

Practice Assignment - Design Component



N5

Design and Manufacture
Research pro forma

SQA

Design brief: _____

Notes to candidates

Before you start to research you must select a brief and read the 'Instructions for candidates' which give details of the skills you must demonstrate and the type of evidence you must provide.

You should speak to your teacher or lecturer before you start if you are unclear about what is required for this assessment.

You must carry out research to gather information, including the requirements of the target market, to produce a detailed specification for the brief.

You must record your research information on this pro forma (you can use both sides).

You should use information from the brief and findings from your research to complete the specification below.

Specification

The product must:

- allow you to demonstrate appropriate practical skills
- Toy must be made out of available materials most likely red pine and MDF
- Toy must adhere to the CE mark regulations
- Toy must be small enough to fit inside 300x190x100mm box
- My toy will be a stacking toy
- Components for stacking toy have to fit in the hands of 18 months - 2 year old child in the 95thile
- Toy should include primary colours to fit in with survey complete
- My toy and box must have high quality finish to make more aesthetic and also must not contain lead or chemicals that could provoke cancer
- Toy must be durable and reusable to help reduce amount of waste helping the environment

Research findings – you can use both sides of this pro forma

Research Areas

The mind map for 'Toy Research' branches into several areas:

- Existing products** (connected to 'sizes')
- Consumer sizes** (connected to 'existing products')
- Anthropometrics** (connected to 'existing products')
- Materials available** (connected to 'cost of materials')
- Box** (connected to 'cost of materials')
- Health and safety** (connected to 'laws / rules')
- Specific to age category** (connected to 'reviews')
- Opinions** (connected to 'parents' and 'market research')
- Consumer surveys** (connected to 'opinions')
- Age Group / Target market** (connected to 'gender' and 'age')
- Aesthetics** (connected to 'colour' and 'available finishes')
- Available finishes** (connected to 'paint' and 'wax')

Name: _____

The sketches and notes include:

- Box lid**: A sketch of a box lid with the text 'for box lid, handle could be associated with chosen toy'.
- Boat toys**: A sketch of a boat with the text 'all areas covered in sheets' and 'no sharp edges so less dangerous 3 chamfers'.
- Environment**: A note stating 'toys should be as much recyclable and reusable to help protect waste with environment'.
- Stacking toy**: A sketch of a stacking toy with the text 'could turn into a stacking toy' and 'dynamic to keep user more attracted as could be used as stacking toy cars'.
- Toy cars**: A sketch of a toy car with the text 'add colours to cars to make more aesthetic for kids' and 'no sharp edges so suitable for younger age groups as it's more safe'.
- Stacking toy**: A sketch of a stacking toy with the text 'would have to be made out of a plastic or metal to make curves' and 'bright colours make more appealing to kids'.
- Stacking toy**: A sketch of a stacking toy with the text 'change colour of each to complement colours' and 'more complex shapes'.
- Stacking toy**: A sketch of a stacking toy with the text 'could make different parts sizes of circle' and 'could make different types of rings'.
- Stacking toy**: A sketch of a stacking toy with the text 'edge sizes of rods to make different' and 'more basic easier for works hop'.
- Stacking toy**: A sketch of a stacking toy with the text 'disassemble into' and 'could make multiple small attaching wheels larger one to fit inside box'.

Practice Assignment - Design Component



MDF stands for medium density fibre board

Material that is cheap so is more realistic

Pine

A cheaper and more readily available alternative to traditional hardwoods. Pine is a pale wood that can range from yellow to almost red in appearance. It's susceptible to wear and denting, especially in high traffic areas.

Beech

A hard durable wood that in its natural form comes in a variety of warm, soft honey tones. Steamed beech has been treated at high temperatures to create a unique red colouring.

- durable and better for environment

- too expensive for child's toy

- we have available in department

Ash

A light wood with a distinctive lustre when polished. It has an open grain and is reasonably hard wearing. Ash can be successfully stained to almost any colour.

downside is durability

box base made out of red pine

box lid and base made of MDF

finishes

Survey of what child's favourite colours are

survey tells us that blue and green are the most popular and orange was least popular

Clear Varnish

3. What colour does your child prefer.

More Details

Rank	Options
1	Blue
2	Green
3	Red
4	Yellow
5	Orange

mark approved meet standard

Conformite Europeene

survey so there is help with what consumer wants

First choice Last choice



blue and green most popular colours

Whether different components of box and toy will have different finishes

eg - box has varnish - toy has paint varnish and wax available in school



Finishes must adhere to British Standards

BSEN 71 series

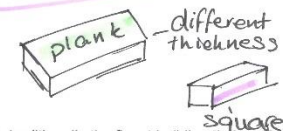
Toys must not contain lead or chemicals that could provoke cancer



primary colours more appealing to kids

Types of Wood

Forms of Supply



Oak

This is traditionally the finest building timber. Colours range from light to medium brown and it's mainly straight grained. Close-grained white oak has well pronounced and long rays. Red oak - so called because of its autumnal foliage - has more flecks and a defined grained finish. Both are heavy, hard-wearing and very strong.

