**Investigation revision**

Michael is investigating the effect of increasing the speed of the motor in a Van De Graaf generator on the distance the hair rises above the head.

Marco volunteered to touch the sphere of the generator while standing on an insulator. As Michael increased the speed of the motor, Marco’s hair started to stand up higher and higher vertically above his head. The results were tabulated as follows:

|  |  |
| --- | --- |
| Speed (RPM) | Height above head (cm) |
| Trial 1 | Trial 2 | Trial 3 | Average |
| 100 | 4 | 3 | 5 | **4** |
| 300 | 5 | 6 | 6 | **5.6** |
| 600 | 7 | 12 | 8 | **9** |
| 900 | 11 | 10.5 | 10 | **10.5** |
| 1200 | 12 | 13 | 14 | **13** |

1. Write an hypothesis.
2. Identify the independent (manipulative) variable.
3. Identify the dependent (respondent) variable.
4. Identify two controlled variables.
5. Identify an anomaly in the results.
6. Graph the results.



1. Describe the relationship between the two variables.
2. What would be height above the head when the speed is 500 RPM?
3. What speed would cause the hair to rise 12cm above Marco’s head?
4. What are some errors that could have contributed to erroneous data?
5. How can you reduce these errors from occurring?
6. What conclusion could be made from this experiment?

Answers:

1. An increase in the speed of the motor leads to an increase in the height of hair above the head; Or, something similar.
2. Independent variable – speed of motor (RPM)
3. Dependent variable – distance hair travels above head (cm)
4. Use same Van De Graaf generator; use the same insulator to stand on; touch the generator in the same manner each time;
5. 12cm in trial 2 at 600 RPM.
6. Graph

Remove to reveal solution

1. The relationship is linear; as speed increases, distance of hair above head increases.
2. 7.8cm above head.
3. 1080 RPM
4. Touching the sphere with wet hands; not cleaning the sphere from impurities after every trial; the motor not set at the correct speed, etc…
5. Make sure the speed is set at the correct dial; clean the sphere after every trial; touch the sphere in the same fashion every trial.
6. My hypothesis is supported. An increase in the speed of the motor resulted in an increase of the distance hair travels above the head.

END