Gentle like a Mother's Touch

Our Mission Statement.

Through a contemporary tri-colour marble design, premium **Earl Grey** tea leaves, gentle **conditioning and cleansing** and **environmentally-friendly** packaging, Bubblon is **revolutionizing** soap one bar at a time.

Why Choose Bubblon?

(How to avoid deficiencies in a Vegan Diet.)

- Vegan friendly, no animal products used!
- An appealing tri-colour marble pattern.
- Choice of different colour palettes.
- Gentle, yet effective cleansing from virgin coconut oil.
- Conditioning properties from oleic acid found in canola oil, and linoleic acid in CRISCO
- Infused with premium Earl Grey Tea leaves.
- Environmentally friendly production and packaging.

Scope and Constraints of the Project

- The overall goal of this project was to create a soap design that could be mass manufactured and sold by retailers.
- The soap needed to be safe to use, and good at cleaning, while being marketable to a target audience.
- The soap also needed to be functional, while still being economically feasible.
- Principles such as Green Chemistry (which can be seen on the right side of the board) were adhered to to reduce environmental impact.

(Mortice Z., et al)

Process Selection (Hot vs Cold Process)

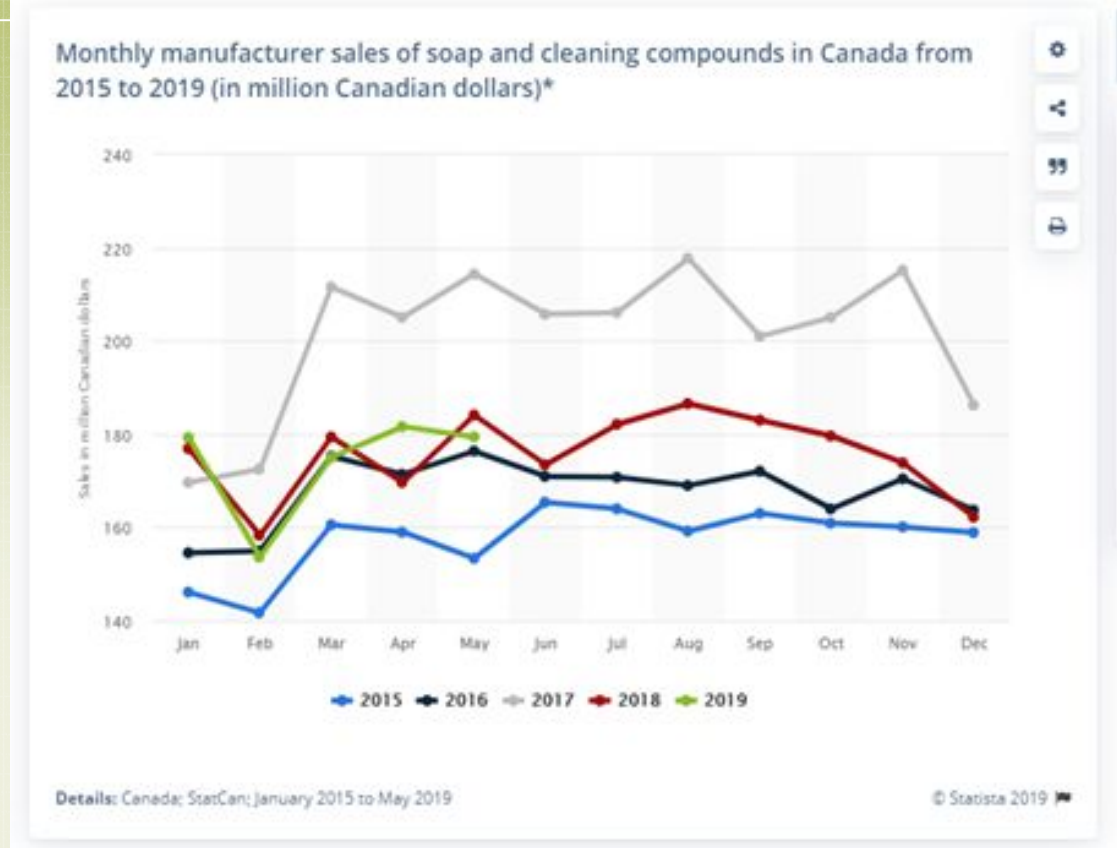
Hot Process	Cold Process
-Much quicker than the cold process, only takes 2-4 hours vs 6-8 weeks. -Easier to mass produce soap due to being able to melt large amounts of soap at a single time. -The soap can be used right after cooling. -More dangerous then the cold process due to high heat. -Less beginner friendly then the cold process, more areas to make mistakes due to it having more steps.	-Better for small, personal applications of soap making due to curing occurring mostly in small batches. -Inherently safer then hot process due to low temperatures. -Marble design can be easily implemented due to the lack of a need to cool the mixture first. -Soap takes much longer to produce due to curing time. More time = More money

Cold process was selected as it is an inherently safer and easier process for beginners, as well as allowing us to more easily implement our design.

