The PROCESS of DESIGN

NAME: _____

CLASS: _____

INTRODUCTION

The 'Design Process' is the secret sauce of successful designers and engineers. It is the step-by-step process that is followed to ensure new products or services will work as intended.

In Design & Manufacture, you are expected to know, understand and follow the Design Process. It will help you gain success in this course and beyond.

You will face questions in your exam covering the 'Design Process'. Use this book to prepare yourself and answer all the questions. Make sure you have your teacher mark your work.

You will also be expected to follow the Design Process in any project you do, and also in your final Assignment.

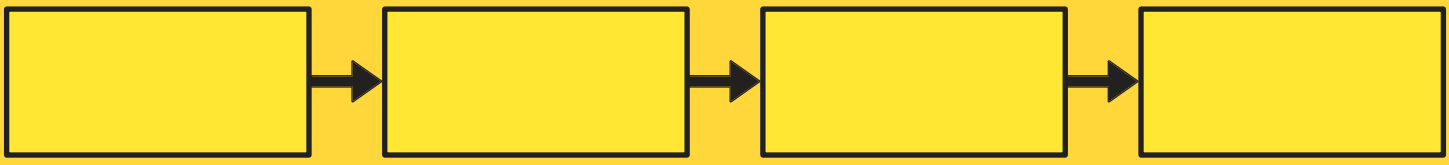
LEARNING CHECKLIST

In this unit of learning, you will cover the following topics:

The Design Process
Open and Closed Briefs
Planning Research
Surveys & Questionnaires
User Trials / User Trips
Types of Research
Presenting Research
Creating Design Specifications

THE DESIGN PROCESS...

The first four steps of the 'Design Process' are perhaps the most critical. They form the bedrock of your designs. State the name of the first four stages in the boxes below. Commit these stages to memory.



Explain why designers and engineers always follow the same design process.