Redwood, European

Pinus sylvestris is grown in Scandinavia, the Baltic states and the Russian commonwealth (the former USSR). It's also grown in the UK, where it's known as Scots pine or British pine. It's a pale yellowish-brown to red brown softwood, commonly used for construction, joinery and furniture.

red pine would be varnished to make it have a more appealing and aesthetic look

ash, oak and beech are more expensive so less suitable for a child's toy that could get ruined

grown in UK means less shipping costs

grown in the UK so less expensive and more eco friendly

Anthropometric data

Table 10.21 Anthropometric estimates for infants from 18 months to 2 years (all dimensions in mm)

Dimension	5th %ile	50th %ile	95th %ile	SD
1. Crown-heel length (11)	780	840	900	36
2. Crown-rump length (8)	490	525	555	20
3. Rump-knee length (13)	200	230	260	18
4. Knee-sole length (15)	210	230	255	13
5. Shoulder breadth (bideloid) (17)	205	230	250	14
6. Hip breadth (19)	150	175	200	15
7. Shoulder-elbow length (22)	145	165	180	11
8. Elbow-finger length (23)	200	220	240	12
9. Head length (26)	160	175	185	7
10. Head breadth (27)	125	130	140	5
11. Hand length (28)	85	95	105	6
12. Hand breadth (29)	45	50	55	3
13. Foot length (30)	115	125	140	8
14. Foot breadth (31)	45	55	60	4

Note: * Numbers in parentheses are the equivalent dimensions in adult tables. See notes on p. 176-7

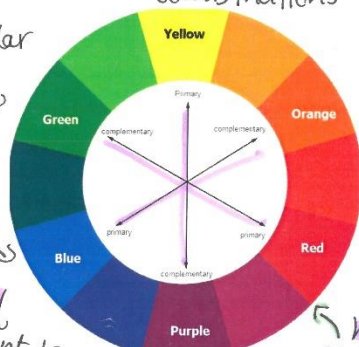
child hand sizes of 18 months to 2 years

hand sizes

helps decide what sizes to make toy so it suits target market

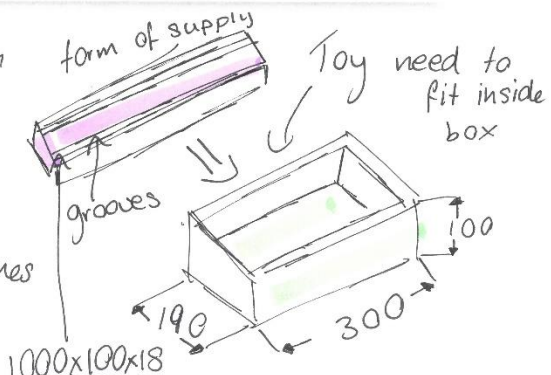
95th %ile to fit all hand length - 105mm hand breadth - 55mm

