



# (ENG) Why do we like certain pictures more than others?

Introduction

Step 1 - Motivational Stage

Step 2 - Investigational Stage

Step 3 - Consolidation Stage

# Introduction

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#In-class activity #Inquiry-based learning #Experimental learning #Gamified learning #Simulation

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Pupils will see a famous work of art, which they will recreate. After the reconstruction is finished, they will calculate the percentages or proportions of the different colours in the picture. Finally, they will put the shares in the ratio of a complementary pair.

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## Learning Objectives

- ☐ Acquire how to build a colour composition in a balanced quantitative ratio (proportion) of colour surfaces of complementary pairs
- ☐ Gain knowledge about an independent analysis of works of art
- ☐ Instil a sense of creating a harmonious colour balance
- ☐ Learn to calculate and solve the whole calculation percentage from the proportion
- ☐ Calculate (calculate and solve) p% (percentages) of the basis
- ☐ Plan the artwork according to the quantitative ratio (proportion) of colours

### ACTIVITY DETAILS

## Activity Details

### Connection of the activity with Art

Art theorists have found that light and dark colours on the painting surface are seen more intensely and others more weakly concerning the background. Due to creating a balance between bright and dark colours, art theorists investigated the QUANTITATIVE RATIO (quantitative proportion) between them.



**Link to local, national School Curriculum** —

Percentage/Calculation with p%



**Equipment required** —

- A computer
- Colour pencils
- A pencil
- A ruler
- Two sheets of A4 paper



## Duration of activity —

60 minutes



## Sources —

Net.pdf, CC

Worksheet proportions of complementary colours.docx

Victor Vasarely, "Quadries No. 2" (1963) with net.jpg, CC

Photo Credits:

1. Picture 1: VICTOR VASARELLY, <https://www.wikiart.org/en/victor-vasarely>
2. Picture 2: Quadries No. 2 (1963), Victor Vasarely, Likovna umetnost 8, učbenik za likovno umetnost v 8. Razredu OŠ
3. Picture 3: "Quadries No. 2", Victor Vasarely, 1963, Likovna umetnost 8, učbenik za likovno umetnost v 8. Razredu OŠ
4. Picture 4: Dandelion light, Ančka Gošnik Godec, 1987, illustration from a picture book lučka Regrat, <https://www.ljubljanskigrad.si/sl/dogodki/ancka-gosnik-godec-lucka-regrat/>
5. Picture 5: Sava, Rihard Jakopič, 1922, Moderna galerija, Ljubljana, <http://zerogravity.mg-lj.si/slo/svetloba/jakopicsava.htm>
6. Picture 6: Parasols, Raoul Dufy, 1906, Museum of Fine Arts, Houston, public domain



