

# Report of Task Analysis of Toothbrush

## About the User

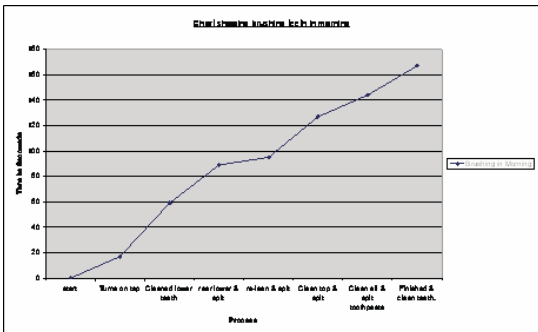
**Name:** Nia John  
**Age:** 19  
**Location:** Student House, Swansea, Wales  
**Sex:** Female  
**Dental History:** Did wear braces for 1 year, has never had a filling. (?)

**Toothbrush Used:** Tesco home brand, This is the 2<sup>nd</sup> toothbrush of this brand, as she prefers the feel of this brand.  
**Toothpaste Used:** Mcleans Ice Whitening.

## Task Analysis

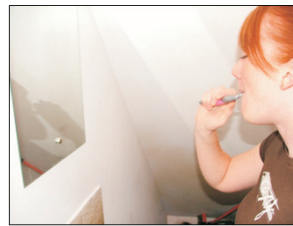
### Analysis of brushing teeth in the morning.

For my second observation I watched Nia brush her teeth in the morning at 9.28 on Sunday morning.



Time (seconds)	Activity
0	Start
17	Turns on tap
59	Cleaned lower teeth
89	rear lower & spit
95	re-lean & spit
127	Clean top & spit
144	Clean all & spit toothpaste
167	Finished & clean teeth.

### Where the teeth are brushed.



This is where Nia brushes her teeth; It's in a toilet room under her stair about 5 meters away from her room. It just has enough room for a toilet, and a sink. Nia will always brush her teeth in front of the mirror.

This is a picture of the sink that Nia uses. She lives in a student house so the sink and everything is very basic. The house dose have another bathroom 2 stories up, which has more room for the storage of brushes, but Nia useless the bathroom downstairs for ease of use.



### Environment Issues

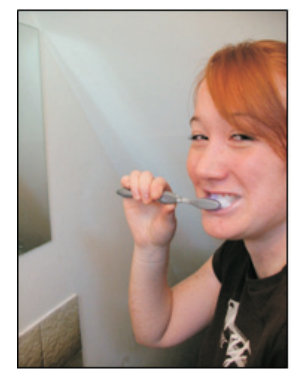


This is Nia's room, and the brush is stored in the multi storage compartment as seen in the lower middle of this picture. It is stored here as there is no room in the bathroom to store it.

The brush is stored at the front of the top draw. Along with other makeup and cosmetic items. One factor why she also keeps here toothbrush in her room is that if you leave anything in a student house its likely to go missing.



Above shows where Nia would always brush her teeth, she would always do it here, this bathroom is 5 meters from her bedroom and under the stairs.



This picture shows the method that Nia uses for cleaning her front teeth se uses a oserlating and reciprocating movement.

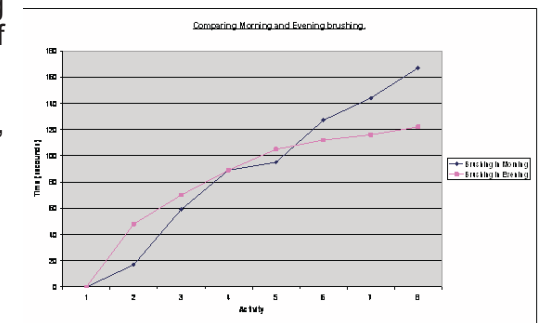
### Comparing the morning and evening tooth brushing.

This chart, is a comparison of brushing, At each dot that illustrates a spit. So I found that both morning and even of brushing require the same amount of spitting, but the times differ. I found from my observation that spitting announced the end of completing a stage of brush.

E.g. Brush lower teeth, spit, Bush rear lower, spit, Brush top teeth.

What the chart shows to me is

- Morning brushing is 46 seconds longer than evening brushing.
- Morning brushing seems to have equal amount of time bushing each area of the teeth
- Evening brushing is "finished" in about 100 seconds then Nia will continue to just quickly re-brush and clean the other areas very briefly.



