

Part 2

# Work with Machines and Materials



Machines make our lives easy, and materials are all around us. Projects on Work with Machines and Materials will help you work with different machines and tools to create new things with different kinds of materials, and to repair and maintain things. You can take up projects related to making electronic toys, carpentry products from wood and bamboo, and pottery products (with and without using a wheel), sewing clothes, decorating fabrics, using computers and smartphones to make games and animations, and using waste materials to make toys or even instruments for a school band. It is up to you to imagine all that you can do with your peers.

Two examples of projects are given in this section, which are Tie and Dye and AI Assistant. You must take up only one project. You can either choose one of these projects or you can design a project of your own choice with the help of your teacher.

## Project 3

# Tie and Dye



0785CH03

This project will help you learn how to make beautiful patterns on fabric with dye. You will do this using different tie and dye techniques.

*As part of the project, you will be able to:*

Learn about different techniques of tie and dye

Prepare natural dye

Explore tie and dye patterns on fabric

Design a product using tie and dye



Figure 3.1: Tie and dye in the classroom



India has a rich history of textiles, with each state having its own traditional ways of weaving cloth and creating beautiful patterns using different methods, like dyeing, embroidery and printing. Some of these weaves and patterns have been used across centuries.

Among these methods is tie and dye, e.g., *Lehariya*, *Bandhani* (Figures 3.1 and 3.2). *Bandhani*, which literally means ‘to bind or tie’, is a resist dye technique. Resist dye techniques prevent dye from colouring some parts, so that it retains the original colour. Thus, it creates beautiful patterns.



Figure 3.2: Bandhani patterns can be created to create intricate designs

In the *Bandhani* method, fabric is folded, tied, twisted, and bound to prevent certain portions from being coloured. Artisans practising this method tie the fabric so that circles, spirals, stripes, and even patterns that appear like plants and animals are created. *Bandhani* is also known as *tie and dye*, and is generally practised in Rajasthan and Gujarat. Usually done on cotton, silk, and wool, traditional *Bandhani* is created using natural dyes made of plants and spices.



### Did you know?

As communities migrate, they continue their traditional work even as they become part of the local community already living in the area. One such community, which migrated from Gujarat many centuries

ago, lives in Tamil Nadu. While most of these immigrants got involved in weaving silk, those in Madurai introduced what came to be called the *Madurai Sungudi* — cotton tie and dye material, generally used for *sarees*.

Thus, tie and dye came to be associated with Gujarat, Rajasthan, and Tamil Nadu too.

Another popular resist dye method is wax resist where wax or a starchy paste is applied either freehand or using blocks/stencils, which have patterns carved on them. These patterns can be geometric, or in the shape of animals or plants. This is known as *batik*, and has traditionally been practised in Madhya Pradesh, West Bengal and Rajasthan.

*Bandhani* is among the oldest tie and dye techniques. The earliest evidence of *Bandhani* is found in the Ajanta caves in Maharashtra where paintings show a woman wearing a dotted cloth that is believed to be *Bandhani* (Figure 3.3).

*Bandhani* is not merely an Indian art form, it also reflects the rich culture of our country. Different colours and styles of *Bandhani* are associated with different communities and worn with pride in both Rajasthan and Gujarat (Figure 3.4). In some communities, different types of *Bandhani* are associated with different rituals.

Since tie and dye products are created by hand, and no two artisans will tie the fabric in the same way, no two pieces are alike. Thus, each pattern is unique.

This project will help you create your own unique tie and dye product.



**Figure 3.3:** Dotted cloth draped over the woman's upper body is believed to be *Bandhani*



**Figure 3.4:** *Bandhani* turban is worn with pride by man in Rajasthan



## What will I be able to do?

By the end of this project, you will be able to:

1. Prepare natural dyes using vegetables, fruits, spices and plants.
2. Design patterns for tie and dye.
3. Use tie and dye to create colourful patterns on recycled fabrics.
4. Prepare a product using tie and dye.



## What will I need?

You will need different kinds of tools and materials before you start working:

### Tools and Materials required

1. **Fabric:** Fabric used for *Bandhani* must be strong since it has to undergo multiple rounds of tying and dyeing. Hence, fabric made of natural fibres is used, e.g., cotton, silk, wool. You can use light coloured thin cotton fabric cut out of old clothes. If there are light-coloured linen or silk clothes that have been discarded at home, you can use them as well. You must ensure no traces of starch or dirt remain by washing the fabric carefully.
2. **Material for tying:** Thread for tying must be white or very light coloured. This is to avoid the colour from 'bleeding' from the thread, that is, to prevent the colour of the thread itself from dyeing the fabric. Rubber bands and clips can also be used if large portions are to resist the dye. Grains, pulses, seeds, small stones, peppercorns, etc., can be used to ensure that the area that resists the dye is of the desired size.
3. **Material for dyeing and fixing:** Natural dyes can be made using a variety of materials, e.g., beetroot, coffee, turmeric, red cabbage, pomegranate, henna, spinach,

orange peels, onion skin and indigo. To ensure the colour of the dye does not wash out or fade too soon or bleed from your product onto other clothes (e.g., on a shirt you are wearing), you will need fixers. For example, salt/vinegar is used to fix the dye when flowers or leaves are used.

4. **Tools:** Measuring cup/spoon, containers, burner/stove, stirrers, iron, mug, plates, scissors, tongs, glass, bowl.



Figure 3.5: Nakhli used by artisans

The *nakhli* or *nakhlo* (Figure 3.5) is a 'ring' made of metal with a protruding blunt edge used by artisans to pick the fabric.



