The science of exercise

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You've got the power: Student sheet

Method

1. Get into teams of three and read through all the instructions before you get started
2. If the weight of the ball is not already known, use a scale to register the mass of the ball
3. In your group, decide who will be the subject, the observer recording the measurements and the timekeeper
4. The subject should stand with their feet shoulder width apart and hold the ball against their chest
5. Next, they should throw the ball as far away as possible. They must try to throw the ball horizontally away from their body, not upwards or downwards
6. The observer should measure the horizontal distance that the ball has been thrown using the measuring tape or metre ruler. They can measure this based off where the ball hits the ground
7. The timekeeper should use a stopwatch or watch to time how long it takes the ball to hit the ground, giving them the time recording
   a. Use the results table to record the distance and time to help them complete their calculations when they have finished
8. Rest for around 30 seconds
9. Repeat two more times and draw a table to record the results
10. Calculate the average distance the ball was thrown, and the average time it took to fall
11. To calculate the amount of power used to throw the ball, use the space below the results table

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Results table

Write down the mass of the ball you are throwing:

Use this sheet to record your groups statistics. Once you have recorded your results, you can begin calculating how much power you used to throw the ball:

Height (metres)	Trial 1		Trial 2		Trial 3		Predicted
Group member	Distance	Time	Distance	Time	Distance	Time	Average

First you need to calculate the among of Force (newtons) used to throw the ball.
Use this equation with your average:

Force = Distance x Mass

Now you have worked out the mass, you can measure the Work (joules) used to throw the ball.
This equation with your results:

Work = Force x Distance

Finally, having measured the work, you can work out how much Power (watts) you used to throw the ball!
Use this equation with your results:

Power = Work / Time