

Keep Cool Deodorant

What's the Problem

- *Have you ever had deodorant that melted on you. Well I have had that happen to me. I am going to design a item that will keep deodorant cool so it won't break or melt. So I can have a long lasting deodorant.*

Criteria & Constraints

Constraints (Limitations and Conditions)

- 1. \$60 or less*
- 2. Two months to be done*
- 3. Reasonable supplies- availability*

Criteria (standards or features to be measured)

- 1. Won't crumble or melt*
- 2. Size small*
- 3. Can fit on different size of deodorants*
- 4. Will not leak*

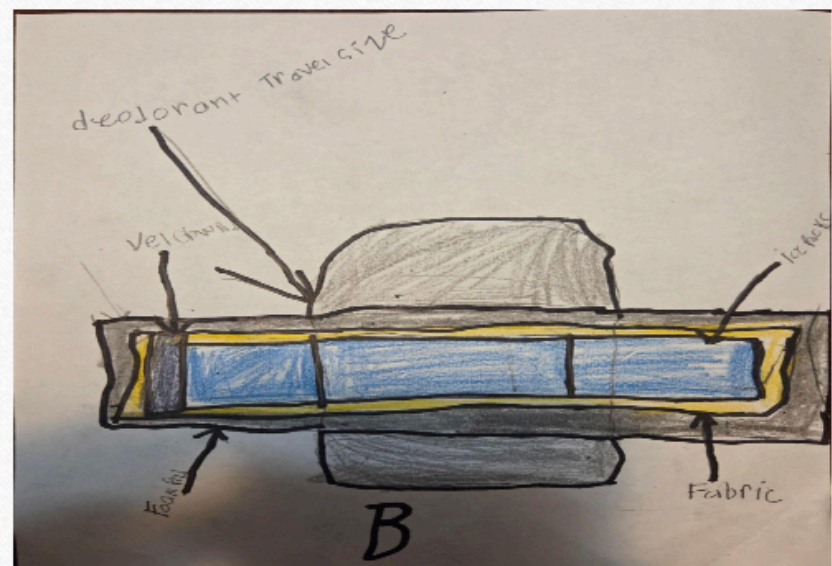
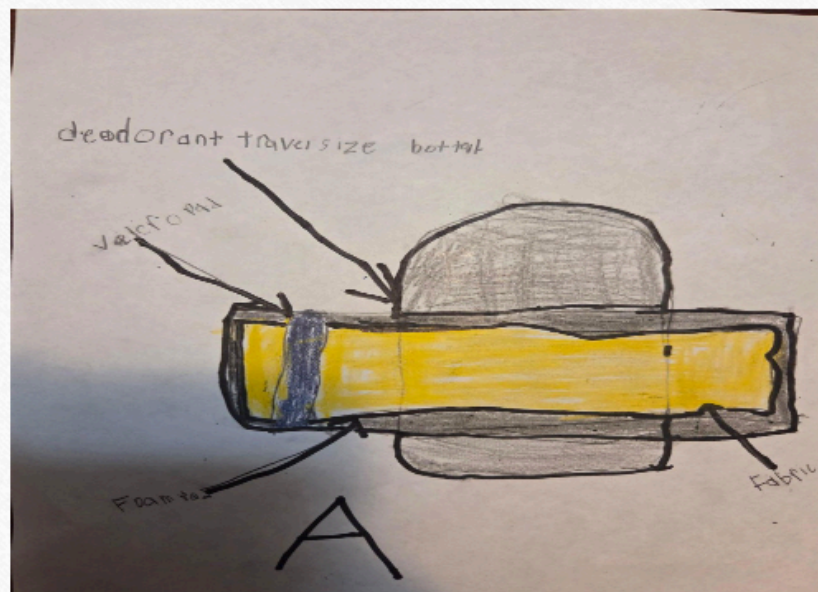
Research

Three facts learned that there are different types of heat transfers, melting points of deodorant depending on their ingredients and there are many chemicals in deodorants. This is important for my project because this helps and shows me what I have to know in order to make a product that will work.

5 Vocab words

1. *melting point* the temperature at which a solid turns into a liquid.
2. *insulation* the act of protecting something by surrounding it with material that reduces or prevents the transmission of sound or heat or electricity
3. *conduction heat* is the flow of heat inside an object. It is also the flow of heat between objects in contact with each other.
4. *radiation heat* is the flow of heat between objects that are not in contact with each other.
5. *convectional heat* is the flow of heat caused by the motion of a liquid or a gas.

