

## **Color Theory Through Shibori: Unit Introduction**

### **Art One - Forty Three Minutes**

#### **Rationale**

At the close of this lesson students will be familiar with the color wheel and basic color theory. Students will have been introduced to the various types of shibori and tie dye, as well as the cultural origin of this style of dying.

#### **Pennsylvania Standards Met**

**9.1.12.A** Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: Color

**9.1.12.C** Recognize and use fundamental vocabulary within each of the arts forms.

**9.2.12.A** Explain the historical, cultural, and social context of an individual work in the arts.

**9.2.12.F** Know and apply appropriate vocabulary used between social studies and the arts and humanities.

#### **Objectives**

- At the completion of this lesson students will know in-depth the subtractive theory of color and the elements of the color wheel associated with this theory.
- At the end of this lesson students will be familiar with the following vocabulary: Shibori, Subtractive Color Theory, Primary Colors, Secondary Colors, Tertiary Colors, Complimentary Colors, Triadic Color Theory, Split Complimentary Colors, Analogous Color Theory.
- Students who complete this lesson will understand the history associated with shibori dye techniques. Including its culture of origin, uses, and how it has been used throughout history.
- At the close of this lesson students will understand how historical figure Sir Isaac Newton has affected the arts.

#### **Resources**

- Color Theory and Shibori PowerPoint Presentation
- *Shibori: The Art of Fabric Tying, Folding, Pleating and Dyeing*, Elfriede Moller
- *Textile Dyeing: The Step-By-Step Guide and Showcase*, Kate Broughton
- Primary and Secondary Subtractive Color Theory Display Board

- Various Tie Dye Examples

### **Materials**

- Unit Pre-Test
- Digital Projector
- Projection Screen
- Computer
- Color Theory Worksheet
- Various Colored Candies

### **Vocabulary**

**Shibori** - A form of direct application textile dyeing that can be traced back to seventh century China. There are many variations of this method including tie dye, wrapping, pleating, sewing, and wood grain.

**Subtractive Color Theory** - Used when mixing paint, dyes, and inks using three primary colors to create all other colors in the spectrum.

**Primary Colors** - Red, Blue, and Yellow. These three colors cannot be created through any other colors they are colors in their own right.

**Secondary Colors** - Made by mixing equal parts of two primary colors, these colors are orange, violet, and green.

**Tertiary Colors** - Made by mixing equal parts of a primary and a secondary to create new color, there are six in the subtractive color wheel. These colors are named by the two colors which created it, the primary color comes first in this name.

**Complimentary Colors** - This refers to color that sit opposite each other on the color wheel. Mixing these together results in black. Pairing these colors near each other results in brighter looking colors.

**Triadic Color Theory** - This is a color theory in which three colors are grouped together. These colors are equal distance from one another on the color wheel forming a triangular shape.

**Split Complimentary Colors** - In this color theory one color is paired with the colors on either side of its compliment. Making a combination of three colors.

**Analogous Color Theory** - This refers to three colors directly neighboring one another on the color wheel.

### **Procedure**

Before class begins check that all digital instruction materials are functioning properly and that the digital presentation is ready to be played. Close the display board before students enter the room.

1. As students enter the room greet them and present the idea of a new unit.

“Good morning/afternoon class! Today we will begin a new unit involving color theory! I want to gauge what you all know about color theory before we begin so I will be administering a small quiz. You have ten minutes to take this quiz.”

2. After ten minutes collect the pre-test from the students and set aside. Hand out the Color Theory Worksheets and have the students take candy from the bowl. Pull up the digital presentation and begin presenting the class with the new material. Break down each slide into smaller bits of information. Encourage student to take notes during the presentation.

“I have a PowerPoint I’d like to show you all. To make sure you all pay attention I want you all to take the worksheet I’m bringing around and get candy from the bowl at the end of the table. There are twelve different colors, you’ll need one of each color. (Begin PowerPoint) First off what is color theory? Color theory is very simply, the study of color. There is a career based around color theory these people are known as color theorists. Color theorists study how color works in art, affects our moods, and sells product. Did you ever notice how many food products come in red packaging? This is because it has been proven that red packaging encourages people to buy an item.

“The image you see is a color wheel. There are hundreds of different color wheels in the world. They relate to different types of color theory. We will be using the RYB, or subtractive color model. This is the most common color theory used by artists because it applies to mixing paint, ink, and dyes. The color wheel is not new, it was first used by Sir Isaac Newton. He didn’t just discover gravity, he invented color theory too. Even so it is still studied and changing every day.”

