Hwa Chong Institution

Project Work

Category 3 Inventions Log Book

Title of Project: Silicone Drip Stop
Group Name: **Drip Stop**
Group Members: 1) Li Haoxin (L) - 2i314 2) Hong Chia Kuo - 2i309 3) Loh Shao Kai Dylan - 2i316

1. Problem Finding

1 A Document a list of problems you have identified. Your documentation should show clearly how your group came up with the problems.

Firstly, we started to be more attentive and paid attention to the problems we had in our daily lives. We then decided to focus on the topic of 'food' as we believe that we have more experiences with those problems, and it can cater to a wider range of people.

<u>Problems Identified</u>

1. Soup spilling out of the bowl while transporting.
2. Ice cream dripping out of the cone.
3. Boiled water being too hot to consume quickly.
4. While carrying soup in a takeaway box, the container might tilt and all the soup will spill out.
5. Drinks take a long time to cool down without being diluted.
6. Food spills are difficult to clean up.

1 B You should have selected a problem based on some considerations. Identify and justify these considerations.

Our consideration are:
Is the problem an issue that can be solved easily by a change in behaviour rather than inventing a whole new idea?

- How big/serious is this problem?
- Do we have experience with this problem?
- Can this problem be solved by a change in behaviour?

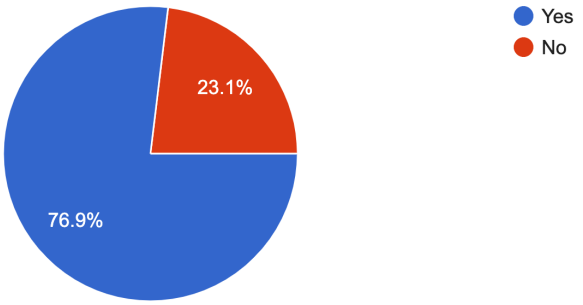
1 C List some problems your group would like to solve. List also the considerations for selection of problems in the evaluation grid below. Score the considerations, against the problems, with points 1 (least significant) to 3 (most significant). Sum up the total points for each problem. Identify that problem you would like to solve.

1. Ice cream dripping, creating a mess
2. Recently boiled water being too hot to drink

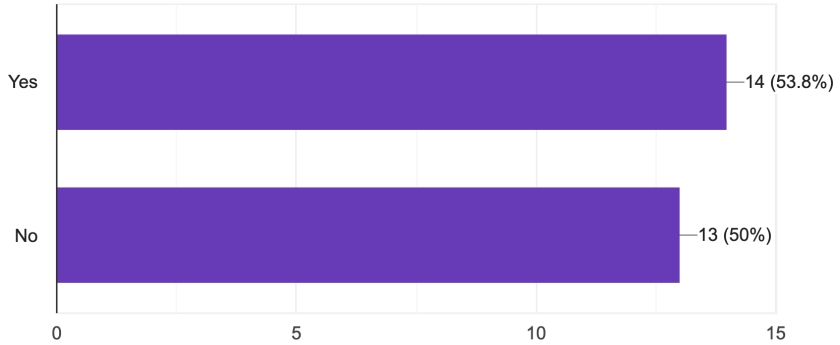
3. Bowl of hot soup spilling

Survey results from 26 respondents:

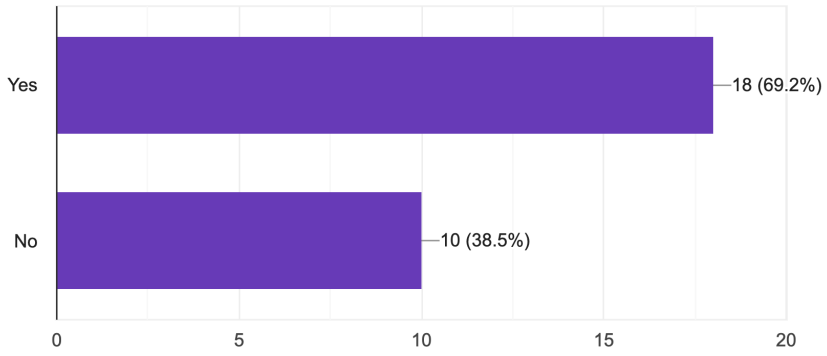
Do you face problems with ice cream dripping and making a mess?
26 responses



