


Year 3 Design and Technology: Textiles – Block A

How can you make a box out of cloth?


- The outline and structure of the block is as follows:

| Lesson 1 | Lesson 2 | Lesson 3 |
|--|---|--|
| Identification of the problem Exploring materials | Explicit teaching of skills relating to the brief | Application of skills Evaluation and adaptation |

| At the end of this block, pupils will ... | |
|---|---|
| Know: | Be able to: |
| Fabric can be stiffened Stiffened fabric can hold a form | Select and apply solutions to stiffen fabric Make a box using stiffened fabric |



Frei Otto Retrospective
by Gisela Stromeyer Designs



Gisela Stromeyer

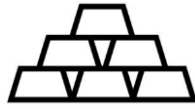
In this block, pupils will explore ways to stiffen fabric. They will have the opportunity to cover a box with cloth and then go on to create a rigid box out of fabric.

| CUSP Design & Technology Long term sequence | Block A | Block B | Block C | Block D | Block E | Block F |
|---|--------------------|--------------------|--------------------|-------------------------|--------------------|--------------------|
| Year 1 | Mechanisms | Structures | Food and Nutrition | Understanding Materials | Textiles | Food and Nutrition |
| Year 2 | Textiles | Food and Nutrition | Mechanisms | Understanding Materials | Food and Nutrition | Structures |
| Year 3 | Textiles | Food and Nutrition | Mechanisms | Food and Nutrition | Systems | Structures |
| Year 4 | Food and Nutrition | Mechanisms | Textiles | Structures | Electrical Systems | Food and Nutrition |
| Year 5 | Food and Nutrition | Systems | Textiles | Mechanisms | Structures | Food and Nutrition |
| Year 6 | Food and Nutrition | Mechanisms | Food and Nutrition | Structures | Electrical Systems | Textiles |

Point of reference: Y3 Textiles – Block A

Pupils will be able to:

- use a template to cut shapes accurately from fabric
- fold and attach fabric to a paper template accurately



Prior Learning

- mould and manipulate paper to create 3D forms
- use a range of methods to join materials

Design or Technology History:

Gisela Stromeyer is a New York-based artist and architect who also trained as a dancer and teacher. Gisela comes from a family of fourth-generation German tentmakers and uses fabric to visually and texturally enhance existing spaces. Her installations start life as sketches which are then developed into finished plans and scale models. She then cuts and sews the fabric herself to create sensuous and fluid forms. Her work can be found in a variety of locations such as private homes, theatre sets and office spaces.

Links to Literature:

What to Do with a Box by Jane Yolen
On Sudden Hill by Linda Sarah
The Most Magnificent Thing by Ashley Spires

Materials:

