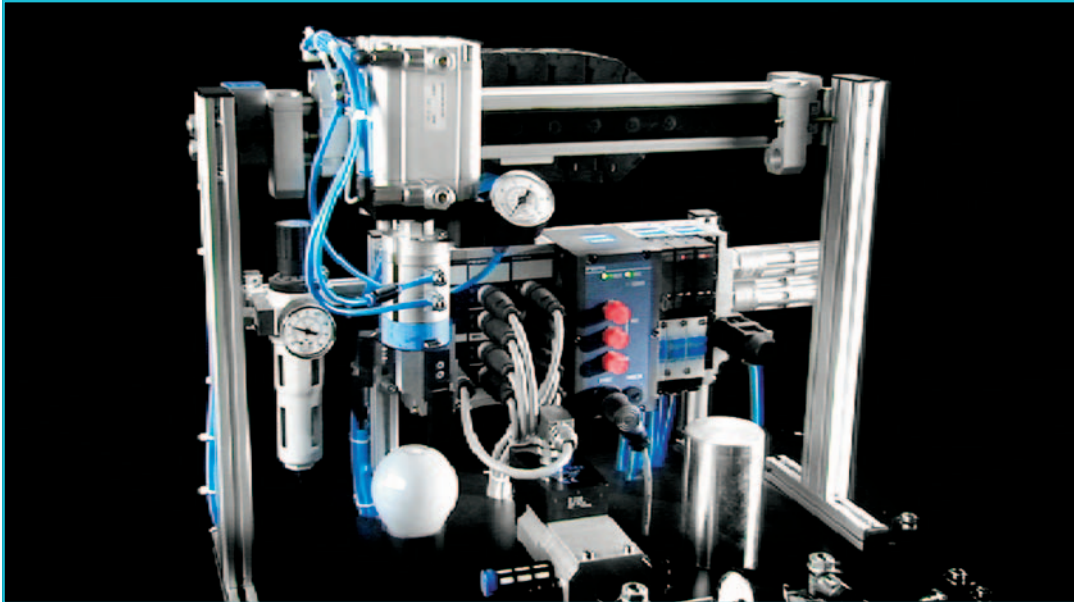


Connect

Industry and hospitals often need to handle and move objects that can be dangerous to touch by hand. Metal objects and fragile glass containers, for example, are often handled using pneumatic hands or grippers.

**Build the Robot Hand and investigate what pressure is needed to hold different objects without dropping or crushing them.
Let's find out!**



Continue

What else can the Robot Hand hold?

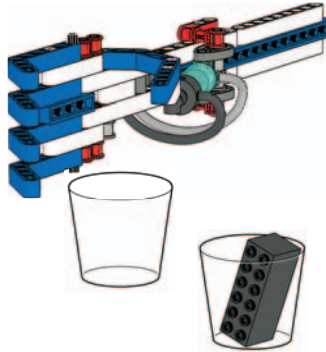
Prepare a fragile paper or plastic cup. Find a variety of different objects to put in the cup. Find out how much pressure is needed for the Robot Hand to pick up the cup.

First, predict how much pressure the Robot Hand needs to lift the different objects without damaging them.

Record your prediction on the worksheet.

Then, test how much pressure is needed.
Record your findings on the worksheet.

Test several times to make sure your results are consistent.



Hint

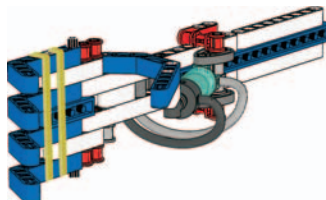
Make an egg-shaped object out of modelling clay. Marks on the clay's surface can be used to record damage caused by pressure.

But remember to wrap it in cling film to keep the elements clean.

Optional: Further investigations

Need a better grip?

