Appendix A

DATA SHEET 1

Getting Ready for Dissection: Part I

Manufacturer/Model Number:

General Product Information:

How many detachable pieces the product has? _____

Part number:	Part name:
1	Package, "Try-me" on package
2	Battery cover
3	2 triple A batteries
4	Toothbrush casing

Describe the pieces including their functions and their materials.

Part number:	Material & Functional Description:
1	Protect and advertise. made of cardboard and plastic.
2	Holds batteries and made up of plastic.
3	Provides the power for the toothbrush to work.
4	~~Big~~ - makes it easy for a kid to hold + use.
5	Motor - turns head
6	Wires - transports electrons
7	Brushhead - cleans teeth

Is it easy to detach each part?

Part number:	Detachment (Easy, difficult, use of force etc.):
1	Medium difficulty. We used scissors to open.
2.	Difficult. The small screw made it hard to remove.
3	Easy. They pop out when the case is removed.
4	

Describe the packaging. Is it easily opened? Describe the opening procedure.

we used scissors, but there is a perforated cut-out.

Opening was medium difficulty.

DATA SHEET 1	
Getting Ready for Dissection: Part I (cont.)	
Product Features: Provide team's collective opinion related to features of the product using the following list as a starting point.	
Packaging (including information insert)	Good information and directions. The perforated cutout is slightly difficult to break and tear though.
Aesthetics (multi-color, etc.)	visually appealing. Iron man color scheme. Iron man head button, cool design.
Cleaning	cleaning is semi-OK because the top spins, but the bottom doesn't. The toothbrush assists brushing, it doesn't do everything for you.
On/off switch location	Great location. Located ~~on the~~ towards the bottom on the front side. Designed great for children.
Battery location	Very bottom, inside the battery case.
Ease of switch use	The toothbrush would turn on by the way a kid would grab it. Easy to use iron man head button that can be pressed and locked.
Handle (Ergonomics)	Bulky, doesn't fit to hand, big.
Quality	Cheap, low quality. Disposable.
Safety	All parts are covered with plastic. Everything is screwed in tightly. very safe.
Versatility, attachments	None
Weight with batteries	83.7 grams (Light weight)
Environmental friendliness	Environmentally friendly.
Other features	None

Product Dissection & Benchmarking Project Handout I – Part II.

Laboratory Tools:

1. Computers which are connected to the internet,
2. Library resources.

Estimated time: 1 hour.

B. Market Realities for the Product:

Tasks:
1. Using on-line and library resources gather and record information on the market presence of the product.

DATA SHEET 1	
Getting Ready for Dissection: Part II	
Cost (Be prepared to record multiple values and sources)	Walmart Amazon $5.00 – $19.99
How long has the product been in the market?	Since 2013.
Target population	Targets young kids (superhero toothbrush)
Versions of the product (Previous versions of the product)	Various Marvel superhero themes.
What are improvements between versions of the product?	More appealing package to consumers.
How is it sold (TV infomercial, drugstores, etc.)	Drugstores, Stores i.e. Target
Patented Features (Please include patent dates).	~~Market Analysis~~ 6,178,579; 6,189,693; 6,360,395; 6,090,083

DATA SHEET 2

1. Noise Measurement:

Location:	**Noise level:**
Brush head 4" away from decibel meter	65.3 dB
Brush head 3" away from the decibel meter	67.0 dB
Brush head 2" away from decibel meter	67.9 dB
Brush head 1" away from the decibel meter	68.8 dB
DC motor 4" away from decibel meter	72.4 dB
DC motor 3" away from the decibel meter	74.1 dB
DC motor 2" away from the decibel meter	75.4 dB
DC motor 1" away from the decibel meter	77.2 dB

Approximate duration of brushing per day: 2 minutes

Average noise level during brushing: 67.3 db (average from brush head)
71.0 db (average of all)

2. Power Measurement:

Voltage supplied to the circuit:

	Battery Type	**Volts (V):**
Battery 1	Triple A	1.5 v
Battery 2	Triple A	1.5 v

Total Voltage:

	Connection Type	**Volts (V):**
Battery 1 and Battery 2	series	3.123 v

Current Measurements

	Averaged Current Value
No load condition	~~3.123~~ 275 mA

Load condition(s)

1. ~~[illegible]~~	~~[illegible]~~
2. ~~[illegible]~~	~~[illegible]~~
3. motor on with significant resistance	295mA
4. motor on with minor resistance	283mA

Mean current 'under load' 289 mA

Power (no load) = Voltage 3.123 X Current .275 = .859 Units W

Power (under load) = Voltage 3.123 X Current .289 = .903 Units W

3. Battery Life

1. Number of hours available per single battery 'under load' conditions: 2.07 Hours

2. Estimate duration for each brushing 1/30 Hours

3. Number of days before battery replacement 31 Days

4. Do these answers make sense to you? yes - once a month

5. Oscillation Frequency

Oscillation frequency 2612 Cycles per minute

43.53 Cycles per second (Hz)

DATA SHEET 2 cont.

Bill of Materials

Product Manufacturer/Model Number:

Date:

Disassembly method (if you don't know what this means, you haven't read Otto & Wood):

Subtract and Operate Procedure (SOP): Yes, No. **Force (Energy) Flow Diagram: Yes, No.**

Part#	Part Name	QTY	SOP Effect	Function	Mass (oz, g)	Material	Manuf. Process	Dimensions	Cost
1	Package	1		Advertise & protect brush	14.5 g	plastic & cardboard		9 x 2.2 x 1.5 (in.)	$0.08
2	Battery cover	1		Covers batteries	6.00 g.	plastic		.75 x 1 x 1 in.	$0.05
3	Triple A Battery	2		Provides power	10.9 g.	Steel casing & chemicals		1.625 x 3/8 in.	$1.00
4	Toothbrush casing	1		protects motor, holds everything together	61.6 g.	plastic		7 5/8 x 1 1/4 x 1 1/2 in.	$0.18
5	Motor	1		turns brush head					$0.30
6	wires			transports electrons					$0.10
7	Brushead	1		cleans teeth					$0.15