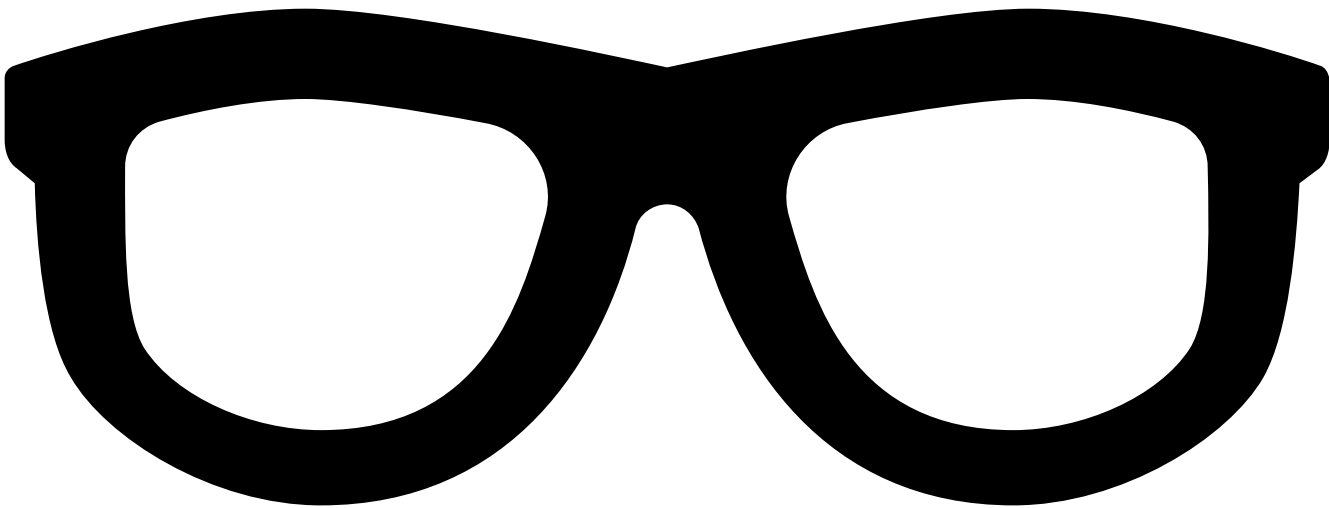
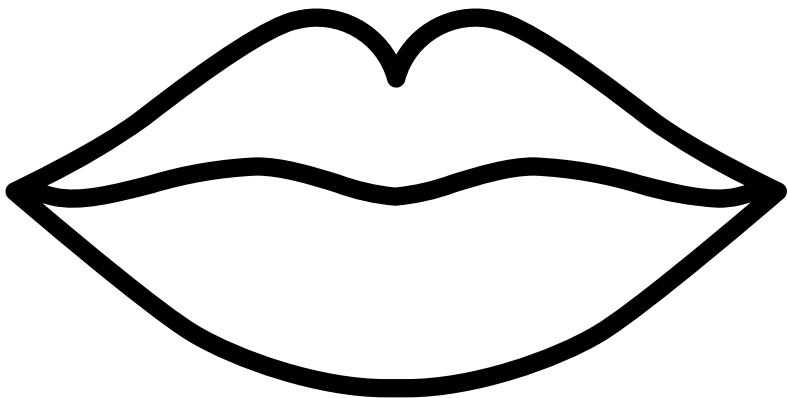
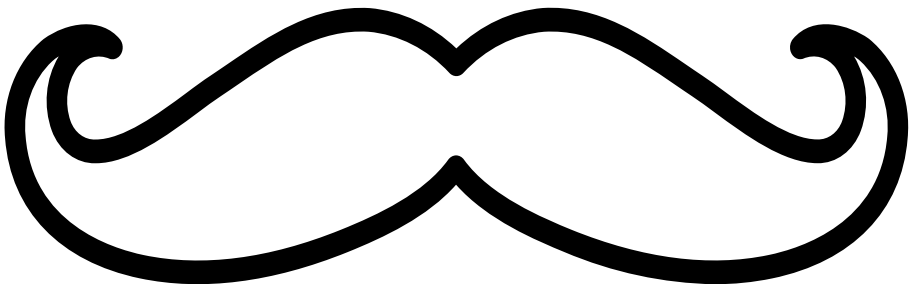
Gelatine, sugar, water, Epsom® salts, PVA glue, commercial spray starch, wallpaper paste, iron-on fabric stiffener, assortment of cotton fabric cut into strips, off-cuts of fabric, dowels, iron (to be used by an adult), corn starch, fabric scissors, felt rectangles, hot plate, small saucepan