### How do I keep myself and others safe?

The following precautions need to be taken during various tasks involved in tie and dye techniques:

1. Wear gloves to protect your hands from warm dyes, and aprons to protect your clothes while using dyes. Use masks to avoid colour splashing on your mouth and prevent breathing in any vapour from the hot dye. Wear goggles to keep your eyes safe from hot water.
2. Work in a well-ventilated area so that smells and vapours do not irritate you.
3. Handle scissors with care while cutting fabric – never point the scissors towards yourself or anyone else.
4. Carefully dispose off any leftover dye solution in the sink. While using the dye, spread plastic sheets on the surface to prevent splashes and to keep the work area safe and clean.



**Internet safety:** Seek help from your teacher while using the Internet. Be careful not to upload or download anything without checking. Do not share personal information anywhere.





## What do I need to know before I start?

Look at the *Bandhani* samples in figure 3.6 below — patterns are repeated across each sample. What patterns do you see? Draw them in the box below the image.



Figure 3.6: Different samples of *Bandhani*

Now, compare the patterns you have drawn with those drawn by your peer. Discuss them with your peer.

### Some other tie and dye techniques

Two examples of popular shaped resist tie and dye techniques besides *Bandhani* are given below:

1. **Leheriya:** Made by folding and tying the fabric before dyeing. This results in a wave-like pattern. The word *leher* means ‘wave’. It represents the flow of water and greenery, which hold high significance in states like Rajasthan and Gujarat.
2. **Shibori:** *Shibori* is an ancient Japanese tie and dye technique. The word *Shibori* means to ‘wring, squeeze or press’. Traditional *Shibori* often used natural indigo dye, which changes colour from green to blue as the fabric reacts with air during drying.





Before you start making your own tie and dye patterns, you need to identify which fabric should be used. It will be useful to understand which fabrics and patterns are popular, and likely to sell. You can also compare the cost of tie and dye products with other products.

One way to do this would be to visit a shop selling clothes. You could also interact with a local boutique owner or a fashion designer.

Visiting a tie and dye workshop will help you to gain firsthand knowledge of the process. You could also invite an artisan to your school to give a demonstration. However, if it is not possible to get an artisan, even a person who does tie and dye as a hobby could be invited.

It is quite possible that a tie and dye workshop is not present in the vicinity. In that case, you can visit a dyeing workshop to get an understanding of the process.

### Activity 1: Visit to a shop

You will observe many types of products in the shop, made of different fabrics using different methods, like weaving, embroidery, dyeing, and so on (Figure 3.7).

While in the shop, try to get a feel of different fabrics by touching them. See if you can find *Bandhani*/*Batik*/*Shibori* or any other kind of tie and dye designs.

Before the visit, think of the questions you would like to ask the shopkeeper. Some pointers are given in table 3.1 but please add to these. Get responses for at least five types of fabrics.



**Figure 3.7:** Range of products made of different fabrics using different methods

**Table 3.1: Exploring fabrics in a shop**

S. No.	Type of fabric (e.g., cotton, silk, linen, synthetic, jute)	What technique has been used to make patterns (e.g., tie and dye, block printing, digital printing, embroidery)	Price (rupees per metre or the cost of a saree)
1.			
2.			
3.			
4.			
5.			

1. Is tie and dye available?  
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2. If yes, then which type (e.g., *Shibori*, *Leheriya*, *Bandhani*, ...)?  
.....
3. What kind of garment is most popular (e.g., *saree*, *dupatta*, scarf, stole, *kurta*)?  
.....
4. Which fabrics and colours are most popular with customers, and sell the most?  
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If you want to explore more varieties and patterns, search online with these keywords to find relevant videos: *Bandhani saree* shops in India, *Bandhani* cloth shop or types of design (your choice) + information.

Explore other key words that will help you fill the table. Remember, there will be variations with change of place, so try and search information from your own city or village, or nearby places.

What else do you think tie and dye can be used for besides clothes, like *kurtas*, turbans, shirts, *sarees*, *dupattas*? Think, and write down your ideas.

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## Activity 2: A visit to a tie and dye workshop

While visiting the workshop, observe everything around and ask as many questions as possible (Figure 3.8).



Figure 3.8: Dyeing of fabric

Ask for a demonstration of the process, and try to do some of the tasks yourself, if possible.

Here are some questions to get you started. Many other questions may come to mind when you are interacting with the experts. Do remember to note the responses to those questions as well.

1. How do you tie the fabric? How do you make sure the patterns are of the same size? How do you make the pattern larger or smaller?

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2. Which tools and materials do you use for dyeing? Where do you get the dye from?

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3. What type of fabrics can be dyed easily? Are all these fabrics good for tie and dye as well?

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4. How do you ensure the colour does not bleed after dyeing?

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5. What should be the temperature of the dye when you dip the fabric? Does the temperature have to be the same for all fabrics and all dyes?

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6. How many times is the fabric soaked in the dye?

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7. How is the fabric dyed? How long does it take?

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8. Is it possible to dye different sections of fabric in various colours? If so, could you explain the process?

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Look at the figure 3.9 below – it shows the process of tie and dye.



In case you are not able to visit a workshop or invite an artist, you can watch an online video, using the following search words on Internet to find a relevant video: tie and dye process, tie and dye workshop, *Bandhani* workshop, *Bandhani* artisans India.

In case you observed something else, do add it to figure 3.9.



