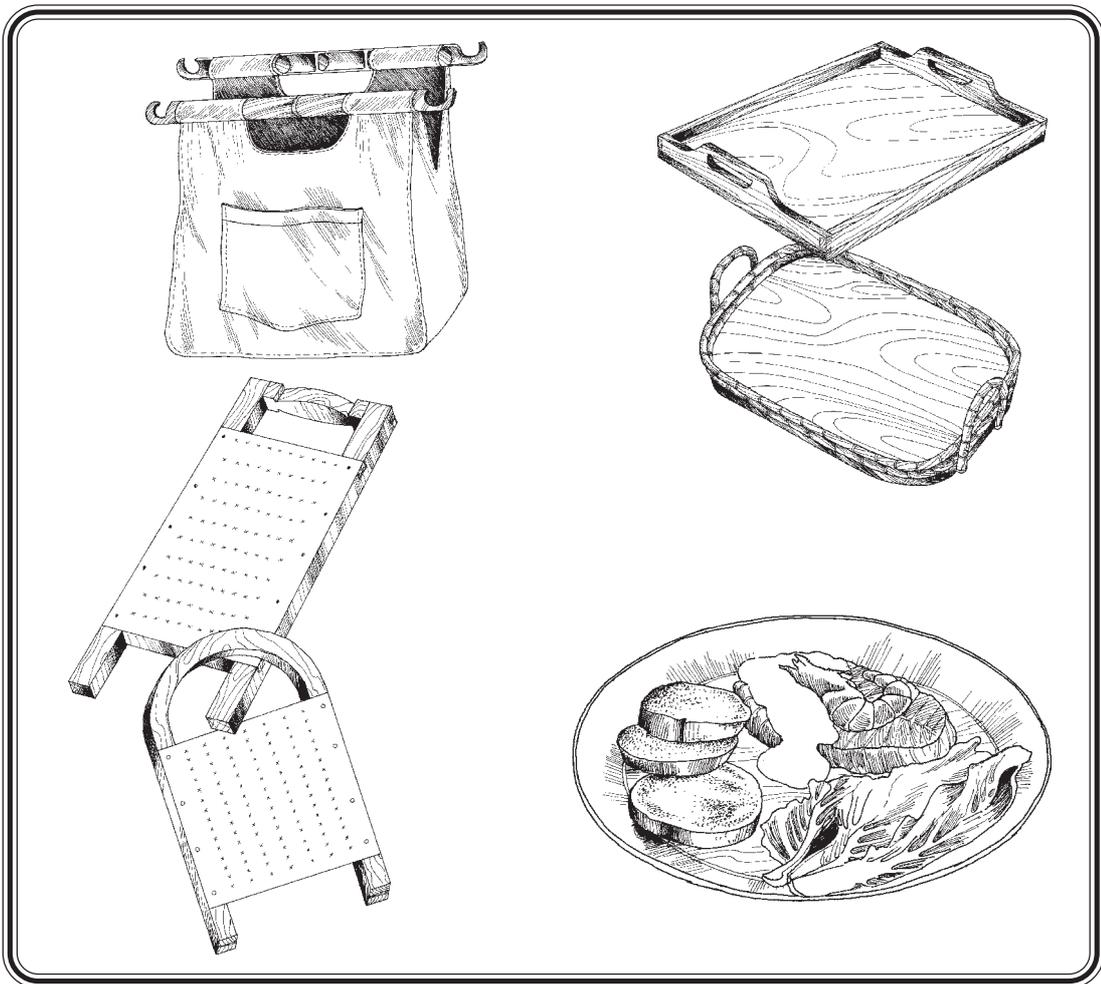


TECHNOLOGY

STUDENT'S BOOK



Year 8

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Year 8

**Ministry of Education
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Note to the Student

The design briefs in this book are suggestions only and it is hoped that you, the student, will become creative and produce your own designs as this is the purpose of this Student's Book. It is hoped that you will not just copy what is already in the book, as this will indicate to the teacher that you are not really interested in technology, and making an effort to improve the design will show you want to improve your ability in this subject.

Design Brief: Food Grater

Problem

Design a device to make it possible to grate any kind of food.

Restrictions

Its size – between 15 and 25 cm in width and 30 and 35 cm in length.

It must be easy to wash.

It must be portable.

It must be able to be hung up.

