

Pushing the Piston to its limits!

Q59

PURPOSE & HYPOTHESIS

The purpose of this project was to see how far a marble will travel when a piston that has different materials attached to it hits the marble, and to learn a few things about electricity and wires. Out of wood, bread, and cardboard on a piston, my hypothesis is the piston pushing a marble will push the marble furthest when cardboard is on the piston.

RESEARCH

In Minecraft I do redstone, which is like wires and in Minecraft there are pistons that push blocks. So, I wondered if they work the same way in real life as they do in Minecraft. I also looked up which is more dense, bread, paper, or cardboard.

MATERIALS

The materials we used are wood, cardboard, bread, screws, double sided tape, a push pull piston, a button, and a 12 volt battery case with wires. We used the cardboard, bread, and wood for the experiment, and we used wood to build the border. We also used cardboard to cover the inside of the border to make it more bouncy. The double sided tape stuck the cardboard to the border, and the screws held the pieces of wood together.



EXPERIMENT

We connected each of our variables (wood, cardboard, and bread) and tested each of them out with them pushing a marble. We hooked a button up to the piston, and everytime we tested one of the variables we fired the piston. We measured each distance and ran each experiment 10 times.

PHOTOS

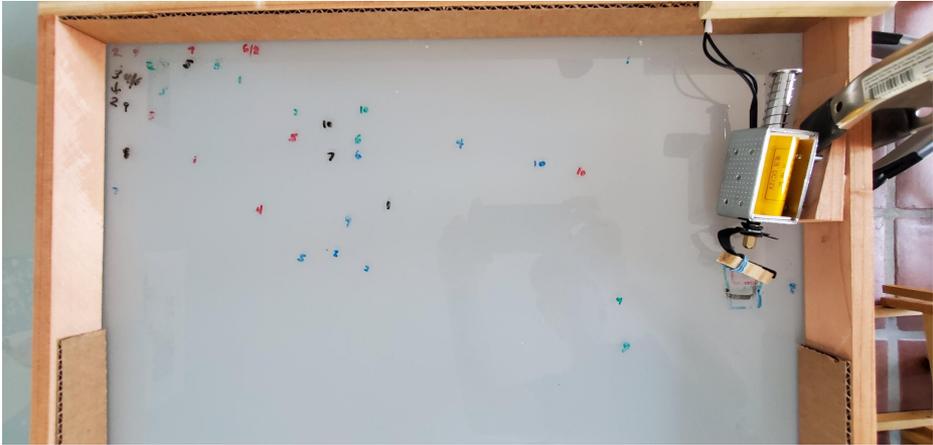
Bread test



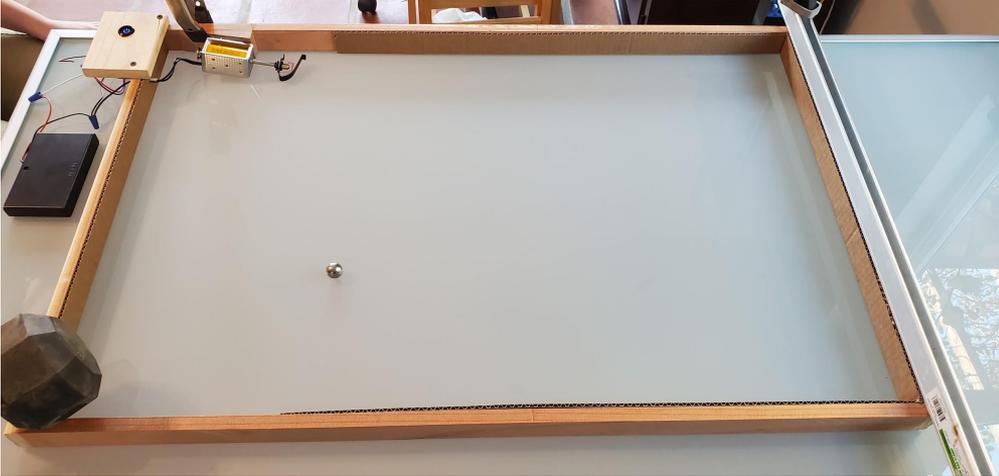
Minecraft piston----->



Setup ----->



Number
marble
markers



ANALYSIS

After the testing we averaged each variable's tests and these are the numbers we got: Control/nothing on the piston was 57.1125 in. as an average. The bread was 58.575 in. average. Cardboard was 61.9125 in. average. And the wood was 63.5375 in. average. So, my hypothesis was wrong. Wood pushes a marble further than cardboard.

CONCLUSION

At the end, my hypothesis was wrong. The wood was better at pushing a marble than cardboard. I think it was because the wood is harder and stronger than any of the other materials. All in all, this project was fun and I learned a lot of things.

REAL WORLD CONNECTION

My real world connection is if I ever have to push something with a piston then I know what the best material to use is. Also I learn some electronics, such as connecting a button to a battery case and a piston.

WORKS CITED

<https://getcalc.com/math-decimal-fraction-0pt1125.htm>

<https://www.bbc.co.uk/bitesize/topics/znmtsbk/articles/z4ymtv4#:~:text=number%20of%20parts.-,The%20line%20in%20a%20fraction%20that%20separates%20the%20numerator%20and,our%20answer%20as%20a%20decimal.>

<https://www.khanacademy.org/math/arithmetic/arith-decimals/arith-review-decimals-to-fractions/v/converting-decimals-to-fractions-1-ex-1#:~:text=Decimals%20can%20be%20written%20in,If%20needed%2C%20simplify%20the%20fraction.>