# Step 1 - Motivational Stage

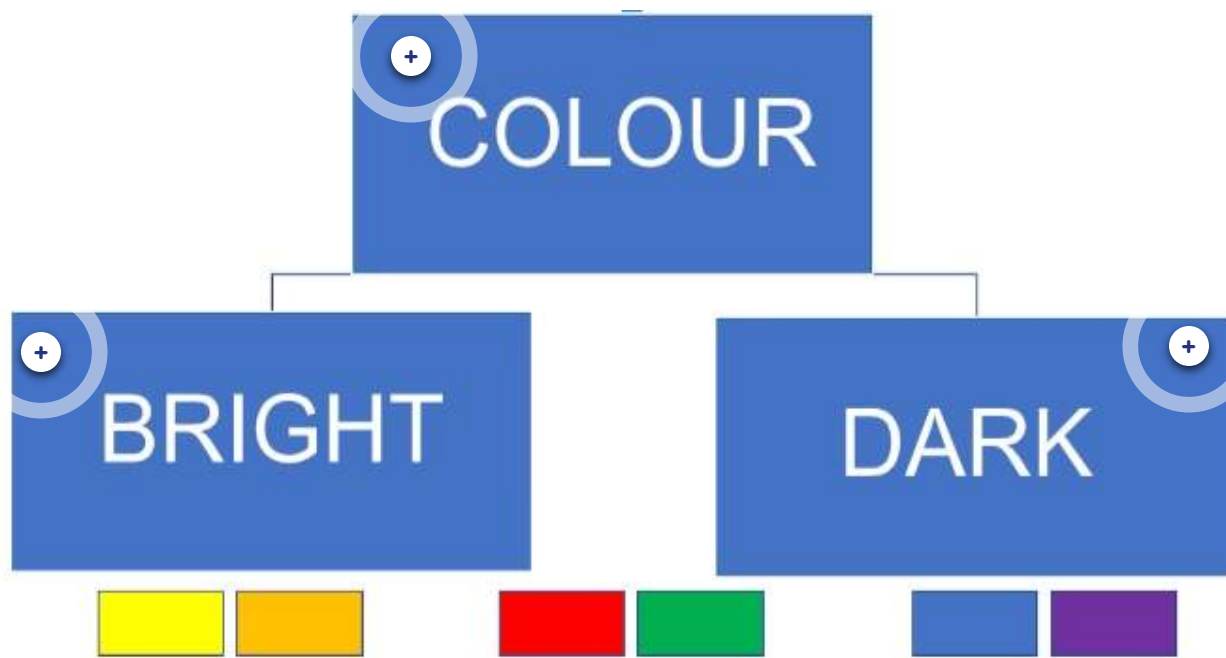
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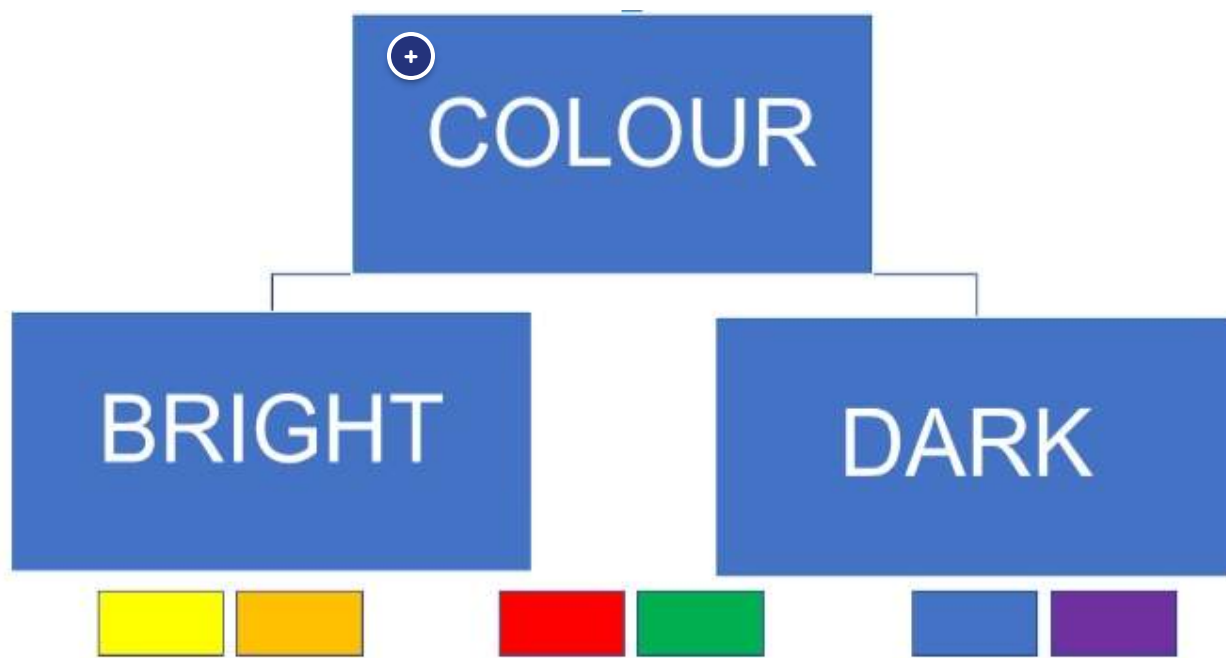


