have completed these, you will be ready to make interesting pneumatic machines.

Air tank

Valve

Piston Rod

Tube

Manometer

Air port

Piston

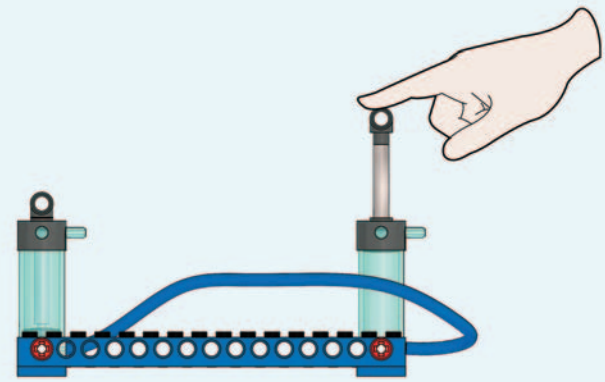
Pump

Cylinder

Force

1A
Build 1A book 5 to step 5.
Press down on the piston rod.
Explain what happened and why.

When I push down on the piston rod...



Tips and Tricks when working with the pneumatic elements!

- The easiest way to empty the air tank is to disconnect the tube going from the air tank to the valve.
- It is always a good idea to start with the valve in the off position. This allows you to control the air flow.

Air tank

Piston Rod

Manometer

Piston

Pump

Valve

Tube

Air port

Cylinder

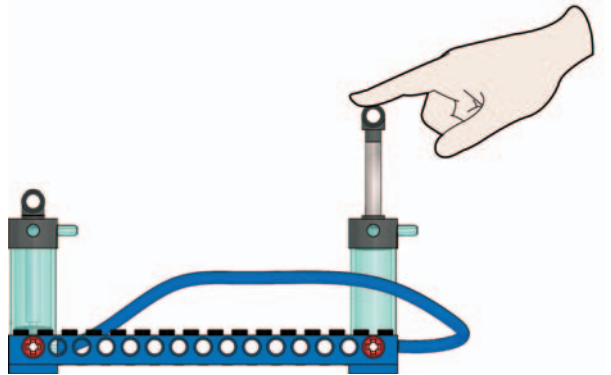
Force

1A

Build 1A book 5 to step 5

Press down on the piston rod.

Explain what happened and why.

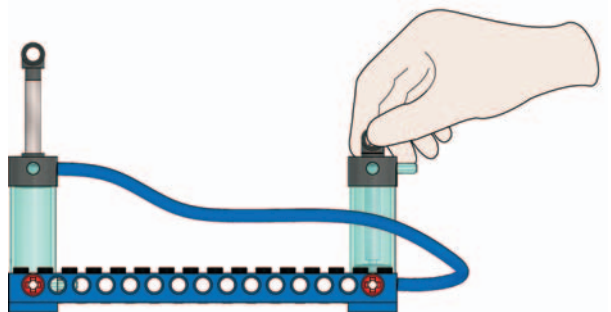


1B

Change the model as shown.

Pull up on the piston rod.

Explain what happened and why.

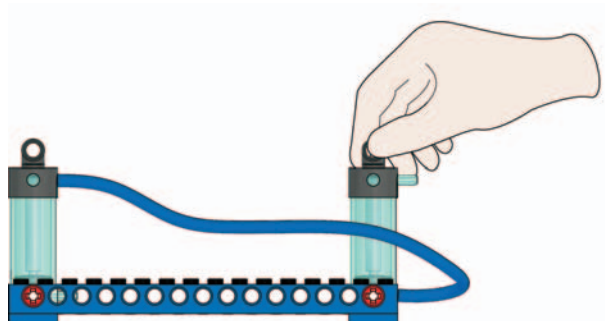


1C

Change the model as shown.

Pull up on the piston rod.

Explain what happened and why.



