



**Cleaning!**



# Title Page - About Us!

**Title:** Cleaning!

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**Team number:** 21350F

**Location of team:**

Trinity Grammar Preparatory School  
Strathfield, Australia

**Word Count:** 1009



# Questions



**01.**

**What is a problem that humans deal with everyday?**

**02.**

**How can robots help the daily hassle of cleaning?**

**03.**

**How did they design and develop robot cleaners?**

**These are some questions we had which has inspired our research about robot cleaners.**

# Cleaning Robots



**Electrolux Ultimate Home 300**

Cleaning is an important part of life. Cleaning is a time-consuming task. A solution to this problem is robots! Robots are machines that help with repetitive tasks as they can do the same thing over and over. Already machines like the vacuum cleaner have made cleaning easier. Using robots and advanced engineering skills, we can make simple task easier.

Robots like the Electrolux Robot Vacuum have helped people sweep the floor of the future.

**In my future want to engineer a robot that is more efficient, environmentally friendly and most importantly clean.**

# Electrolux



## Why Electrolux?

With many questions on how to improve cleaning in the future we wanted to learn more about vacuum cleaners. The reason we chose Electrolux is that they were the first company to develop a robotics vacuum cleaner called the Electrolux Trilobite in 2001. This had led us into an investigation into the history on Electrolux.

## What we know about Electrolux:

Founded by Axel Wenner-Gren an engineer and entrepreneur in 1919, Sweden. Electrolux's goal is to make vacuum cleaners lighter and easier to use, ensuring to improve health and hygiene. Electrolux are continuing to clean the world with new technological advancements.

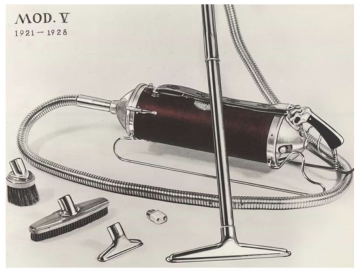
## Career Connection:

Designing vacuum cleaners

**Sources:** <https://www.electrolux.com.au/explore/> and <https://www.electroluxgroup.com/en/design-timeline-12568/>

# Electrolux Vacuum Timeline

## (Highlights)



### **1921 Model V**

The first vacuum cleaner with metal runners.

**What an interesting design.**



### **1964 Luxomatic**

The first vacuums with a cord winder and dust bag indication system.

**Huge technological improvements**



### **2001 Trilobite**

The first robotic vacuum that uses ultrasonic sound to navigate and recharges itself.

**What a huge change so futuristic**



### **2014 Mab (not real)**

A flying robot home cleaning concept wins a design competition.

**Is this the future of our vacuums?**



### **2017 Pure i9**

3D image mapping, can climb and can be used when not at home.

**Amazing!**

**Sources:** <https://www.electroluxgroup.com/en/design-timeline-12568/> and <https://www.electroluxgroup.com/en/history-timeline-2010-2019-27599/>



# Electrolux Design Process



“Good design doesn’t happen by accident” - quote from the Electrolux website



## Electrolux Design Philosophy

**Foresight.** Continuously interpreting trends and insights to develop a point of view about the future, which inspires and directs our work.



**Creativity.** Applying the unique sensibility and perspective of designers to identify opportunities, solve problems and nurture a creative culture throughout Electrolux Group.



**Context.** Designing for real use and thinking in terms of ecosystems, beyond one product at a time. By truly understanding usage patterns and behaviors, we seek to simplify decisions and guide actions.

## **Foresight = futuristic thinkers**

Electrolux uses customer trends and looks in the future to think about new designs and reinvent the way people think and want to buy their futuristic cleaners.