Colour wheel to help decide colour combinations

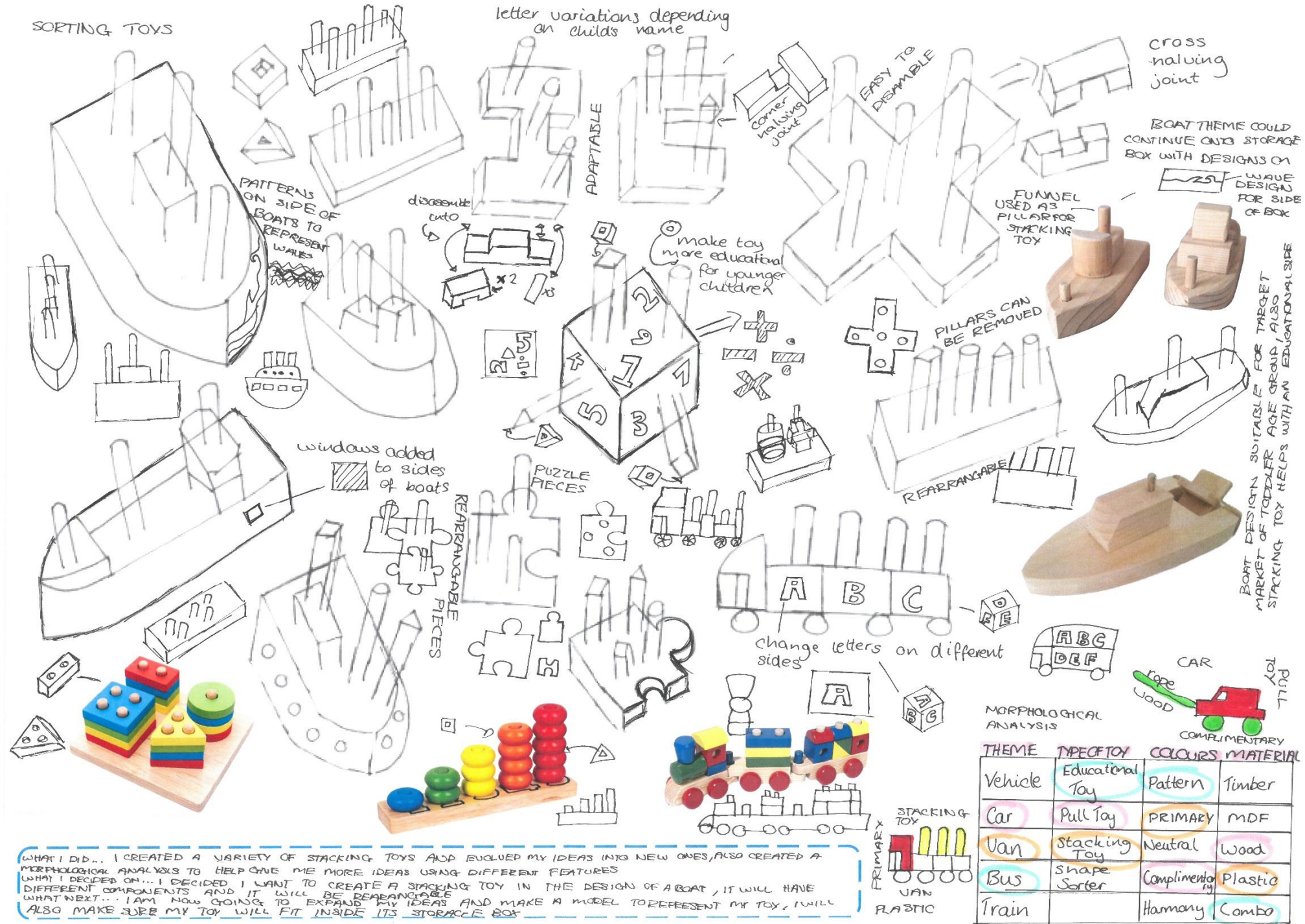


opposite from each other are colours that complement each other

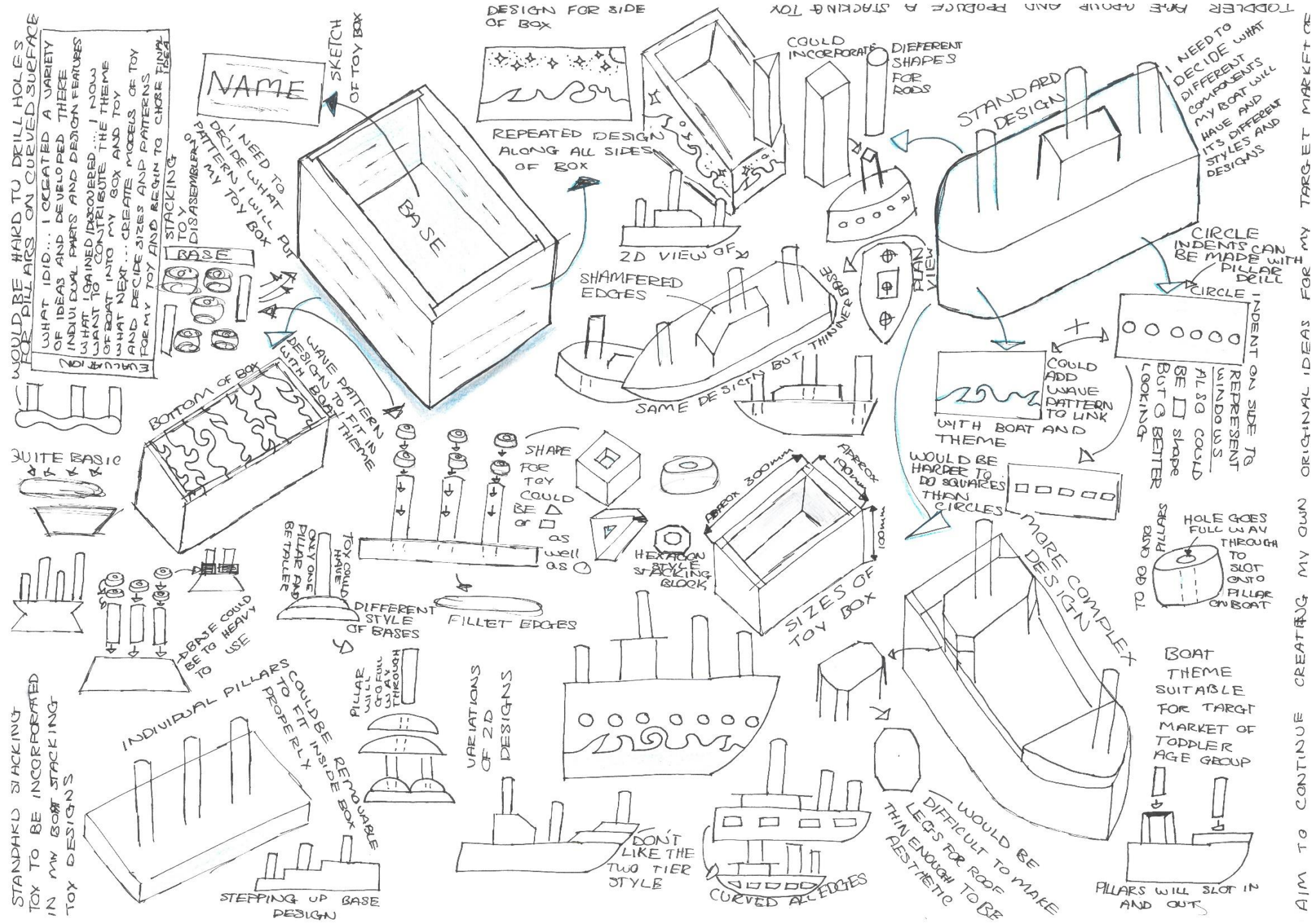
harmony colours are ones next to each other colours stand out from each other to appeal to kids



