02. CREATING DESIGN ALTERNATIVES

M2U3P2 DESIGN AND TECHNOLOGY

CREATING DESIGN ALTERNATIVES

- When we have decided the solution for our problem next step will be to design a working piece / prototype
- We have to take into account the product design principles and the creativity, and we should create more than one design

PRODUCT DESIGN PRINCIPLES

- Our prototype has to meet the requirements as following:
  1. Function
  2. Safety
  3. Structure
  4. Ergonomics
  5. Aesthetic
  6. Maintance
  7. Cost
  8. Material and process

1. FUNCTION

- Function is the most important thing to consider
- The product needs to have the function to solve the problem

2. SAFETY

- We need to consider the dangers that are made by our product, its systems and methods
- For example:
  - Are there any small parts?
  - The safety of the color
  - Any sharp parts?

3. STRUCTURE

- When designing the product we need to take into consideration its strength and structure
- We should always choose the structure that is most suitable for use and the enviroment

4. ERGONOMICS

- We have to consider the design of appliances, products, systems or methods related to the human body
- The have to be comfortable to use and should not affect the human body
- We also have to consider the limitations of our body when designing something (don't design something too small, too big, too high...)

5. AESTHETIC

- When designing something we should take into consideration the appearance of the product in order to catch the attention of the user
- We have to chose something that will affect the psychological perception such as shape, color, texture, materials that make the product

6. MAINTENANCE

- When designing something we have to consider the parts that need to be replaced or repaired
- It shold be easy to operate on it and find the replacement parts

7. COST

- Pre-evaluation of the workpiece, its construction plan and materials can help use decide the budget that will be used for creating one product
- We need to include all the parts and elements, and get an estimate cost, or otherwise we will have a problem with the budget later

8. MATERIAL AND PROCESS

- When designing we have to choose the materials that match with the functions of the prodcut and how it will be used
- We should not use something that is too complicated to use in the process of making
- Use materials that are easy to find

PACKING AND HANDLING

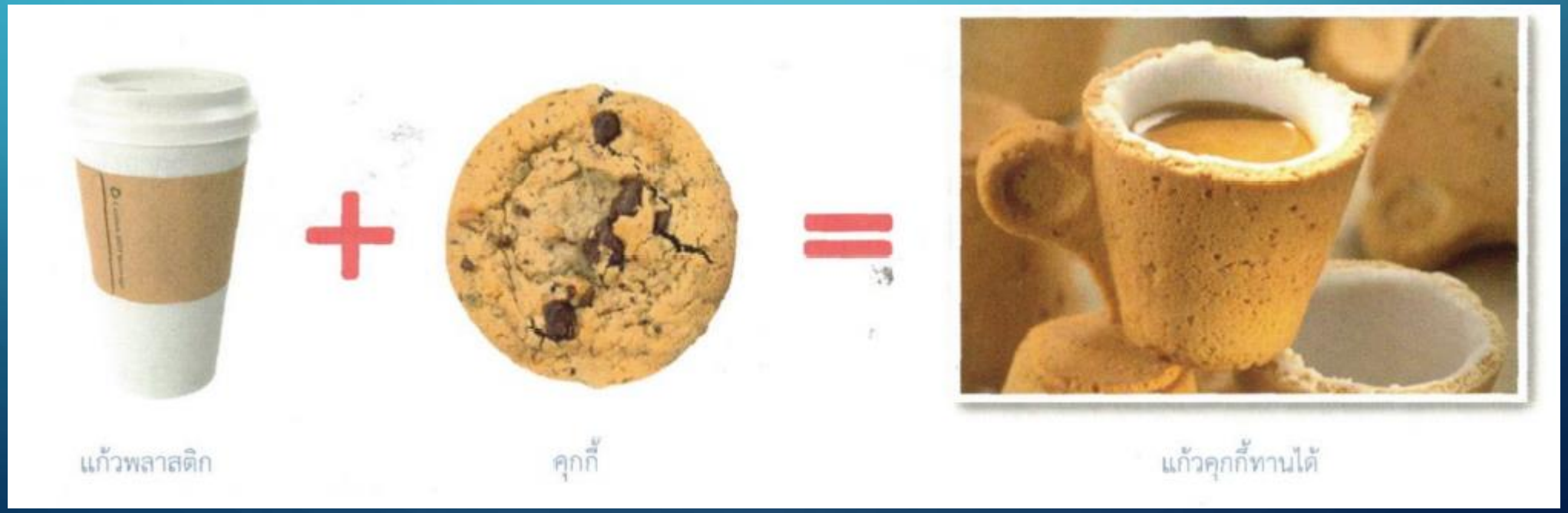
- Excpet these 8 rules we need to think about how easy will it be to pack it and transffer to other places
- Will it be good for the environment (i.e. save energy, use natural materials, use reused or recycled materials, make less waste during production)