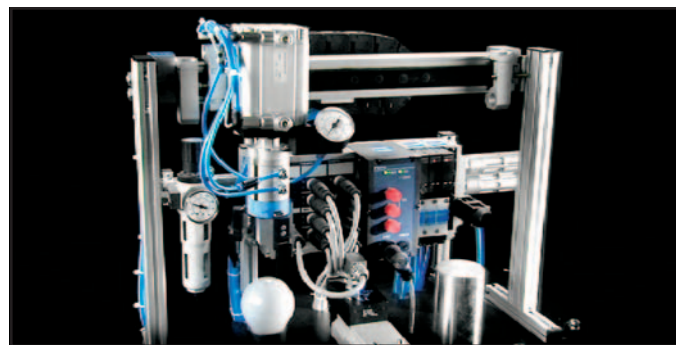
Experiment by adding different materials to the Robot Hand for a better and safer grip that also causes less damage.



Robot Hand

Name(s): _____

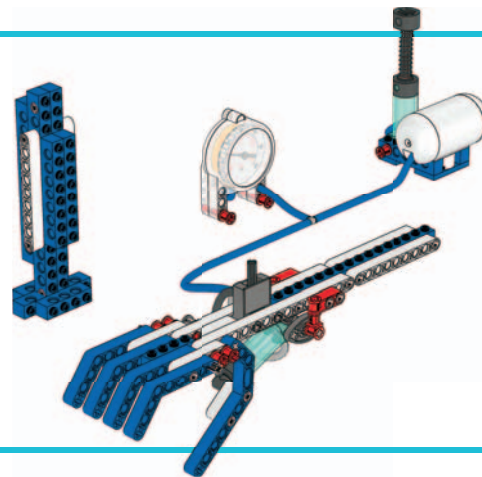
Build the Robot Hand and investigate what pressure is needed to hold different objects without dropping or crushing them. Let's find out!



Build the Robot Hand and the carrier.

(All of book 2A and book 2B to page 10, step 16)

- Pump air into the system and use the manometer to detect whether there is an air leak
- Try the valve settings and check all moving parts to ensure that they move freely
- Then open the hand and empty the air tank



How good a grip?


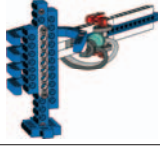
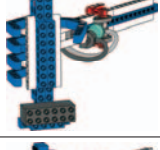
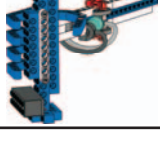
The Robot Hand can pick up the carrier from two different sides – the smooth white side and the studded blue side. Find out how much pressure the Robot Hand needs to pick up the carrier.

First, predict how much pressure the Robot Hand needs to lift carrier A.

Then, test how much pressure is needed.

Next, follow the same procedure for Robot Hands B, C and D.

Test several times to make sure your results are consistent.

	My prediction	My findings
A 		
B 		
C 		
D 		

Explain your findings:

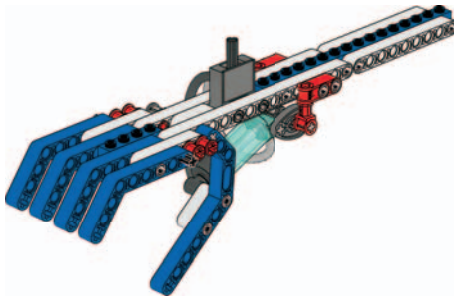
What else can the Robot Hand hold?



Prepare a fragile paper or plastic cup. Find a variety of different objects to put in the cup. Find out how much pressure is needed for the Robot Hand to pick up the cup.

First, predict how much pressure the Robot Hand needs to lift the different objects without damaging them.

Then, test how much pressure is needed.

Test several times to make sure your results are consistent.



	Object	My prediction	My findings
A			
B			
C			
D			

Optional: My Amazing Pneumatic _____ !

Invent a new and useful machine that uses the same mechanism as the Robot Hand but does a different job. Sketch it and explain the three most important features.

Optional: Further Research

Describe some of the industries and jobs the Robot Hand is used for and what some of its limitations might be.