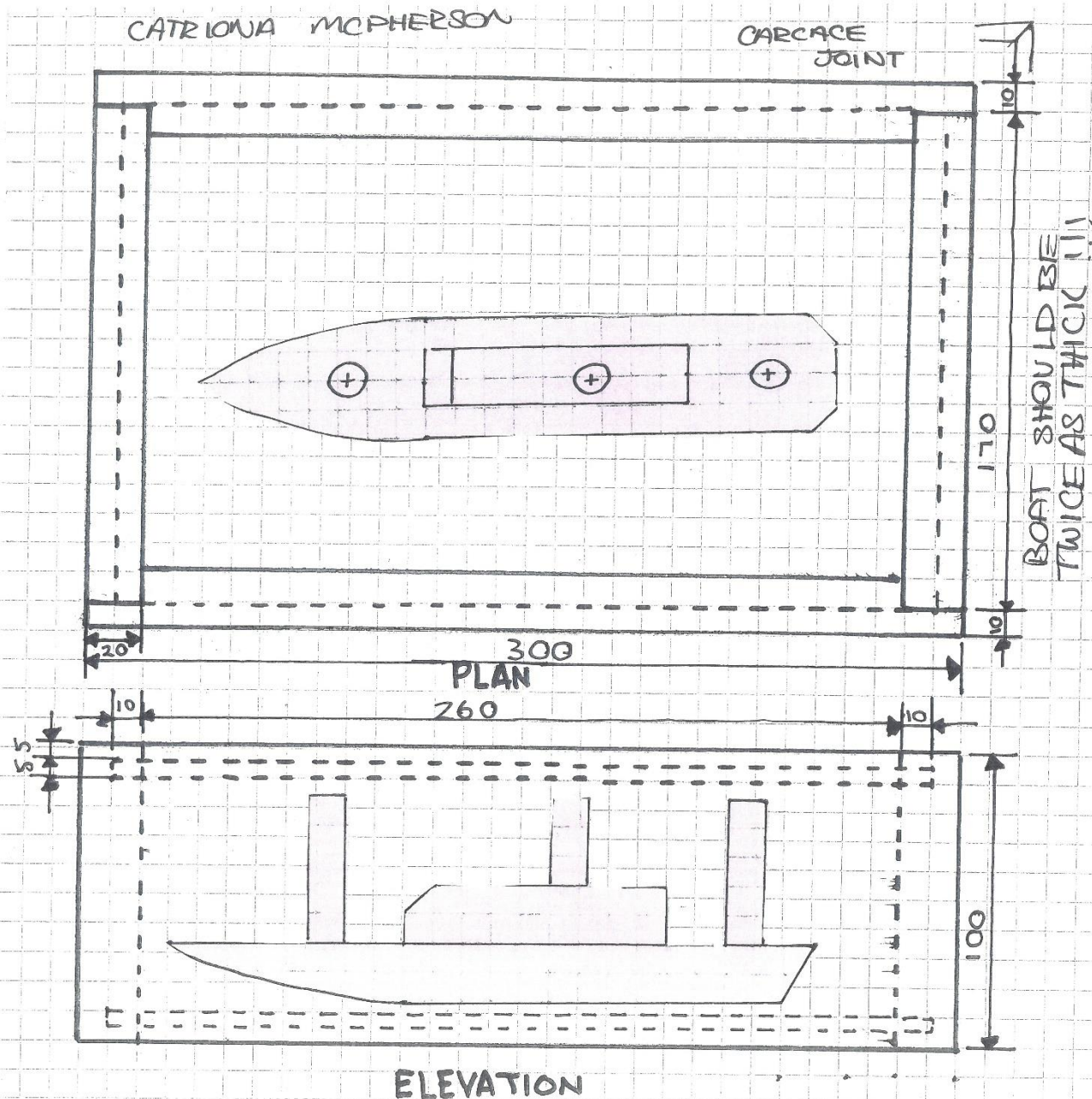
Practice Assignment - Design Component



Practice Assignment - Design Component



Practice Assignment - Design Component



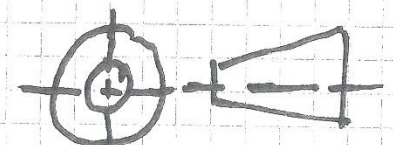
TASKS.

- ① SKETCH DIMENSIONS ON THE ELEVATION & PLAN
- ② FINISH OFF ELEVATION BY ADDING THE POSITION OF THE BASE (HIDDEN DETAIL)
- ③ CREATE CARD / PAPER MODEL OF YOUR BEST / MOST CHOSEN IDEA. REMEMBER THAT THEY MUST BE HALF SCALE
- ④ SCAN THIS PAGE WITH MODELS ON THEM.

ALL DIMS IN MM

WHAT DOES THIS MEAN?