CREATIVITY OF THE DESIGN

- Every person has an ability to use its creativity to respond a problem in a wide, diverse, new and valuable way
- By being able to think, adapt and combine we can create new things
- Problem solving in engineering needs knowledge, resources and creativity to create different methods and products

EXAMPLE 1: COOKIE CUP

- Instead of using plastic cups for coffe we can make cups form cookies and after we finish drinking we can eat it



EXAMPLE 2: PENCIL MADE FROM NEWSPAPER

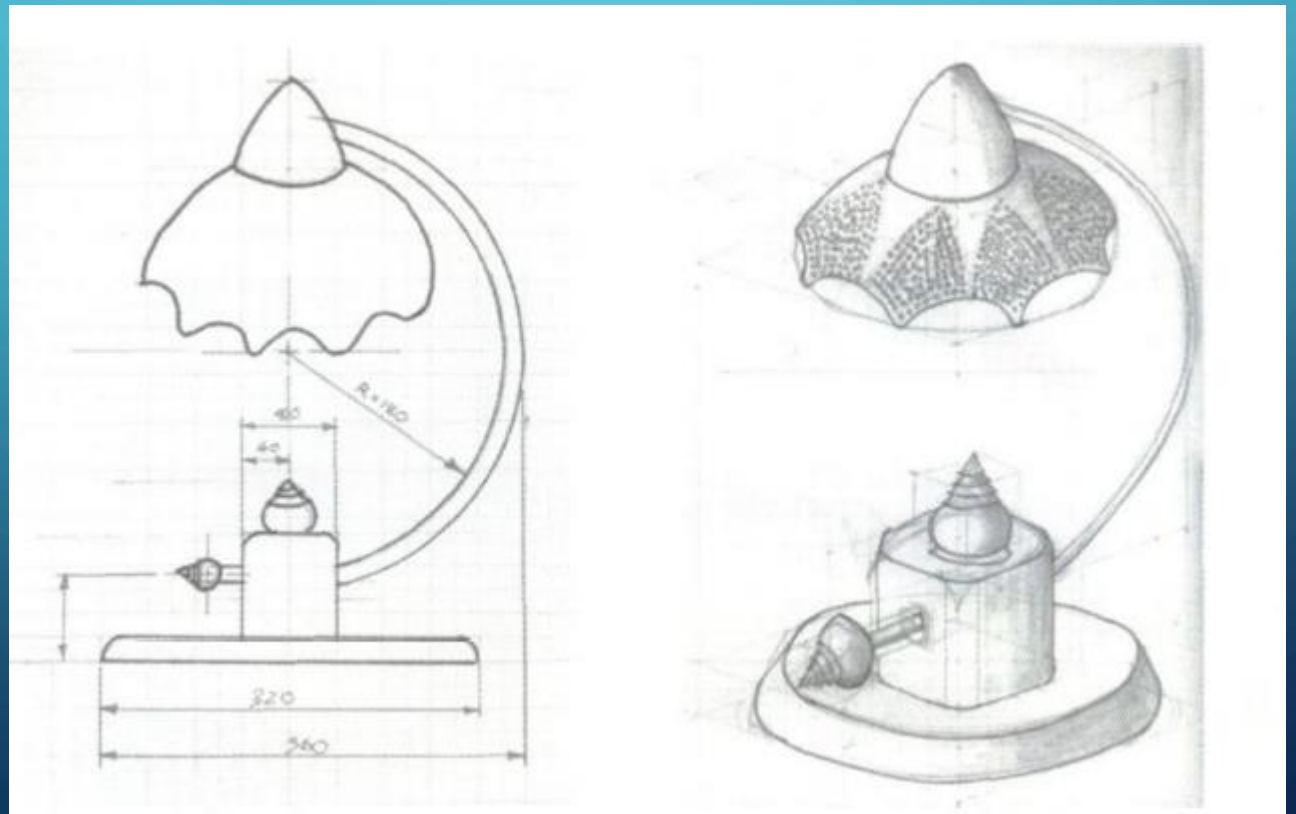
- We can reuse old newspaper and make pencils out of them, this way we reduce the use of wood