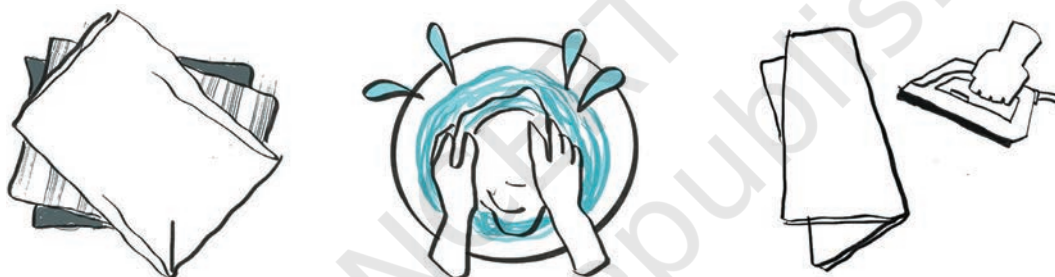
## What do I have to do?

### Activity 3: Exploring the art of tie and dye

Before you make your product, you must practice and experiment with fabrics, dyes and designs. First, make some samples on a small piece of fabric.

#### Step 1: Prepare the sample fabrics

Get five handkerchief-sized ( $6 \times 6$  inches) fabrics. These fabrics could be from an old shirt, *kurta*, *saree* or anything that is not in use any more. You can use different kinds of fabric— thin cotton, thick cotton, silk, linen or any other fabric to see the difference in results. Remember to start with white or light-coloured fabrics so you can see your designs better. Figure 3.10 shows how the fabric is to be prepared.



**Step 1:** Cut the fabric

**Step 2:** Wash to remove any starch to dirt

**Step 3:** Dry the fabric and iron it to remove any crease

Figure 3.10: Preparing fabric for tie and dye

Write the details of the fabrics you are going to use in table 3.2 below:

Table 3.2: Checklist of samples

Sample number	Fabric used	Preparation of fabric (e.g., cutting to size, washing, drying and ironing)

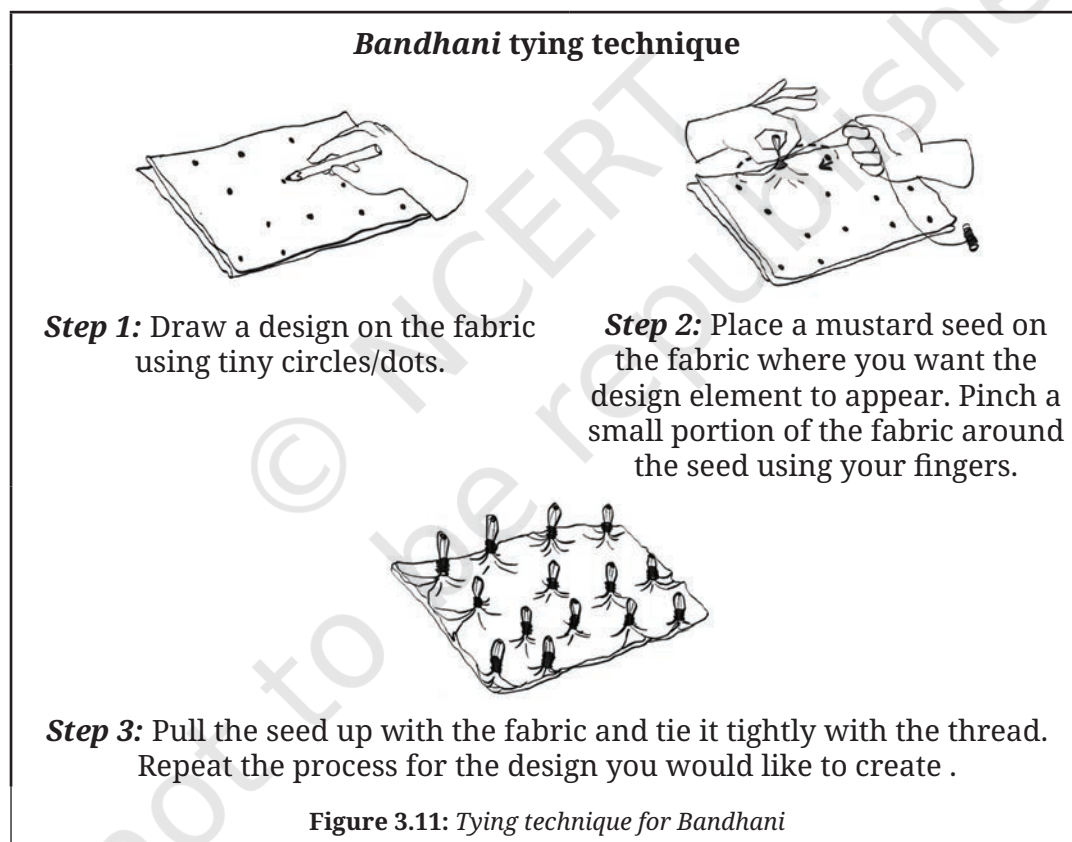


## Step 2: Tying the fabric

You have already read that when we tie the fabric, we prevent the part that has been tied from getting coloured by dye. This resisting of the dye creates patterns due to the difference between the parts that are dyed and not dyed. Tying the fabric in different ways will create different and unique design(s).