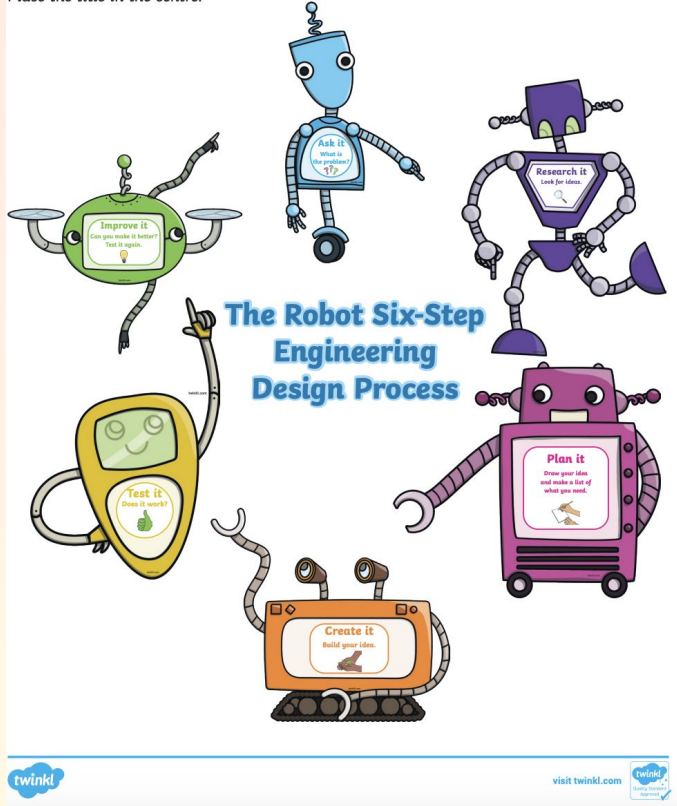
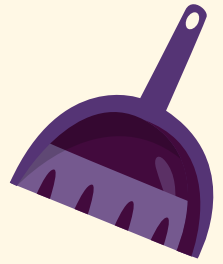
## **Creativity = problem solvers**

Electrolux has a group of designers that look at cleaners of the past, make improvements and solve common problems or complaints. These designs also look into the failures of other companies and fix their mistakes to develop futuristic vacuums.

## **Context = considerations**

Electrolux are all about making their products real, they consider the needs of the environment trying to make eco-friendly designs and listening to the feedback of their customers.

# VEX Design Process



**Design processes are very important to a successful robot or company.**

This is the design process we used to make our robot during the VEX IQ Full Volume competition.

We will use this design process to share how Electrolux design a vacuum cleaner and how we designed our robot this year in VEX IQ.

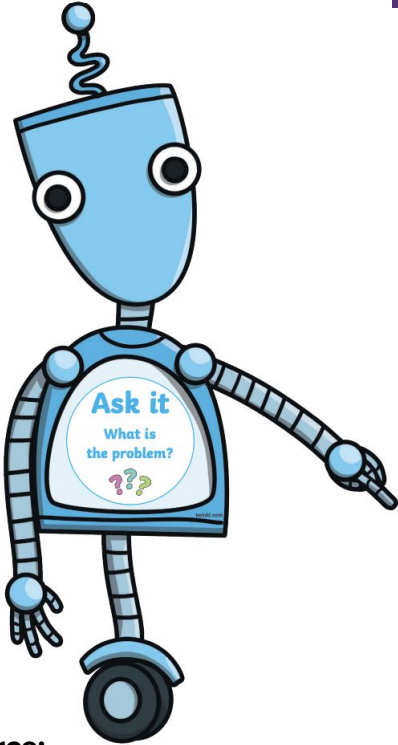
**Source:**

<https://www.twinkl.com.au/resource/robot-six-step-engineering-design-process-poster-cfe-t-1000000067>



# Applying the Design Process

## Ask it - What is the Problem?

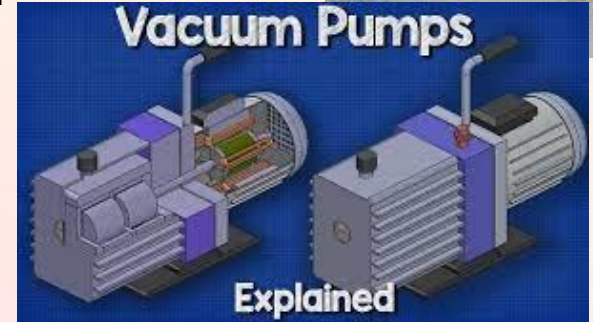


Source:

<https://www.electroluxgroup.com/en/gathering-dust-the-history-of-the-vacuum-bag-29603/>

### Electrolux Vacuum:

Electrolux redesigned the dustbag. They had a common complaint from their customers which was the dust bag so they started asking how to solve the problem.