Market

(Young Adults)

(What is rights of nature?)



Monthly Manufacturer Sales of soap and cleaning compounds in Canada from 2015 to 2019. (Statistics Canada)

Market Analysis and Target Audience

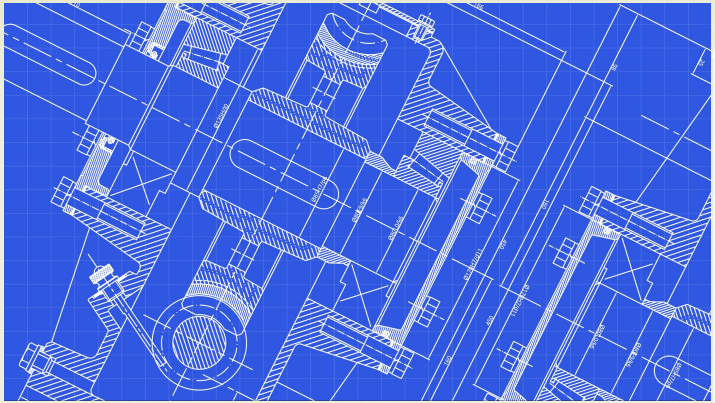
- Mother Earth is targeted towards teenagers and young adults.
- This is done through:
  - Contemporary marble design
  - Premium Earl Grey tea leaves giving a tea fragrance.
  - Creamy vanilla fragrance
  - Vegan friendly design.
- A study done by the University of British Columbia found that Canadians will have more disposable income in the coming years.
- Veganism is increasing in popularity, over 10% of Canadians under 35 consider themselves vegan (CTV News)
-

Competition and Pricing

Many vegan, high end soaps are priced around $6 for 100g and $11 for 200g. We will price our soap at around: **$5.00** for 100g and **$6.00** for 120g(Profit Margin of 50%).

Design

(Byrne et al)



(Scaling product design with Blueprint)

Visual Design

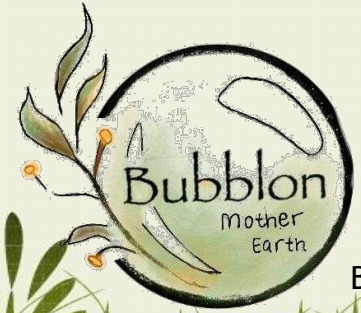
- The soap features a tri colour design with a marbled top.
- The three colours will be orange, brown, and white.
  - These represent warm colours of the fall and winter season.
- Tea leaves are visible in the soap to give a rustic, homemade aura.
- A hand-cut cubic shape, giving the soap a natural, hand-made appearance.
- Vanilla fragrance was chosen to give warm scent for the cold winter and autumn months
- Earl Grey was chosen as it compliments Vanilla and the leaves provide exfoliation

We decided to use a loaf pan as our mold as it:

- Allowed for the production of a cubic shape.
- Reusable, meaning it would be more financially and environmentally friendly.