Do you face problems with hot soup spilling out of the bowl (e.g. at hawker centers)?
26 responses



Do you face problems with boiled water too hot to be consumed quickly?
26 responses



Evaluation Grid

Considerations (weightages at the side)	Weightage	Soup spilling out of bowl on tray when transporting	Ice cream dripping out of cone	Boiled water is too hot
Is this problem something we have experience with?	1	2	3	2
How big/serious is this problem?	2	3	2	3
Does this problem need an invention to solve?	3	2	3	1
Total:		14	16	11

2. Define the Problem

2 A Extent of problem (Research and discuss the problem and write down the problem statement)

Problem Statement: How can we minimize dirtying of fingers due to dripping ice-cream?

This problem is prevalent now among almost all people, especially the young. Moreover, a very large number of people eat ice cream, thus we believe that it can cater to a wide range of people.

We also conducted a survey to find out what problem people find the most trouble with.

2 B Compare and contrast the existing or similar solutions.

The Drip Drop invention made by 2 14-year-olds in the United States is a thick wafer saucer that fits around an ice cream cone to catch drips.

Our invention is different from the Drip Drop, as it is made of silicone, and is completely waterproof, compared to wafer, which might get soggy and fall apart, causing the melted ice cream to drip all over your hand.

Our invention is also reusable, while the Drip Drop is not.

3. Your BIG IDEA

3 A Describe your proposed invention.

We propose to create a silicone plate that wraps around the ice cream cone, standoffs attaching the part touching the cone to the plate. Melted ice cream flows from the cone onto the silicone plate, then into the collection area, where it can be drunk by the user via a built-in straw.

3 B Explain the purpose of your proposed invention and the potential benefits to users.

Light - Our invention will be made of silicone, which is lightweight, so that users can enjoy their ice cream without unnecessary discomfort.

Clean - Our invention solves the problem of ice cream dripping to create a better experience of having ice cream

Simple - Our invention is easy to use as users only need to slot the cone into the silicone device to make it work. It also acts as an ice cream cone holder.

3 C In what ways would your proposed invention be different and/or better than existing solutions, if any?

- The existing solution requires you to attach an extra collector which might fall off
- The melted ice cream might still drip out from the collector while tilted, whereas our product allows melted ice cream to flow to the bottom of the device, where flaps stop it from flowing out easily.
- The existing solution's collector is very dependent on its quality as it might be too soggy and fall apart.

3 D What are some problems you expect in the course of your proposed invention?

- The support might not be enough to hold the ice cream upright
- Production of it could be expensive as silicone is expensive
- Cleaning the device might be difficult

