Rock Concert

Kindergarten

Testable Question:

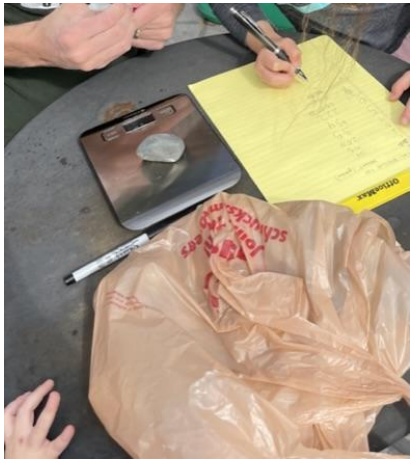
Do bigger rocks make a bigger sound when they fall into water?

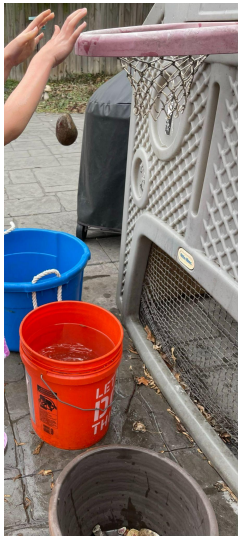
Prediction:

My hypothesis is that bigger rocks make a bigger sound, because they’re bigger and it would make sense that they make a bigger sound because of their weight and size.

Procedure:

1. Collect rocks of different sizes so that we have a lot of different rocks to test
2. Use a scale to weigh each rock and record the weight in a list and on the rock
3. Drop each rock from the exact same height (the lip of a basketball hoop) into a bucket full of water
4. Listen for the sound that the rock makes when it hits the water and record the sound on a scale of 1-5 with 1 being the quietest and 5 being the loudest
5. Graph the data that we collected to see if our prediction is true





Background:

When we were at the creek we were throwing rocks into the water and different rocks made different sounds. I wondered if the size of the rock made it make a louder or softer sound when it hit the water.

In my research I found out that bigger rocks do make a louder noise than small rocks when dropped into water from the same height.

I thought it was an interesting question and I was curious about what caused the rocks to make different noises when they hit the water.

Constant Conditions:

Independent Variable: The ONE thing you change

- The rocks were different weights - some were heavy, others were not as heavy, others were very small and light. We measured the weight in grams.

Dependent Variable: What you are measuring or observing

- The sound that each rock makes on a scale of 1-5 (1 being low and 5 being high)

Constant Conditions: What you are keeping the same every time

- We dropped the rock from the same height each time (about 44 inches off the ground - at the level of the basketball hoop on a playhouse). We dropped it into the same amount of water each time.

