



Design &
Manufacture

Notes Booklet

Once a specification has been drawn up it is then the task of the designers to start generating possible solutions to the problem. There are a number of idea generation techniques which can be used to support this process

Morphological Analysis

This is when you create lists of the different variations you could make a product then mix and match between options to create different solutions.

Steps/Key stages:

- Identify the different factors that could be changed in a product and use them to create columns.
e.g Material, power source, target market, function etc
- Identify the different options that could be available for each of these factors/columns and complete the table
e.g Material: wood, metal, plastic, glass, composite
- Select a different option for each factor/column and design a product with these options
- Repeat this process using different options from each column to create a wide range of ideas

Exam Question

Example: Design a cartoon alien

If I was designing a cartoon alien I would think of the factors I could change such as eyes and teeth.

Then I would think about what options I could have for each of these factors so I could be thinking of different numbers, shapes or colours and using these to complete the table.

Eyes	Legs	Teeth	Shape
1	Hairy	Sharp	Round
2	Long	Square	Square
4	Short	None	Polygon
5	None	Round	Wavy



Random Picture Technique/Pencil for a walk

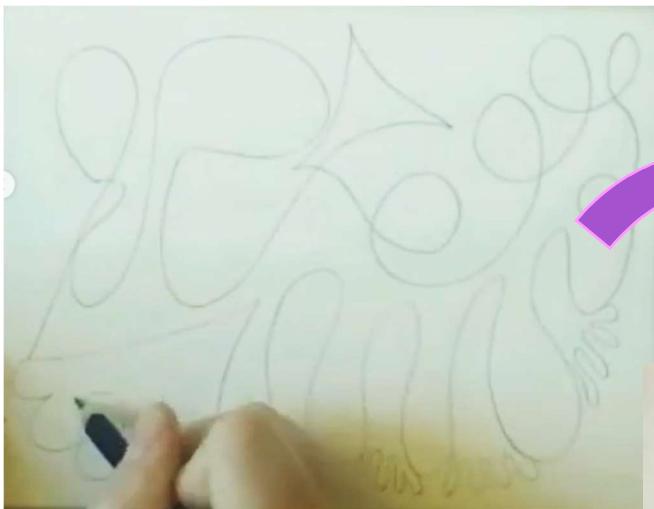
Uses randomly generated shapes to inspire a products design.

Steps/Key stages:

- Without lifting your pencil off the page fill your paper with random lines and shapes
- Identify a shape or pattern within the lines that you can use to inspire your design; this might be the overall shape or a component part
- Use this shape to generate a design solution.

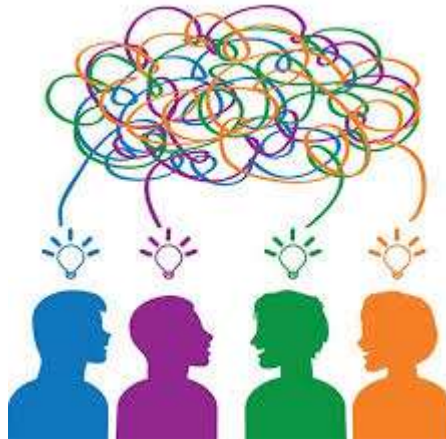
Example: Monster design

Trying not to take my pencil off the paper too often I drew a series of random shapes
I then looked at the shape as a whole and added in basic detail/made changes
Finally I added colour and detail



Brainstorming

This is when the design team come together to solve a design problem. The design brief is pitched to the team and all ideas are written down and discussed. The benefit of this techniques is that it is a group activity and one person's idea might spark another idea from another team member. At the end of the activity the best ideas are discussed, and the team agree which idea(s) to take forward.



Steps/Key stages:

- Decide on the best method of pitching the brief/problem to the team
- Decide on who best to include in the activity, where and how long the activity should last for
- Pitch the idea to the team and jot down everyone's ideas; good or bad!
- When the time is up review the ideas and suggestions made and identify the best ideas to take forward

Example: Car design

If I was designing a new car I would be thinking about all the different possibilities and things I could change or add.



SCAMPER

Scamper is an acronym and is a method used to help improve or adapt existing ideas or products

S – Substitute; material, part, technology

C – Combine; parts features, materials

A – Adapt; a feature or part for another use

M – Modify: change the scale, colour, target market

P – Put to another use: repurpose functions, incorporate recycled materials

E – Eliminate; remove elements, features or excess material

R – Reverse; turn the product inside out, flip/rotate the shape

Example: Carabiner Clip

Shown below is a high quality sketching exercise looking at all the things that could be changed about this current design, what else could it be used for, how could it be improved. Etc