3 E What and when are the major milestones (project timeline) in your invention?

March: Researching problems, finding solutions, sketching ideas

April: Proposal evaluation

April-August: Research on solutions and construction of prototype

August: Final evaluation

4. **Construction <u>or</u> Modelling Process***

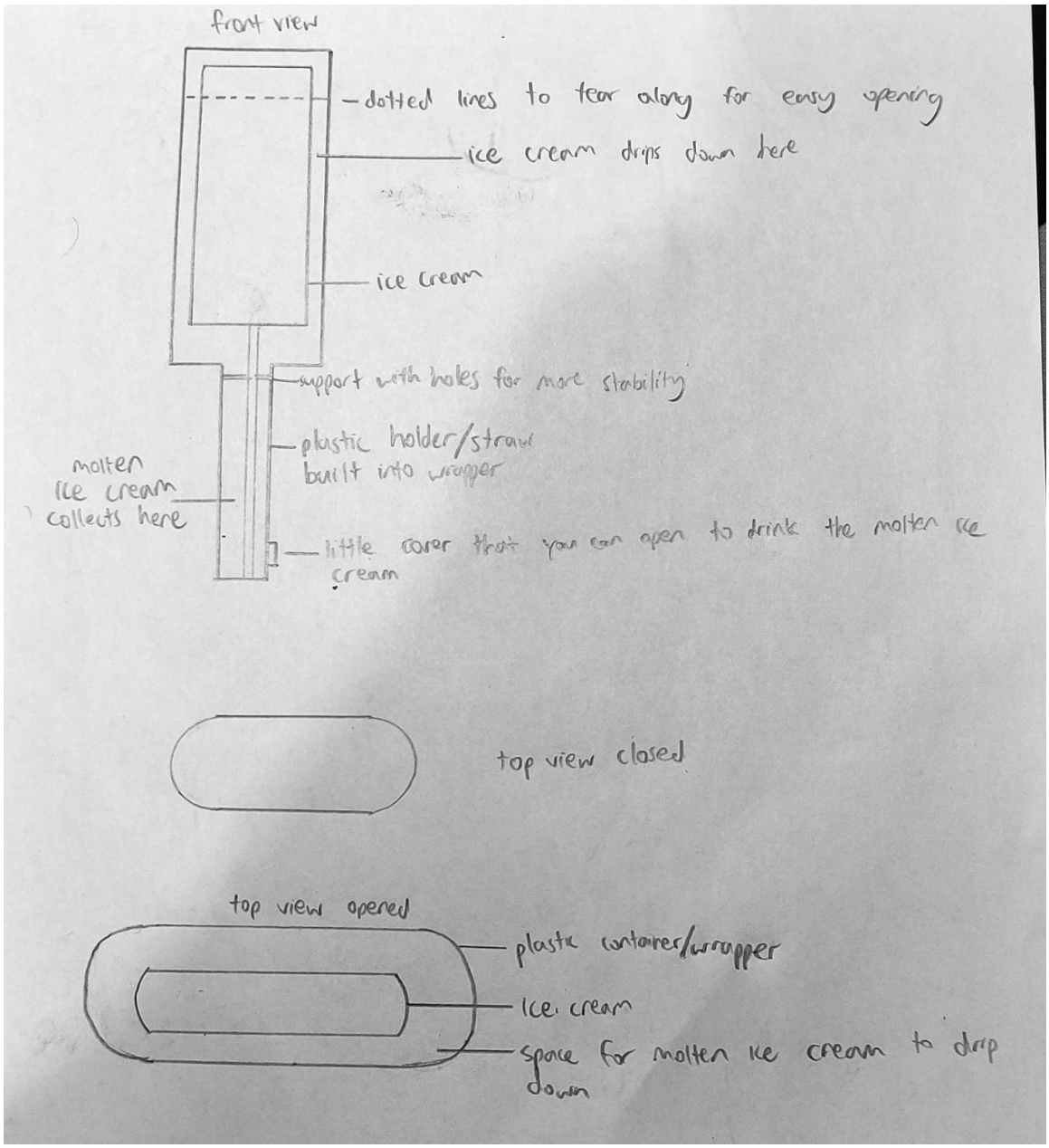
4 A Explain how and why the materials were chosen for the prototype/ product of your invention

This product will be made with food-grade silicone, as we need our product to be: waterproof, flexible, strong, and non-toxic. The straw part of the product will be made of acrylic, as it is non-toxic, waterproof and strong.