3. If there are no questions move onto slide two. Walk around and check that all students have their candy in the correct place on the worksheet.

“Subtractive color theory begins with just three colors. These colors are called the **primary colors**. These colors are red, blue, and yellow. The primary colors cannot be made, they exist in their own right. These colors are used to create the remaining nine colors on the color wheel. I want you to pick up your red, blue, and yellow M&M’s and put them onto your paper where they belong”

4. If there are no questions move onto slide three. Make sure all of the student place the secondary colored candy in the correct place on the worksheet.

“The next layer of color on the color wheel are the secondary colors. These are violet, orange, and green. The secondary colors are made by mixing equal parts of two primary colors together.

These colors can only be made through the mixing of two primary colors. Red and blue create violet, blue and yellow create green, and yellow and red produce orange. Now take your secondary colored candies and place them onto your worksheet. Remember the secondary goes between the two colors that were combined to make it”

5. If there are no questions move onto slide four. Have students lay out their remaining candy on the worksheet, check that all of the students have their candy in the correct place.

“It isn’t that simple though. There are oranges that appear to yellower or redder, than pure orange. These colors are called tertiary colors. A tertiary color is made by combining equal parts of a primary and secondary color. When making a tertiary color it is named after the two colors from which it is mixed. The primary color is always listed first. These colors are red-violet, blue-violet, blue-green, yellow-green, yellow-orange, and red-orange. These colors can range from extremely close to the secondary, to almost a pure primary. Just like the secondary these colors go between the two colors used to create them. Red-orange will go between red and orange. I want you to put out your six tertiary candies where they belong.”

6. If there are no questions move onto slide five. Have students move two complimentary colored candies into the boxes below the color wheel on the worksheet. Check that each student understands how to pick out complimentary colors.

“Colors on the color wheel work together in relationships. There are many ways colors can work together. The first of which is to be compliments. Complimentary colors can be primary, secondary, or tertiary. To be compliments colors need only be opposite one another on the color wheel. Red and green are compliments, as are blue-violet and yellow-orange. A primary will always have a secondary compliment. A tertiary will have a tertiary compliment. I want you all to pick a color and put it into one of the boxes below the color wheel on your paper. Then in the next box place this colors compliment. I’m coming around to check and see that everyone has compliments picked out and in the boxes.”

7. If there are no questions move onto slide six. Have students put back the compliment and instead take the two candies on each side of it and place these into the boxes.

“A variation of this is split complimentary. This is when a color is paired with the two colors that sit on either side of its compliment. For red this would be yellow-green and blue-green. Split complimentary will always have three colors. I want you all to put back one of your candies from the complimentary color scheme. Then take the candy that is directly to its left and directly to its right. Put these pieces in the boxes. This is a split-complimentary color scheme.”

8. If there are no questions move onto slide seven. Have students put back all of their candies before picking an analogous color scheme. Check that all of the students understand what an analogous color scheme is.

“Analogous color schemes are considered to be the most appealing to the human eye. An analogous color scheme is made up of three colors that neighbor each other on the color wheel. They can all be in the same family, such as red-violet, violet, and blue-violet. But they can also be more different such as yellow-orange, yellow, and yellow-green. This color scheme will also always have three colors. Let’s start by putting back all the candy we’ve taken off, then pick a new color, one you haven’t used so far. Put it in one of the three boxes. Then pick up the candy that goes next to it and place it in one of the boxes. Do this again. You have just created an analogous color scheme!”

9. If there are no questions move onto slide eight. Have student put back all of the candy before picking a triadic color scheme.

“The final color scheme I want to discuss is triadic. This one can be tricky. It is made of three colors, tri meaning three. These colors must all be evenly spaced on the color wheel. In the subtractive method this means there are three colors between each color of the relationship. Using red you would skip three colors and land on blue, then skip three colors and land on yellow, then skip three colors and land back on red. Let’s put back all three of our analogous colors. Now pick up a candy, any piece you want. Then put it in the box, to find the next candy count three colors, and then pick up the fourth. Put this piece in the box. Now count three colors, pick up the fourth and put it in the box. These three colors are triadic.”

10. Ask the class for any questions concerning color theory, subtractive color theory, and color relations using the RYB color wheel. If there are not pose some to the class. Return to slide one and use the color wheel while answering and/or asking these questions.