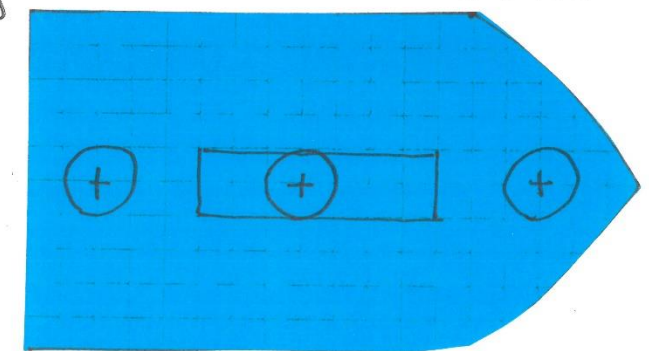
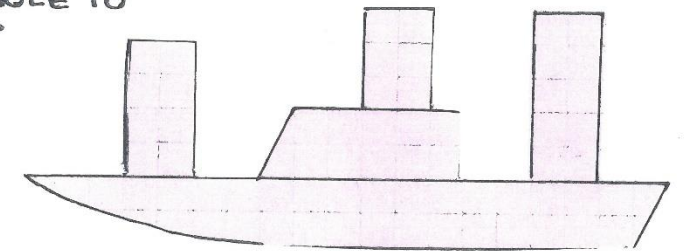
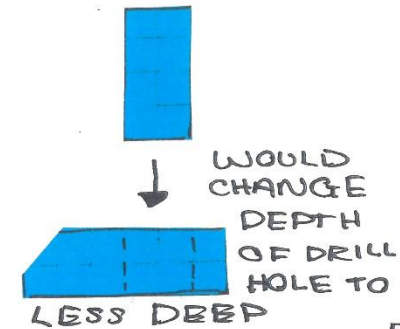
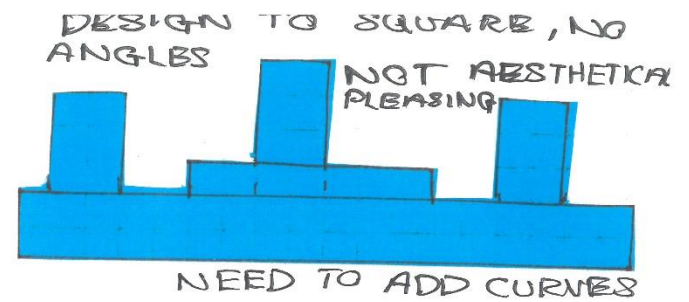
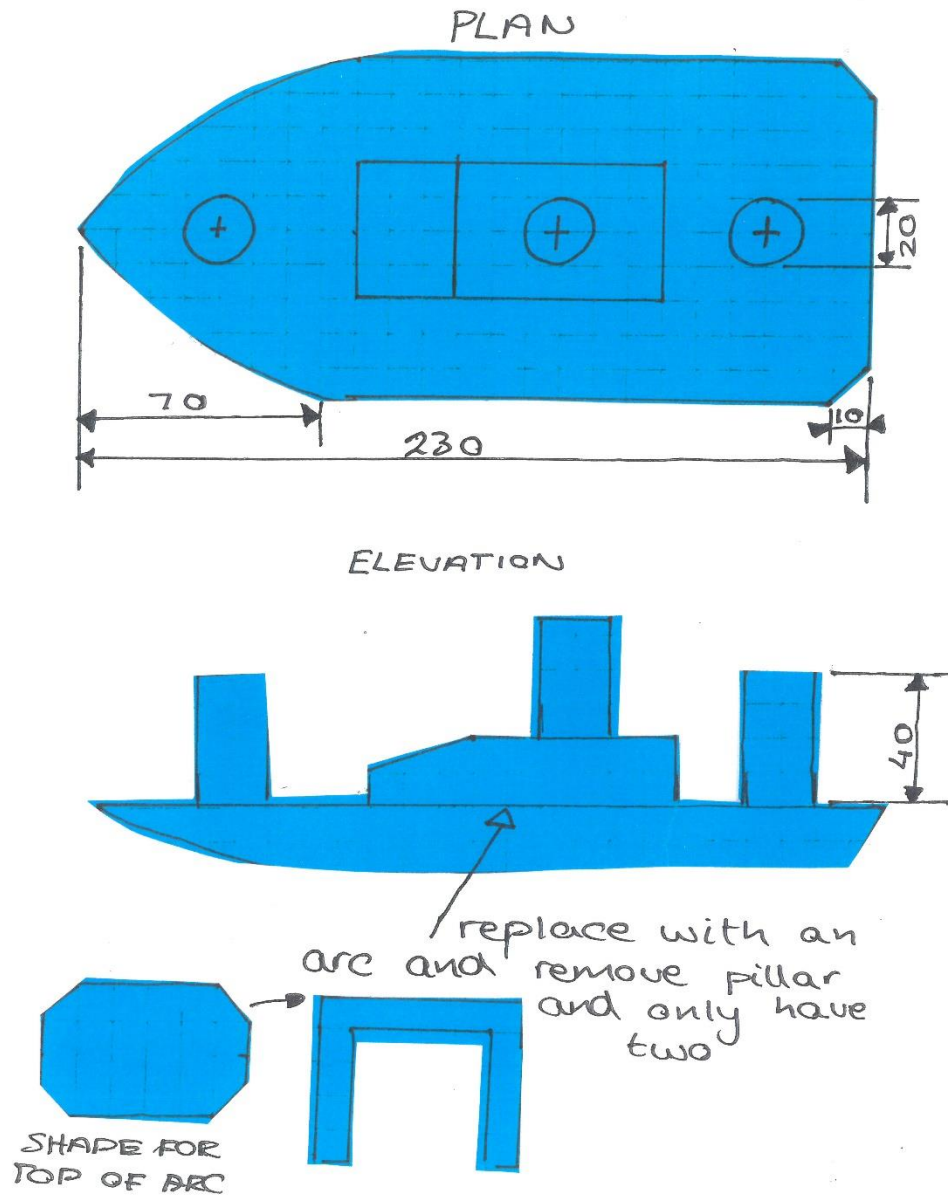
SCALE 1:2