4 B Explore these considerations that may guide the construction of your prototype/ product.

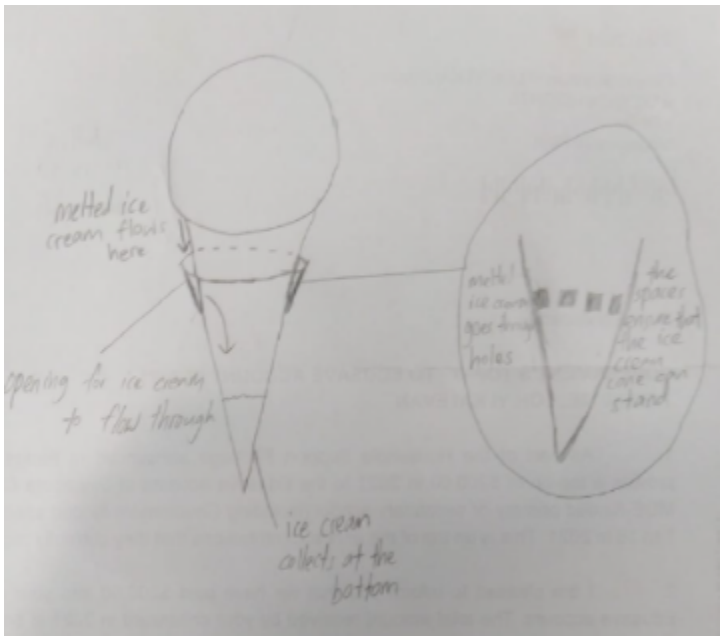
- Lightweight
- Waterproof
- Easy to produce
- Simple to use
- Ability to be used with cones of most sizes

Model 1



This is our first model. After some consideration and advice from judges, we realised that ice cream dripping from plastic wrappers was a problem that was easy to solve without an invention. This could be done by simply wrapping the wrapper around the ice cream, forming a “cone” below, where the melted ice cream will drip into the wrapper. Thus, we decided to focus on the problem of dripping ice cream cones.