Logo, Slogan, and Packaging

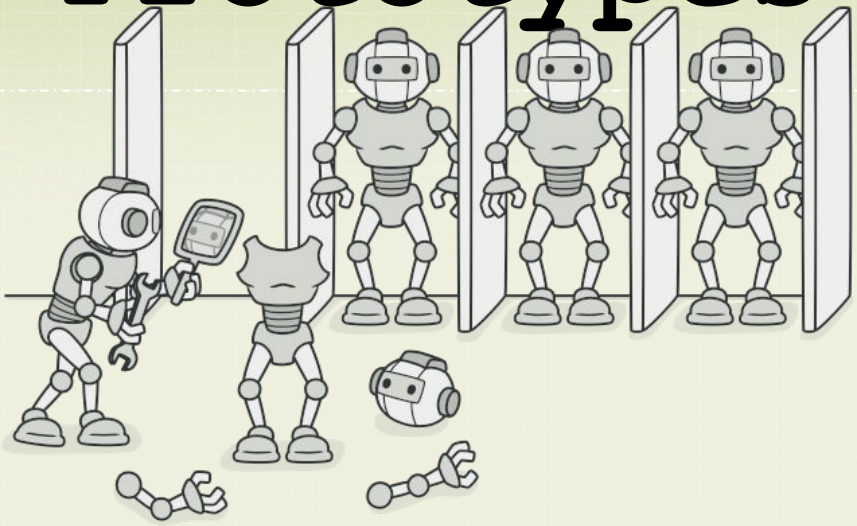
- Bubblon's logo echoes our key company goal of nature-friendly gentle soap by featuring leaves.
- Our slogan, "Gentle Like a Mother's Touch" communicated our core value of a caring, nature-based soap.
- Our packaging is also meant to echo the hand-made, natural theme of our soap through twine and brown colours, as well as the use of recyclable materials.



Bubblon Logo

Our Slogan

Prototypes



(Prototype)

Prototype's and Process Constraints

- Prototype 1
- A double layered soap which would have had one cleansing side, and another conditioning side.

Prototype 1 Constraints:

- Two separate hot plates would have been required for two seperate soaps.
- Time constraints, the layered design would have taken longer due to the need to cool the soap before layering.

General Process Constraints.

- Making a marbling pattern on the inside of the soap with cold-process is nearly impossible.
- No access to tools to remove things like excess glycerin .

Prototype 2

- Same oil composition as our final soap
- Smelt foul due to a reaction between the lye and tea
- The lye solution created with the steeped tea resulted in an unexpected dark colour of the soap and therefore, the colouring and overall visual design did not show as intended

Limitations

(picpedia.org)

(Writing Point: How to Write About Your Study Limitations Without Limiting Your Impact)

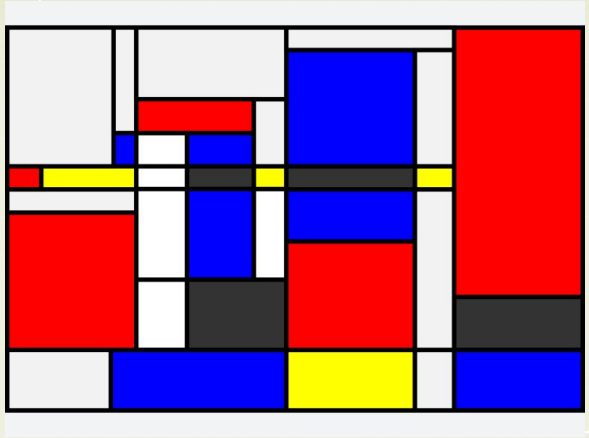
Constraints on Production

Some constraints that the company faced includes:

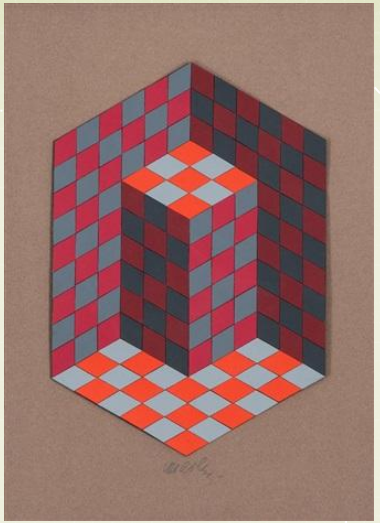
- Lack of equipment for some prototypes
  - Two layer soap with two different functions
- Lack of equipment for hot-process soap
- Lack of equipment to create a complete swirl pattern

(Cooking Pot Colouring Page)

Composition



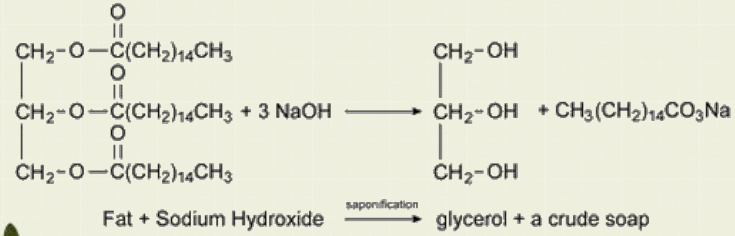
(Composition)