Explain to pupils:

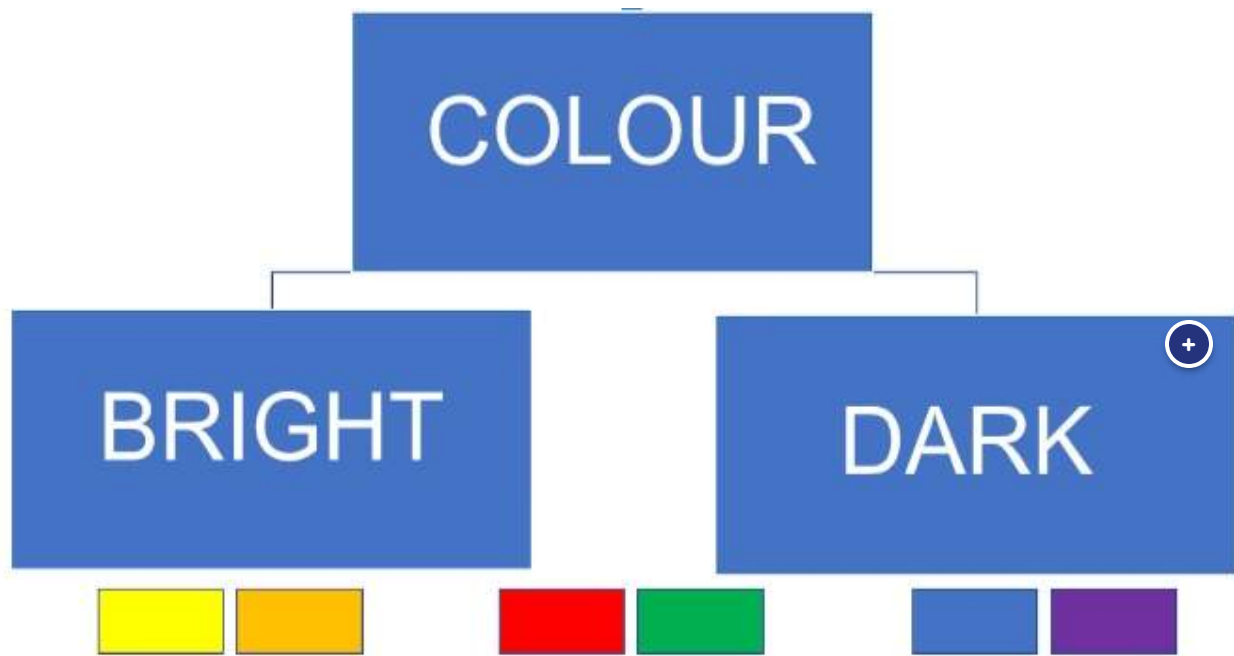
**QUANTITATIVE or QUANTITATIVE COLOUR CONTRAST (Proportion of colours in complementary pairs)**

Warm colours are brighter. We notice them quickly, and they give us a feeling of closeness. Cool colours are darker and they seem more distant.