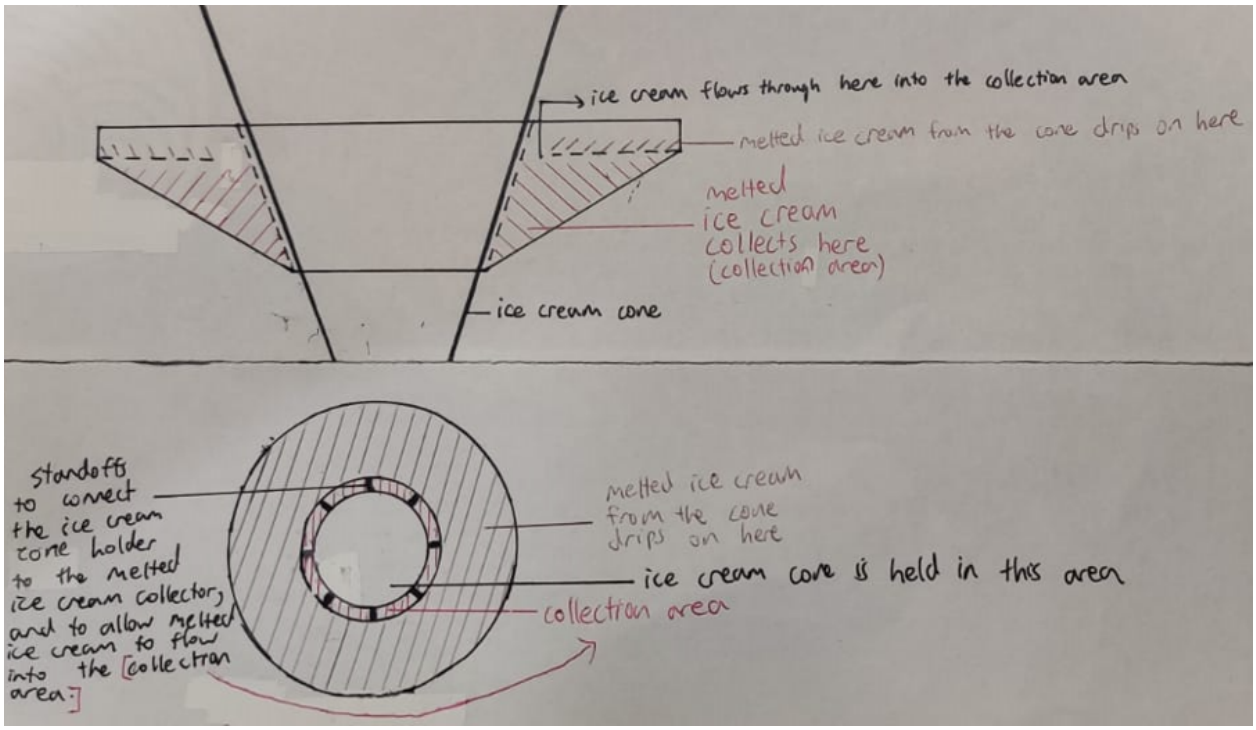
Second Model

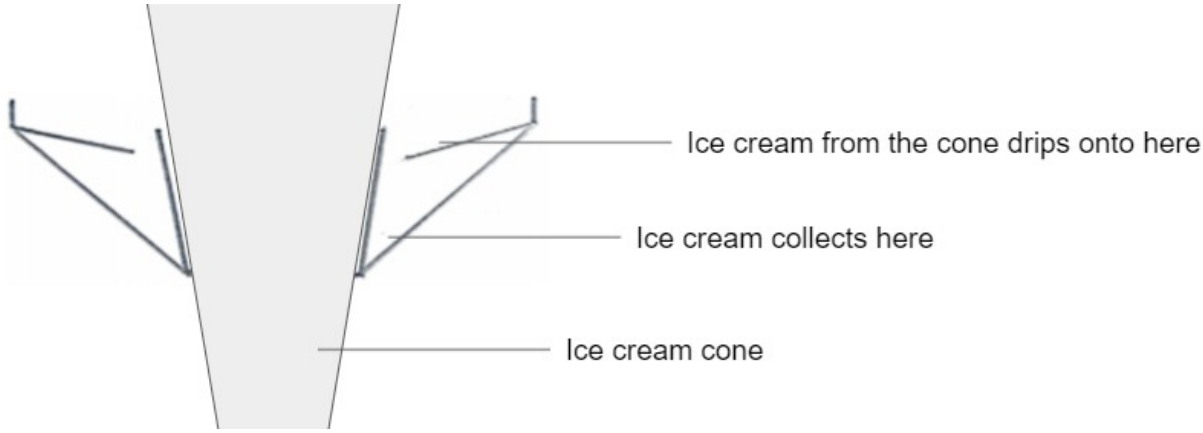


This is our second model. For this model, we decided to use a combination of wafer, edible wax, and absorbent and edible materials (e.g. marshmallows), to create this. The edible wax will prevent the melted ice cream from making the cone soggy, and prevent it from falling apart, as it's waterproof. The marshmallow-like material will be used to collect and soak up the ice cream collected at the bottom of the cone, preventing the bottom of the cone from falling apart due to sogginess.

However, we decided to scrap this idea as we thought that it would be too hard to manufacture, and will also be very expensive, as there are a lot of edible small parts that have to be produced, creating an extremely high failure rate, which in turn increases the price.