TOY BOX ORTHOGRAPHIC DRAWING

26-10-20

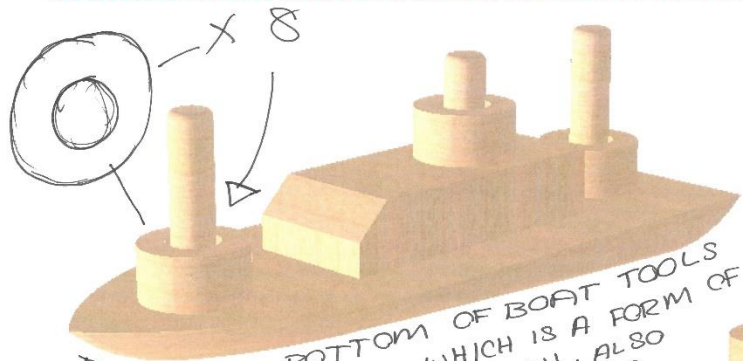
Practice Assignment - Design Component



Practice Assignment - Design Component



WHAT I DID... I FINALISED MY DESIGN AND HOW IT WILL BE MANUFACTURED AND PUT TOGETHER ALSO THE JOINTS IN THE BOX AND WHETHER IT MEETS MY SPECIFICATION WHAT I GAINED... A FULL UNDERSTANDING OF HOW I WILL MAKE MY TOY IN WORKSHOP WHAT NEXT... CREATE A CUTTING LIST AND A WORKING DRAWING FOR MY TOY.

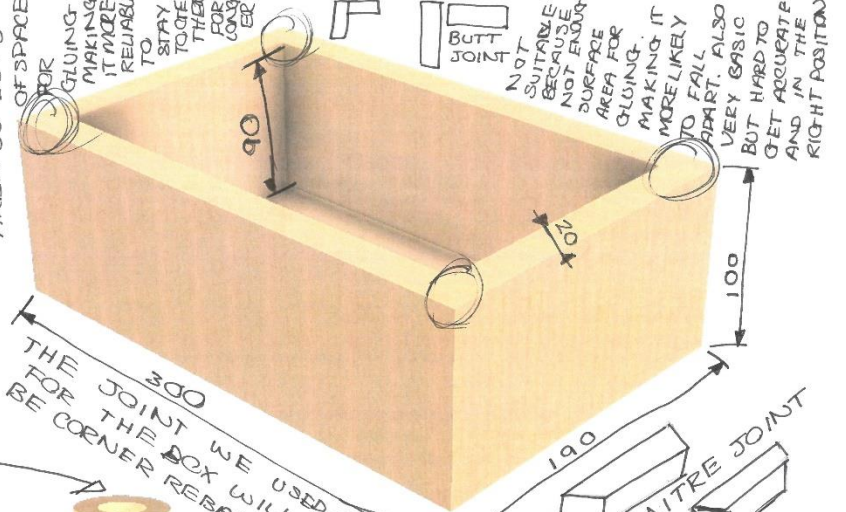
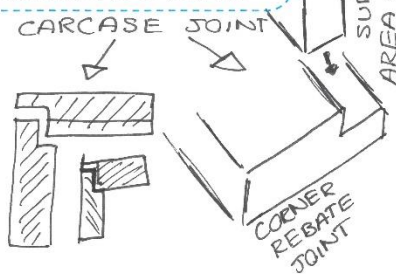


TO ROUND BOTTOM OF BOAT TOOLS USED ARE A RASP WHICH IS A FORM OF FILE WITH VERY SHARP TEETH, ALSO CHISELS AND SANDPAPER TO GIVE A ROUND SMOOTH BASE

ASSEMBLY ORDER

- 2ND LEVEL OF BOAT IS APPLIED TO BOAT BASE USING PVA GLUE
- STACKING TOY PILLARS GLUED INTO BOAT BASE USING PVA GLUE TO MAKE FLUSH WITH BOTTOM OF HOLES
- TOYS FOR PILLAR NOT GLUED

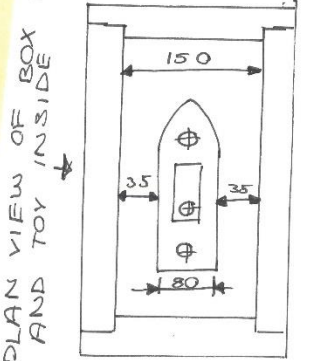
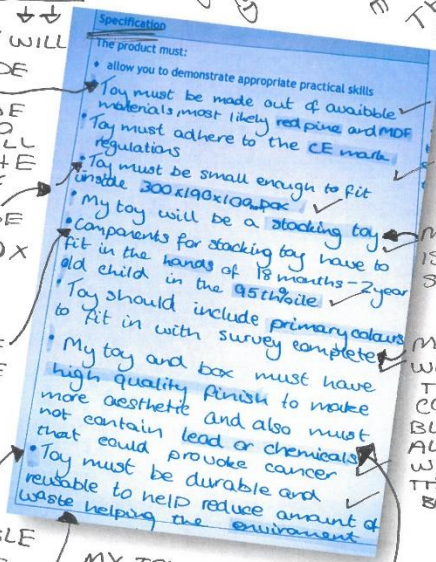
ONTO PILLAR THEY CAN BE PLACED INTO PILLARS HOWEVER SO THEY CAN BE EASILY KEPT TOGETHER MAKING IT SUITABLE FOR TARGET MARKET OF TODDLERS WHO ARE MORE LIKELY TO LOSE PARTS.



