To investigate the factors that affects the average speed of a falling cake case

Business

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******** I predict 50 cake cases will fall with a greater speed than the others.

This is because more cake cases have a greater mass and will therefore hit the floor with a quicker time, and a greater speed. My research suggests that because the mass is greater with more cake cases, they will reach a constant speed slower therefore accelerating for longer.* To calculate the average speed I used the equationo Speed = DistanceTime* The distance I am dropping the cases from is 1. 8 metresPreliminary planI will get 50 cake cases* Measure the height of where I want to drop cake cases off.* Use a timer and time the time it takes for the cake case to fall to the floor of the determined height.* Then record my results in a table then determine the average time by adding my first and my second times then dividing them by two* Then to find the average speed I used the equation speed = distance over time* So I divided my distance by my average time to get the average speed.

SafetyTo keep the experiment safe I will make sure that the cupboards are secure and wont fall over. I will also keep the experiment area clear of other people. I will measure* The distance from the top of the cupboard to the floor (1. 8m) with a tape measure* The time for the cake cases to hit the floor, in seconds, with a stop-clock* My measurements are going to be to 1 decimal place because tape measures and stop-clocks do not measure any more accuratelyI will repeat the experiment* Twice so I can determine the average time and to keep it a fair test. Fair test* I will make it a fair test by conducting the experiment twice and dropping the cake cases from the

same height. And using the same equipment, I will not change the cake cases or the stop clock because changing these could cause my readings to change.

. ResultsPreliminary tableNumber of casesHeight (m)Time for cake cases to fallAverage speed (m/s)Time 1(s)Time 2(s)Average time (s)11. 81. 312. 151.

731. 0421. 81. 441. 191. 291.

3931. 80. 811. 701. 601. 0841.

80. 901. 131. 021. 7651. 80.

870. 860. 872. 0661. 80.

860. 850. 862. 0971. 80. 700.

760. 732. 4681. 80. 710. 690.

702. 5791. 80. 550. 640. 603101.

80. 470. 620. 503. 6ImprovementI improved my preliminary plan by deciding to make my results more accurate.

I can do this by making another table and trying the experiment with 5- 50 cake cases, because I feel that my preliminary isn’t accurate enough. I will also take more readings of the time it takes for the cases to hit the floor. This is my final result tableNo. CasesTime 1 (s)Time 2 (s)Time 3 (s)Average time (s)Average speed (m/s)50. 890.

760. 810. 822. 19100. 760. 730.

730. 742. 43150. 620. 770.

680. 692. 60200. 590. 590.

650. 612. 95250. 630. 710.

670. 672. 68300. 650. 640. 630.

642. 81350. 660. 720. 690. 692.

60400. 670. 670. 670. 672. 68450.

590. 690. 640. 642. 81500. 630.

600. 600. 612. 95I plotted out my final table out as a scatter graph. ConclusionMy graph shows clearly that an increase of the number of cake cases, and mass, makes them fall at a greater speed. It shows that the speed of 5 cake cases is “ 2.

19″ and 50 is “ 2. 95” metres per second. My prediction was right because I said that “ 50 cake cases will fall with a greater speed than the others” which they did. More cake cases fall at a greater speed because they have a greater mass and therefore weight. When a small weight is dropped, it doesn’t take long for the air resistance to build up against it.

When air resistance is equal to weight, the cases fall at a constant speed. When the mass is greater, the air resistance takes longer to build up to equal the weight. The cases are accelerating for longer before they reach a constant speed (or their terminal velocity) causing them to fall at a greater average speed. My research suggests that if I added more cases, the speed

would continue to increase. EvaluationMy preliminary results are better than my final results, and I don’t feel that my results were accurate enough because my preliminary results turned out to be the better set of results, because of this my results aren’t as reliable as they should be.

I should repeat the experiment. My results were accurate to 1 decimal place, I could use more advanced equipment unavailable at school to gain greater accuracy. My plan was detailed enough but I think I could have added a little more to it on how to carry out the experiment. My results also support my conclusion. To improve my experiment I could take more readings, try the experiment again and draw up a new table and use the average speed from each table to determine an over all average speed.