Year 7 Forces Assignment 2017

Fidget Spin-off

PART 1 – THE SPINNER

For this challenge, you will need a fidget spinner to test. First give your spinner a nickname. Then record your spinner's materials it's made from, number of bearings, colour, and size. Measure the diameter (length from one tip to another tip across the center) and the thickness with a ruler. Be sure to indicate the units you used to measure. Finally, draw your spinner. Show and label any specific features like curves, points, weights, bearings, or other designs.

Nickname of Spinner

Colour

Materials

Number of weights

Diameter

Thickness

Mass

Illustration

(5 marks)

PART 2 – THE TECHNIQUE

First practice spinning. Once you have developed a technique that you are comfortable with, fill out the checklist. You will need to use this same technique each time you spin when collecting data so write it all down.

Hand used: left/right

Body position: standing/sitting/other

Spinner location: table top/carpet/lino/other

Start position: spinner on surface/spinner in hand

Hand movement: push with one finger/quick flick with 2 fingers

(5 marks)

PART 3 – THE SPIN

Spin each fidget the same amount of times Working with a small group or partner, you cannot split the spins. You must be consistent and do the technique as marked on the technique page each time. Time the length of the spin, use either minutes and seconds or just seconds. Be sure to circle which you used. The spin is over when the spinner no longer moves on its own. If the spin ends due to human error (bumping it for example) you must tick the box.

To convert minutes + seconds into total seconds:

(# minutes x 60 ) + left over seconds = total seconds

|  |  |  |
| --- | --- | --- |
| **Spin** | **Time (seconds)** | **Human Error** |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |
| **4** |  |  |
| **5** |  |  |
| **6** |  |  |
| **7** |  |  |
| **8** |  |  |
| **9** |  |  |
| **10** |  |  |

 (5 marks)

PART 4 – THE GRAPH

Use the data to create a bar graph of the total seconds each spin lasted. Title your graph and label the trials and seconds. Think about how to label your y-axis to fit your data best (scale).

INSERT GRAPH HERE – "INSERT CHART" THROUGH MICROSOFT WORD OR EXCEL

(5 marks)

PART 5 – THE LANDMARKS

Look at your data to determine the following. First, calculate the average length of time in seconds that your fidget stayed spinning using the data from ALL trials. Next, eliminate outliers in this case, do NOT use the data when a spin ended due to human error. Then calculate the average length of the spin in seconds when a human error did NOT end the spin. Use the space to show your work.

To find the average length of your spins:

(total number of seconds) ÷ (number of spins)

|  |  |
| --- | --- |
| **Mean/Average length of spin**  **(include trials that ended in human error)** | **Mean/Average length of spin**  **(NOT including trials that ended in human error)** |
|  |  |

**Questions:**

1. How does the average change, when you calculate it without the outliers?
2. Which average do you think more accurately reflects the length of time the spinner fidget will spin?

(6 marks)

PART 6 – CLASS DATA

Share and record the data with classmates to determine which spinner stayed spinning the longest on average. Use the average spin length for spins that did NOT end with human error.

|  |  |  |
| --- | --- | --- |
| **Spinner nickname**  **(group members)** | **How many weight did you use per arm?** | **Average length of spin in seconds** |
|  |  |  |
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(2 marks)

PART 7 – CLASS GRAPH

Share and record the data with classmates to determine which spinner stayed spinning the longest on average. Use the average spin length for spins that did NOT end with human error.

INSERT GRAPH HERE – "INSERT CHART" THROUGH MICROSOFT WORD OR EXCEL

(5 marks)

PART 8 – THE RESULTS

Answer the following questions

1. Write a definition for a

(a) controlled variable

(b) independent variable

(c) dependent variable

1. Identify the following variables in this experiment

(a) controlled variables

(b) independent variable

(c) dependent variable

1. How did increasing the mass of the fidget spinners affect the inertia of the fidget spinner? (Refer to your class data)

1. Explain or Draw the balanced forces that are applied to the fidget spinner before the experiment starts.

1. Briefly explain or draw how unbalanced forces are applied to the fidget spinner to make it spin. Identify the greatest force being applied to the spinner.

(11 marks)

PART 9 – CONCLUSION

Write a summary of your findings

(2 marks)

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TEACHER FEEDBACK: