JSRP - Water surface tension for different temperatures

7/03/2015 - Today my Dad and I started construction of the ~~structure~~ ~~that~~ apparatus that I will use for my experiment. We used some spare bits of wood from down in our back garden. We fixed two identical pieces of wood (32.5cm × 8.9cm × 1.9cm) to a bigger block of wood (13.5cm × 12.9cm × 4cm). We then got a dowel (~ 12cm long) and put nails in about 1.5cm deep and slotted the nails on each end of the dowel into drilled holes in the pieces of wood. We then wedged another piece of wood (~~13.7cm~~ 13.7cm × 2.4cm × 4cm) in between the other pieces, above the block, so that the dowel could spin smoothly. We then drilled a hole in the dowel and put a pre-cut length of wire through the hole to act as the beam. Then we hung a bottle cap by three pieces of cotton string on one end, and on the other we hung a needle and tied the cotton on the needle in the middle so it hung horizontally.

8/03/2015 - Today I started the testing and ~~I started~~ I started by placing a piece of yellow ~~tape~~ tape on the side of the jug to ensure that the water level is consistent. The first experiment I am doing is the control, I am leaving the water for five - ten minutes to ensure that it is in fact room temp and not affected by the cold of the tap. For scientific purposes, room temperature is between 20°C and 26°C with an average of 23°. I then repeated the test ~~8~~ 8 times to make sure that there are no anomalies in the tests.

Test #	Temp (°C)	Grains of Rice
1	25	30
2	25	30
3	25	30
4	25	26
5	25	26
6	25	27
7	25	28
8	25	25

Then after that I did the first hot test: (pTO)

Test #	Temp. (°C)	Grains of Rice	Time of day
1	30	29	
2	30	29	
3	30	24	
4	30	29	
5	30	32	
6	30	33	
7	30	30	
8	~~30~~ 31	31	2:25 pm
9	31	29	2:28 pm
10	31	31	2:31 pm
11	31	25	2:33 pm
12	31	28	2:34 pm
13	31	32	2:36 pm
14	31	30	2:39 pm
15	31	29	2:40 pm
16	31	27	2:41 pm
17	31	27	2:42 pm
18	31	26	2:44 pm
19	31	28	2:45 pm
20	31	29	2:46 pm
21	31	23	2:47 pm
22	31	30	2:49 pm
23	31	27	2:50 pm
24	31	27	2:51 pm
25	31	29	2:53 pm
26	31	24	2:55 pm
27	31	26	~~2:55 pm~~ 2:57 pm
28	31	28	2:59 pm
29	30	29	3:09 pm
30	30	28	3:10 pm
31	30	30	3:12 pm
32	~~20~~ 20	37	8:04 am 9/03/2015
33	20	49	8:07 am
34	20	39	8:09 am
35	20	41	8:12 am
36	20	38	8:14 am
37	21	39	8:19 am
38	21	40	8:21 am

10/03/2015 - Today, I found out that my thermometers' sensor is at the top and not the bottom as a previously thought. This means that all my test results that I have done could be invalid, this has put a major dent in my schedule.

Test #	Temp. (°C)	Grains of Rice	Time of day
39	26	30	8:00 pm
40	27	31	8:03 pm
41	26	31	8:05 pm

11/03/2015 - Today I continued my tests but with the thermometer completely submerged in the water. If the results from this test in comparison to my previous tests are drastically different, it may mean that I will have to re-do all of my previous tests.

Test #	Temp. (°C)	Grains of Rice	Time of Day
1	16	39	7:12 am
2	16	34	7:17 am
3	15	42	7:47 pm
4	14	38	7:49 pm
5	~~13~~ 13	50	7:54 pm
6	13	47	7:56 pm
7	13	40	7:59 pm
8	13	48	8:01 pm

12/03/2015 - Today I have started testing the hot temperatures for my experiment & I think that the water surface tension will be less.

Test #	Temp. (°C)	Grains of Rice	Time of day
1	38	26	6:50 pm
2	40	24	6:53 pm
3	41	27	6:56 pm
4	42	25	6:58 pm
5	42	23	7:02 pm
6	41	24	7:04 pm
7	41	26	7:08 pm
8	41	22	7:10 pm
9	35	28	7:29 pm
10	35	29	7:31 pm
11	35	28	7:33 pm
12	39	27	7:35 pm
13	34	29	7:37 pm
14	34	27	7:39 pm
15	34	28	7:41 pm
16	39	29	7:44 pm

14/03/2015 - Today I continued my experiments with the thermometer fully submerged in the water.

Test #	Temp(°C)	Grains of Rice	Time of day
1	21	35	10:30 am
2	21	40	10:34 am
3	21	38	10:36 am
4	21	39	10:39 am
5	21	42	10:41 am
6	21	40	10:43 am
7	20	41	10:46 am
8	20	39	10:50 am
9	29	30	11:52 am
10	33	29	11:55 am
11	31	25	12:10 pm
12	30	31	12:13 pm
13	28	29	12:51 pm
14	28	27	12:58 pm
15	28	28	12:59 pm
16	28	26	1:03 pm

15/03/2015 - Today I started my background research and how useful my experiments might be to industries such as the printing, soap and detergent, cosmetic etc.