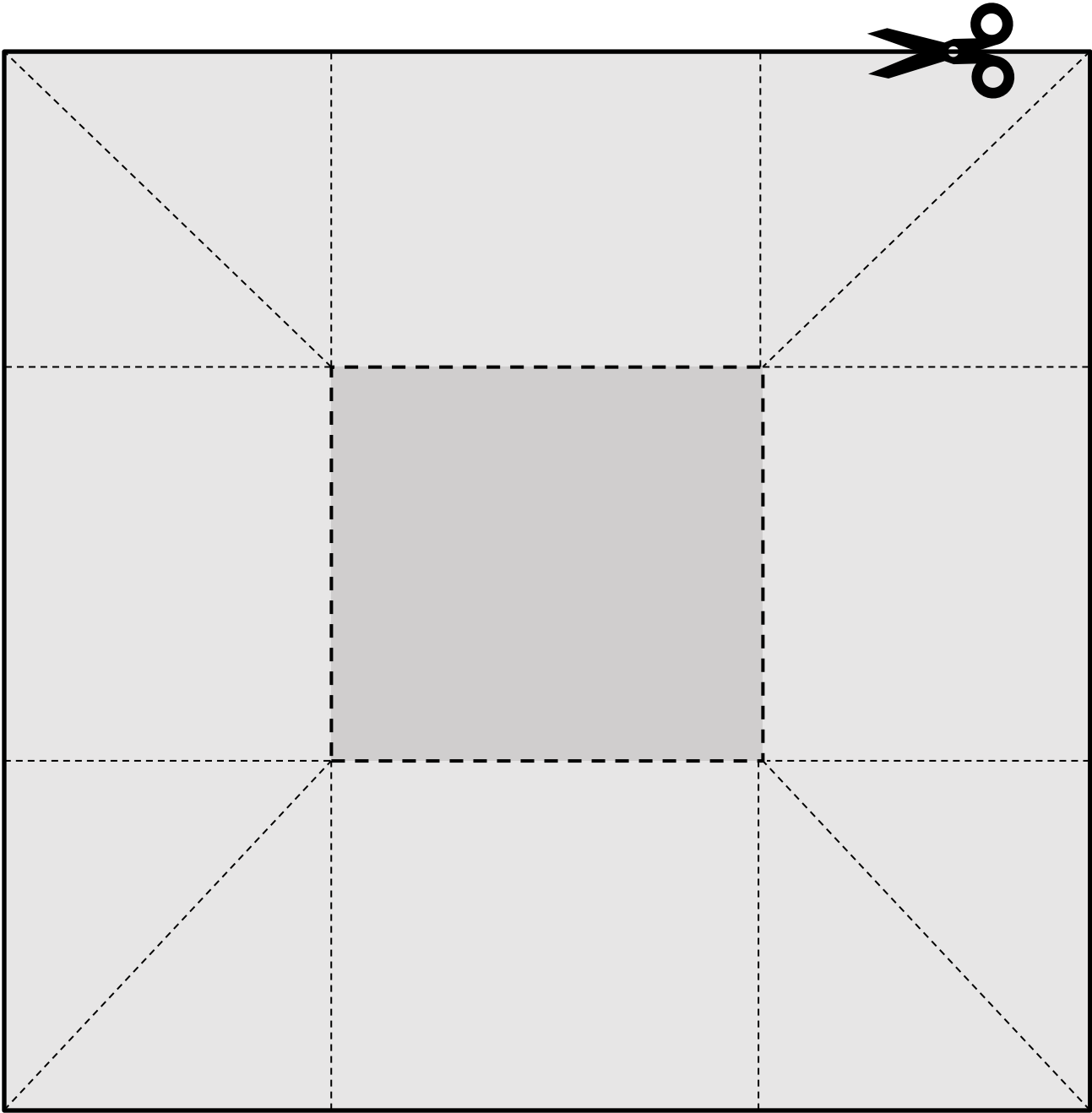
Health and Safety:

This block requires pupils to use: fabric scissors, an iron (to be used by an adult), commercial spray starch, corn starch, Epsom® salts and wallpaper paste. Teachers should ensure that they follow their own school's risk assessments and policies for using the necessary materials and equipment. Pupils should be taught about how to use equipment and materials safely and responsibly as part of these lessons.