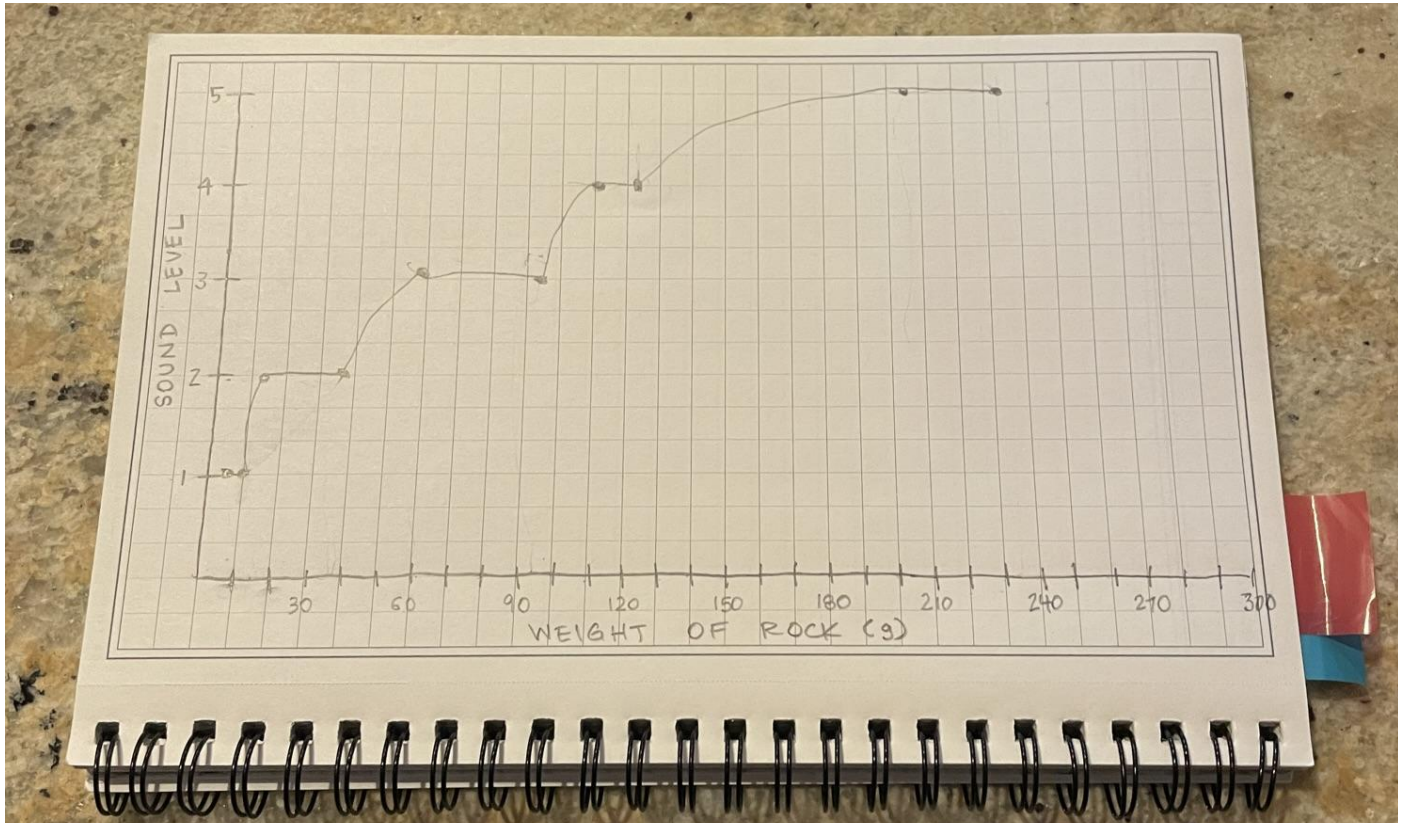
Data and Trials:

Chart of observations (44 rocks dropped):

Rock Number	44	21	43	42	23	40	41	38	39	14	4	13	22	31	24	25	20	18	34	33	28	36	37	35	2	12	1	11	7	9	3	6	16	27	29	30
Weight (grams)	1	4	6	8	10	11	15	22	23	25	35	38	43	45	50	52	54	55	60	64	76	78	92	94	105	111	123	132	160	186	208	222	223	233	239	312
Sound (1-5)	1	1	1	1	1	1	2	1	2	1	4	2	3	3	1	3	4	3	3	3	4	4	4	3	5	4	4	5	5	2	5	5	5	5	3	5

Data and Trials (continued):

Graph of observations (10 data points graphed):



Conclusion and Reflection:

I found out that my prediction was correct - usually the heavier rocks were the ones that made the loudest sound and the lighter rocks made a quieter sound.

I was surprised that some of the heavy rocks were actually quieter than some of the lighter rocks and some of the lighter rocks were actually louder than some of the heavier rocks. I wasn’t sure why, and then my parents and I talked about it and looked at some of my data points… (see next page)

Conclusion and Reflection (continued):

…Extension: I only put 10 rocks on the graph, and then my parents and I talked about some of the other data. I learned that there is something called an “outlier.” It’s when one rock is different than the way most of the other rocks are and it doesn’t fit close to the graph line. We found 3 outliers in my chart of data and we put them on my graph. It’s easy to see that they don’t follow the same pattern as the other rocks. I think this might be because of the shape of the rock -- like, maybe a less round rock that has sharp edges makes a quieter sound. This could be another hypothesis for me to test!