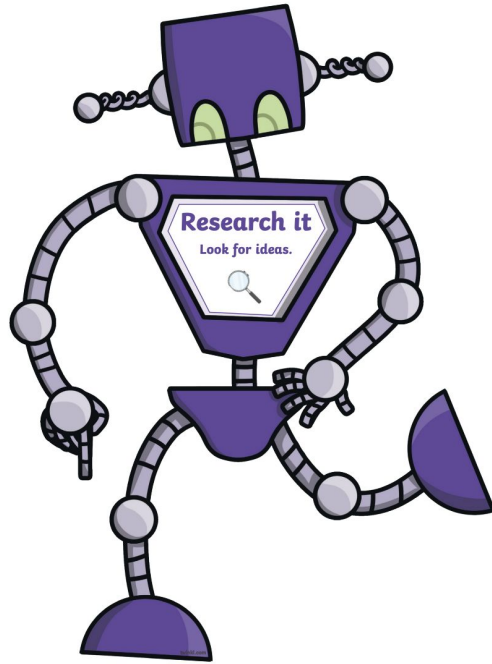
### VEX Robotics:

My team asked ourselves, what was the most effective robot, that will pick up the scoring blocks the fastest? We developed a goal to identify the problem and solve it.

VEX: Our goal is to build a robot that can score a high level of points. To do this we will need to build a much better robot.

# Applying the Design Process

## Research it - Look for ideas



### Electrolux:

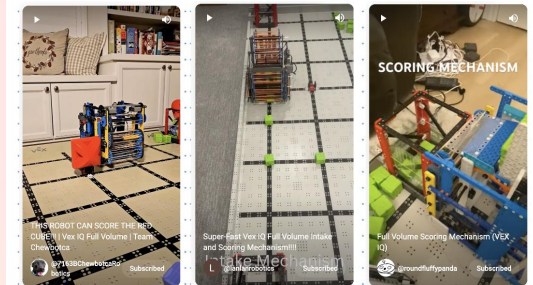
Electrolux look at the past to conduct research. In 1908, the first vacuum cleaner to use electricity was created. Electrolux built on another companies idea to created their own electric vacuum.

### VEX:

My team watched videos from YouTube about robots that could score well. They all used an intake roller so we tried and use that.

Source:

<https://www.electroluxgroup.com/en/images/vacuum-cleaner/>



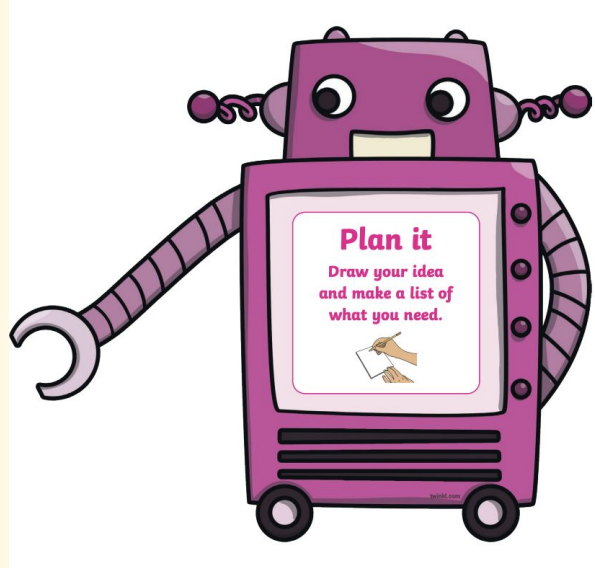
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# Applying the Design Process