_____
_____
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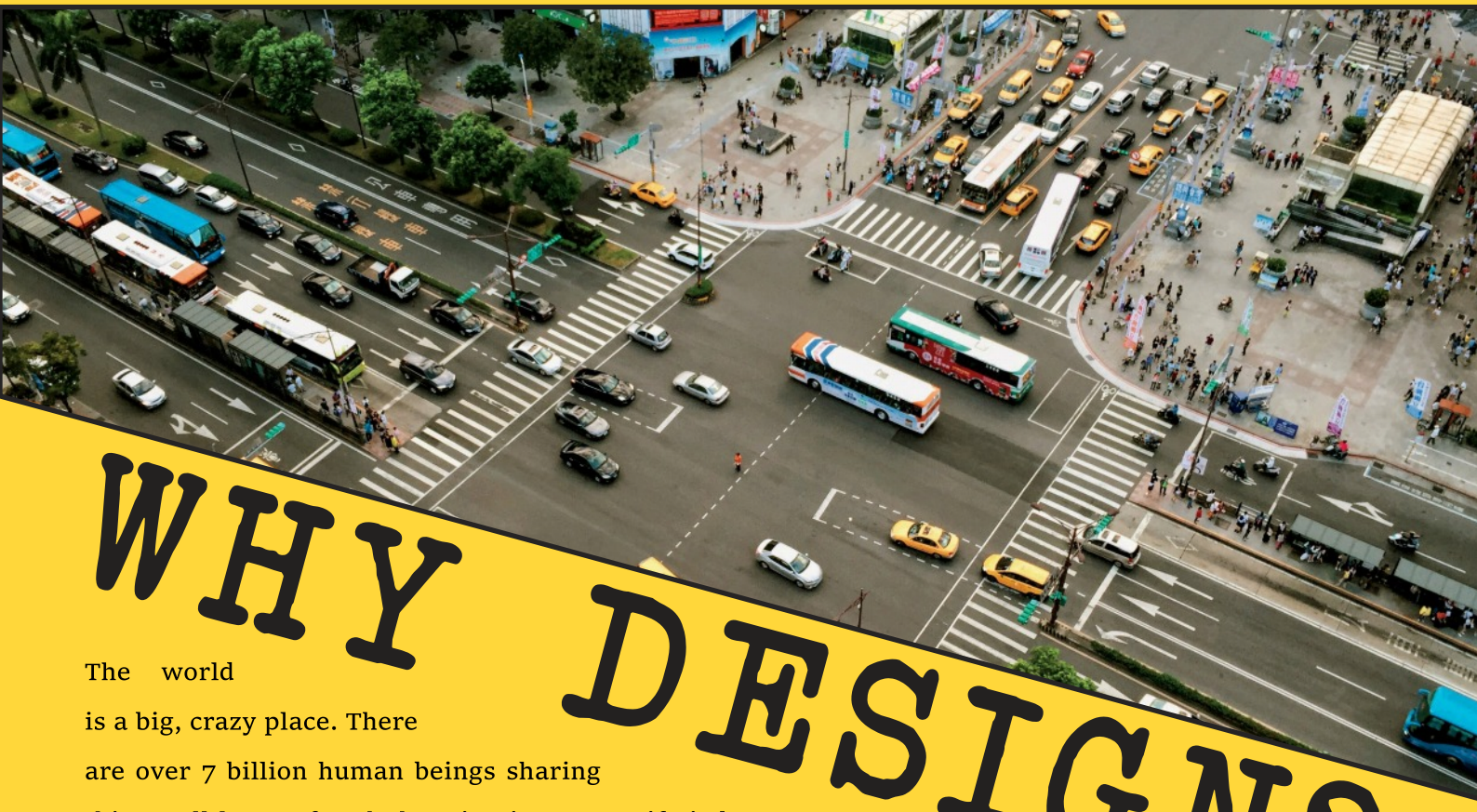
_____(2 MARKS)



WHY DESIGN?

The world is a big, crazy place. There are over 7 billion human beings sharing this small lump of rock, hanging in space. Life is busy, crowded and a competition for resources. We create products and services to make our lives slightly better. Except, most of the things we create mostly suck. They make our lives more complex, destroy our environment and cost far too much for most people on the planet. Good design can solve this.

Describe one product, service or scenario that needs to be improved.

_____

_____

_____

_____

_____

_____(3 MARKS)

Explain the term 'sustainability', and why it is an essential consideration for designers and engineers.

_____

_____

_____

_____

_____

_____(3 MARKS)

KNOW YOUR BRIEFS!

The Design Process must start somewhere.

And it does, with the 'Design Brief'.

The Design Brief is a description of a problem. The problem can be for a person, group of people, animal, product, service or environment.

Design Briefs can contain lots of information.

It is important to analyse Design Briefs in detail. You will need to find all the areas that need to be researched, and what limitations will be upon your design.

For your Exam and Assignment, you will need to be able to write design briefs, as well as analyse them.

There are two types of Design Brief. You need to understand each type of design brief. You will be taught this in class, or you can research this. Ensure you understand the **two** types of Design Brief.

Describe an 'open brief', including advantages and disadvantages.

(# MARKS)

Describe a 'closed brief', including advantages and disadvantages.

(# MARKS)

RESEARCH

Research is the backbone of good design. Once you have a 'Design Brief', you need to analyse is carefully and research how the different Design Factors will impact the design.

Your research must be focused on learning how to make a good design. Don't waste time on things that are irrelevant. Record all your research and make sure it is clearly presented.

Questionnaires and surveys

Describe the features of an 'open survey'.

(4 MARKS)

User Trips / User Trials

Describe the features of a 'User Trip/Trial'.

(4 MARKS)

WHAT DO YOU KNOW?

"Research is the real journey into the unknown"

Each Design Factor should be researched. However, how you research each Design Factor will be different. Remember, you want to get the most useful information possible.

Design Factor	Describe what this Design Factor means and why it is important.	Research Technique(s) that could be used to get useful data
FUNCTION		
PERFORMANCE		
AESTHETICS		
ERGONOMICS		
MARKET		

Walkie-Talkie

Vacuum Cleaner

Drinks Bottle

Three products are shown above, each completely different in every respect.

What needs to be researched for each? How would you conduct the research?

Download the worksheets from DesignClass.co.uk

Describe two different ways of conducting a 'Product Comparison'. Include what you could learn from this

(4 MARKS)

Describe the following terms used in relation to materials: Compression, Tension, Hardness, Buoyancy & Density.

(5 MARKS)

Explain why hygiene is an important consideration for design.

(2 MARKS)

PRESENT YOUR FINDINGS!

"There are known knowns.
There are known unknowns.
And there are unknown unknowns"

Research is great, unless of-course, you don't bother to draw any conclusions from it. Conducting research then ignoring the findings is maybe worse than doing no research at all.