17/03/2015 - Today I am battling through the background info and trying hard to find past research. It turns out that the relation between surface tension and temperature was discovered in 1894 by van der Waals

18/03/2015 - Today I gave my mum my draft JSRP to proof read it and mark it to further along my final JSRP.

28/03/2015 - Today I have started to finish my JSRP and I am just adding the final details and then I printed and binded it so that the presentation side of my works will hopefully fall in my favor.

Photo Log from the 7th of March

Photos of the construction of the apparatus:

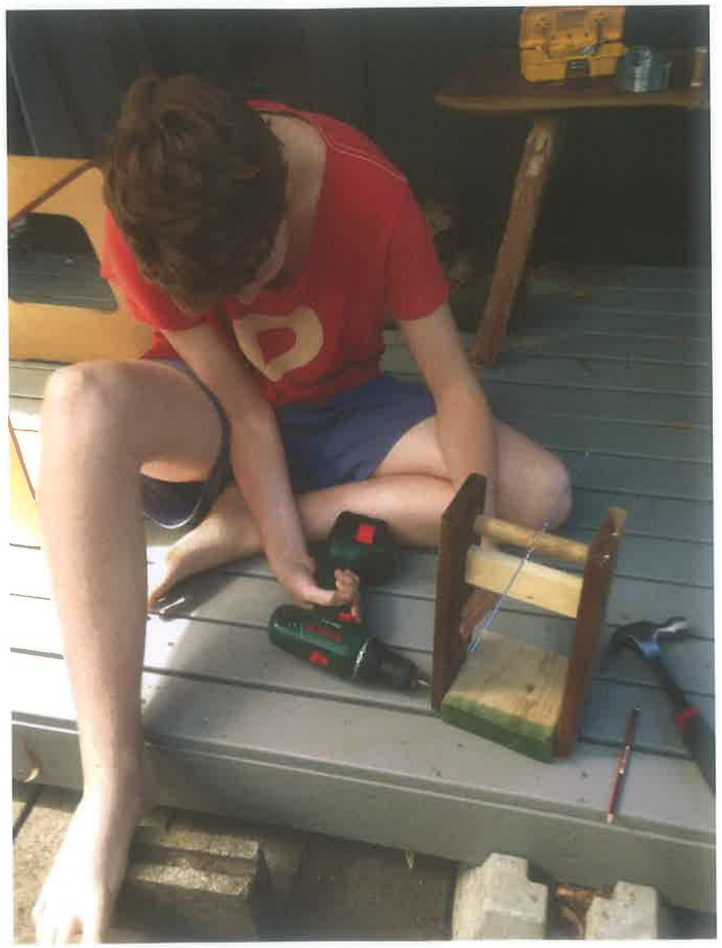


Photo of me screwing on the vertical piece of wood. The the block of wood to make a 'U' shape.

Photo of me screwing the other piece of wood further into the block of wood to again achieve the 'U' shape.

Photo of final experimental apparatus from the front without the jug, needle or bottle cap.

Photo of final experimental apparatus from the side without the jug, needle or bottle cap.

Photos of the first practice test of my apparatus.