## Plan it - Draw your ideas

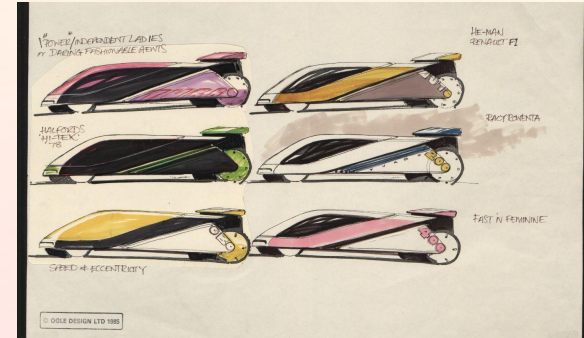


### Source:

<https://www.electroluxgroup.com/en/images/vacuum-cleaner/>

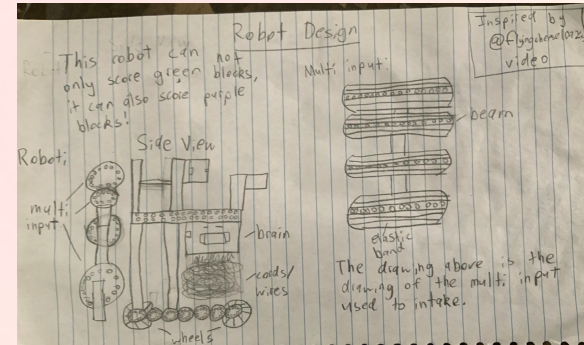
### Electrolux:

These hand drawn plans show how Electrolux looked at cars when designing of their first vacuum the Model V.



### VEX:

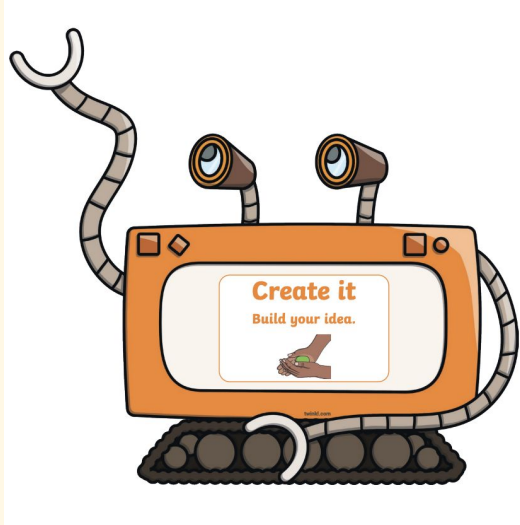
In VEX we spent a lot of time analysing research and drawing out new ideas. Helping us to see if the solution is possible.





# Applying the Design Process

## Create it - Build your idea



### Electrolux:

Electrolux's factory where they built many of there successful vacuum cleaners.

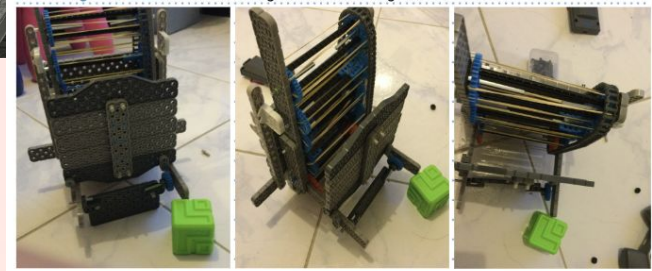


### VEX:

When building in VEX my team used thinking skills to follow our plans and build the robot we designed.

#### Source:

<https://www.electroluxgroup.com/en/images/vacuum-cleaner/>



Front View

This shows the backboard which is used to help the block go up and be scored in the goals.

Side View

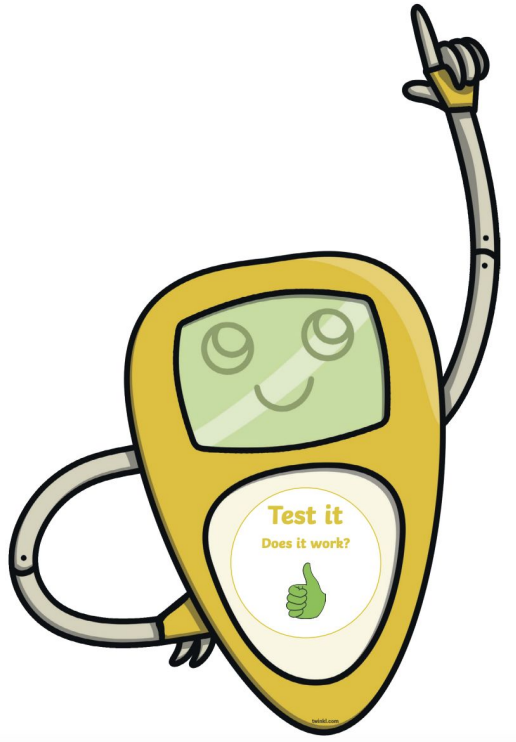
This is the gear mechanism that makes the intake part do all the moving.