(Past Auction)

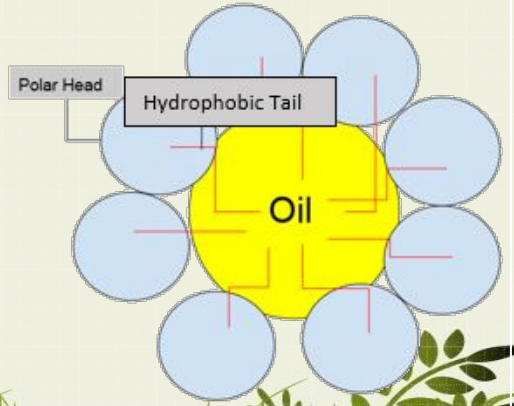
Saponification and Surfactants

- A chemical reaction in which a hydroxide ion breaks the bond between the glycerol and fatty acid of a triglyceride
- This causes the fatty acid to bond with the non-hydroxide portion of the base to form a soap molecule.
- This soap molecule acts as a surfactant, allowing it to trap and remove grease molecules from dirty objects.



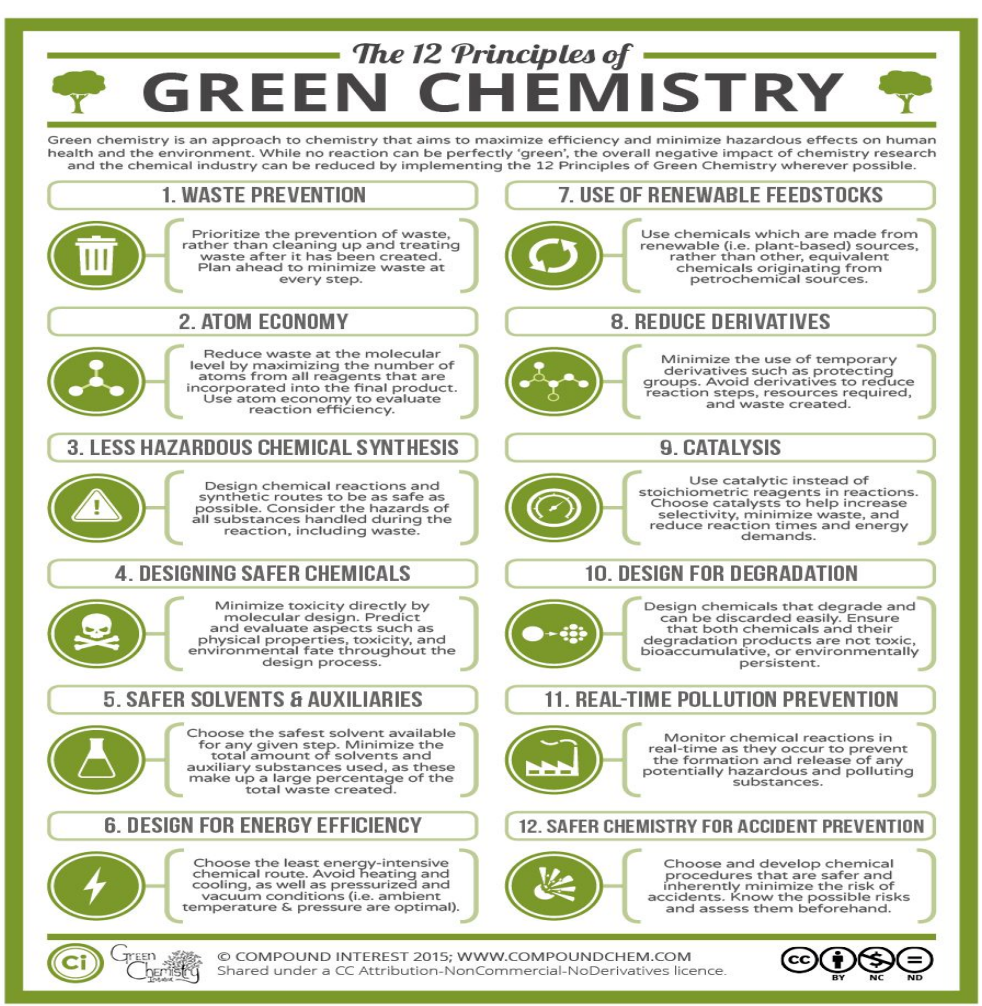
Saponification reaction (Helmenstine, 2019)

Soap acting as surfactant



Bubblon and Green Chemistry.