It must be able to be used for a long time.

It should be strong and not breakable.

Investigations

Materials

Consider a range of materials which may be useful in making the grater.

Think about the size of the grater and size of punch used.

Consider the use of any locally available materials (cost).

Processes

Write down any information about the processes which would be involved in using the materials.

Tools

Different types of tools to be used.

How to make the grater.

Safety

Solution

Draw a number of sketches for designing the grater.

Choose one to make detailed drawings of the joints and features.

Draw a final solution in 3 dimensions.

Manufacture

Follow the information you have gathered in your investigation on materials, processes and tools, and the design to make your grater.

Evaluation

Is it accurate?

Are you pleased with the final outcome?

Are you pleased with the choice of materials?

If not, what materials would you choose instead?

Will the grater be useful?

If not, what will happen to it?

What did you learn from this project?

Did you enjoy doing the project?

Design Brief: Tea Tray

Problem

Design and make a tray to hold drinking cups.

Restrictions

It must be waterproof.
The handle should fit the hand well.
It must not be too heavy.

Investigation

Examine a range of materials to determine which would be suitable for use in making this tray.
Give information on the processes which would be required to complete the tray.
Identify, list and describe the various tools which may be used in the manufacture.
Investigate the safety procedures you may have to employ in making this tray.
Examine other tea trays and shapes to see what makes a good tray.

Solution

Draw at least five different ideas for your tray.
Choose one and develop by drawing details and features of joints etc.
Draw a final solution in 3 dimensions. Colour it if possible to make it look as real as possible.

Manufacture

Use and handle tools safely. Follow the safety procedures you have identified.
All parts must be finished according to good craft practices.
Sand all parts before assembly.

Evaluation

After completing the project answer the following questions:
Are you satisfied with the final outcome?
If not, then why not?
What new skills have you learnt in carrying out this project?
Is there anything about your tray you would like to change?

Design Brief: Pencil Case

Problem

Design and make a container to hold pencils, pens, erasers and other materials to be used in school (pencil box or bag).

Restrictions

It should be able to hold the pencils etc.

It should be large enough to hold everything, but small enough to fit into a school bag.

It must be able to be closed tightly.

Investigation

This container can be constructed with any materials that are available or convenient.

Materials

Wood, bamboo, metal, plywood, hardwood, material (cloth), plastic.

Processes

Depending on the materials available, the teacher will need to help and guide the student in the appropriate methods of manufacture i.e. material (sewing machine), wood (working tools).

Students will need to take the measurements of the pens, pencils etc, so that the container is the right size.

Design

The shape will also depend on:

- (a) the material used,
- (b) the number of items to be placed in the container.

Timber is require that the container will be either rectangular or square in shape. Material will allow a little flexibility in design. Bamboo is cylindrical, and will create difficulties of storage.

Design Brief: Shoulder Bag

Problem

Design and make a shoulder bag.

Restrictions

Amount of cloth used should not exceed 1 metre in length.

The bag must have handles to hang over shoulder when carrying the bag.

Use machine stitching only on the bag.

Investigation

Cloth

What type would you choose for your bag? Give reasons why.

Materials

Which ones would you use to make up this bag? What would you use each material/equipment for?

Style

What shapes, sizes, etc. of bags have you seen?

Work procedure

Describe steps, in order of work that you would follow when making up bag.

Cost

How much does your bag cost? How do you find this out?

Solution

Draw three concept design ideas.

Choose one and proceed to develop it further, giving details such as size, shape, etc.

Manufacture

Make up the bag according to ideas developed above.

Design and work according to a time plan.

Evaluation

Is your bag completed? Did you complete it according to your time plan?

Does the finish product resemble your final design?

Are you happy with it?

Design Brief: An Item from Wool or Pandanus

Problem

You have in your classroom wool and/or pandanus leaves. You have to make an item out of these.

Restrictions

It must be functional.

It must be completed in four lessons.

Investigation

Item

What can you make using wool and/or pandanus?

Processes

What processes do you need to use to produce your selected item?

Time

Will you be able to complete this item in four lessons?

Materials

What do you know about wool and how it is prepared for use?

What do you know about preparing pandanus for use?

Solution

Produce three concept ideas (designs).

Develop one of these designs, with all the details you wish to have on it.

Manufacture

Prepare a time plan to show your procedure of work and what you intend to do each lesson.

