

PROJECT LEAD THE WAY

PLTW

Igniting imagination and innovation through learning.

The evolution of Design

**“Basic research is what I am doing
when I don’t know what I am doing.”**



- Wernher von Braun
***Father of the United States space
program***



What is Research?

- Research is the systematic **study and investigation of materials and sources in order to gather information**, establish facts, reach new conclusions, explore an idea or issue, solve a problem and/or make an argument.



Types of Research

- Primary Research

- Generating original information

- Secondary Research

- Gathering information that has already been generated



Question

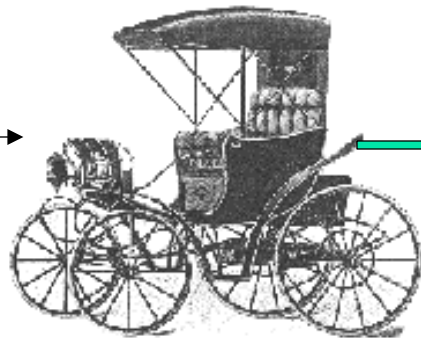
What comes to mind when you hear the word evolution?



Evolution

- A gradual development of something

Evolution of Product Design



History of a Product

Today we will research products and address some of the questions below

⑩ Why do we change products?

⑩ How did it change?

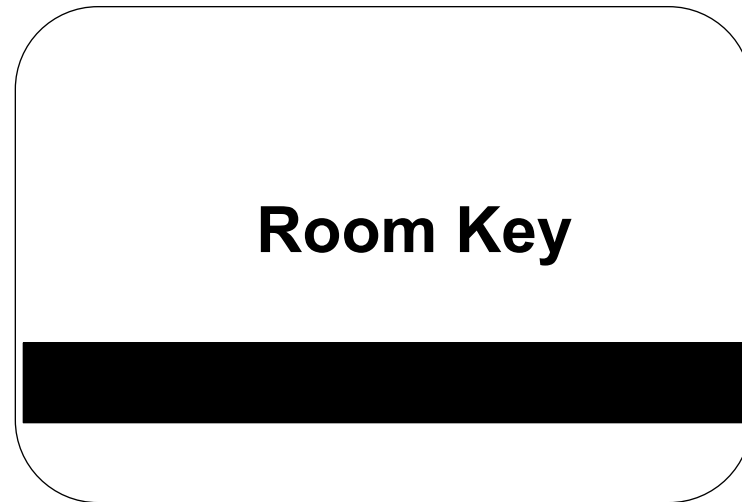
⑩ Who impacts these changes?



History of a Product

10 When do changes take place?

- Changes are happening all the time
- It is a fast paced society





History of Products

- Where do these changes come from
 - The changes come from engineers/inventors/companies because there is a **need** for them.
 - Environmental **need**
 - Consumer **need**
 - A government **need**



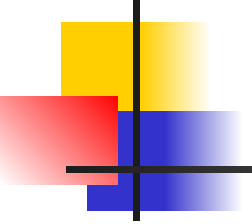
Evolution of products could be good and the bad

- Changes can be for the better
 - Product could make things easier, faster, safer
 - Product could be better for the environment
 - Poland Spring Bottles have less plastic
- Changes can be for the worse
 - Bad for the environment
 - Invasion of privacy
 - Product could be more complicated and less reliable



What product could you not live without?

With your partner, come up with a list of the top five products you could not live without. Then discuss with your partner which one is #1.



Example Product Evolution

“MIT Invention Index at the Massachusetts Institute of Technology, asked which of five inventions Americans could not live without.”

“The toothbrush emerged as the undisputed champ, beating out the car, the personal computer, the cell phone, and the microwave, in that order, as the most prized innovation.”



Invention vs. Innovation

Invention is the creation of a product or introduction of a process for the first time. **Innovation**, on the other hand, occurs if someone *improves on* or *makes a significant contribution to* an existing product, process or service.



The First Toothbrush

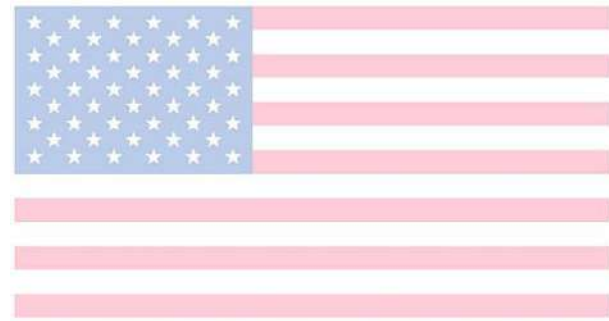
Some records indicate a version of the toothbrush dates back as far as 5000 years ago. Babylonians rubbed a “*chew stick*” on their teeth and mouth to keep them





The Bristle Toothbrush

In 1498 a bristle toothbrush was created in China. The bristles were actually the stiff, coarse hairs taken from the back of a hog's neck and attached to handles made of bone or bamboo.