Working as a Designer

| Design | Make | Evaluate | Apply |
|---|--|---|---|
| The art or process of deciding how something will look or work. | Create something by combining materials or putting parts together. | Form an opinion of the value or quality of something after careful thought. | Use something or make something work in a particular situation. |





Point of explanation:

Y3 Textiles – Block A





| Core Knowledge | Explanation |
|----------------|---|
| starch | Starch is a white substance from potatoes and some grains, used to make cloth stiff. |
| PVA glue | PVA glue is a synthetic polymer used as an adhesive for porous materials. PVA glue is used to secure or 'paste' things like clothing, paper and wood. |
| gelatin | Gelatin is a virtually colourless and tasteless water-soluble protein prepared from collagen and used in food preparation, photographic processes and glue. |

| Technical Vocabulary | Definition |
|----------------------|---|
| stiffen | to make something, such as cloth, hard and unable to bend |
| interfacing | an additional layer applied to the inside of garments or other sewing projects, in certain areas only, to add firmness, shape and structure |
| cloth | woven or felted fabric made from wool, cotton or a similar fibre |

| |
|--|
| Link to Video: https://vimeo.com/662662207/9f31d387d3 |
| <ul style="list-style-type: none"> • Explanation and demonstration of taught content • Lesson by lesson guidance • Exemplification of techniques and outcomes |





Point of delivery:

Y3 Textiles – Block A

| Revisiting prior learning  | Taught content  | Point of practice  | Point of reflection  |
|---|---|---|---|
| <p>1. Set up a test with a control sample</p> | <p>Identify the variables that will change and those that will not in a fair test</p> <p>Explore a range of solutions that can be applied to a fabric to make it rigid</p> <p>Draw conclusions from test results about which solutions are most effective at adding rigidity to fabric</p> <p>Record findings</p> | <p>Pupils will need samples of cotton cloth cut to the same size. A corn starch solution will need to be prepared in advance of the lesson.</p> <p>Introduce the key vocabulary and Knowledge Note for this unit. Provide each pupil with samples of cotton fabric. Prompt them to describe the properties of the fabric. Define the term 'solution' and explain that they will be experimenting with applying different solutions to seven of the samples to see which is most effective at making the fabric more rigid.</p> <p>Through questioning and discussion, establish how to ensure the test is fair.</p> <p>Prompt pupils to apply an even layer of each solution (Epsom© salts and liquid starch, gelatin, spray starch, sugar and water, gelatine, corn starch, PVA glue) to their samples of cotton. Iron-on fabric stiffener could also be applied to an additional cloth sample.</p> <p>Once dry, encourage pupils to describe the effects of each solution on the pieces of fabric, comparing them to the control sample. These samples can be added to their portfolios with annotations and a record of pupils' findings and conclusions.</p> <p>Finally, demonstrate to pupils how to make fabric paper (refer to video) for use in Lesson 3.</p> | <p>Can explain what a variable and control sample is</p> <p>Can explain how to make a test fair</p> <p>Can use appropriate vocabulary to describe the properties of fabric samples once different substances have been applied</p> <p>Can make an accurate recording of test results and draw reasonable conclusions from these</p> |
| <p>2. A template is used to replicate shapes</p> <p>Solutions can be applied to fabric to make it rigid</p> | <p>Suggest and explore ways in which a box can be covered using fabric</p> <p>Use a template to cut fabric to the appropriate size and shape</p> <p>Fold and manipulate fabric to cover both the inside and outside of a box</p> <p>Make a record of steps completed and evaluate outcomes</p> | <p>Introduce the key question for this unit: How can you make a box out of fabric?</p> <p>Refer pupils to previous DT sessions where they have used templates to draw and cut shapes accurately from paper and fabric. Demonstrate how to create a card template from a box which is then used to cut fabric to the desired shape and size.</p> <p>Show pupils how to place the template onto fabric and cut around it, allowing a gap of approximately 1cm. Pose these questions to pupils: Why is it necessary to add a 1cm allowance to each side? What is the purpose of doing this?</p> <p>Using PVA glue, pupils then cover the outside of the box with the fabric, folding the excess fabric to form neat edges. Excess fabric is also used to join the sides together once the box has been reconstructed. Challenge pupils to suggest how the inside of the box could be covered. Could they use the same template? Will the template need to be adapted? Pupils could use a fabric such as felt to cover the inside of the box, trimming any excess fabric as necessary. Strips of fabric can then be applied to the lid, using PVA glue.</p> <p>Pupils make a record of the steps they have followed in their portfolios and then complete Vocabulary Task 1.</p> | <p>Can generate and express ideas about how to cover a box with fabric</p> <p>Can use a template to cut fabric accurately</p> <p>Can fold and manipulate fabric to cover the inside and outside of a box</p> <p>Can follow a series of steps to achieve an outcome</p> <p>Can record a series of steps and evaluate an outcome</p> |