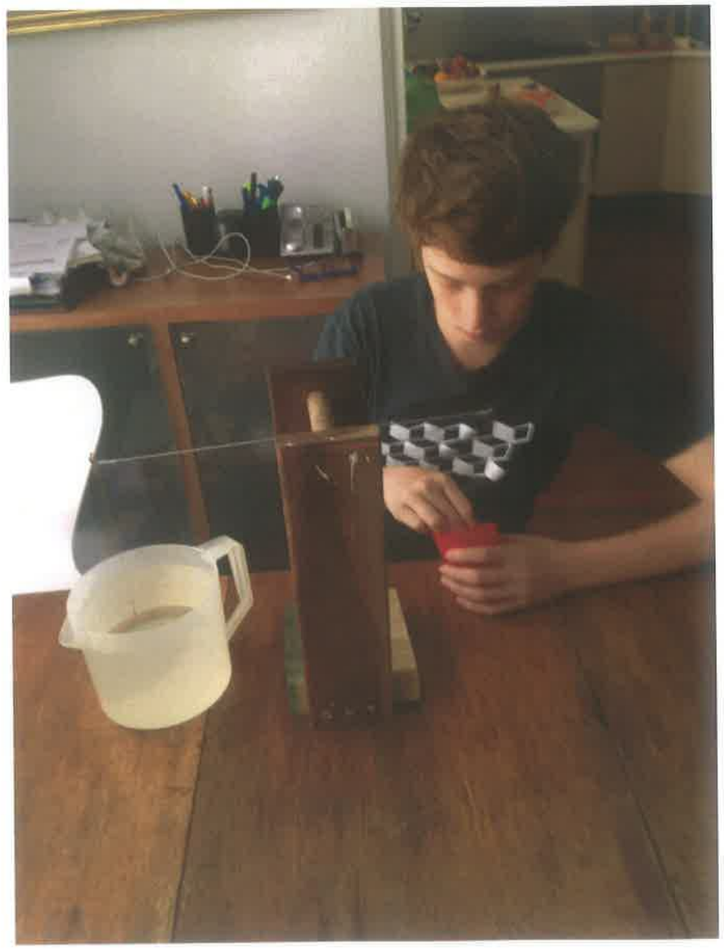
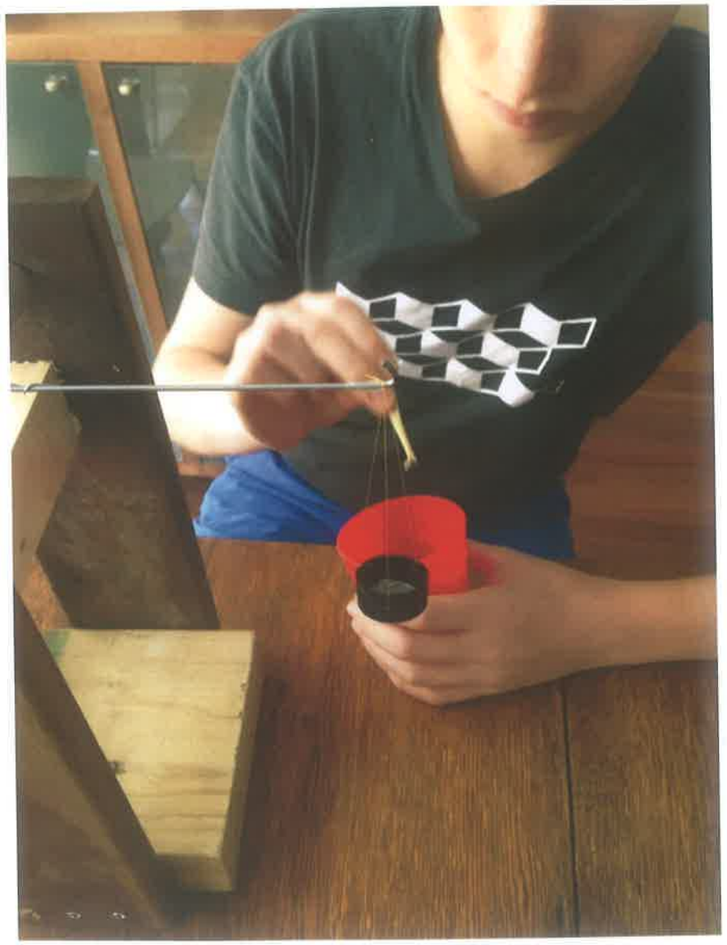


Photo of my first practice experiment with me about to put the first grain of rice in the bottle cap.



~~Photo~~ Photo of me about to ~~put~~ place a ~~rice~~ rice grain into the bottle cap, but also showing inside the bottle cap.

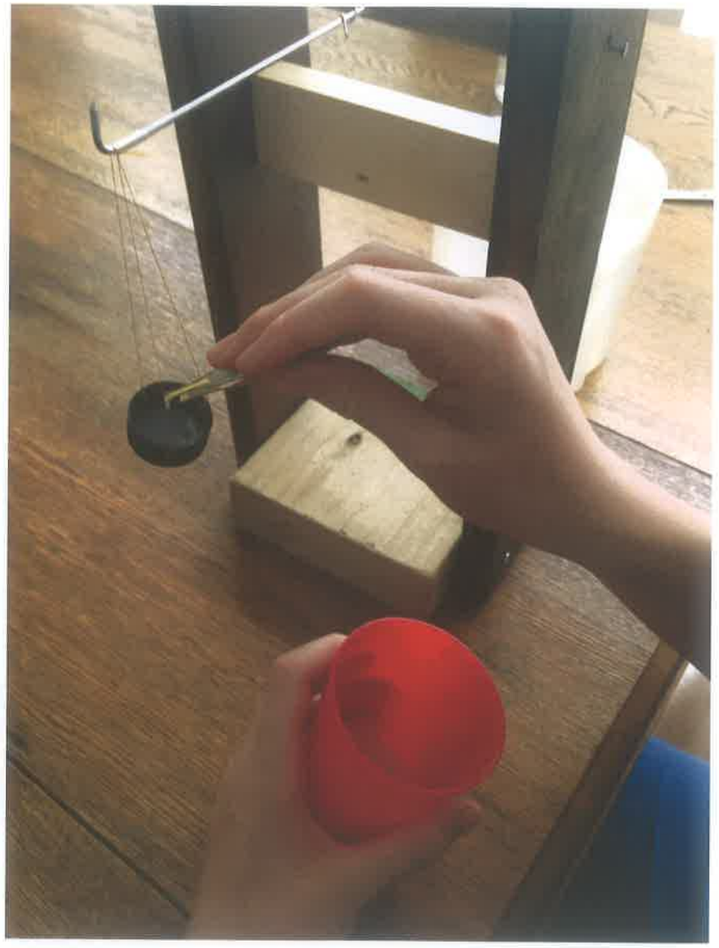


Photo of me dropping a rice grain into the bottle cap.

Photo of the water surface tension acting on the needle and not letting the needle come out of the water.