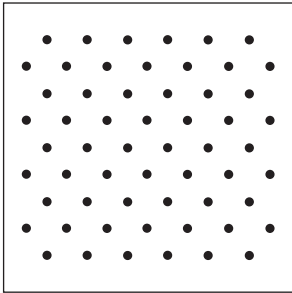
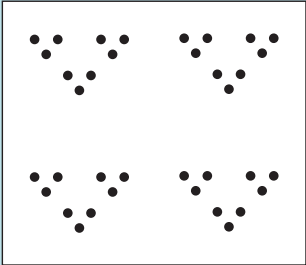
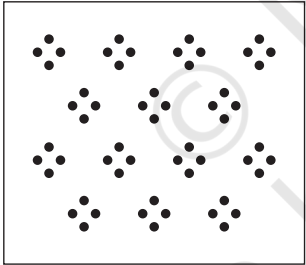
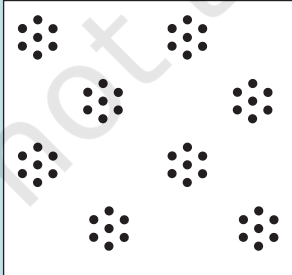
Experts can tie and dye the same fabric multiple times to introduce colours in the patterns — this is done by dyeing the fabric multiple times, each time tying different parts of the fabric to get a different colour and pattern. However, we will stick to two colours — the original colour of the fabric and the colour of the dye.

The technique for tying fabric for *Bandhani*, *Shibori* and *Leheriya* is given in figures 3.11 to 3.13, respectively.

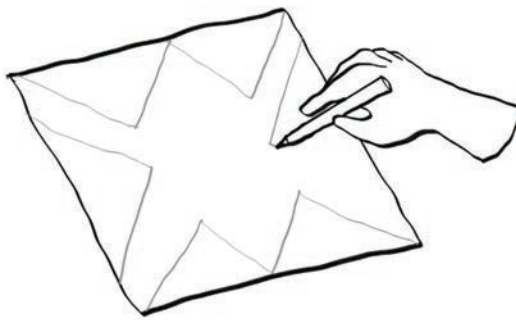


Traditionally, *Bandhani* patterns are given different names depending on the number of knots in the design. Larger designs are made by repeating these patterns. Some examples are given in table 3.3; try to make your own design using any of these.

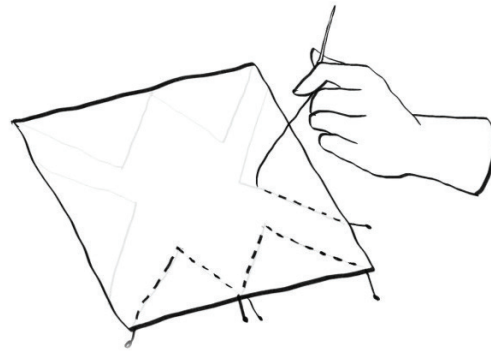
Table 3.3: Examples of some traditional *Bandhani* patterns

Name of the pattern and image	Your design using this pattern
<p><i>Ekdali</i>: Single dot</p> 	
<p><i>Trikunti</i>: Groups of three</p> 	
<p><i>Chaubandi/Chaubasi</i>: Groups of four</p> 	
<p><i>Satbandi</i>: Groups of seven</p> 	

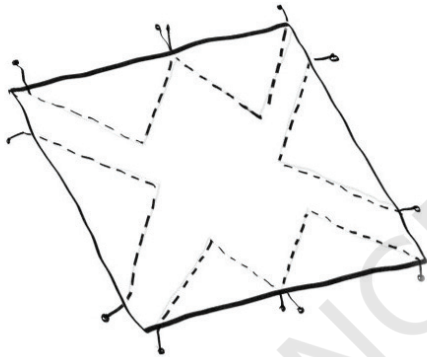
### Shibori tying technique



**Step 1:** Draw the design on the fabric. You can draw the design either in a straight or dotted line.



**Step 2:** Use a needle and thread to sew simple running stitches along the lines of your design. Make sure to keep even spacing for a neat pattern.



**Step 3:** Continue stitching until your entire pattern is outlined with the running stitches. Keep the stitches loose, as they will be gathered later.



**Step 4:** Gently pull the loose ends of the thread to gather the fabric, creating folds. The tighter you pull, the more distinct your design will be.



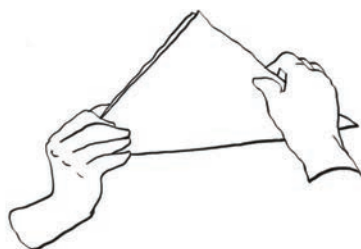
**Step 5:** Once gathered, tie a firm knot at the end of the thread to hold the folds in place. Make sure it is tight, so the dye does not seep into the folded areas.

You can vary the pattern by varying the length of the stitches, the angle of the lines, and where and how tightly you tie the thread.

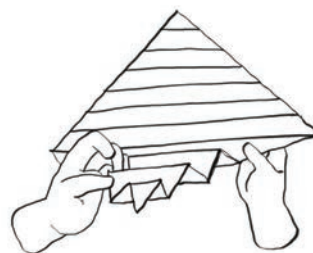
**Figure 3.12:** Tying technique for Shibori



### Leheriya tying technique



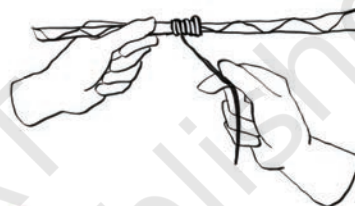
**Step 1:** Fold the fabric in half and find the centre point. This will help in creating symmetrical pleats.



**Step 2:** Start making small, even pleats by folding the fabric back and forth like an accordion. Ensure the pleats are neat for a clean pattern.