Point of delivery:

Y3 Textiles – Block A

| Revisiting prior learning  | Taught content  | Point of practice  | Point of reflection  |
|---|---|--|--|
| <p>3. A starch or PVA solution can be used to stiffen fabric</p> <p>A template can be used to cut desired shapes from fabric accurately</p> | <p>Select a stiffening agent and use templates to create fabric props that will hold their shape</p> <p>Use a box as a mould in order to create a box shape from fabric</p> <p>Use a template to form a box that requires no cutting</p> <p>Make a record of the processes involved and evaluate outcomes</p> | <p>Remind pupils of the key question for this unit: How can you make a box out of fabric? Encourage pupils to explain what they have learnt about how to change the properties of fabric.</p> <p>Direct pupils to use the templates provided to cut shapes of props from fabric. Using a chosen stiffening agent such as a solution of PVA glue and water, pupils change the properties of the fabric so that the props can be made rigid, attached to sticks and hold their shape.</p> <p>Demonstrate to pupils how to create a box shape from lightweight fabric by covering a box in plastic wrap and building up a layer of fabric strips and PVA solution to cover the surface. Once dry, remove the box and plastic wrap and pose the question to pupils: How could the fabric box be made more rigid?</p> <p>Finally, revisit the fabric paper that the pupils created in Lesson 1. Show how this can be folded and manipulated to form a box, using the template provided.</p> <p>Encourage pupils to make notes and drawings of the boxes they have made and the processes they have completed.</p> <p>Pupils evaluate their fabric boxes by completing Vocabulary Task 2.</p> | <p>Can cut a range of shapes accurately using a template</p> <p>Can apply layers of fabric and PVA glue over a mould to create a desired form</p> <p>Can fold and manipulate fabric to create a neat box</p> <p>Can make suggestions about how a form can be reinforced or made more rigid</p> <p>Can identify improvements that could be made to their work</p> |

Questions for assessment

What does rigidity mean?

Does the thickness of the fabric used affect how much fabric is needed to cover the box?

How does the texture and rigidity of each treated sample differ from the control sample?

Why is it important to cover the outside of the box first?

Does the amount of solution you apply affect the results?

How could your fabric box be made stronger and more rigid?

Which is the most effective solution / substance at giving rigidity to fabric?

What happens if you do not fold your fabric paper firmly?

Why is a 1cm allowance needed when cutting the fabric for the box?

What improvements could you make to your fabric boxes?

Teacher Note:

Instructions for sugar and water solution

- Put 1 cup sugar and ½ cup water in a small pan. Cook over a low heat, stirring mixture constantly until it becomes clear. Do not let the mixture boil.
- When mixture is completely clear, remove from heat and cool.

Oracy and Vocabulary: Y3 Textiles – Block A

Task 1:

Order these adjectives from least rigid to most rigid.

| | | | | | | |
|--|--------|-------|------|--------|----------|--|
| | supple | solid | firm | flimsy | flexible | |
| | | | | | | |

Exploration:



1. Do the words *firm* and *brittle* mean the same thing?
2. What is the difference between *flexible* and *flimsy*?

1. Does adding twice as much stiffening solution make the fabric twice as rigid?
2. Which stiffening solution is most effective to make fabric more rigid? How do you know?
3. Does thicker fabric need less stiffening solution to make it rigid?

Task 2:

How successful were you in creating boxes from fabric?
Answer these questions to evaluate and reflect on your work.

1. How strong and rigid was the box you made from strips of fabric?
2. What could you do to make the box stronger and more rigid?