Stick to this plan when making the item.

Evaluation

Did you complete the item on time, according to your plan? If not, why not?

Did you use all the processes and include all the details you had on your final design? If not, why not?

Are you happy with your work? Can you suggest any improvements?

Design Brief: Decorated Tablecloth

Problem

Design and make a decorated tablecloth.

Restrictions

It must be washable.

You must be able to iron it.

It must fit a coffee table.

It should also be able to be used for other purposes (e.g. as a TV screen cover).

* If your teacher wishes, you may make another item, such as a pillowcase, instead of a tablecloth.

Investigation

Size is an important factor. Examine a number of tablecloths to find a suitable size.

What makes a fabric suitable for using as a tablecloth?

Investigate a number of methods of decoration and give reason for your choice of method to be used.

List and describe the processes which will be involved in the making of your tablecloth.

Describe the tools which you will use and how they may be used safely.

Consider how cost may be a factor in your choice of materials.

Solution

Draw at least 4 different ideas for your decorated tablecloth.

Choose one to develop into a final solution. Draw details of edge seams and the decorative method you will use. Include any special features.

Prepare paper patterns where necessary.

Draw a final solution.

Manufacture

Use and handle tools safely.

Consult the teacher before using a machine you are not familiar with.

Evaluation

When you have completed your project, examine your tablecloth carefully and answer the following questions:

Are you pleased with what you have done? If not, why not?

If you were to make the tablecloth again, what things might you change or add?

What new skills have you learnt from this project?

Design Brief: An Item of Clothing

Problem

Design and make an item of clothing.

Restrictions

The amount of cloth should not be more than two metres.
It should illustrate the use of two different kinds of seam.
It should be completed in about fourteen lessons.

Investigation

Item

What are you going to make?

Materials

Cloth - What properties should this cloth have? Why?
What about colour?
What other things would you need to use in your sewing?

Size

Is the item of clothing for you or for someone else?
What size are you? How can you find out?

Cost

Calculate the cost of the necessary materials.
Can you afford them? If they are too expensive, how can you solve the problem?

Processes

How would you join the parts of the garment? Name the seams you could use.
What decorations or additional features could you have on the garment?
What processes would be used?

Safety and Health

Why should the cloth be absorbent?

Solution

Produce two concept ideas (designs) for a garment. Develop one to be your final one, with all necessary details on it.
What seams are you using?

Manufacture

Produce a job sequence for making up your item.
Make a time plan to follow when making up your item.

Evaluation

Did you complete your garment according to your time plan?

Does it match your original design? If not, why not?

Does it have on it the two types of seams? If not, why not?

Did you make any changes to the design while you were making the garment? If so, why?

Design Brief: Fish or Meat for Supper

Problem

You are cooking supper.

Restrictions

The protein foods you have in your kitchen are fish and meat.
You have to prepare and cook your dish and clean up during one lesson.

Investigation

Food

What do you know about meat and fish?
What are you cooking, meat or fish?

Cooking method

Which method are you going to use? Why?

Ingredients

What other ingredients do you need to cook your chosen dish?

Time

Do you have enough time to prepare, cook and clean up in one lesson?

Cost

How much will your dish cost?
If it is too expensive, how can you cut down the cost?

Safety and Health

What precautions must you take regarding safety and health, while you are carrying out your project?

Solution

Study different recipes and identify the one you are going to use.

Manufacture

Work out a work plan for members of your group to follow, to make sure each person participates fully.

Evaluation

Did you finish on time, according to your work plan?
Is your dish well cooked? If not, why not?
Do you like the taste? If not why not? What could you do to improve it?
Did all group members do their share of the work?

Design Brief: A Cheese, Milk or Egg Dish

Problem

You are cooking lunch.

Restrictions

The protein foods you have in your kitchen are milk, cheese and eggs.
You have to prepare and cook your dish and clean up during one lesson.

Investigation

Food

Are you using all three kinds of food in your dish? If not, which ones have you chosen?

What do you know about the foods you are using in your dish?

Cooking method

Which method are you going to use? Why?

Ingredients

What other ingredients do you need to cook your chosen dish?

Time

Do you have time to prepare, cook and clean up in the one lesson?

Cost

How much will your dish cost? If it is too expensive, how can you cut down the cost?

Solution

Study different recipes and make sure you are happy with your choice.