Air tank

Piston Rod

Manometer

Piston

Pump

Valve

Tube

Air port

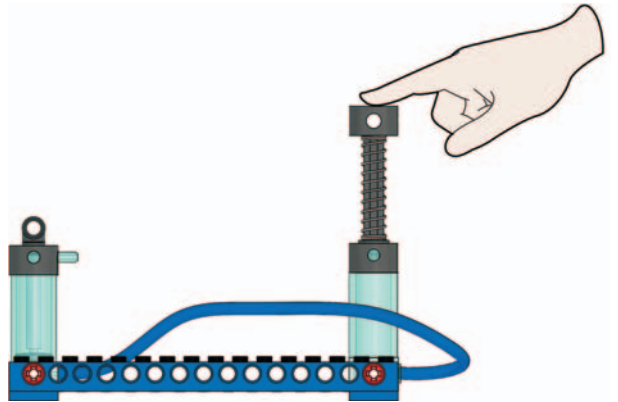
Cylinder

Force

2A

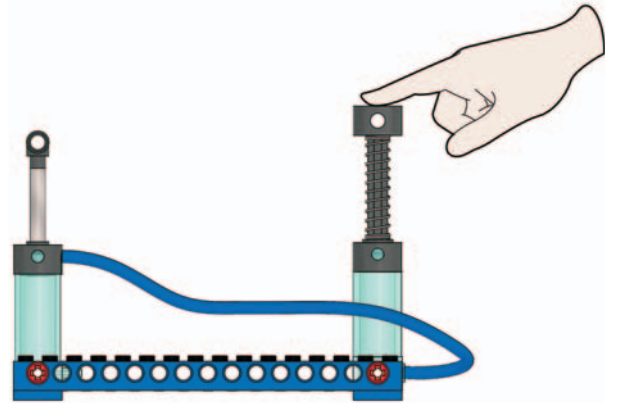
Build 2A book 5 to step 7

Press down on the pump once.
Explain what happened and why.



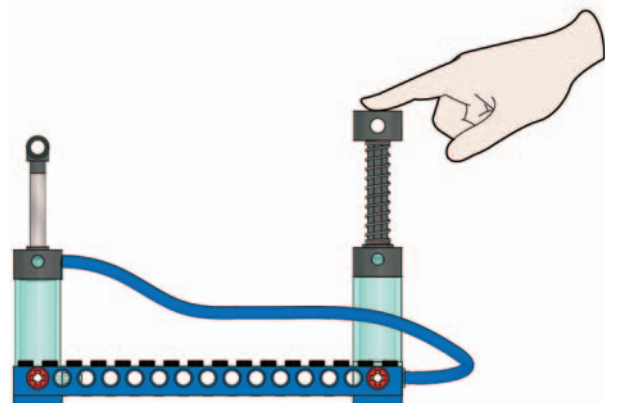
2B

Change the model as shown.
Press down on the pump once.
Explain what happened and why.



2C

Keep pumping and after each pump
try pulling the cylinder piston rod up.
Explain what happened and why.



Air tank

Piston Rod

Manometer

Piston

Pump

Valve

Tube

Air port

Cylinder

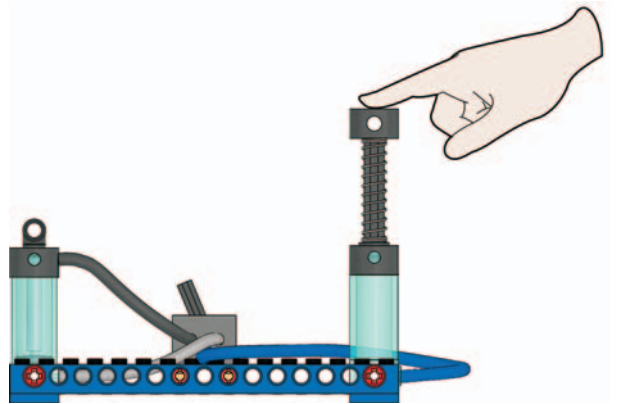
Force

3A

Build 3A book 5 to step 10

Press down on the pump once.