“What are the primaries? secondary’s, tertiary’s? What always comes first in the name of a tertiary color?”

11. Move onto the second half of the lesson using slides ten and eleven.

“You might be asking how will you learn how to create all of these colors and color relations, well we’ll be doing some tie dying! Tie dye is a type of shibori. Shibori is an ancient Chinese method of dying that involves various types of twisting, folding, and wrapping. All of this is secured for the dye bath by extremely tight tying. On this page you can see examples of sewing and wrapping, two

method of shibori tie dying. Once used to create clothing and textiles shibori is now an art form used all across the globe.”

12. If there are no questions move onto slide twelve.

“When doing shibori there are many variations but they can almost all be broken down into four simple steps. Draw, sew, tie, and bind. We will be learning how to create a dye plan and then transfer our ideas directly onto the fabric. Then using a basic running stitch, which we’ll learn next class, you’ll sew the shapes you’ve drawn. Then all of the threads will be pulled very tight and tied. The excess fabric will be bound with thread, and wrapped in plastic (a second binding). We will learn these steps in the coming days.”

13. If there are no questions move onto slide thirteen. Pass around the basic tie dye sample.

“Tie dye is the most basic and common method of shibori. We will not be making the t-shirts and scarves you see at craft fairs. We will be studying the art of shibori and its many methods. Our first experience will be a basic tie dye using sewn circles. Our work will look similar to the piece on the right. I’m passing around the room a sample of a tie dye I’ve done. If you look at the board to the left of the room you’ll see two examples of the first project. The large piece was done using plastic, the smaller pieces were tied and bound before dying.”

14. If there are no questions move onto slide fourteen. Pass around the pleating and tie dye combination sample piece.

“Pleating is another simple form of tie dye, however it relies on folding the fabric to create patterns in the fabric. By folding the fabric onto itself over and over and tying the fabric the areas inside the folds will receive less dye and appear lighter after unwinding. The sample being passed around the room is of both pleating and tie die combined The darker edges show where dye was applied to the folded fabric and allowed to spread. This is small sample of a much larger piece of work. I also have a piece that is an example of what we will be doing using pleating and complimentary colors. See how the areas of overlap create a darker yellow? Not brown like you might think.”

15. If there are no questions move onto slide fifteen. Pass around pole wrapping samples.

“The wrapping method can take practice, it requires a lot of strength to be properly bound. It starts the same as pleating but the folded fabric is then wrapped around either a rope or pole. I use PVC pipe in my own work. The fabric is wrapped on an angle and tied very tightly then bunched up and twisted. This creates tiger like stripes on the fabric. I have one example that you can see has pole wrapped and dyed twice. This mounted example that will be coming around is yellow, yellow-

orange, and yellow-green. This is a dye sample that creates tertiary colors. We will be doing a work similar to this.”

16. If there are no questions move onto slide sixteen.

“Wood grain is very hard to master. It requires a lot of sewing, and very tight pulling and tying. This method requires sewing at least twenty running stitch lines about ¼” apart and pulling them extremely tight before dyeing. If you would like to try this type of dyeing I will gladly teach you but it will require a lot of time outside of class.”

17. If there are no questions move onto slide seventeen. Pass around the sewing sample piece.

“Sewing is a method we will use in our assignments. You can see how it shows in my example on the board ,and is present in the piece going around the room. Sewing is simply done by folding the fabric over and moving a running stitch along the fold. This effect can be achieved without folding as well. This is the first method we will be using starting tomorrow. I have here a sample where sewing lines are very easy to see, you can see the difference between the folded over, and the straight sewing lines.”

18. Take student questions. If there are no questions turn on the lights and review the concepts by referring to the display board in the front of the room.

### **Evaluation**

Students will be evaluated on their knowledge of the subject by taking a pre-test at the beginning of class. The test has ten multiple choice questions, worth one point each.