DESIGNING THE SOLUTION TO THE PROBLEM

- After choosing the solution, we can design the idea in many ways, such as sketching, drawing, flowchart diagrams, explaining the steps...
- We do that to summarize concepts and to make it easier to communicate to others

1. SKETCHING

- Is a way of showing the idea of the solution in which the picture must show details in each part
- It should also show shapes, functions and internal mechanisms



2. MAKING A DIAGRAM

- It is a way to show the idea of a solution by creating a sequence of work procedures in a form of showing pictures of how the solution works or how to solve the problem from start to finish

3. FLOWCHART

- It is a way to show ideas of the solution that are expressing the workflow from the begining to the end by using standard symbols

MODELING THE SOLUTION

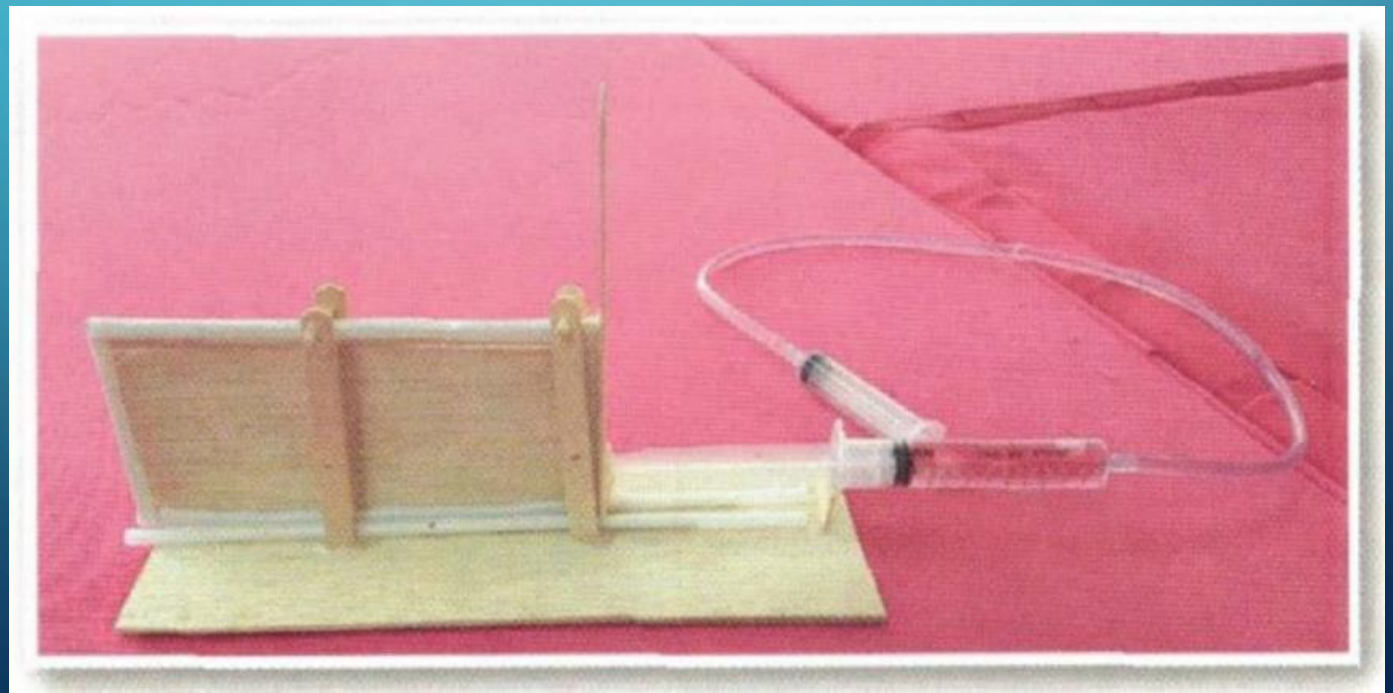
- When we have designed the solution, we should try to create a model
- The purpose of the model is to study, analyze, examine and present the desired concepts
- There are many types of models, such as working model and design model

DESIGN MODEL

- The model is created to study or present the shape of the workpiece in a short time
- The materials used should be materials that can be easily folded and connected together

THE FUNCTIONAL MODEL

- Functional model is a model that doesn't focus on the shape but on testing the work componnets such as electrical circuits, mechanisms...
- Materials that are used to create functional models should be cheap and easy to fnd



THE END