American Contributions

The first American to patent a toothbrush was H.N. Wadsworth in the 1850s.

Companies in the U.S. started mass producing the toothbrush around 1885.

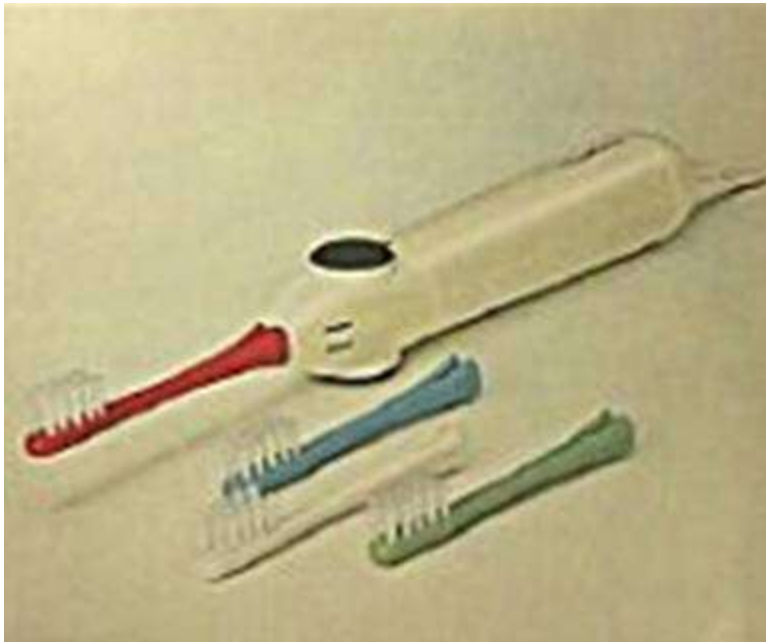
Most Americans did not brush their teeth until Army soldiers in World War II were taught the habit of tooth brushing and brought their enforced habit back home after the War.

Nylon Bristles

Natural bristles were used in toothbrushes until nylon was discovered. In 1938, nylon, invented by Dupont, replaced the natural bristle. One of the first nylon toothbrushes to commercialize the industry was called Doctor West's Miracle toothbrush.



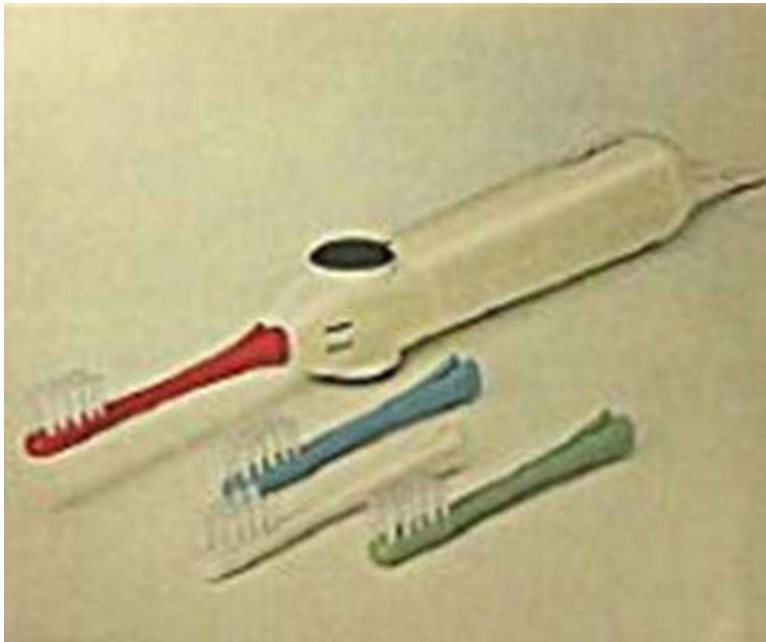
Electric Toothbrush



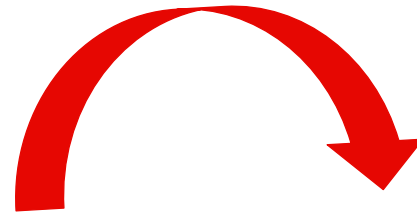
The Broxodent shown above was marketed by the Squibb company.

In 1960 the first commercialized electric toothbrush was marketed in the United States. The technology was developed in Switzerland in 1939.

Electric Toothbrush



The Broxodent shown above was marketed by the Squibb company.



Sonicare™



Other Design

Over the past 100 years there have been many innovations to the toothbrush: better handles, spinning heads, and improved bristle configurations to name a few.

A pioneer in this transformation was Dr. Robert Hutson, a periodontist from San Jose, California. Hutson invented the first toothbrush with soft end-rounded nylon bristles. He named the product "Oral-B".



Better Design



VS.





Electronic Advancements

Toothbrush designs are now starting to include electronics. The RadiusTM toothbrush has a built-in timer that blinks light or plays music to let you know how long to brush.

RadiusTM