Top View

The small intake belt and gear mechanism at the front of the robot to score cubes.

# Applying the Design Process

## Test it - Does it work?



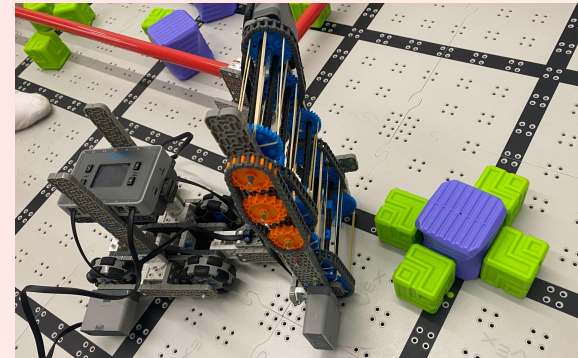
### Electrolux:

At a 1924 sales event Electrolux let the customers test their products before purchasing them. Proving their products reliability and better than competitors products.



### VEX:

During the building process we would continually test out our designs to see if they would work.

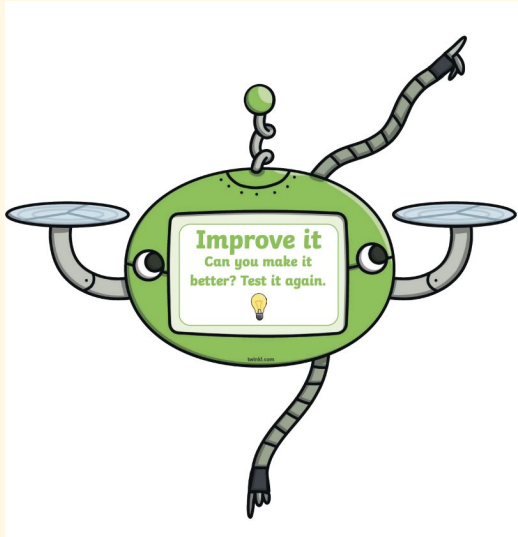


Source:

<https://www.electroluxgroup.com/en/images/vacuum-cleaner/>

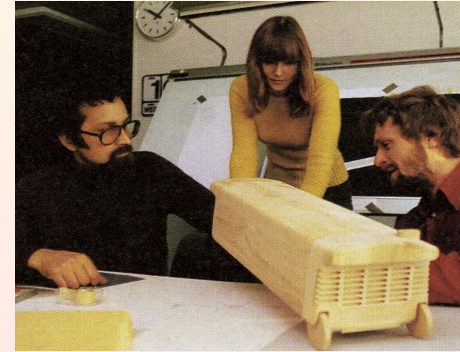
# Applying the Design Process

**Improve it - Can you make it better?**



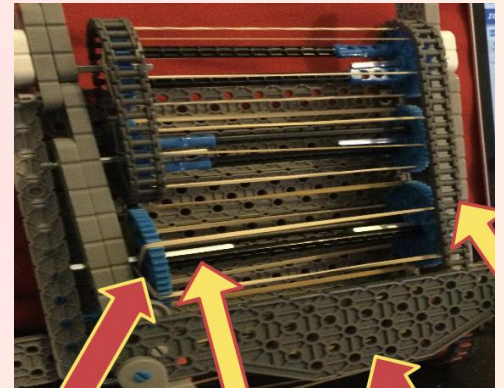
## **Electrolux:**

Once built they sell their products then they work on making improvements and designing the next best vacuum.



## **VEX:**

We made many modifications to our robot during the VEX season.





# Career Readiness



1. **Coding:** VEX is helping us by teaching us the beginning of coding. Coding will be an important skill we will need later in life.
2. **Knowledge:** VEX is giving me a mechanical brain as we build robots, this also has inspired my passion for looking at cleaning robots.
3. **Design:** It is teaching me about the design cycle which we will need on our future jobs. Giving us the mindset to ask, research, plan/draw then create and improve.
4. **Thinking Skills:** We have been getting better at explaining our thinking when we do the logbook and gives us more confidence.