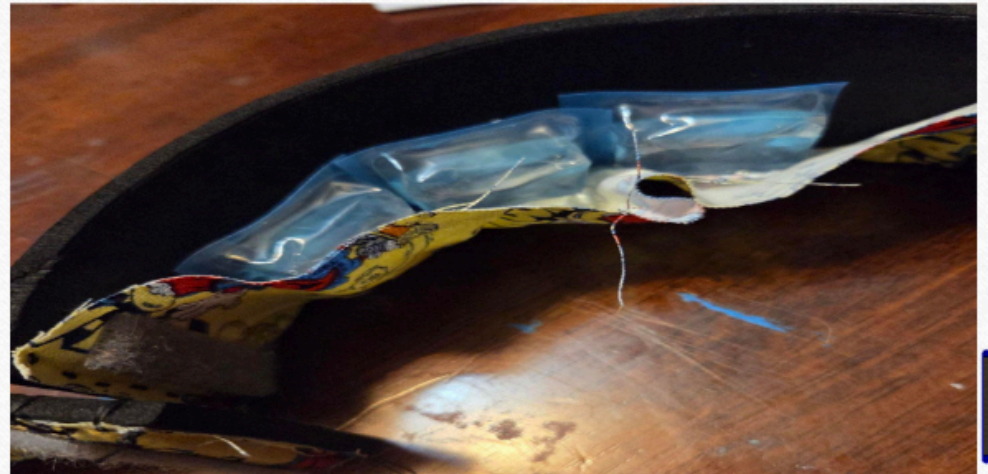
Sketches



Concept Rubric

		Constraints			Criteria		
Design #							Total Score
1	price	materials	weather	>\$60	availability	<90 degree	100
2	size	materials	weather	>\$60	durability	<90 degree	90
3							
4							

Prototypes



Materials

- *Dove men's deodorant travel size.*
- *Pad of foam.*
- *Ice pack*
- *knitting cid*
- *fabric.*
- *velcro pad*
- *Thermometer*
- *Infrared thermometer*
- *Electric heater*
- *Notepad*

