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Testing Paper Airplanes

An easy and fun way to use hypothetical testing, or the scientific method, is with paper airplanes. In this experiment, one must collect data, make a hypothesis, test that hypothesis, and then come up with a conclusion. We also used variables in both our experiment and the one for the class.

The variables that we used in our test were weighted, winglets, and a different design of airplane. Stability is important in airplanes, but especially paper airplanes. Normally paper airplanes are just barely stable. If a paper airplane is instable, then it will either nose dive quickly or turn off from the original path. In testing airplanes, stability was a main factor. Weight can help the stability of paper airplanes depending on where the weight is on the paper airplane. If the weight is in the middle, it will stabilize the paper airplane. On the contrary, if the weight is too far forward or too far back, then the paper airplane will nose dive and not fly far.

Winglets are when one turns up the ends of the wings of a paper airplane. Winglets can give directional stability (Science of Paper Airplanes). There are many times, depending on how well the paper airplane is folded, that it can fly sharply off to one side or another. This can shorten the flight of the paper airplane.

Our hypothesis was that our control paper airplane would fly the farthest. We started out with the paper airplane that we called our control airplane. It was the simple paper airplane that most people learn when they are young. We used normal computer printing paper. This airplane flew 12 feet in a controlled environment. Next we used the same design with construction paper. Construction paper is a heavier material and so in adding weight, the guess would be that

distance would be added as well. However, construction paper lacked stability and nosedived immediately. After the failed attempt of construction paper, we went back to our control material of computer printing paper and added weight to it. The added weight on the paper airplane was a paper clip attached to the middle of the bottom of the paper airplane. When flown, the paper airplane flew 14 feet. After this attempt, we used the same control and added winglets to the paper airplane. Winglets are supposed to give directional stability and should add distance. However, the winglets did not help on stability as much as desired and flew directly to the left of where it was thrown. Overall the distance flown was 6 feet, but distance outward was only three feet. Lastly, we tried a different design for the paper airplane. We affectionately call this type of airplane the 'trick paper airplane'. This airplane has many more folds and has some added weight because of the folds. However, this airplane did not travel as far as we thought either. We thought from the weight added airplane and how far it flew, that this airplane would do some of the same. Instead, it was instable enough that it did not fly far at all before flipping over and falling to the ground.

Airplane Used	Distance 1	Distance 2
Control	12 feet	11 feet 5 inches
Construction paper	1 foot	1 foot 6 inches
Weight added	14 feet 2 inches	14 feet
Winglets	3 feet	2 feet 10 inches
Trick airplane	5 feet	4 feet 11 inches

Our hypothesis was found to be false. We thought that the control airplane would fly the farthest and that adding other things in to the airplane would only hinder it. However, the opposite was found. When weight was added, distance was greatly added. The stability was much greater and the flight was smoother. Our conclusion was that the best paper airplane for flight was our control material with computer printing paper and added weight.

In class, we will use a control material and our control design for the first flight. Computer printing paper will be used and the simple design will be demonstrated in class to make sure everyone makes the same paper airplane. Once that is demonstrated and each group has made their paper airplane flight, then the construction paper will be used. Again, each group will be allowed to make the same control design and fly their airplane. The distance will be measured. Then materials will be set out for each group to decide on which materials will make the paper airplane fly the farthest. Before they pick what materials they choose, a hypothesis must be made about what will make the best paper airplane. After a hypothesis is formed, then they can pick out their materials and make the paper airplane with the control design. Once all groups have made their paper airplanes, everyone will again measure the distance flown and they will find out whether their hypothesis was correct or incorrect.

Once that has been established, each group will be allowed to make whatever airplane they want out of any material and with any design. They will make the hypothesis of what will fly farther than with the control design. Again, once each group is done then we will measure the distance flown and their hypothesis will be put to the test.

After both of these experiments have been done, we will show the class our test results and what we found to be true. We will wait until after their experiment so they have no bias

towards in one material or design over another. The class may find different results than we did if they have a different design than what we used.

Our conclusion is that our control design was the best design in distance of how far a paper airplane can fly. However, more than just paper airplanes, hopefully everyone learned more about the scientific method. Even though this test is used more for younger kids, it can still be enjoyable for older classrooms because it brings the fun back into learning. We also learned that just because we are older, that doesn't mean we knew what material or design would work the best.