- Bubblon has taken many steps to abide by the 12 Principles of Green Chemistry (as can be seen on the right side of our poster) as possible.
- Our packaging was designed to degrade in nature as to not contribute to landfills, and was made with recyclable materials.
- Plant-based oils, such as coconut oil and sunflower oil were the primary oil components in our soap.
- The safer cold process was chosen over the hot process to make the soap.



(The Twelve Principles of Green Chemistry: What it is, & Why it Matters)

Theoretical vs Real Soap

- Our soap calculator and our soap have the same composition.
- Our soap turned out as expected based on the values found in our soap calculator.
- Through small testing, we found it had extremely strong cleansing and conditioning.
- We also found it had a lower bubbly lather and creamy lather, which was expected based on the calculator.

CRISCO

- 38% of our soap is composed of CRISCO, which is a brand of shortening made of vegetable oils.
- CRISCO is composed of hydrogenated cottonseed oil, thus the high SFA content in the oil contributed heavily to the hardness of the soap
- CRISCO is also a contributor to the conditioning property (which refers to an oil's emollient content) of the soap as it is also high in linoleic acid, which has a direct role in maintaining water retention on our skin

COCONUT OIL

- At 86.5% SFAs, this oil was also responsible for the hardness of the soap
- Coconut oil was the main contributor for the cleansing properties (which refers to the soap's ability to attach to other oils). This is also related to the high SFA content, which are more non-polar than M/PUFAs. "Like dissolves like" results in the fatty acids being able to dissolve dirt and oil off the skin.
- Unique to coconut oil, the high lauric acid content has been found to have antimicrobial activity by disintegrating the ratty layer of lipid coated bacteria.

SUNFLOWER AND CANOLA OIL

- These oils were used as a secondary component to maintain the conditioning property.
- These oils are high in oleic acid which aids in the permeability of the skin barrier, allowing for other water retaining fatty acids to maintain moisture on the skin.
- This alongside the other FAs ensure the soap does not dry out our clients' skin.

Cleansing...

Refers to a soap's ability to attach with other oils.

- Oils that have high cleansing potential are usually composed of lauric and/or mystic acids, which have strong hydrophobic ends.
- soaps with too much of these oils can strip the protective layer of the epidermis and irritate the skin
- Our soap calculator ensures that there is no surplus of these kinds of fatty acids

Lather...

Bubbly and creamy lather indicate the type of lather

- To achieve bubbly lather, the SFAs are increased, while creamy lather relies on P/MUFAS (poly/monounsaturated fatty acids).
- Using our soap calculator, our soap provides consumers with both types for the optimal experience.

Conditioning...

Conditioning refers to an oil's emollient content, i.e. its' ability to maintain moisture on the skin.

These properties usually come from unsaturated fatty acids such as linoleic acids. These acids are likely to have hydrophobic properties as they are not washed off.

Hardness...

refers to the physical hardness of the soap.

- Oils that can contribute to this component are composed of saturated fatty acids (SFAs)
- this structure allows for stronger intermolecular forces and increased melting points
- Our soap calculator ensured that the composition of oils used optimizes hardness for consumers.

Soap Making Process

(Making an Easy, Basic Beginner Soap, and Then Making it Fun!!)

(Rigdon, T)

Procedure

1) Oils and water are measured
2) The oils are heated to around 26 degrees celsius and mixed together
3) A magnetic stirrer is placed into the water and turned to around 400 rpm and lye is measured and slowly poured into water. The mixture is finished when the solution is transparent
4) Mix and blend the solution with the oils together for 10 minutes
5) Separate the mixture into 3 bowls and add colouring and tea leaves to the user's liking
6) Pour the 3 coloured mixture in a mold and use a wooden stick to create a marble pattern
7) Allow the soap to cure for at least a week