Procedure

1. Get Dove men deodorant travel size.

2. Measure the deodorant.

3. Cut the foam and the fabric to deodorant

4. See if the foam and the fabric fits the deodorant.

5. Then sew the fabric to the foam just the bottom.

6. So there is a hole for ice pack.

7. Make sure it fits the deodorant

8. Freeze the ice pack.

Procedure

9. *Make second prototype*

10. *Cut the foam and the fabric shorter because it will not have ice packs.*

11. *Sew the fabric and the foam together*

12. *See if the prototype fits on the deodorant.*

13. *then test the prototypes together in the bathroom with a heater.*

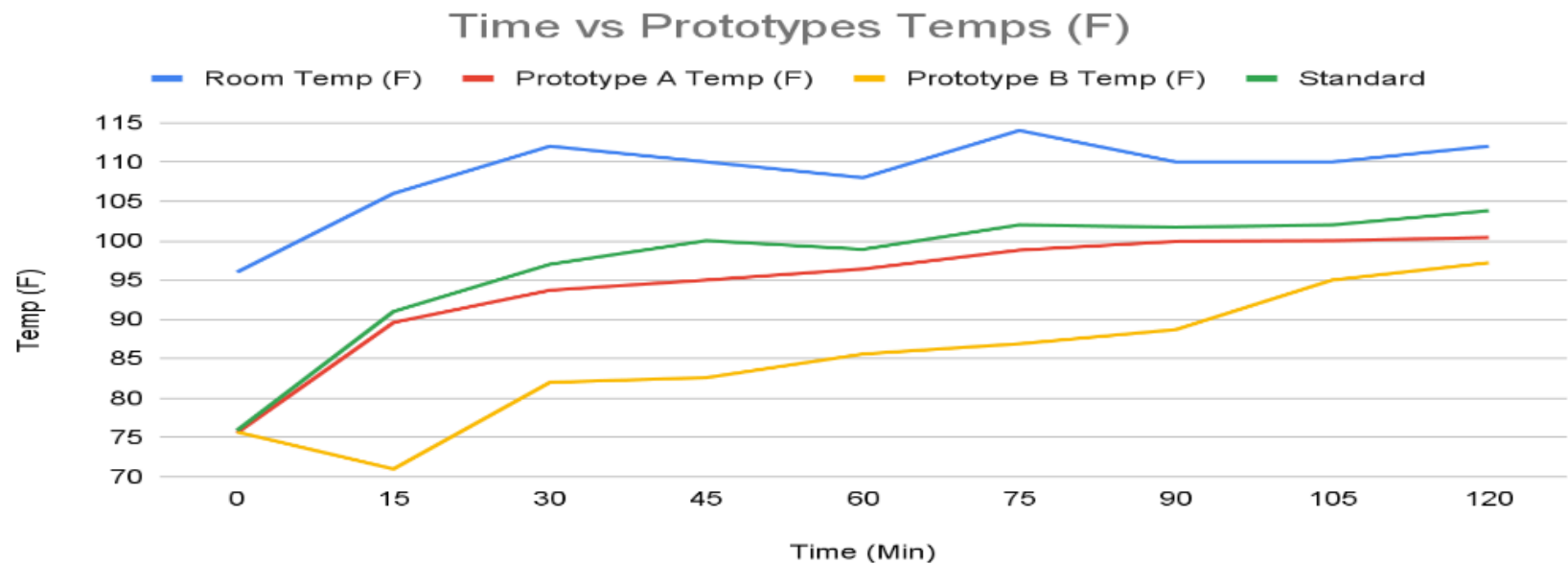
14. *Check the temperature of the deodorants in 15 minute times frames for 2 hours*

Data Collection Table

How long will deodorant stay solid?

Time (Min)	Room Temp (F)	Prototype A Temp (F)	Prototype B Temp (F)	Standard (F)	
0	96	75.6	75.7	75.9	
15	106	89.6	71	91	
30	112	93.7	82	97	
45	110	95	82.6	100	
60	108	96.4	85.6	98.9	
75	114	98.8	86.9	102	
90	110	99.9	88.7	101.7	
105	110	100	95	102	
120	112	100.4	97.2	103.8	

Data Analysis Graph



Final Product Pictures



Standard



Prototype A



Prototype B

Critique and Redesign

Prototype A

- *Strengths, The thick foam pad help the temperature stay lower for longer than the standard, The velcro help it stay together and keep its shape.*
- *Weaknesses, The velcro had to be stitch to the foam pad, The Prototype was flimsy.*
- *Improvements, Maybe having the hole thing covered but not like a packet, Make it sturdy.*

Prototype B

Critique and Redesign

- *Strengths, The ice packs helped it keep the temperature lower than the Prototype A and standard for a longer time, The foam pad was thick so that helped the temperature stay lower too, Velcro help it to stay together and shaped.*
- *Weaknesses, The ice packs made it heavy and that made it to flimsy, The velcro had to be sewed in to the foam pad,*
- *Improvements, I would make it into one thing that you can just stick in the freezer, Sew the top of the Prototype, Make it sturdy, Have it the foam covert the hole thing but you still can use the deodorant.*

Evaluate Solutions

Evaluation Analysis

- o A good evaluation answers the following questions:*
 - 1. I tested my prototypes in a room with a controlled source of heat. A and B both held the deodorant cooler than the standard. B tested with the best results.*
 - 2. My prototype could be improved by, having the ice covered all the way, it could be better, by having a cover for the lid as well as being able to freeze the whole sleeve, vs just adding the ice packs into the cloth section.*
- o Prototype B was effective because the ice did not melt right away and kept the deodorant as a solid for a longer period of time.*
- o In my investigation, some things that could have gone wrong or effected my data is, the battery life of the infrared thermometer, the heater not keeping a heat constant, and the shelf life of the deodorants.*

Application

- *I think that my project was important because this would help a lot of people. I also fixed a problem in my life. I think you should look how much time and effort that I put in.*
- *Something I would change is the . I would make it easier by doing my slides earlier then at last moment. I would change the supplies used to stop the deodorant from melting.*

Acknowledgements

"I would like to thank my amazing science teacher for helping me with my slides, my mom for helping by getting my supplies, and helping me sew the case. My dad for helping me making the graphs, making the design and helping carry out the experiment. Then I would like to say "Thank You" to JS mom for helping me brainstorm ideas."