3. Write the steps you completed to create a box from fabric paper.
4. A pupil is struggling to form their box from the fabric paper. What advice would you give them?





5. Which method do you think was the most effective one to use to make a fabric box? Explain your choice.
6. What improvements could you make to your fabric boxes?




Vocabulary: Y3 Textiles – Block A

| OWN-it | Analyse  |
|---|---|
| Underline the root word. | |
| stiffened | |
| Underline the part of this word that means <i>between</i> . | |
| interface | |
| Underline the adjective. | |
| stiff stiffen | |

| KNOW-it | Define  |
|---|--|
| Write the word that matches this definition. | |
| a woven or felted fabric | |
| <input type="text"/> | |
| Complete this sentence. | |
| Gelatine is used _____ | |
| _____. | |
| Tick the most accurate definition of <i>interfacing</i> . | |
| <input type="checkbox"/> an additional layer used to add firmness to fabric | |
| <input type="checkbox"/> a type of thick fabric | |

| LINK-it | Connect  |
|---|---|
| Write two words that begin with the prefix <i>inter</i> . | |
| <input type="text"/> | |
| <input type="text"/> | |
| Write two synonyms of the word <i>cloth</i> . | |
| <input type="text"/> | |
| <input type="text"/> | |
| Tick the word that does not mean the same as <i>stiff</i> . | |
| <input type="checkbox"/> rigid | |
| <input type="checkbox"/> flexible | |
| <input type="checkbox"/> solid | |

| USE-it | Use in context  |
|---|--|
| Use the word <i>starch</i> in a sentence. | |
| _____ | |
| _____ | |
| Tick the box if the word <i>rigid</i> has been used correctly. | |
| The box was very <i>rigid</i> and was easily bent. | |
| <input type="checkbox"/> | |
| Write a sentence using the words <i>starch</i> , <i>fabric</i> and <i>stiffen</i> . | |
| _____ | |
| _____ | |

Knowledge Note:

Y3 Textiles – Block A

Year 3: Textiles

How can you make a box out of cloth?



Core content:

Explore ways to stiffen fabric.
Cover a box with cloth.
Create a rigid box out of fabric.

Technical vocabulary:

Starch – a white substance that comes from potatoes and grains and is used to make cloth stiff.



PVA glue – an adhesive used to secure or 'paste' things like clothing, paper and wood.



Gelatin – a virtually colourless and tasteless protein used in food preparation, photographic processes and glue.



Stiffen – to make something, such as cloth, hard and unable to bend.



Interfacing – an additional layer applied to the inside of garments to add firmness, shape and structure.



Cloth – woven or felted fabric made from wool, cotton or a similar fibre.



Connections:

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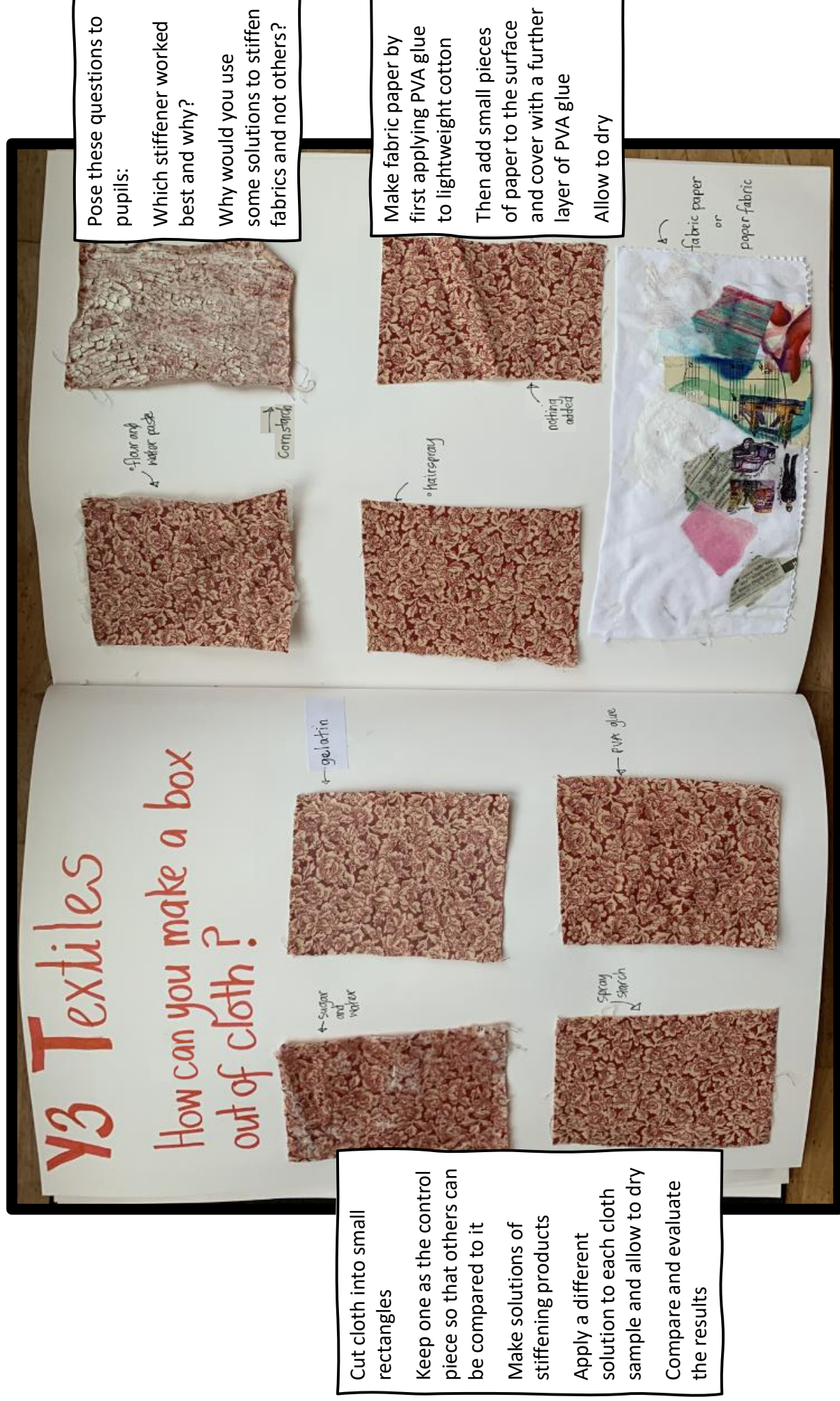


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Exemplification: Y3 Textiles – Block A

How can you make a box out of cloth?



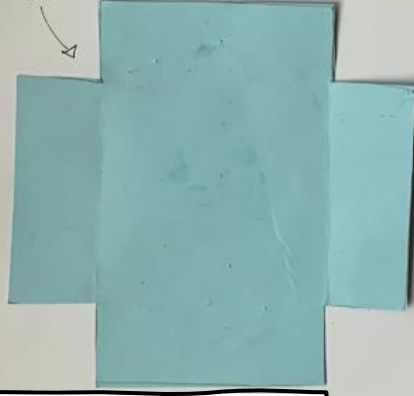
Exemplification: Y3 Textiles – Block A

How can you make a box out of cloth?

Make a template by tracing around a box that has been opened out

Ensure that an extra allowance is left all the way around the template

Pin the template onto fabric and cut around it



glue fabric to the box using PVA glue



allow to dry and cut off over hanging cloth



Attach the fabric to the original box with glue and hold it in place with clothes pegs

Allow to dry

Make a lining for the box following the same process

Use a fabric that won't fray



wrap a box with plastic wrap



cover in glue - be careful not to tear the plastic



lay small strips over the glued plastic and cover in another layer of glue



allow to dry and then remove the plastic wrap



the glue has made a plastic-like layer over the surface

the cloth has held the shape and form of the box

Carefully remove the box from the plastic wrap

Peel off the plastic wrap to reveal the box formed from the cloth

Exemplification: Y3 Textiles – Block A

How can you make a box out of cloth?