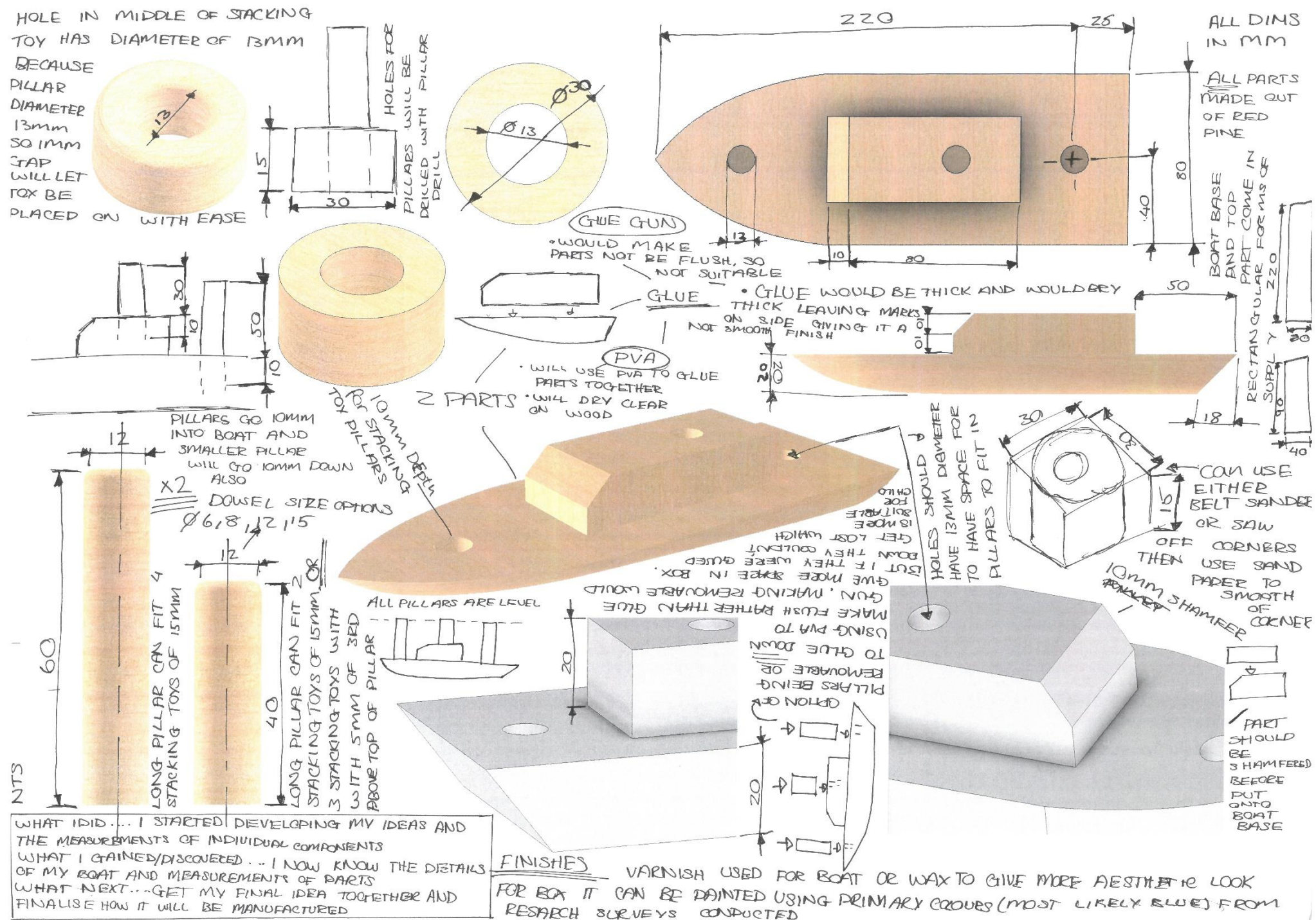
THE JOINT WE USED FOR THE BOX WILL BE CORNER REBATE JOINTS

CHECKLIST OF SPECIFICATIONS

- MY TOY WILL BE MADE OUT OF RED PINE AND SO WILL THE BOX
- MY TOY WILL FIT INSIDE BOX AS IT IS 220 X 80 X 70 INSIDE BOX OF 260 X 150 X 90 BOX
- MY TOY COMPONENTS ARE SMALL ENOUGH TO FIT INSIDE A CHILD OF 18 MONTHS - 2 YEARS
- TOY IS MADE OUT OF RED PINE WHICH IS DURABLE TO REDUCE AMOUNT OF WASTE
- BOX IS ALSO MADE OUT OF RED PINE SO ALSO DURABLE
- MY TOY DOES NOT INCLUDE SOLVENTS IN THE PVA GLUE WHICH IF THERE WAS COULD BE DANGEROUS TO BREATHE IN