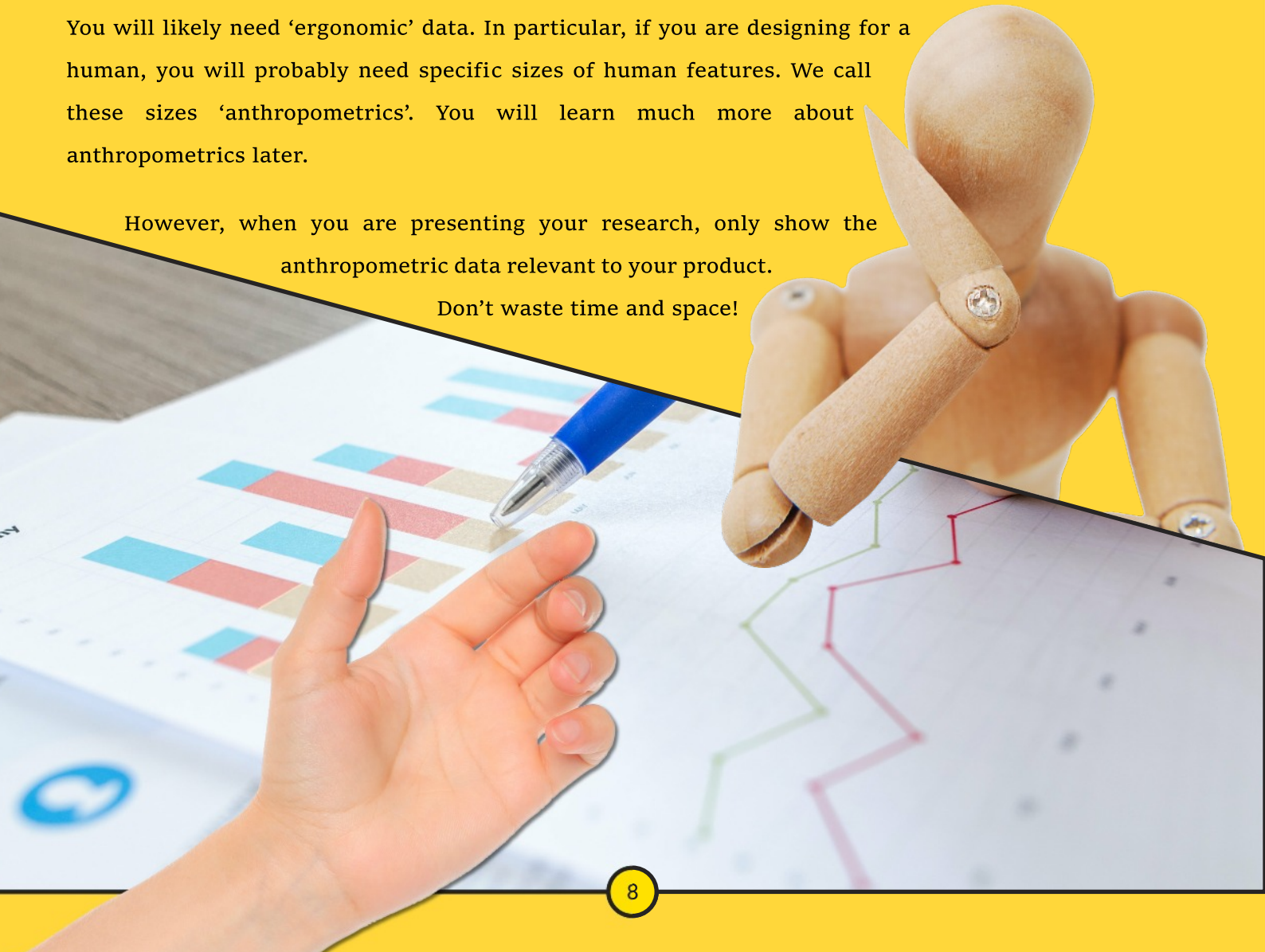
Designers and engineers must look closely at what they discovered from their research.

You must be able to present your research in a way that is easy to understand. You must also make conclusions based upon your research and present these conclusions clearly too. Also explain why the research was important and what you have learned from it. This is essential for any design Assignment.

You will likely need 'ergonomic' data. In particular, if you are designing for a human, you will probably need specific sizes of human features. We call these sizes 'anthropometrics'. You will learn much more about anthropometrics later.

However, when you are presenting your research, only show the anthropometric data relevant to your product.

Don't waste time and space!



GRAPHS & CHARTS

When dealing with surveys, polls or closed-question questionnaires, presenting your data in the form of graphs and charts can make the information far easier to understand.

There are a wide range of graphs and charts, and you should be able to choose the correct type for the data you are trying to represent. Your teacher will explain more about graphs and charts, or visit DesignClass.co.uk

Describe the best graph of chart to show the raw number of people that prefer something.

(2 MARKS)

Describe the best graph of chart to show the percentage of people that prefer something.

(2 MARKS)

Describe the best graph of chart to show a trend over time.

(2 MARKS)

BE SPECIFIC!

"Before designing anything make sure you know precisely what you are designing!"

Once you have conducted your research, it is time to convert your conclusions into a series of design rules - called a 'specification'. A specification is a key stage in the Design Process.

A specification must, well, specify some precise rules a design must follow if it is to succeed. Some specification points will come from the brief, but most will come from your research.

Design Factor	Describe what a Specification point must include for each Design Factor.	Make a symbol for annotation
FUNCTION		
PERFORMANCE		
SAFETY		
MATERIAL		
AESTHETICS		
MARKET		

Kettle #1

Kettle #2

Research the kettles shown above (or other kettles provided by your teacher.)

Create a specification point for **materials** for kettle #1 and kettle #2, above

(2 MARKS)

Create a specification point for **performance** for kettle #1 and kettle #2, above

2 MARKS)

Create a specification point for **safety** for kettle #1 and kettle #2, above

(2 MARKS)

Course Notes v1.1