2. Lets Fix the Problem

2.1. Fixing the Problem

To **fix a problem** first we need to **analyze the problem** and **find the cause/reason** for that problem. After we know the cause we have to **start thinking about the solutions**. We have to carefully analyze our solutions to see which one will also work in the future.

As our technology got better, our life span also got longer so our population started to grow. As a result of population growth and city expansions, we have started to develop new technologies but also started to make problems for the environment.

We, humans, aren't the only problem for nature. There are also **natural disasters**, like volcanos, wildfires, earthquakes, floods... They affect our lives also so we need to develop technologies that will prevent them

Wildfires are natural disasters that can happen because of a storm during the summer or dry season. Wildfire can make the air toxic because of the dust and gas that is released from the fire.

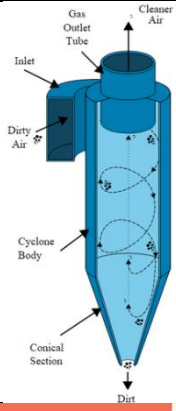
Floods usually happen during the rainy season. There is too much water in the river so the river spills out and the water goes everywhere. It can damage our property and it can bring diseases and infections.

Earthquakes are usually caused when rocks underground start to break. The sudden release of energy shakes the ground. It can easily destroy houses and cities; it also affects animal and plant life.

Volcano is a rupture in the crust of the planet that allows hot lava, volcanic ash and gasses to escape from a magma chamber. Volcanos also make the air toxic because the ash causes air pollution and lava can start a wildfire.

2.2. Technology in Environment Management

For **water treatment technology** we have made tiny microbots that can absorb and remove toxic heavy metals from the water. They move by a chemical reaction and we control them using a magnet.



For **air treatment technology** we use a machine called cyclone which separates the bad things from air by spinning the air inside, the bad particles get stuck in the filter and clean air goes out.

In **solid waste management** we separate the waste into types (organic waste, general waste, recyclable waste and toxic waste). We do so to make it easier to manage and destroy it.

2.3. Analyzing the Situation

When trying to identify what is the real problem in our environment we need to analyze the situation around us. For that, we will use the 5W1H method.

Question	Explanation
What?	What is the problem?
Who?	Who gets affected by the problem?
Why?	Why is the problem happening?
When?	When did it happen?
Where?	Where did it happen?
How?	How did it happen?

3. Lets Design

3.1 Analyze the way of problem fixing

When we are trying to design a solution for a problem, we need to consider the conditions and the technological resources. **Technological resources** are divided into 7 categories:

1. **Human –** when making a solution we need to consider the person that will make it. Human needs to have knowledge and skills in that area

2. **Data & Information –** We have to analyze and process the data that we have collected in order to make an effective solution

3. **Material –**We need to carefully choose the material that we will be used for fixing the problem

4. **Tools and equipment –** Tools are things that help us increase our ability in some kind of work. It makes the process easier, more comfortable, and faster.

5. **Energy –** for every type of work we need to use energy (human energy, electrical energy, thermal energy...). Without energy, there is no work.

6. **Capital –** is the money, budget, property, business, and places that are important factors in solving the problem and creating the solution

7. **Time –** is an important factor in deciding the solution is the ability to solve the problem in a short time. We always should choose the solution that is easier and faster

3.2 Creating Design Alternatives

When we have decided what solution, we want we need to create a working prototype that follows product design principles:

1. **Function –** The product needs to have a function to solve the problem

2. **Safety –** We need to consider the dangers that are made by our product, its system, and methods

3. **Structure** – When designing the product, we need to take into consideration its strength and structure

4. **Ergonomics –** We have to consider if the design will be comfortable to use and will it affect the human body

5. **Aesthetics –** When designing something we should take into consideration the appearance of the product in order to catch the attention of the user

6. **Maintenance –** When designing something we need to consider the parts that need to be replaced or repaired. It should be easy to operate on it and find spare parts

7. **Cost -** We need to pre-evaluate the costs of our product so that we don't have later problems with our budget.

8. **Materials and process –** When designing we have to choose the materials that match the functions of the product and how it is used.

When designing the prototype we have the most common types of models, which are **the Design model** and the **Functional model.**

A design model is created to study or present the shape of the workpiece/prototype in a short time. The materials used should be materials that can be easily folded and connected

A functional model is a model that doesn't focus on the shape but on testing the work components such as electrical circuits, and mechanisms.... Materials that are used are cheap and easy to find.