**Step 3:** Continue folding until the entire fabric is pleated. Hold the fabric firmly to maintain the folds.



**Step 4:** Carefully hold the pleats and tie them tightly with thread at the centre. Ensure the knot is secure to keep the pleats in place.



**Step 5 :** Tie the fabric at equal intervals on both sides of the centre. This will create the *Leheriya* pattern after dyeing.

You can vary the design by decreasing or increasing the number of pleats, as well as the distance at which you tie the thread.

**Figure 3.13:** Tying technique for *Leheriya*

Now, you are ready to tie your first sample. First, think of a design, draw it on the fabric and then tie your first sample fabric. Do not tie and dye all samples together. Doing one sample at a time will help you improve your tying technique. You can decide which technique to use; however, it is recommended you try more than one technique.

On the basis of your experience of tying, fill table 3.4. Draw the design of the sample, and note any challenges you faced and their solutions. You can make additional samples if needed.

**Table 3.4: Making the samples**

Actions	Details	Challenges and solutions
Sample number and fabric: Tying technique used:		
Design of the sample		
Sample number and fabric: Tying technique used:		
Design of the sample		
Sample number and fabric: Tying technique used:		
Design of the sample		

Sample number and fabric: Tying technique used:		
Design of the sample		
Sample number and fabric: Tying technique used:		
Design of the sample		
Sample number and fabric: Tying technique used:		
Design of the sample		

### Step 3: Preparation of dye

Different kinds of dyes, both chemical and natural, are available in the market. Of these, natural dyes are more environment friendly.

To prepare natural dyes, select the ingredients based on the colour you want (e.g., turmeric/marigold flowers for yellow, beetroot for pink, spinach leaves for green, blue hibiscus/blueberry/blue pea flower for blue).






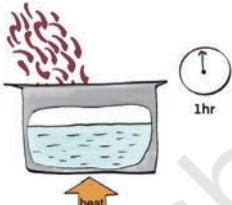
You can also search for methods of preparing natural dyes of different colours on the Internet by using keywords: process for making natural dye from plants of ..... colour (mention the colour of your choice).

Figure 3.14 shows the process for making pink/red dye solution using beetroot.


**Making pink/red dye**




**Step 1:** To create a natural beetroot dye, start by chopping or crushing two medium-sized beetroots. This helps effective release of colour.



**Step 2:** Add the crushed beetroot to 1 L of water and let it slowly boil for about 1 hour. This process extracts the rich red pigment from the beetroots.



**Step 3:** Once the mixture has cooled down, strain the liquid using a cotton cloth or a strainer to remove any solid pieces, leaving only the coloured liquid.




**Step 4:** Finally, add one to two tablespoons of salt to the dye solution. This acts as a fixer, and helps set the colour, making it more effective for dyeing fabric.

Your natural beetroot dye is now ready to use. The quantity of the plant (vegetable/flower/fruit) and water will depend on the shade of colour needed and the weight of the fabric — the darker the shade and the heavier the fabric, the more quantity is required.


**Figure 3.14:** Making pink/red dye using beetroot

Figure 3.15 shows the process for making yellow dye using turmeric, which is easily available at home.

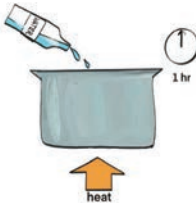
**Making yellow dye**




**Step 1:** Measure 2 tablespoons of turmeric powder and keep it ready for use in a bowl.




**Step 2:** Take half a glass of cold water and dissolve the turmeric in it using a spoon.



**Step 3:** Measure 1 L of water in a large container. Place it on heat and let it simmer.



**Step 4:** Add the cold water and turmeric solution to the warm water, and let it simmer for an hour.



**Step 5:** Add 1–2 tablespoons of salt/baking powder/vinegar to the dye – this will act as fixer.

Your natural turmeric dye is now ready to use. The darker the shade of yellow and the heavier the fabric, the more quantity of turmeric is required.

**Figure 3.15: Making yellow dye using turmeric**



### Did you know?

Heating plays an important role in the dyeing process as it increases the solubility of dye in water, speeds up the dyeing process, and helps fix the dye to the fabric. However, there are some dyes and processes which require no or minimal heating. While there are several techniques, two are mentioned here:

### Passive heating process




If time is not a constraint, then dye can be prepared using solar energy. This would require putting the dye and fabric in a glass jar and placing it in a sunny spot to slowly extract the dye with minimal heat. This process can take several days to weeks, depending on the shade of colour you want – the darker the shade, the longer it takes.



### Cold water dyes

Cold water dyes, which use chemicals to fix the dye instead of heat, are available in the market. The dye is mixed in cold water or water at room temperature. Tied fabric is soaked in the dye, and then in a solution made with a fixer before the final rinsing.

Table 3.5 has other examples of preparing dye of different colours from plants.