### Timing analysis of brushing teeth.

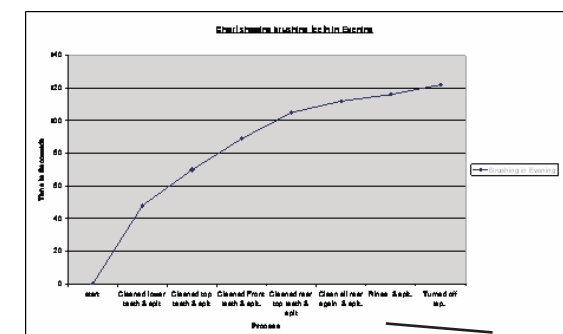
#### Analysis of brushing teeth in the evening.

For my first analysis I observed Nia brushing her teeth in the evening. Nia brushed her teeth at 1.10am on Saturday evening / Sunday evening.

I started this observation and recorded time data as displayed in the list below. I also observed what was generally happening at the same time. I then have plotted the data into a primitive line chart. (each dot on the chart is when Nia spat out her toothpaste) This shows that Nia spent the most time brushing her lower and rear teeth.

Its interesting to see that Nia spends less and less time brushing her teeth as she gets to the end. When at the end she is just rinsing and lightly brushing her whole mouth.

Time (seconds)	Activity
0	Start
48	Cleaned lower teeth & spit
70	Cleaned top teeth & spit
89	Cleaned Front teeth & spit.
105	Cleaned rear top teeth & spit
112	Clean all rear again & spit.
116	Rinse & spit.
122	Turned off tap.



### Photos of Morning Brush (the only observational pictures)

This shows Nia Brushing her teeth, its shows the way in which she cleans her lower teeth.

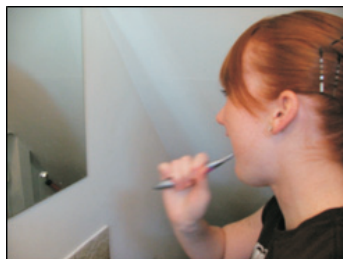
#### Key things to note.

- Holding the toothbrush at top.
- Little finger doesn't touch brush
- Pivot for cleaning lower teeth is mostly in the wrist and arm.
- Nia will always brush her teeth in front of the mirror.



You can't really see that much in this picture, its move a action shot.

- You can see that the hand has a firmer drip over the pink part of the handle.
- The little finger still doesn't touch the brush.
- Nia looks in the mirror while brushing her teeth, as to assist her.



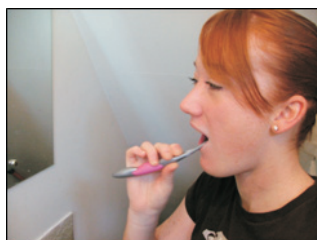
This shows Nia brushing her front teeth.

- The brush is held the same as lower teeth, with a stronger grip on the top of the brush.
- She opens her mouth when cleaning her teeth.
- She used a osculating and reciprocating movement clean her front teeth.



This is the last of cleaning lower rear.

- There appears to be more concentration in cleaning the lower teeth.
- The brushing motion is very soft and she uses her thumb to pivot the top of the brush to clean her teeth.



## Functional Issues



### • Features of toothbrush

#### ○ Easy grip handle

This toothbrush has a large grip which is made from a different plastic from the rest of the toothbrush. This is meant to be where the toothbrush is held. Although from my observation I found that this wasn't true.

#### ○ Different length brushes

##### ▪ Tip

The Tip of the brush is longer than the other brushes. You can see from the above picture that these have had the most wear and have been pushed outwards leading me to think that too much pressure has been applied to these brushes.

##### ▪ Middle

These dark brushes are used for cleaning the flats and getting into the areas within the teeth. I think these are stiff and short enough to do a successful job.

##### ▪ Outer

These bristles are the ones responsible for cleaning the side of the teeth. It looks like that the lower side has had quite a lot of wear. Leading me to think this side gets the most pressure, as Nia is right-handed this side of the toothbrush is properly used to pivot the other brushes on.

#### ○ Pliable plastic handle

The brush handle is slightly soft so that if excessive pressure is applied the brush will bend. The outer of the brush is a very smooth plastic, but apart from holding in the bristles the plastic handle is more of an aesthetic than a functional part of the brush.