Explain what happened and why.

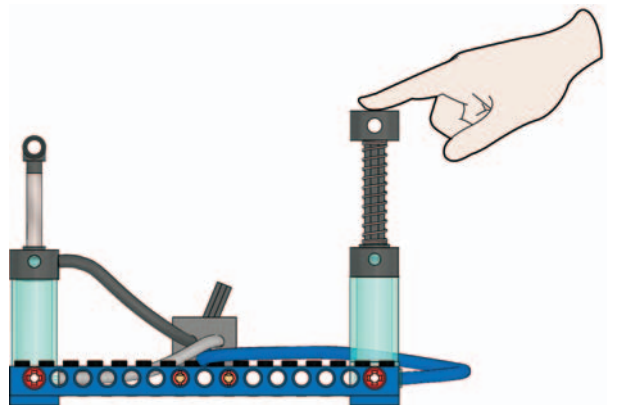


3B

Change the model as shown.

Press down on the pump once.

Explain what happened and why.



Air tank

Piston Rod

Manometer

Piston

Pump

Valve

Tube

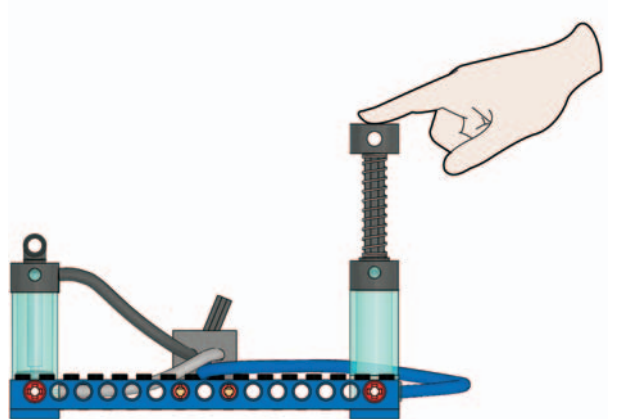
Air port

Cylinder

Force

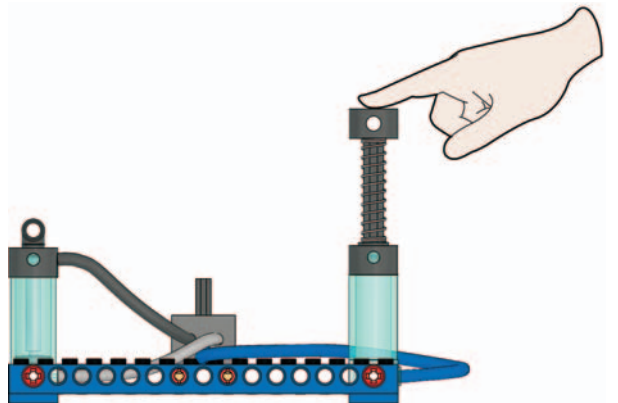
3C

Change the model as shown.
Press down on the pump once.
Explain what happened and why.



3D

Change the model as shown.
Press down on the pump twice.
Explain what happened and why.



Air tank

Piston Rod

Manometer

Piston

Pump

Valve

Tube

Air port

Cylinder

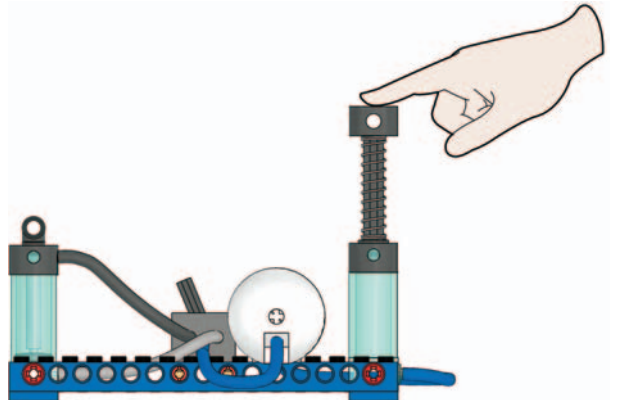
Force

4A

Build 4A book 5 to step 13

Press down on the pump twice.