**Table 3.5: Making dyes from plants**

Colour	Plant	Image	Steps to prepare dye (the amount of dye needed depends on the shade you want to achieve)
Blue	Blue hibiscus		<ul style="list-style-type: none"><li>• Mix 100 g blue hibiscus in 1 L of water</li><li>• Simmer the water to the boiling point</li><li>• Strain the solution to remove the flowers and add 250 mL vinegar</li></ul>
Brown	Tea/Coffee		<ul style="list-style-type: none"><li>• Mix 100 g coffee powder/tea powder in 1 L of water</li><li>• Simmer the water to boiling point</li><li>• Strain the solution to remove any coffee particles and add 250 mL vinegar</li></ul>
Green	Spinach		<ul style="list-style-type: none"><li>• Chop 100 g spinach</li><li>• Add it to 1 L of water</li><li>• Simmer the water to boiling point</li><li>• Strain the solution to remove any vegetable particles and add 2 tablespoon of salt</li></ul>

Yellow	Marigold		<ul style="list-style-type: none"> <li>• Mix 100 g marigold in 1 L of water</li> <li>• Simmer the water to boiling point</li> <li>• Strain the solution to remove the flowers and add 250 mL vinegar solution</li> </ul>
Red	Pomegranate		<ul style="list-style-type: none"> <li>• Mix 100 g pomegranate seeds in 1 L of water</li> <li>• Simmer the water to boiling point</li> <li>• Strain the solution to remove the seeds and add 2 tablespoons of salt</li> </ul>

Which colours have you chosen to dye the samples? .....

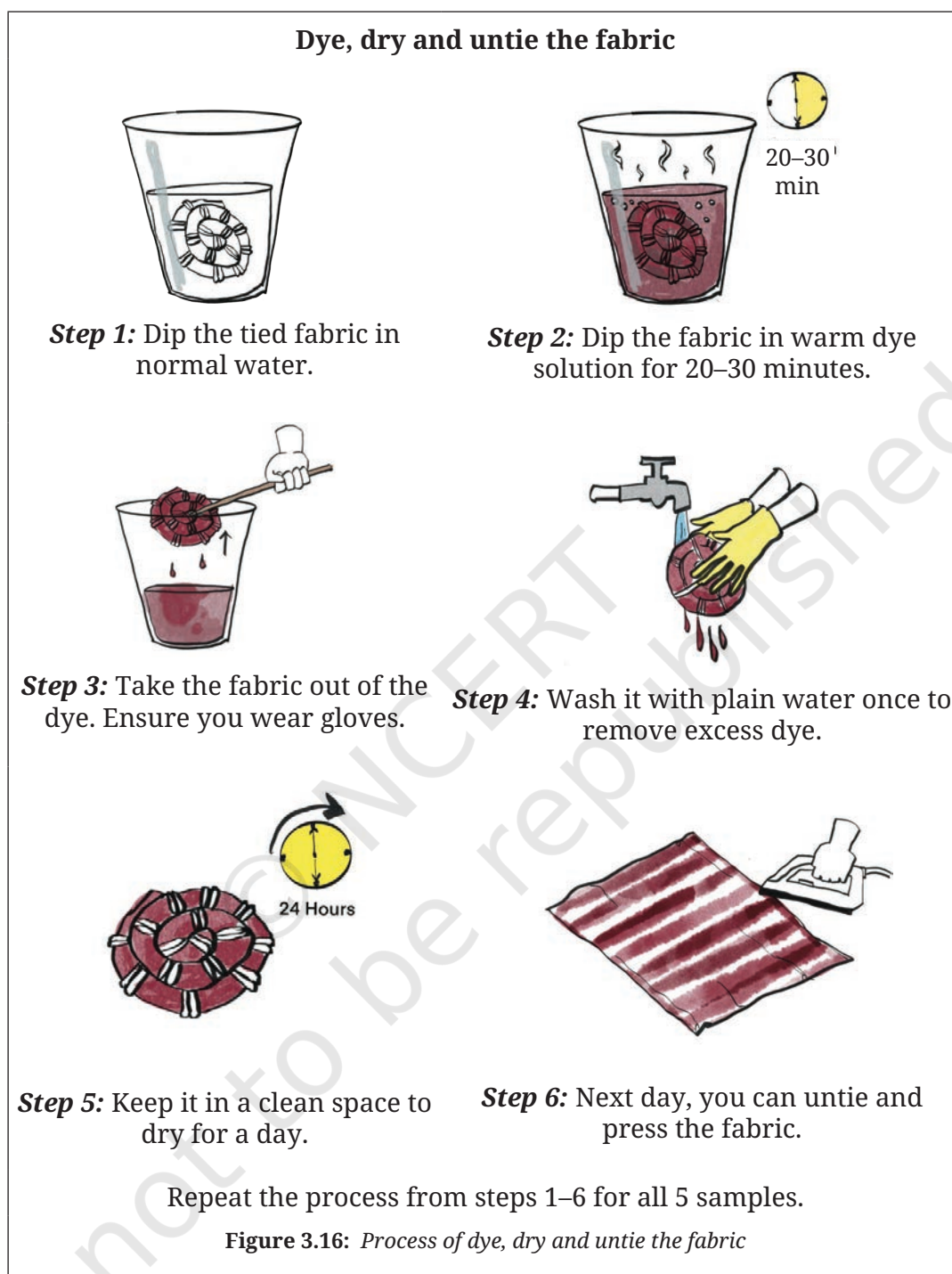
Fill table 3.6 for the dye you prepared for each sample – in case you used the same dye, please mention the details.

**Table 3.6: Preparing dyes with different plants**

Steps	Details
Materials used to prepare the dye	
Quantity of the ingredients	
Quantity of water	
Materials used to fix dye	
Safety precautions taken	
Any other material that will give a similar colour	



Figure 3.16 shows the process for dyeing the tied fabric.



Did you face any of the challenges listed in table 3.7? See if you can overcome these challenges with other samples.

**Table 3.7: Common challenges and their solutions**

Challenge	Try this solution
Did the thread break or open during the dyeing process?	Tie the fabric tightly and handle it carefully to ensure that it does not loosen during the process.
Did you spill the dye solution during the process?	Ensure that there is enough space where you are working to keep the dye and other material. Use a cloth or gloves to hold the hot container.
Did you cut the fabric while untying the fabric by mistake?	Do not use scissors to cut the thread. You can use the needle to find the point of thread and use your hand to further untie it.

