**Experiment: Measuring Magnetism**

**Aim**

To investigate how the distance between two magnets affects the amount of force with which they repel each other.

**Hypothesis**

The \_\_\_\_\_\_\_\_\_\_ distance there is between two magnets, the \_\_\_\_\_\_\_\_\_\_ force will   
  
be needed to keep them together as they repel each other.

more / less

more / less

**Equipment**

|  |  |
| --- | --- |
| * Two bar magnets * Two books | * Ruler * Spring balances (2.5 N and 5 N) |

**Method**

1. Place the two books next to each other against the wall, leaving a small gap in between.
2. Place the magnets in the gap with two similar poles facing each other (N-N or S-S). One magnet should be against the wall; the other should be free to move between the books.
3. Calibrate your spring balance.
4. Use the 2.5 N (blue) spring balance to push the free magnet towards the one against the wall.
   * If your spring balance reaches its maximum force, stop using it immediately and switch to a bigger one.
5. Record the amount of force required to hold the magnets at the distances given in the Results table.

**Variables**

|  |  |  |
| --- | --- | --- |
| *Independent Variable (what are you changing?)* | *Dependent Variable (what are you measuring?)* | *Controlled Variables (what are you keeping the same?)* |
|  |  |  |

**Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Distance between magnets (cm)** | **Repulsion Force (N)** | | | |
| **Trial 1** | **Trial 2** | **Trial 3** | **Average** |
| 0 |  |  |  |  |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |

**Graph**

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**Discussion**

Answer the following questions in your book or device:

1. Did your results support your hypothesis? Explain your answer.
2. Use your graph to estimate how much force would be needed to hold the two magnets 1.5 cm apart. (Hint: you’ll need a line of best fit first – and it might not be a straight line!)
3. Why do the two magnets repel each other? Is this a contact or non-contact force?
4. How is magnetism similar to gravity? How are they different?