Practice Assignment - Design Component



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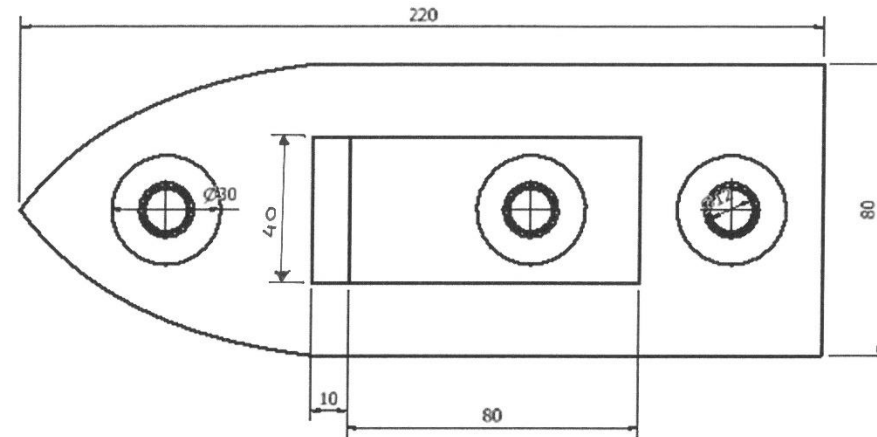
Sequence of operations

Stage	Operation	Tools/equipment
1	MARK OUT MEASUREMENTS ON BASE AND PART TO GO ON BASE	STEEL RULE, TRY SQUARE, MARKING GAUGE
2	ROUND BASE OF BOAT	RASP, BEVEL EDGE CHISEL, SAND PAPER
3	CUT DIAGONALS ON BASE AND TOP	TENON SAW
4	MARK OUT ϕ OF OUTSIDE OF STACKING TOY PARTS AND INSIDE ϕ	COMPASS
5	DRILL DRILL HOLES FOR STACKING TOY PARTS AND BOAT BASE	PILLAR DRILL
6	CUT EDGES OF STACKING TOY PARTS THEN ROUND	TENON SAW, CHISEL, SAND PAPER
7	GLUE BOAT TOP AND DOWELS ONTO BASE	PVA GLUE
8	ADD FINISHES	VARNISH, PAINT

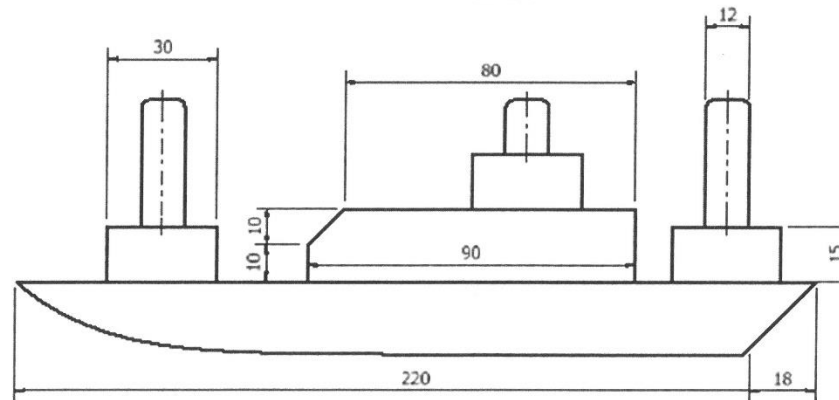
Cutting list

(all sizes in mm)

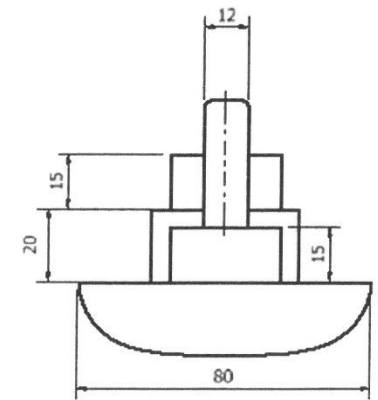
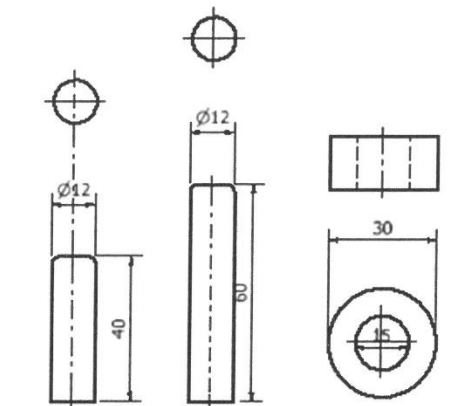
Part	Material	Quantity	Length	Breadth	Thickness
1	RED PINE	1	220	80	20
2	RED PINE	1	90	40	20
3	RAMIN DOWEL	2	60	$\phi 12$	$\phi 12$
4	RAMIN DOWEL	1	40	$\phi 12$	$\phi 12$
5	RED PINE	8	30	30	15



PLAN



ELEVATION



END ELEVATION