Explain what happened and why.

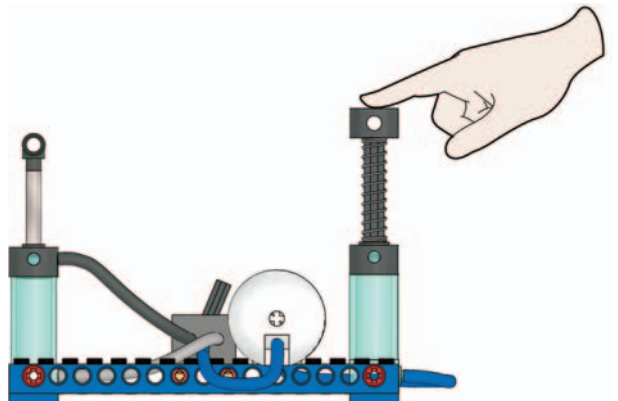


4B

Change the model as shown.

Press down on the pump twice.

Explain what happened and why.



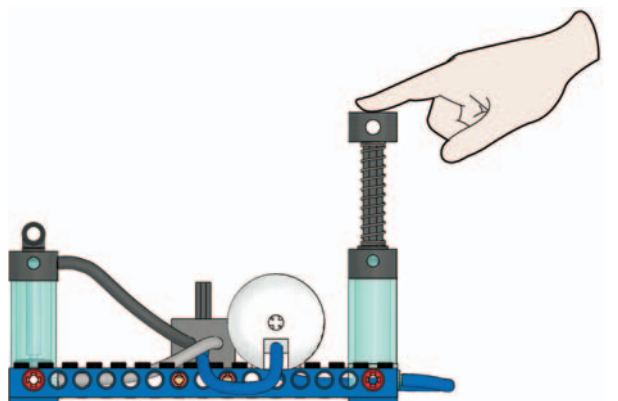
4C

Change the model as shown.

Press down on the pump twice.

Explain what happened and why.

How many pumps are needed to fill the tank completely?



Air tank

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Cylinder

Force

5A

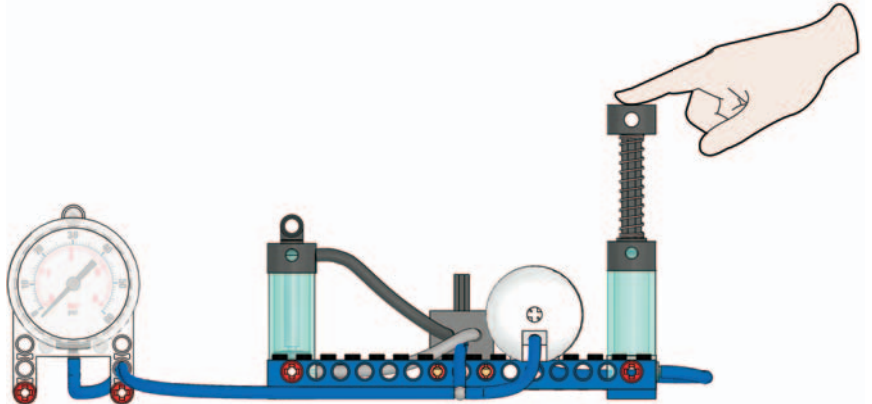
Build 5A book 5 to step 17

Press down on the pump twice.

Explain what happened and why.

Then keep pumping.

What's the highest pressure you can obtain?



Test how many times can you extend and retract the piston rod when using 1 bar of pressure.

Then do the same test using 2 and 2.5 bars?