#### • How Hygienic is the brush?

Part of the functional ability of the brush in my opinion is how well it will keep clean. I didn't have the ability to test this. Although if I was to continue my studies I would do a swab and test to see if the plastics used in this brush repelled or incubated bacteria.

## Emotional Issues

For Emotional issues I created a list of questions, which I got Nia to answer after brushing her teeth. The results of this are at the end of this report. I will just diagnose the outcome here.

### • Emotional Issues in morning.

In the morning I didn't have time to re-ask the questions and fill in the surveys but I did verbally probe her and these were what I found out

- Nia will get emotional attached to a old toothbrush and after 3 months or the time that you need to change it. She will have created an emotional bond to the toothbrush.

### • Emotional Issues in Evening.

To find a way of finding emotional issues, I made a questionnaire which has been written up and attached to the end of the document. In this section I will just summarise the main emotional aspects, that I found via the survey and talking to Nia.

- Nia would use the touch of her tongue, until she got a statistically feeling. Which was also known as the "Zing". She wasn't fully happy unless she could feel this.
- The most important time for clean teeth was on a date. So this means that Nia is most conscious and believes that good dental hygiene will get her a better mate.

## User Issues

Skill level needed

### • Record of Ergonomics

#### ○ Comfort

#### ▪ In mouth

Nia found that this toothbrush was a good size and it fitted well into her mouth. Although she did say that cleaning her top rear teeth could be made easier.

#### ▪ In hand.

From my observation I can see that the handle is the wrong shape for the way that Nia holds the toothbrush. There is a lot of excess that has been moulded into the toothbrush in the name of aesthetics.

#### ○ Safety

#### ▪ In mouth

For the toothbrush there are no really direct safety problems, as this toothbrush already complies to all ruling of toothbrushes.

#### ○ Efficiency

#### ▪ Speed of brush

The speed of brushing was helped by the 3 layers of different length brushes. This means that Nia could use less strokes to get a more effective clean of her teeth.

### • Record of Ease of use issues

#### ○ The handle could be redesigned so a better firmer grip could be adopted.

#### ○ The toothbrush could have a change of brush, for getting into the side of back teeth.

#### ○ The way in which Nia cleans her front teeth I believe could be made more efficient, as the toothbrush is hard to clean anything but the front 12 teeth.

## Technical Issues

### Issues related to technical performance.

I can't really talk too much about actual technical analysis, as I didn't have anything to compare it by, and chart or the chance to go in and see which part of the teeth were cleaned. Although I am just going to write a short passage on how this could be done.

- Cleanliness of teeth, Compared to a colour chart, from a very stained teeth to very clean teeth
- Removal of Food, You can now get mouth wash, that will pick up bits of debris and food, and will show you the remains when you spit this out. This could be counted and help to work out the technical ability of the toothbrush.
- Removal of plaque. It is possible to get a tablet that will show all of white plaque that you have missed. I could have got my participant to take one of these and work out a percentage of plaque left.
- Cleanliness of gums, these could be compared to a colour chart, as healthy gums have a healthy glow.

*If I was to do this technical analysis, I would have to do it over a long set of time and set level that I could compare it by. I would also need to make sure that the participant had equal amount of staining on the teeth each time to get a far overview of the technical ability of the brush.*

What makes you go and brush your teeth?  
 "Before bed, but no pyramis and brush teeth"  
 What do you do if you are unable to brush your teeth?  
 "I don't brush"  
 Would you use someone else's toothbrush in the above situation?  
 "Yes"  
 What is the first thing you try to do if you realise you haven't cleaned your teeth?  
 "Cleaner"  
 What is the most important, fresh breath, clean feeling, fresh gums or removed deposits of food?  
 "Fresh breath, Clean feeling"  
 How do you know you have finished brushing?  
 "I feel neat fresh, with that Zing feeling"  
 How would you describe the feeling after you have brushed your teeth?  
 "Zing... zing" (exact quote, make a noise which was referring to that feeling of clean teeth)  
 How do you replace a toothbrush, and do you get to like the feel of one better?  
 "Do get attached to the brush and the comfort feeling of a brush a bit like a old friend"  
 On above scale rate  
 Smell  
 Touch  
 Taste  
 Sound