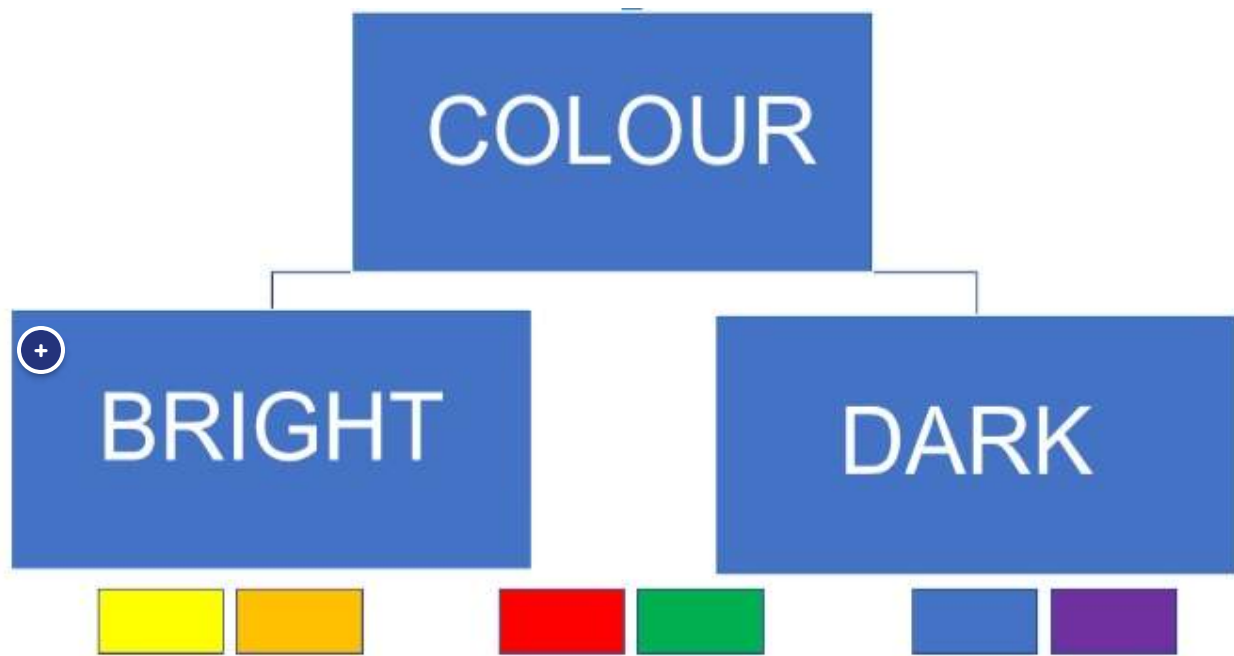


COLOUR



## DARK

- deary
- sad
- giving a feeling of distance
- unapproachable



## BRIGHT

- merry
- vivid
- lively
- giving a feeling of closeness

Art theorists have found that light and dark colours on the painting surface are seen more intensely and others more weakly concerning the background.

Due to creating a balance between bright and dark colours, art theorists investigated the QUANTITATIVE RATIO between them.

THE QUANTITATIVE OR QUANTITATIVE RATIO IS THE RATIO WITH WHICH WE DETERMINE HOW MANY COLOURS ARE ON THE PAINTING SURFACES.

The size of the coloured surfaces should be in the right proportion to the brightness colour values.

## Everyday life problem

Explain to pupils:

We want to calculate the percentage of which colour is in a painting by a famous painter and get the ratio between different colours. You will calculate what ratio the artist Victor Vasarely used in his painting "Quadries no. 2".

## Consolidation of already known content

Explain to pupils:

Complementary colour pairs are:

- Yellow and purple,
- Orange and blue,
- Red and green.

These colours are in a specific ratio, which we will calculate and determine the percentage of each colour in the pair.

A part of a whole or a share expressed as a fraction

$$\frac{1}{100}$$

this is called a percentage. Its sign is %.

$$\frac{1}{100}$$

Fraction means one part in a hundred, or one per cent of the whole.

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p per cent means

$$\frac{p}{100}$$

$$p\% = \frac{p}{100} \text{ of a whole}$$

One hundred per cent

$$\frac{100}{100} = 1$$

means whole or a base –

$$100\% = 1$$

is a whole. The percentage can also be written with a decimal number.

