Diya gravitational potential energy, which is converted

Diya Mokha 7E To investigate the change in time taken (seconds) when a toy car (113g) is rolled down a ramp (1.

23 m) while the ramp is set to various heights in cm (10, 15, 20, 25, 30) measured using a timer. Research Question: How does the time taken (seconds) of a toy car (113g) going down a ramp (1. 23 m) change when the ramp is set to different heights in cm (10, 15, 20, 25, 30)? Hypothesis: In this lab, the time taken (seconds) for a toy car (113g) to go down a ramp (1. 23 m) while the ramp is set to various heights in cm (10, 15, 20, 25, 30) is being investigated.

It is predicted that if the car is at its highest incline then it will go down the ramp at the fastest time possible because of gravity. Gravity pulls something at its strongest point. Air resistance and friction are the main forces holding an object back, when a slope is steeper the car is basically pulled down by gravity which results in reaching faster.

Also when the toy car is placed on top of the ramp it has a certain amount of gravitational potential energy, which is converted into kinetic energy when the car travels down the ramp. So the higher the ramp is, the more gravitational potential energy (www. khanacademy.

org)   there will be to be converted into kinetic energy, resulting in more kinetic energy making the car travel at a faster speed. The car's change in potential energy is mass times gravitational acceleration This loss of gravitational potential energy shows up as an increase in kinetic energy. This related to Newton's second law which is force is equal to mass times acceleration. Independent variable: Height of laboratory jack which holds the

ramp (10, 15, 20, 25, 30) measured in cmDependent variable: The time taken for the toy car to travel down the ramp measured in seconds using a timer. Controlled variables: Controlled Variable How it affects the data? How will it be controlled? Mass of the carThe mass of the car has a large effect on the time for the car to go down the ramp, if the weights are different then it is likely that the heaviest car will reach the fastest and since we can only have one independent variable the masses must all remain the same. The toy car will be weighed before it is put on the ramp using a weighing scale so that it is a fair test. Length of the rampThe length of the ramp has a strong effect on the time taken for the toy car to go down the ramp this has an effect on the time because if the ramp is longer the toy care will definitely take longer to go down the ramp .

The ramp will be measured using a meter ruler so that it is a fair test. Force that is used to push down the toy car This effects the data because if the toy car is pushed down the ramp with more force it is sure to reach faster then if the toy car is rolled with less force, if the car is pushed with different forces the experiment will not be a fair test This will be controlled by placing the car on top of the ramp and simply letting it go without a push so that it is a fair test. Apparatus Quantity Toy Car x1Rampx1Laboratory jackx1 Timer x1 Ruler x1Hazard Risk Prevention The toy car It is possible that the car rolls of the ramp and goes and hits a person or breaks some glass which is also a risk because somebody can step on it and get hurt An object can be placed at the end of the ramp so that when the car reaches the bottom it will be stopped. Method: The laboratory jack is set at 10 cm The ramp is placed on top of the laboratory jackThe car is rolled down the laboratory jack The car

should be timed using a timer This should be tried 3 – 8 timesNow the laboratory jack should be made taller by 5cmThe experiment should be repeated until the laboratory jack is at 30 cmThe averages of your results must be calculated. Raw DataHeight of laboratory jack (cm)Times for the car to go down the ramp (seconds)   Trial 1Trial 2Trial 3102. 372.

322. 56151. 211. 281. 59200.

971. 341. 28250. 970. 941300. 7510. 82 Calculations: 2.

37 + 2. 32 + 2. 56 = 7. 25 7. 25 / 3 = 2. 42 1. 21 + 1.

28 + 1. 59 / 3 = 3. 02 0. 97 + 1. 34 + 1. 28 / 3 = 2. 7 0.

97 + 0. 94 + 1 / 3 = 2. 24 0. 75 + 1 + 0. 82 / 3 = 2. 023 Processed DataHeight of laboratory jack (cm)Average time for the car to go down the ramp (seconds) 102. 42153. 02202.

7 252. 24302. 023Observations: The car was faster when the laboratory jack was at 10 cm compared to when it was 15 and 20 cm The results were not dramatically different Some of the results did not make sense for example when the laboratory jack was at 20 cm the times were 0.

97, 1. 34 and 1. 28.

Conclusion: The results obtained the hypothesis. The results suggest that as the laboratory jack got higher the time taken for the car to go down the ramp was quicker. The fastest time was 0. 75 seconds and the slowest time was 2. 56 seconds.

The range of our results were 1. 81. This was all possible because while on top of the ramp the car has a particular amount of gravitational potential energy, and while the car is going down the ramp the gravitational potential energy is converted into kinetic energy.

Gravity pulls something at its strongest point. Air resistance and friction are the main forces holding an object back, when a slope is steeper the car is basically pulled down by gravity which results in reaching faster. Hence the height of the laboratory jack which holds the ramp does affect the time taken for a toy car to go down the ramp. Evaluation: Limitation How it affects the data? ImprovementsNumbers of trials (3)Three tries can be enough however to get an even more accurate result the experiment should be tried a few more times.

Next time i will try 5-6 tries to get the most accurate result possible The range (10, 15, 20, 25, 30)Even though the laboratory jack only goes up to 30 cm a taller one can be used to get a wider range. Next time a taller laboratory jack will be used so that we can get a wider range. TimingIf different people time the experiment times may not be as accurate because different people may have slightly different ways of timing. Next time only one person can time so it can be fair test Bibliography: http://www. all-science-fair-projects. com/print_project_1594_57 Website Title: Science Fair Projects Ideas   Article Title: #Procedure: Date Accessed: March 16, 2017https://betterlesson. com/lesson/621694/experiment-does-the-height-of-a-ramp-affect-the-distance-a-toy-car-travels Website Title: BetterLesson Article Title: Experiment: Does the height of a ramp affect the distance Date Accessed: March 16, 2017https://www. scientificamerican.

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Website Title: Scientific American   Article Title: Speedy Science: How Does

Acceleration Affect Distance   Date Accessed: March 18, 2017   Author:

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