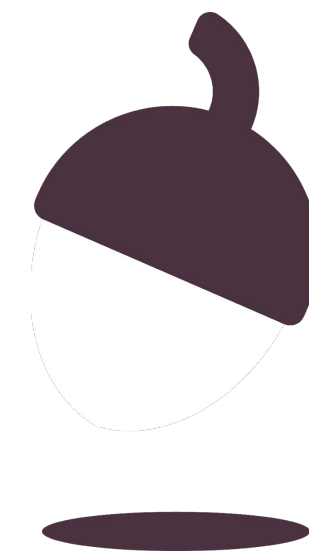


Combined Science - Physics - Key Stage 4 - Forces

# Work Done

Mr Saville



**OAK**  
NATIONAL  
ACADEMY

# Warm up

1. A man has a mass of 82.5 kg. Gravitational field strength ( $g$ ) on Earth is 9.8 N/kg. Calculate his weight. Give your answer to 3 significant figures
2. A box has a weight of 27 N.  $g = 9.8$  N/kg. Calculate its mass. Give your answer to 2 significant figures
3. Bob has a mass of 85 kg. During the launch of the spaceX dragon capsule his weight reached 2499 N. How many 'g's did he experience (*Hint: calculate  $g$ , then compare to Earth's normal  $g$  of 9.8 N/kg*)



# Independent Practice

1. A man pushes a box across a distance of 11 metres using 320N of force. How much work does he do?
2. A weightlifter lifts a woman 2.5 metres into the air. If the woman has a weight of 580 N, how much work does the weightlifter do?
3. A man pushes a shopping trolley for 22 metres down a supermarket aisle. The force needed to move the trolley was 0.014 kN. How much work does the man do? Give your answer to 2 significant figures.
4. A man transfers 0.45 kJ of energy to move a load 13 metres. How much force does he apply? Give your answer to 3 significant figures.



# Exam question

1. 10.0 J of work is done lifting a ball a distance of 1.8 metres.

How much force was used to lift the ball?

- A. 0.18 N
- B. 18 N
- C. 5.6 N
- D. 8.2 N

**[1]**



# Exam question

Question from OCR, B721/01 Additional Science, Paper 1, June 2016

2. Janna walks up **four** stairs. She weighs 500 N. The height of one stair is 0.15 m.

Calculate the **work** done by Janna using this data. **(2)**



ii) Janna walks up another four stairs. She has now walked up eight stairs.

Compare the amount of work done walking up eight stairs with the work done walking up four stairs. **(1)**



# Exam question

3. Sanjay learns about forces and planets. He collects information about the weight of the same object on different planets. Sanjay has **not** put the unit for work done in the table.

Calculate the work done to lift the object 20 m on Mars.

Planet	Mass of object in kg	Weight and force to lift the object in N	Work done to lift the object 20 m
Mercury	1	3.8	76
Venus	1	8.8	176
Earth	1	10.0	200
Mars	1	3.9	-----

Write down the unit for work done in your answer. **(2)**