Look at the samples carefully.

What did you learn to do/not to as you moved from samples 1–5?

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#### **Step 4: Documenting a swatch file**

Create a swatch file to display your samples (Figure 3.17). A swatch file is a combination of your creative samples with some details. You will use this file to present your samples. For each sample include the following:

1. Fabric sample
2. Type of fabric
3. Technique used for tying and dyeing
4. Fabrics and dye used
5. Challenges faced while creating the sample
6. Step-by-step process of preparing the samples

Sample 1:



Fabric type: \_\_\_\_\_

Tying technique: \_\_\_\_\_

Material used for tying: \_\_\_\_\_

Plants used for dyeing: \_\_\_\_\_

Steps followed to create this sample: \_\_\_\_\_

Challenges faced while creating this sample: \_\_\_\_\_

Figure 3.17: Sample of a swatch file

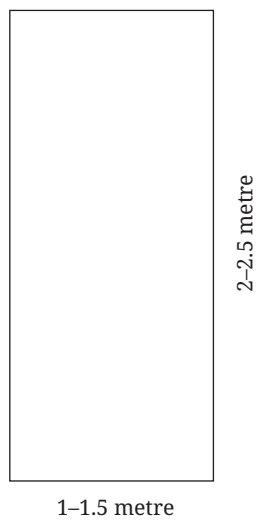
#### Activity 4: Making the final product

After trying your hand at 5 samples, you have learned the stepwise process of tie and dye. Now, you are ready to create a product you can use.

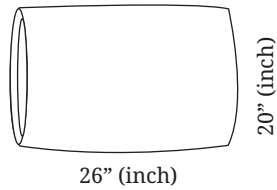
##### Step 1: Selection of a product

Select a product that you would like to create, e.g., *dupatta*, pillow cover, scarf, or dress material. First, select the fabric—try and find old clothes at home that are not worn anymore or old bedsheets, and cut them as needed. Figure 3.18 shows a size chart for some of the products.

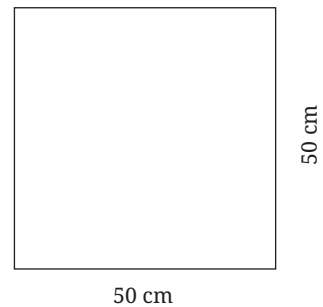
Average size of dupatta



Size for pillow cover



Size for scarf



**Figure 3.18:** Measuring and selecting fabric

You can take the help of your teacher, a family member, or a tailor from a nearby shop to cut the fabric in the proper size.

1. Which product will you make?

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2. Which fabric did you select? Why?

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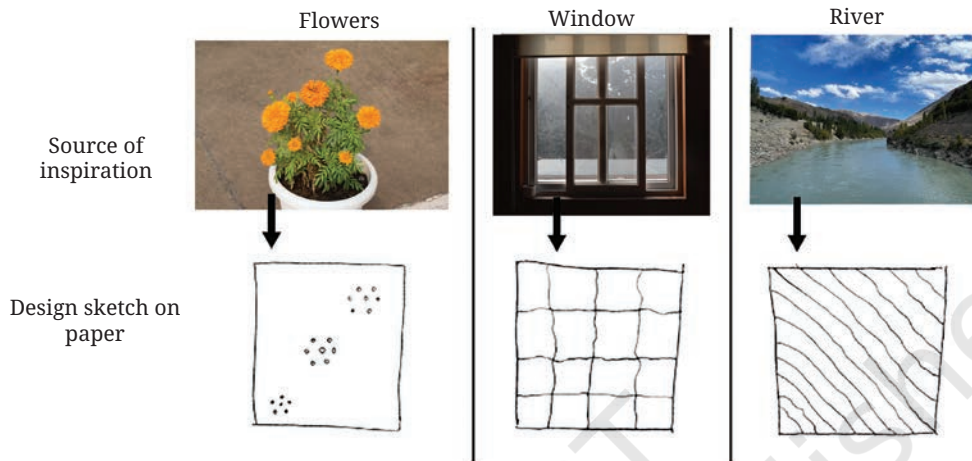
3. Sketch the pattern of your product with dimensions.

A large empty rectangular box for sketching the pattern of the product with dimensions.



## Step 2: Finalise the design, colour and tying technique

You need to come up with a design for using the tie and dye technique. You can take ‘design inspiration’ from things around you. Figure 3.19 shows some design examples inspired by everyday objects.



**Figure 3.19:** Design inspiration and designs for tie and dye

Now, try and draw a design inspired by the flower in figure 3.20.



