

WJEC Wales Physics GCSE

SP2.2: Terminal Speed

Practical Flashcards

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Outline the basic steps of the practical.



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1. Attach a pointer to a clamp stand and place the clamp stand on the desk.
2. Record the distance from the pointer to the floor.
3. Measure the mass of one cupcake case and then drop it well above the height of the pointer.
4. Record the time it takes to fall from the pointer to the floor (start timing as it passes the pointer).
5. Add another cake case to the stack and repeat.
6. Repeat with an increasing number of cases.



Why must the cake case be dropped well above the height of the pointer?



Why must the cake case be dropped well above the height of the pointer?

By the time it reaches the pointer and the timer starts, the case should be falling at terminal speed and so must fall through a suitable distance to reach it.



Why is a cake case a good object to use for this experiment?



Why is a cake case a good object to use for this experiment?

They have a low mass and have a relatively large surface area, meaning they reach terminal velocity quickly.



What equation should be used to calculate terminal speed?



What equation should be used to calculate terminal speed?

$$\text{Speed} = \text{Distance} / \text{Time}$$

Where distance is the height of the pointer from the ground and where time is the time taken to fall from the pointer to the ground.



What safety precautions should be taken
in this experiment?



What safety precautions should be taken in this experiment?

1. The pointer is sharp and at eye level so safety glasses should be worn.
2. The clamp stand should also be clamped to the bench so it does not topple and cause injury.



Explain the process of reaching terminal speed.



Explain the process of reaching terminal speed.

1. Initially, the air resistance is negligible and the downwards resultant force is equal to the object's weight.
2. As the speed increases, air resistance increases so the resultant force downwards decreases.
3. Eventually the upwards forces (resistance) are equal to the weight, so there is no resultant force and thus no acceleration.



What assumption is made in this experiment?



What assumption is made in this experiment?

The cake case has reached terminal speed by the time it reaches the pointer.



What happens to the terminal speed when more cake cases are added to the stack?



What happens to the terminal speed when more cake cases are added to the stack?

1. More cake cases mean a larger mass, so greater weight.
2. Surface area is the same, so the air resistance is the same.
3. The terminal speed will be higher.