Name:

Period:

### Color Theory and Tie Dye Pre-Test

1. What is color theory?

- a) the study of color and how it affects our lives.
- b) the study of color and how it changes in different lights
- c) the study of color and how they mix together
- d) the study of color and how it happens in nature

2. Who invented the color wheel?

- a) Benjamin Franklin
- b) Leonardo DaVinci
- c) Sir Isacc Newton
- d) Socrates

3. Which type of color theory is also known as RYB?

- a) Additive
- b) Subtractive
- c) Primary Color Theory
- d) Basic Color Theory

4. What are the primary colors?

- a) red, orange, yellow
- b) blue, green, yellow
- c) orange, violet, green
- d) red, yellow, blue

5. What are the secondary colors?

- a) blue, green, violet
- b) green, violet, orange
- c) red, yellow, blue
- d) red, orange, green



6. Which colors are tertiary colors?
- a) red, red-violet, red-orange
  - b) red, yellow, blue
  - c) red-violet, blue-violet, blue-green
  - d) yellow-green, yellow, yellow-orange
7. Which colors are compliments of each other?
- a) red and green
  - b) green and blue
  - c) yellow and orange
  - d) blue and blue-violet
9. What are three colors that make an analogous color scheme?
- a) red, orange, green
  - b) blue, green, red
  - c) blue, orange, blue-violet
  - d) blue-green, blue, blue-violet
9. Which colors make up a triadic color scheme?
- a) yellow-green, yellow, orange-yellow
  - b) orange, green, violet
  - c) violet, red, blue
  - d) red-orange, blue-violet, blue-green
10. What is tie dye?
- a) a method of dying that involves folding, twisting, and tying fabric for direct dye application
  - b) a fashion movement started in the 1960's that is usually worn by hippies
  - c) a method of dying popular only at summer camps and craft fairs
  - d) a brand of dye used for coloring fabric

# Color Theory

Primary  
Secondary  
Tertiary

## What is color theory?

Color Theory is the study of color and its role in art and design. Color theorists in today's world study how color effects mood, sales, and even eating habits.

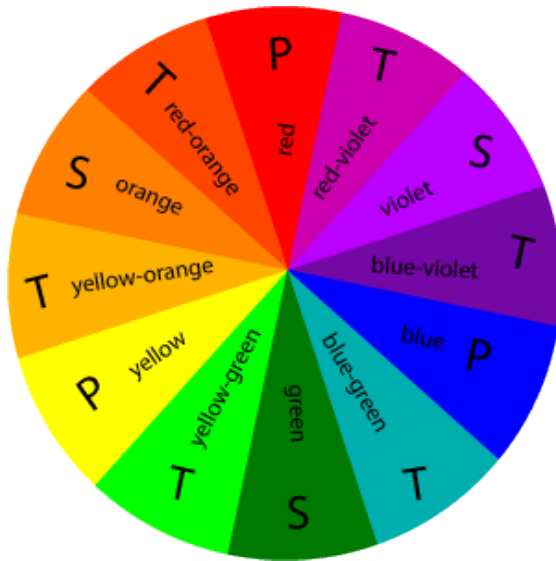
Color theory studies revolve around the color wheel, which was invented by Sir Isaac Newton. There are many variations on the basic color wheel, and even these vary depending on the color theory being discussed.

We will be studying the RYB or Subtractive color model. Within this theory there are three primary colors, three secondary colors, and six tertiary colors.



Above is an example of a subtractive color wheel

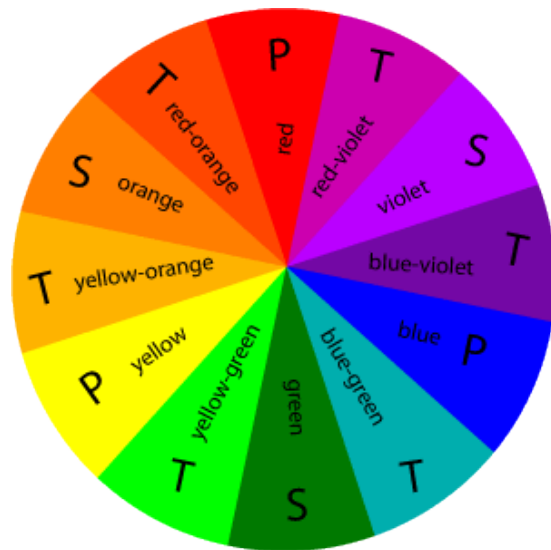
## The Color Wheel – Primary Colors



The subtractive color wheel is used to show color relations. The colors labeled P are the three **primary colors**. These colors are red, yellow, and blue. They are the primary colors because they cannot be made through the combination of any other colors. They are colors in their own right.

The **primary colors** are used to create all of the other colors seen on the color wheel.

## The Color Wheel – Secondary Colors



The next level of color in the color wheel are the **secondary colors**. The colors labeled S are the **secondary colors**. These colors are made through the combination of equal parts of two **primary colors**.