Graphs and Data

			Contribution to Overall Soap Recipe and Properties							
	Density	Cost	SAP (NaOH)	SAP (KOH)	Hardness	Cleansing	Conditioning	Bubbly Lather	Creamy Lather	Cost
oconut Oil, 76 deg	0.92	1.63	5.49	7.71	23.7	20.1	3	20.1	3.6	$ 0.53
hee, any bovine	1.01	1.67	0	0	0	0	0	0	0	$ -
risco, old	0.81	0.42	5.206	7.296	9.88	0	26.6	0	9.88	$ 0.20
vocado Oil	0.92	1.86	0	0	0	0	0	0	0	$ -
live Oil	0.92	0.6	0	0	0	0	0	0	0	$ -
esame Oil	0.92	1.77	0	0	0	0	0	0	0	$ -
orn Oil	0.92	0.27	0	0	0	0	0	0	0	$ -
rapeseed Oil	0.92	0.86	0	0	0	0	0	0	0	$ -
unflower Oil	0.92	0.28	2.16	3.024	1.76	0	13.92	0	1.76	$ 0.05
anola Oil	0.92	0.21	2.128	2.976	0.96	0	14.56	0	0.96	$ 0.04

Properties of Oils and Lye Used.

Mass of Oils	100							
Percentage of Water as a Percentage of Oils	38%							
Mass of Water	38							
	Mass of NaOH (g)	Mass of KOH (g)	Hardness	Cleansing	Conditioning	Bubbly Lather	Creamy Lather	Cost
Totals	14.984	21.006	36.3	20.1	58.08	20.1	16.2	$ 0.81
		Recommended Ranges	29-54	12-22	44-69	14-46	16-48	
		Targets	36	18	60	21	17	
		Objective Function	1.03E+01					

View of final soap properties

MW	56.1056 g/mol	39.997 g/mol	200.3178 g/mol	280.4472 g/mol	278.43 g/mol	228.3709 g/mol	282.47 g/mol	256.43 g/mol	298.461 g/mol	284.48 g/mol
MW	56.1056	39.997	200.3178	280.4472	278.43	228.3709	282.47	256.43	298.461	284.48
Oil	SAP - KOH	SAP - NaOH	Lauric	Linoleic	Linolenic	Myristic	Oleic	Palmitic	Ricinoleic	Stearic
Coconut Oil, 76 deg	0.257	0.183	48	2	0	19	8	9	0	3
Ghee, any bovine	0.227	0.162	4	2	1	11	19	28	0	12
Crisco, old	0.192	0.137	0	52	0	0	18	13	0	13
Avocado Oil	0.186	0.133	0	12	0	0	58	20	0	2
Olive Oil	0.19	0.135	0	12	1	0	69	14	0	3
Sesame Oil	0.188	0.134	0	43	0	0	40	10	0	5
Corn Oil	0.192	0.137	0	51	1	0	32	12	0	2
Grapeseed Oil	0.181	0.129	0	68	0	0	20	8	0	4
Sunflower Oil	0.189	0.135	0	70	1	0	16	7	0	4
Canola Oil	0.186	0.133	0	21	9	0	61	4	0	2

Fatty acid composition of each potential oil.

Oil	Hardness	Cleansing	Conditioning	Bubbly Lather	Creamy Lather	Density	Cost per 100mL
Coconut Oil, 76 deg	79	67	10	67	12	0.92	1.63
Ghee, any bovine	55	15	22	15	40	1.01	1.67
Crisco, old	26	0	70	0	26	0.81	0.42
Avocado Oil	22	0	70	0	22	0.92	1.86
Olive Oil	17	0	82	0	17	0.92	0.6
Sesame Oil	15	0	83	0	15	0.92	1.77
Corn Oil	14	0	84	0	14	0.92	0.27
Grapeseed Oil	12	0	88	0	12	0.92	0.86
Sunflower Oil	11	0	87	0	11	0.92	0.28
Canola Oil	6	0	91	0	6	0.92	0.21

Cleansing properties, density, and cost of potential oils.

Mass of NaOH (g)	Mass of KOH (g)	Hardness	Cleansing	Conditioning	Bubbly Lather	Creamy Lather	Cost
15.602	21.873	41.45	30.15	51.82	30.15	11.3	$ 0.96
	Recommended Ranges	29-54	12-22	44-69	14-46	16-48	
	Targets	40	22	44	46	16	

Properties of the top layer of prototype 1

Mass of NaOH (g)	Mass of KOH (g)	Hardness	Cleansing	Conditioning	Bubbly Lather	Creamy Lather	Cost
14.098	19.761	29.97	6.03	65.44	6.03	23.94	$ 0.62
	Recommended Ranges	29-54	12-22	44-69	14-46	16-48	
	Targets	35	12	69	15	48	

Properties of the bottom layer of prototype 1

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