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Fact or Friction

The purpose of my experiment is to determine the factors that affect friction, from load, number of surfaces, and horizontal surface area.

I believe that increasing both load and number of surfaces will increase the friction, but increasing number of surfaces will have a greater effect. I also believe that there will be no difference between horizontal contact area and number of surfaces.

- 1.) Take 40 sheets of 8.5 inch by 11 inch paper, and separate into 2 groups of 20. Glue these papers together in book format.
- 2.) Layer the pages of these two new books one on top of the other. If the books were labeled a and b, the pages would be layered a, b, a, b, a, b... etc.
- 3.) Put the binder clips on the ends of the two books that are pointing outward.
- 4.) Tie one end of the rope to a binder clip, and the other to the pole.
- 5.) Hook the spring scale on the other binder clip.
- 6.) Grasp the spring scale and pull slowly. When the two books start to pull apart, look at the scale and record the value it shows. This will be your constant in the experiment.
- 7.) Undo the binder clips.
- 8.) Take 20 more sheets of paper. Separate them into 4 groups of 5, and glue them in book format.
- 9.) Take each new mini-book, and glue one on the top of each original book. Then take the remaining two mini books and glue them on the bottom of the original books.
- 10.) Do not layer these new books. Just put the binder clips back on.
- 11.) Repeat step 6. The value shown represents the books with loads applied.
- 12.) Undo the binder clips.
- 13.) Now layer the pages that were not layered before, and put the binder clips back on.
- 14.) Repeat step six. This value is for more layers.
- 15.) Undo the binder clips.
- 16.) Take 20 11 inch by 17 inch papers.
- 17.) Divide these papers into two groups of 10, and glue each group into book format.
- 18.) Repeat steps 2-6.

This value is for horizontal surface area. The results from my experiment show that the most effective way to increase friction is by using a system of layering. Increasing the load also increases friction, and according to Amontons' first law, it is a direct relationship. On a small scale, there appears to be no difference between layering surfaces and increasing the contact area horizontally. However, Amontons' second law suggests that this will not hold true on a larger scale, because there may be a variation that increases. Further study is required on the topic.