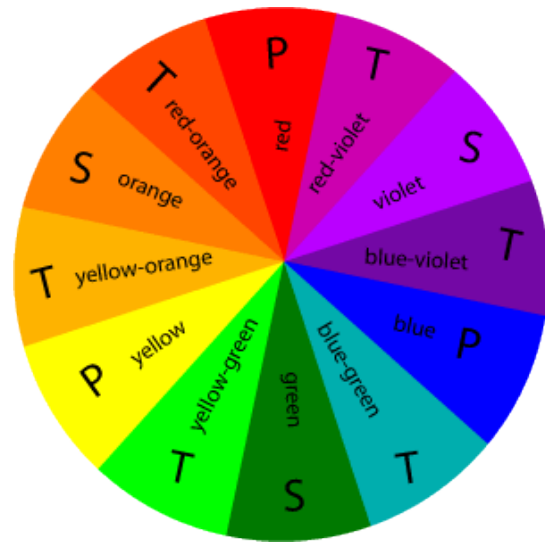
These combinations are:

violet (red + blue)

green (blue + yellow)

orange (red + yellow)

## The Color Wheel – Tertiary Colors

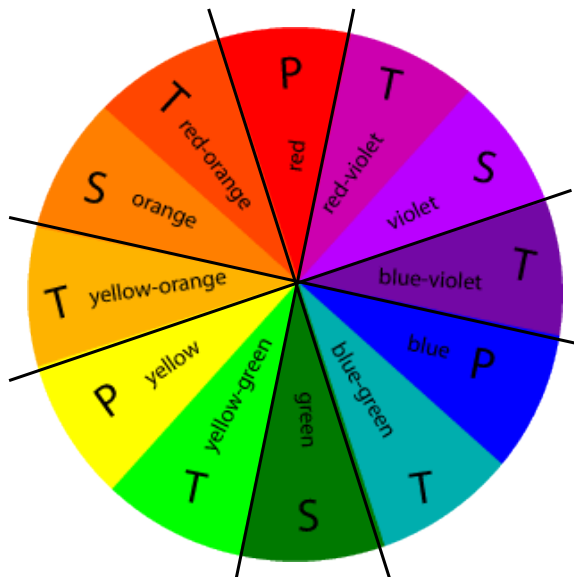


After the secondary colors there are the **tertiary colors**. The colors labeled T are the **tertiary colors**. These colors are made by combining equal parts of a primary color with a secondary color. There are six tertiary colors. These colors are:

red-violet,  
blue-violet,  
blue-green,  
yellow-green,  
yellow-orange,  
red-orange.

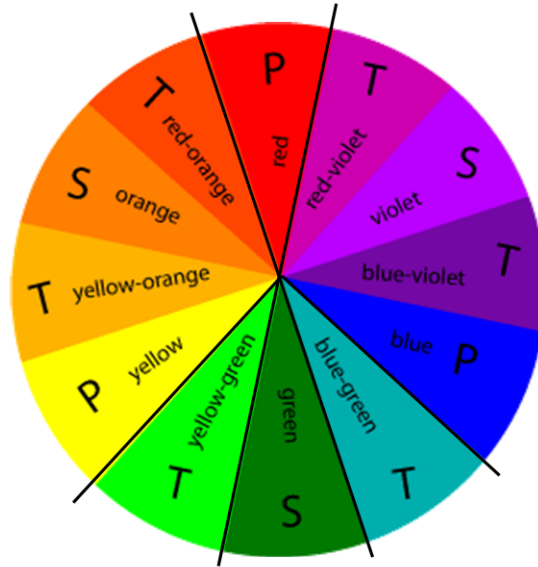
The name of the primary color is always first, the secondary is second.

## Color Relations – Complimentary Colors



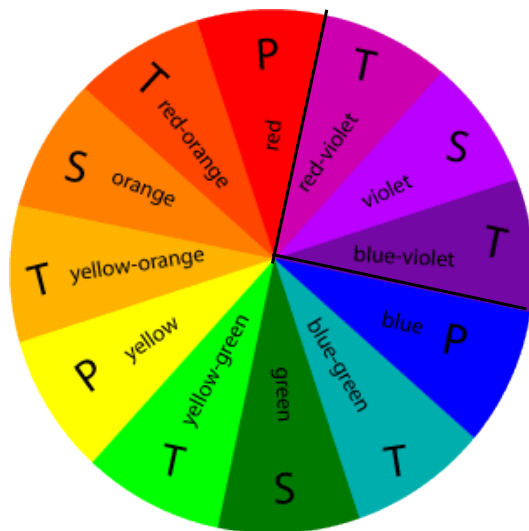
A color's complement is the color opposite to it on the color wheel. The complement of a primary color is always a secondary color. Red and green are complements. A tertiary color will have a tertiary color as a complement. blue-violet and yellow-orange are complements. Complements make each other appear brighter. Although when mixed they will create black with a hue of the primary color.