Manufacture

Produce a work plan for members of your work group to follow, to make sure that each person participates fully.

Evaluation

Did you finish on time according to your plan of work?

Is your dish well cooked? If not, why not?

Do you like its taste? If not, why not?

Did all the group members do their share of the work?

Design Brief: A Fruit and Vegetable Dish

Problem

You are preparing and/or cooking a dish for lunch.

Restrictions

You are using fruit and/or vegetables only.

You are preparing and/or cooking only one dish.

You have to complete this dish in only one lesson.

Investigation

Food

What do you know about fruit and vegetables?

What specific foods are you going to use?

Cooking method

What preparation or cooking method are you going to use?

Why did you choose this method?

Ingredients

What other ingredients do you need to cook this dish?

Time

Do you have time to prepare and/or cook your dish in the one lesson?

What about cleaning up afterwards?

Cost

How much does your dish cost? If it is too expensive, how can you cut down the cost?

Safety and Health

What precautions must you consider regarding health and safety while carrying out this project?

Solution

Study different recipes and make sure you are happy with your choice.

Manufacture

Produce a plan of work for members of your group, to make sure that each person participates fully.

Evaluation

Did you finish on time according to your plan of work?

Is your dish well cooked? If not, why not?

Do you like the taste? If not, why not?

Did all group members do their share of the tasks well?

Design Brief: Cereals

Problem

You are helping to cook the family meal.

Restrictions

You are cooking the cereal dish.

You have to prepare and cook this dish in one lesson.

Investigation

Food

What do you know about cereals?

What specific cereal are you going to use?

Cooking method

What cooking method are you going to use? Why did you choose this method?

Ingredients

What other ingredients will you have in this dish?

Time

Do you have time to prepare and cook your dish in one lesson? What about cleaning up afterwards?

Cost

How much does your dish cost?

If it is expensive, how can you cut down the cost?

Safety and health

What precautions must you consider regarding safety and health during your cooking lesson?

Solution

Study different recipes and make sure you are happy with your choice.

Manufacture

Produce a work plan for your group, to make sure each person participates fully.

Evaluation

Did you finish on time according to your plan of work?

Is your dish well cooked? If not, why not?

Do you like the taste? If not, why not?

Did all the group members do their share of the tasks well?

Design Brief: Making a Healthy Lunch

Problem

You have a small brother who attends primary school. Your mother is sick and you have to prepare your brother's lunch.

Restrictions

You can use either all or some of the following foods: cheese, milk and eggs.

You may also use some other food that you have available in your kitchen.

The cost of the dish must be less than VT 500.

You have to prepare, cook and clean up in one lesson.

Investigation

Food

Are you going to use all the three food mentioned in your dish?

If not, which one(s) have you chosen?

What do you know about the three foods that you are working with?

Cooking Method

Which cooking method have you chosen to use? Why?

Ingredients

What other ingredients are you going to need to cook your chosen dish?

Why?

Time

Do you have time to prepare, cook your chosen dish and clean up in one lesson?

Cost

Does your dish meet the maximum cost mentioned? It is it too expensive, can you cut the cost?

Safety and Health

What hygiene rules should you observe while working?

What safety rules should you keep in mind during the practical?

Solution

Is your work plan well detailed so that everyone participates fairly?

Manufacture

Follow your work plan so that everyone is involved in the preparation, cooking and cleaning up.

Evaluation

Was the work plan well followed? If not, why?

Did everyone participate fairly? If not, why?

Was the dish cooked on time? If not, why?

Did you enjoy the dish? If not, why?

Design Brief: Using Paper Maché

Problem

Most schools have lots of scrap paper that can be used to create something else. How can we recycle it?

Restriction

Use of only scrap paper

Investigation

1. Types of paper suitable/unsuitable
2. Softening
3. Time
4. Colouring
5. Binding
6. Base materials

Solution

Designs:

Picture frames
Book covers
Egg carton animals

Manufacture

Method of creating/producing.

Evaluation

Types of paper used
Method of colouring
Designs created
Could you do this again?
Would you change anything?
How does this benefit us? (The environment - recycling)

Design Brief: Money Container

Problem

Design and make a container to save your coins and/or notes inside.

Restrictions

It must be strong.

It must be portable and able to stand on its own.

It can be made from any available materials.

It must be attractive.

It must be people proof.