Sketches of Final Product



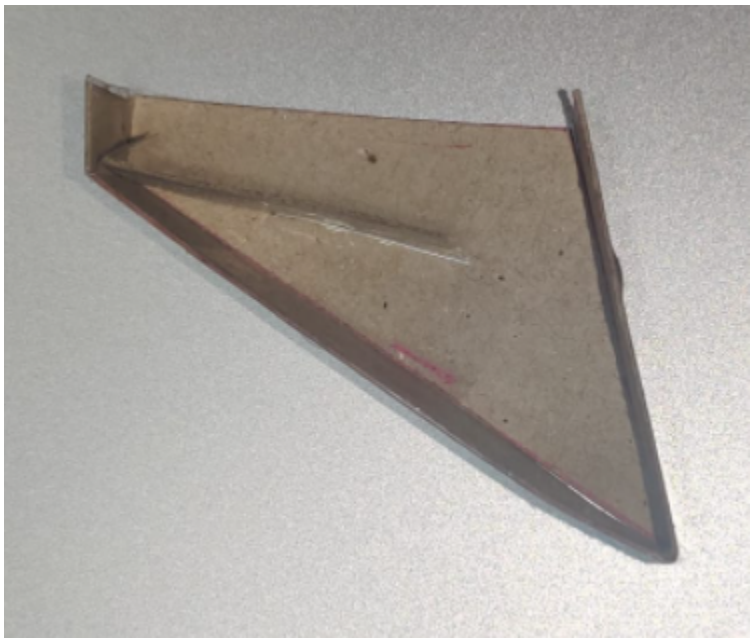


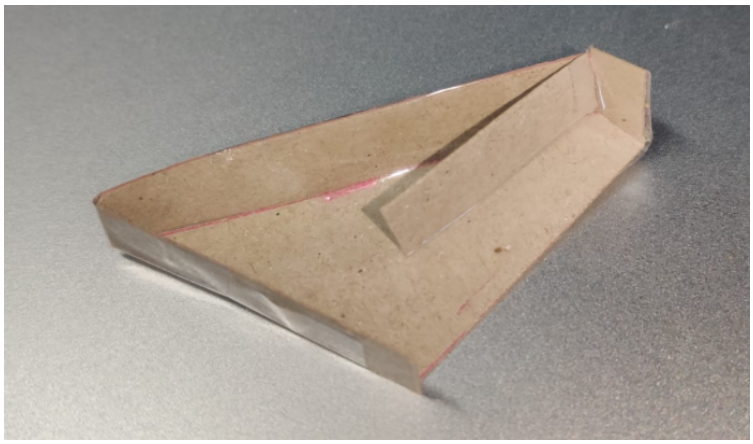
This is our final product, made out of food-grade silicone. The melted ice cream drips from the cone, and flows into the collection area.