## Color Relations – Split Complimentary



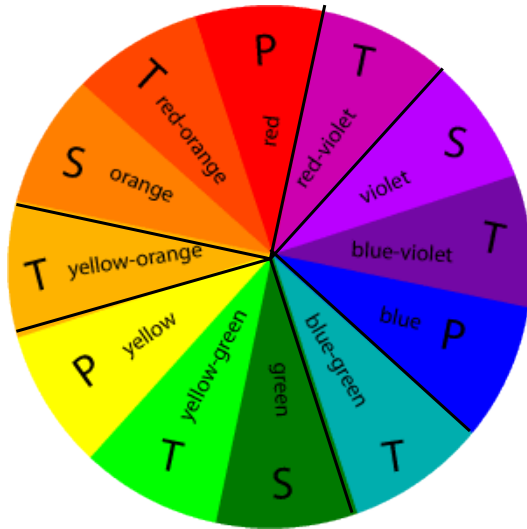
Split Complimentary is a color relation that uses three colors. The first color, and the two colors on either side of it's compliment. Using **red** for example, its compliment is green. The colors on either side of green are **blue-green** and **yellow-green**. These three colors make up a split-complimentary color relation.

## Color Relations - Analogous



An analogous color scheme uses colors that are directly next to each other on the color wheel. This color scheme usually contains three colors. This color scheme is often found in nature and is very appealing to the eye. An example of this color scheme is **red-violet**, **violet**, and **blue-violet**.

## Color Relations - Triadic



An triadic color scheme uses three colors that are equally far apart on the color wheel. There are five variations of this color scheme on the color wheel. An example of this color scheme is **red-violet**, **blue-green**, and **yellow-orange**.

How are we going to learn all of this?!?!

## Shibori - Tie Dye

Tie dye is a form of shibori dying. Shibori originated in China and is unlike other ancient textile dying methods. Originating as far back as the seventh century shibori has been found in Japan, Eastern Europe, and Indonesia. It stands out from other methods of dying because it involves folding, wrapping, twisting and pleating the fabric then securing the work with string. The fabric is then submerged in a dye bath, rinse and unwound to reveal patterns.



## Shibori - How it's done

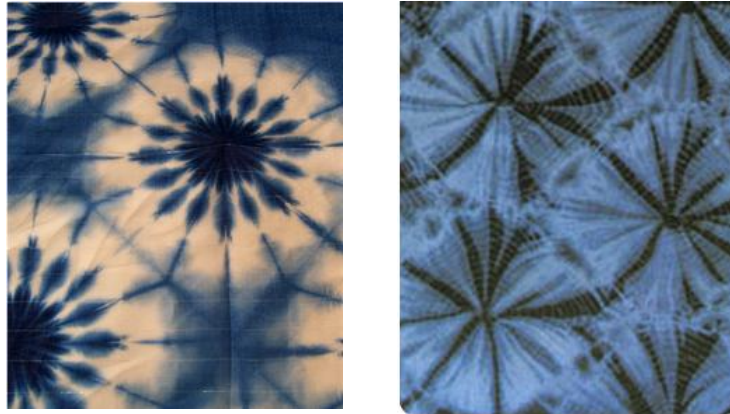
Shibori is a fairly simple process to learn. There are four simple steps to each process of shibori dying.