Investigation

Materials

List all the materials which might be suitable for making this container.

Describe the tools which you might use in making the container.

Describe the safety precautions which are important in making this container.

Examine the coins and determine what might be the suitable size for the opening.

Consider the processes which might be involved in making the container.

Solution

Draw a range of design ideas (at least 5).

Choose one and make detailed drawings of it.

Complete a final solution drawing in 3 dimensions.

Manufacture

Use and handle tools safely.

Follow your own design and the processes you have investigated.

Evaluation

Is the container efficient?

If not, what can you do to improve it?

Does it look like your final design?

If not, why has it been changed?

Design Brief: A Bone Carving

Problem

There are a lot of beef bones lying in the paddock.
What could you make from them?

Restrictions

The pendant must be made from the piece of bone you are given.
It must be suitable for hanging around the person's neck.

Investigation

Investigate:
The cultural significance of bone carving.
The ways in which bone must be prepared for carving and the safety aspects.
The tools which can be used for carving bone. Can you make your own?
Which tools are used for each operation?

Solution

Draw a number of design ideas.
Begin with basic shapes.
Pick one and draw it in detail. Include measurement.
Draw your design onto the piece of bone.
Draw a presentation drawing in colour.

Manufacture

Make a bone carving stand.
Cut around the design using a coping saw.
Shape your bone pendant until it is the correct shape.
Take a piece of carpet board and polish your bone carving until all sides and edges are smooth and shiny.

Evaluation

Does the final product look like your design. If not what changes were made and why?
What did you find the most difficult about making the pendant?
Was there a better way you could have done it?
Did the person it was made for like it?

Design Brief: Clothes Hanger

Problem

Your clothes are getting dirty because you have nowhere to keep them except the floor. Design and make a hanger for your clothes.

Restrictions

The hanger must be made of wood and wire.
The timber must not warp in hot or cold weather.
It should be attractive to look at.
It must be easy to hang it on the wall.

Investigation

Investigate all the timber and methods which could be used to make the hanger.
List in detail the processes involved in making a hanger.
Identify, list and describe how to use tools required to complete the process.
List safety precautions which must be taken when making your hanger.

Solution

Sketch at least three different ideas for your hanger.
Choose one of these ideas and develop drawings of the components.

Manufacture

Plan, cut and prepare the pieces involved in making the project.
Complete and finish each with sandpaper.
Assemble all components and complete the hanger.

Evaluation

Does the hanger do the job it was made for?
Are you happy with the outcome?
If not, what can you do to improve it?
Draw some feature you might include in future.

Design Brief: Fruit Container

Problem

When you pick too much fruit to use straight away you need something to hold it.

Design a device for containing fruit.

Restrictions

It must not be too heavy.

It must have a base.

It must be easy to handle.

Investigation

Examine a range of materials and finishes that would be suitable for making a fruit container, and list them and why they might be suitable. Identify, list and describe various tools which may be used in manufacture. Examine other fruit containers and fruit shapes to see what makes a good container.

Solution

Draw at least five different ideas.

Choose one and develop by drawing details and features.

Draw a final view in detail.

Manufacture

Prepare a cutting list and plan what to do.

Cut out all parts.

Sand all parts.

Join the parts together with the correctly identified finish.

Evaluation

Are you satisfied with the final outcome?

If not, then why not?

What new skills have you learnt in carrying out this project?

Design Brief: Bag for Storing Plastic Bags

Problem

When we go shopping, the things we buy are put in plastic bags. We usually throw them away after emptying them. There must be some ways to store the bags and reuse them. So design something to store the plastic bags.

Restrictions

The approximate size should be 400 mm x 400 mm.

Investigation

Cloth

What type would you use to make up this bag?
Can old cloth be used?

Materials and Equipment

Which ones would you use to make up this bag?
What would you use each piece of material/equipment for?

Style

What shapes, sizes, etc. of bags have you seen?

Work Procedure

What safety rules should you observe, when making up the bag.

Cost

How much does your bag cost?
How did you find this out?

Solution

Draw four concept design ideas.
Choose one and proceed to develop it further, giving details such as size, shape, etc.

Manufacture

Make up the bag according to ideas developed above.
Design and work according to a time plan.

Evaluation

Is your bag completed?
Did you complete it according to your time plan?
Does the finished product resemble your final design?
Are you happy with it?