Animation of our final product

https://youtu.be/6KXwoMorTN4

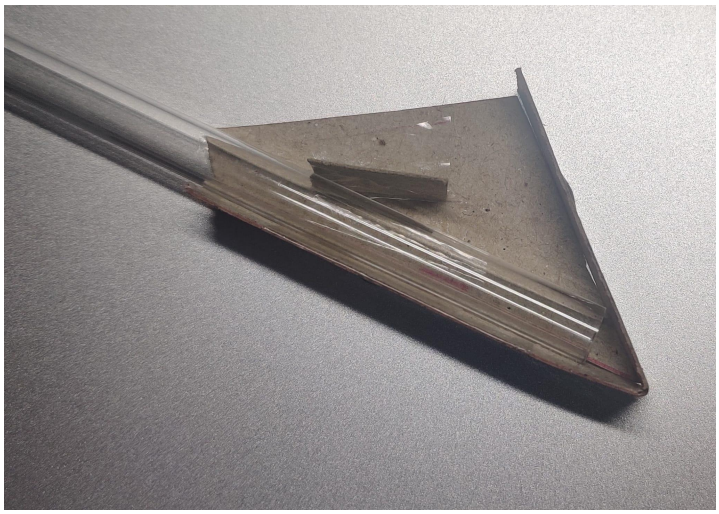
First Prototype

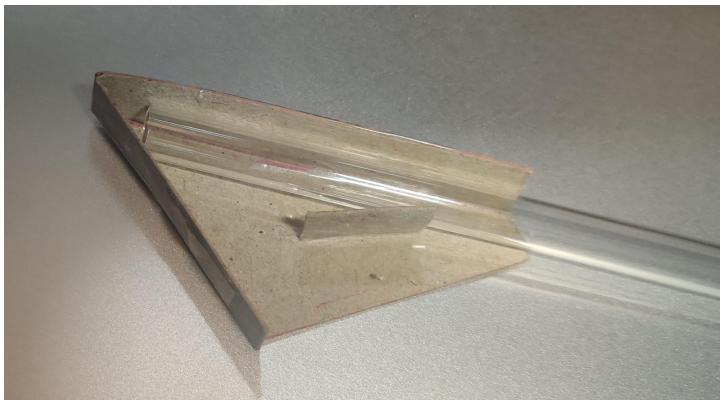




The first prototype was made of cardboard, and is only a small section of the final product.

Version 2 of First Prototype





We decided to add a straw to the invention, so that the user can drink the melted ice cream easily.

The straw would be made of acrylic, as it is non-toxic, waterproof and strong.

Final Prototype

https://youtu.be/RDoi9-LKJEI

↑ Here is the link for the video of the final prototype.

The real-world product will be 1.2x larger, as the size of the prototype was limited by the size of materials we had on hand.

The straw of the real-word prototype will also be a lot shorter than our final prototype, with only 2cm of extra length starting from the edge of the collection "plate".

Constraints

Constraints we faced while doing our project

- Covid-19 restrictions made it a lot more difficult to discuss in-person with our mentor
- We do not have access to silicone, thus could not make a fully functional prototype
- Our final prototype could not be made life-size, as the materials we had on hand were too small, and our tools are not specialized enough to make a more accurate prototype

Constraints of our final product

- If the device is tilted too steeply or shook too hard, ice cream can still drip out
- If the device is tilted too much when in use, the ice cream will not drip into the collection area
- It can only contain up to a certain volume of ice cream before overspilling
- Not all of the ice cream can be drunk out of the collection area using the straw, due to size limitations of the straw
- If the cone is too small, it might slip out of the device
- The device is difficult to store when you are travelling with no bags

5. **References**

Read http://www.bibme.org/citation-guide/apa/ on how to cite references.

6 A Cite the references you have used for your project work. Your source of reference should come from different types (e.g. books, magazines, websites, journal articles, interviews, photographs, product brochures, reviews etc.)

Animations are made using FlipaClip

O. G., & S. N. (2019, April 25). The Drip Drop. Retrieved from https://www.kickstarter.com/projects/15865846/the-drip-drop

Reisner, A. (2016, August 26). How to Stop Your Ice Cream Cone from Dripping. Retrieved from https://www.tastingtable.com/cook/national/prevent-ice-cream-cone-drips#:~:text=Plant a mini marshmallow in,a small pile of M&M's.

O.G, & S.N (2018, October 28). Stop Your Ice Cream From Melting On Your Hand With This Add-On Cone. Retrieved from https://www.youtube.com/watch?v=PjgNsVsQiW8

Flory, B. (2017, June 14). The 7 Types of Plastic & What They Mean to Your Health. Retrieved from https://www.nontoxicrevolution.org/blog/7-types-of-plastic#:~:text=High-density polyethylene, or HDPE,up by most recycling programs.

Mercado, M. (2018, October 24). The "Drip Drop" Saves Ice Cream From Melting Down Your Cone - And It Was Invented By Teens. Retrieved from https://www.bustle.com/p/the-drip-drop-saves-ice-cream-from-melting-down-your-cone-it-was-invented-by-teens-12974855#:~:text=17-year-olds Sam Nassif,the typical ice cream cone.

John. P. (2020, July 16). Drip Drop Ice Cream Cone (2021). Retrieved from https://www.sharktanksuccess.com/drip-drop-ice-cream-cone/

ABCNetwork. (2016, April 22). The Drip Drop - Shark Tank. Retrieved from https://www.youtube.com/watch?v=y5nmwuu6RX0