**Figure 3.20:** Design inspired by a flower

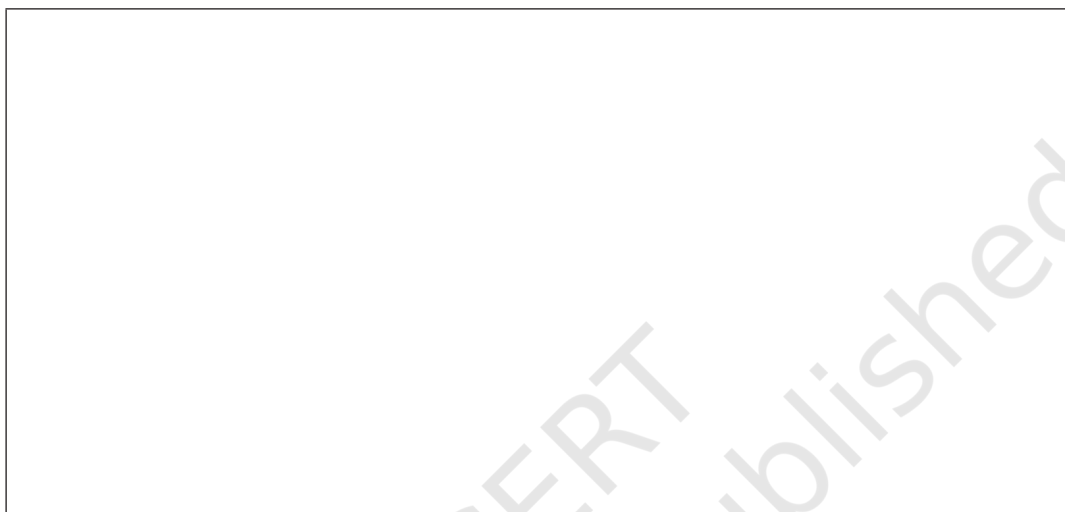
Take a fun walk around and get inspired by the world. Look at nature, art, or even your favourite things to spark ideas for your design. Imagine, nature can inspire patterns of tie and dye techniques. The pattern you finally chose could be based on such a ‘design inspiration’.

After you decide your design(s), choose the dye colour and the tie and dye technique.

1. What is your design inspiration?

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2. Draw the design you want on your product in the box.

A large empty rectangular box with a thin black border, intended for drawing a design. A faint, diagonal watermark reading 'NCERT Not to be republished' is visible across the box.

3. Which plant (vegetables/flowers/fruits) or other materials (e.g., tea, coffee) will you use to prepare the dye?

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4. Which tie and dye technique will you use?

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### **Step 3: Tie and dye the product**

It is time to bring your tie and dye dream to life. Prepare your fabric and make it ready for the tying and dyeing process. Follow your design and create patterns by tying the fabric in creative ways.

Make sure you follow all the safety rules. You have a bigger cloth this time than your sample fabrics, therefore use 2–3L of water to make a larger quantity of plant dye. After dyeing the fabric, leave it to dry for a day.

Describe what you did in table 3.8.

**Table 3.8: Recording the process of making the final product**

Actions	Steps taken
Preparation of the fabric	
Tying	
Preparation of dye	
Dyeing and drying	

#### Step 4: Untying the product

The final step is untying the dried fabric carefully to reveal your unique design. Once the knots are undone, iron your product to smoothen out any wrinkle. The heat of the iron must be selected according to the fabric.



#### Did you know?

Some modern tie and dye artists use a technique called *reverse tie and dye*. Instead of adding dye to fabric, they remove colour using bleach or other chemicals to create striking white patterns against a dark background.

1. Did you manage to create the design you wanted? If not, what might be the reason?

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#### Activity 5: What did you invest?

You invested both time and maybe some money was spent to gather material. Tables 3.9 will help you estimate the cost of the product.

**Table 3.9: Product costing**

List of materials	Quantity of materials	Cost of the material (₹ 0/- if you recycled materials)



### What did I learn from others?

1. You learnt during field trips, online and offline interactions with experts, family and friends, community members, and other sources. What did you find most interesting?

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2. What did you learn from family/community members (e.g., any information about traditional clothes at home, stories about making clothes or special memories attached to clothes)?

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### What did I do and how long did it take?

It is important to understand how much time is required for an activity to be completed.

Calculate the approximate amount of time in hours you spent on each activity. Mark them on the timeline on the next page. If you did more than the activities suggested in the book, please add the number and time taken.






Activity	1	2	3	4	5
Time taken (Periods)	---	---	---	---	---



## What else can I do?

Ornamentation is about adding that special touch to your creation. You can add your creativity to decorate the product. Look for materials you already have — recycled items, leftover fabrics, buttons, silk or cotton thread, mirrors, etc. Table 3.10 has some examples; you can get more ideas from your teacher, family members, or friends.

**Table 3.10: Ornamentation of your finished product**

Types of ornamentation	How to do it?
	<ul style="list-style-type: none"> <li>Place the lace on the fabric where you want to attach it.</li> <li>Pin the lace to the fabric so that it does not shift when you sew.</li> <li>Use a simple running stitch to fix the lace with the fabric.</li> </ul>
	<ul style="list-style-type: none"> <li>Choose the buttons of your choice.</li> <li>Plan how you will use them – for example, you may like to add 4 buttons at the corners of your scarf or 5 buttons on each side of your <i>dupatta</i>.</li> <li>Fix the buttons to the fabric using needle and thread.</li> </ul>
	<ul style="list-style-type: none"> <li>Choose the pom-pom/tassel of your choice.</li> <li>Plan how you will use them, for example, you may like to add 4 tassels at the corners of your pillow cover/cushion or 7 tassels on each side of your <i>dupatta</i>.</li> <li>Fix the pom-pom/tassels to the fabric using needle and thread.</li> </ul>

You can also explore embroidery, beadwork, and sequins apart from the things mentioned in table 3.10. This will make your product even more unique.



### Think and Answer

1. What did you enjoy doing?
2. What challenges did you face?
3. What will you do differently next time?
4. Write the journey of a tie and dye product from producing raw materials to reaching the market. Which jobs are involved in this process?
5. Identify few examples of jobs related to the work you just did. For example, artisan, dyer, fashion designer, retailer, and textile researcher. Look around, speak to people and write your answer.