1. Iron your fabric flat and draw the lines to be sewn using a pencil or fabric pen.
2. Using a running stitch sew all the lines with each end of the thread on top of the fabric.
3. Pull the thread as tight as possible and create an overhand knot to secure the thread.
4. Bind the sewn fabric with thread very tightly and secure with an overhand knot



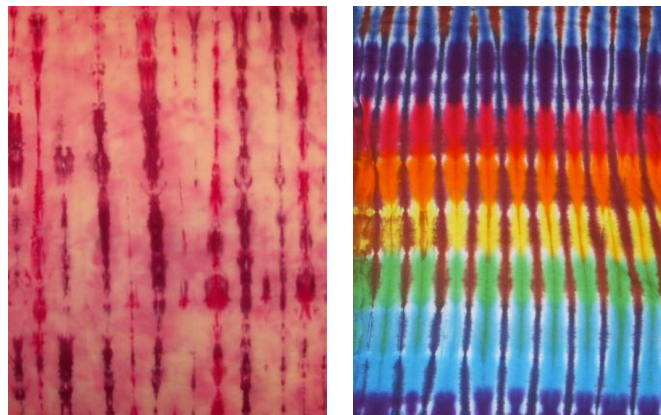
Your ready to dye!

## Types of Shibori – Tie Dye



Tie dye is done by tying off circles of fabric and tightly winding thread around the excess fabric. This can be done free hand or by first sewing circles.

## Types of Shibori – Pleating



Pleating is done by folding the fabric into equal sized plates and tying off the fabric at various interval. The result is dark lines at the folds and lighter color in the middle of the fabric when opened.



## Types of Shibori – Wrapping



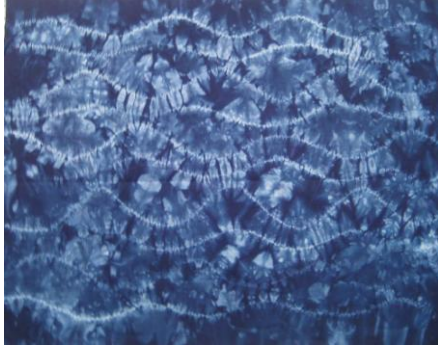
The wrapping method of shibori begins the same as pleating. The fabric is repeatedly folded onto itself until it is only a strip. The strip is then wound around something (I use PVC pipes) and tied very tightly. The tied fabric is bunched and twisted before being dyed.

## Types of Shibori – Wood Grain



Wood Grain is one of the more advanced types of shibori. This time consuming method involves sewing dozens of lines using a individual running stitches. After every ten or so lines you begin to pull and tie the threads. There needs to be at least twenty threads to complete a successful wood grain. This is a very hard skill to learn and requires very neat stitching, and tight tying.

## Types of Shibori – Sewing



The simplest form of shibori, sewing involves sewing random running stitch lines and pulling them tight. This can be done in combination with tie dye or on its own.

## Self-Evaluation

This lesson went very well with both classes I taught it to. At first I felt doing a thirty minute PowerPoint might not work out well. I thought the class would get bored, or not pay attention. To remedy this I planned to use guided notes to keep the students paying attention. After talking with my cooperating teacher this idea was scrapped and using the candy to create a color wheel was developed. This required me to go back and rewrite certain parts of my lesson, and add elements to my presentation. I also had to create the sheet that students would be working on. I think this was an extremely positive change to this lesson. It allowed me to make sure each student was grasping the concept by making them show me the theory every step of the way. Some students did not want to use the candy, claiming it was “pre-school” work, others really liked being able to eat their work at the end of class. I do think this worked better than guided notes might have, only because it gave me the opportunity to gauge the progress of each student during the lesson.

The pre-test was just about perfect, of the ten questions the two that were answered correctly most often were asking about the primary and secondary colors. This is something students should have been learning and using since elementary school. I was not surprised that most of the class knew these answers. Some students worked very hard on the pre-test, even after I explained it was mostly new information. This makes me hopeful that they will try just as hard throughout the remainder of the unit.

I also liked using a PowerPoint to present the information. This allowed me to highlight each color theory and relation right on the screen. The beginning of the PowerPoint was somewhat long and required the students to work along with me. However the second half was lighter, full of pictures, and showed them the exciting product we are working towards.

I would most definitely use this lesson again in my classroom. Even if I chose to eliminate shibori from the unit I could easily remove those few slides from the presentation and continue to use it to teach color theory. The use of candy was a fun idea that kept most of the students engaged. I believe those who were not engaged would have been even less interested in taking notes. This lesson may be harder to work with at other times of the year, the Easter holiday is near so there was a lot of colorful candy to be found. A mix of M&M’s and jellybeans left me with all of the colors on the color wheel. If candy is not available glass stones, mosaic pieces, or even colorful spools of thread could be used to continue the hands on element of this lesson. One improvement for this lesson might be to have the students color their worksheets after the presentation. This way they would have something to look back on rather than relying on the classroom visuals.