0,01 of a whole is 1%

## Step 2 - Investigational Stage

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### STUDENTS' TASKS

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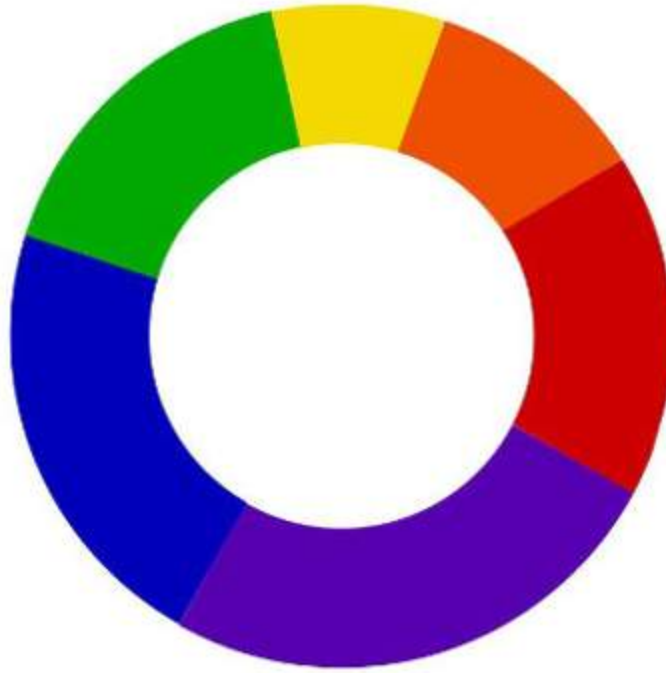
#### Task 1

Explain to pupils:

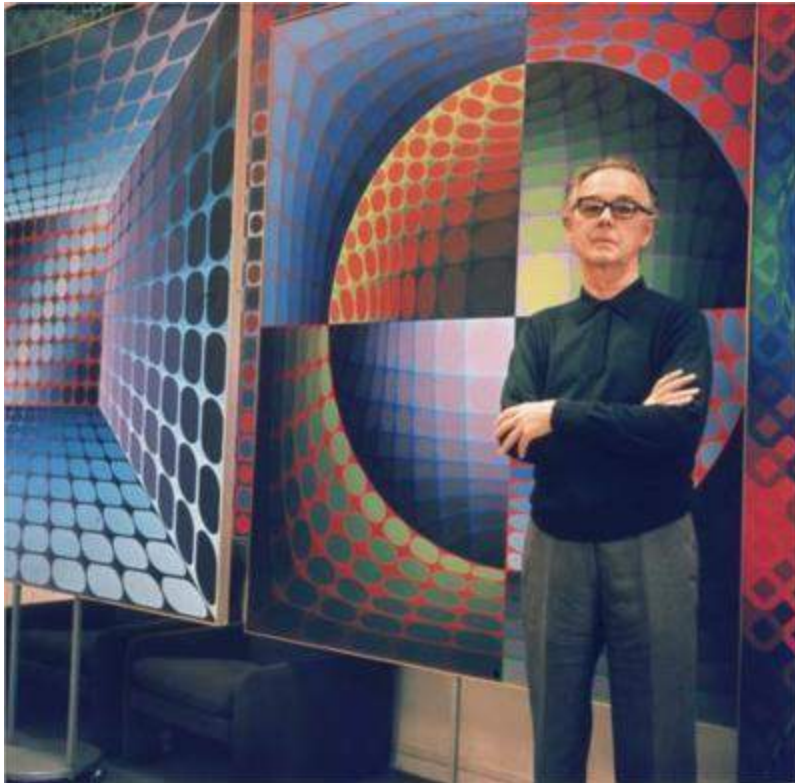
The size of the coloured surfaces should be in the right proportion to the brightness colour values. The Swiss painter and sculptor J. Itten arranged quantitative relations between colours in a circle. Yellow is the

brightest, followed by orange, red, green, and blue, the darkest is purple.

*(text adapted from Dr. T. Tacol, Art expression, Textbook for art education in the 8th grade of a nine-year elementary school, 2006)*



**Art assignment in connection with math:**



**VICTOR VASARELLY (1906 – 1997)**

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Victor Vasarely was a Hungarian-French artist.

He was a representative of the painting direction Op art – visual art, a style of visual art that allows the use of optical illusions. These works are abstract; many objects are included, often done in black and white. Shapes in the paintings created in the Op-art style give us the impression that they seem to be moving, undulating, flashing, etc.

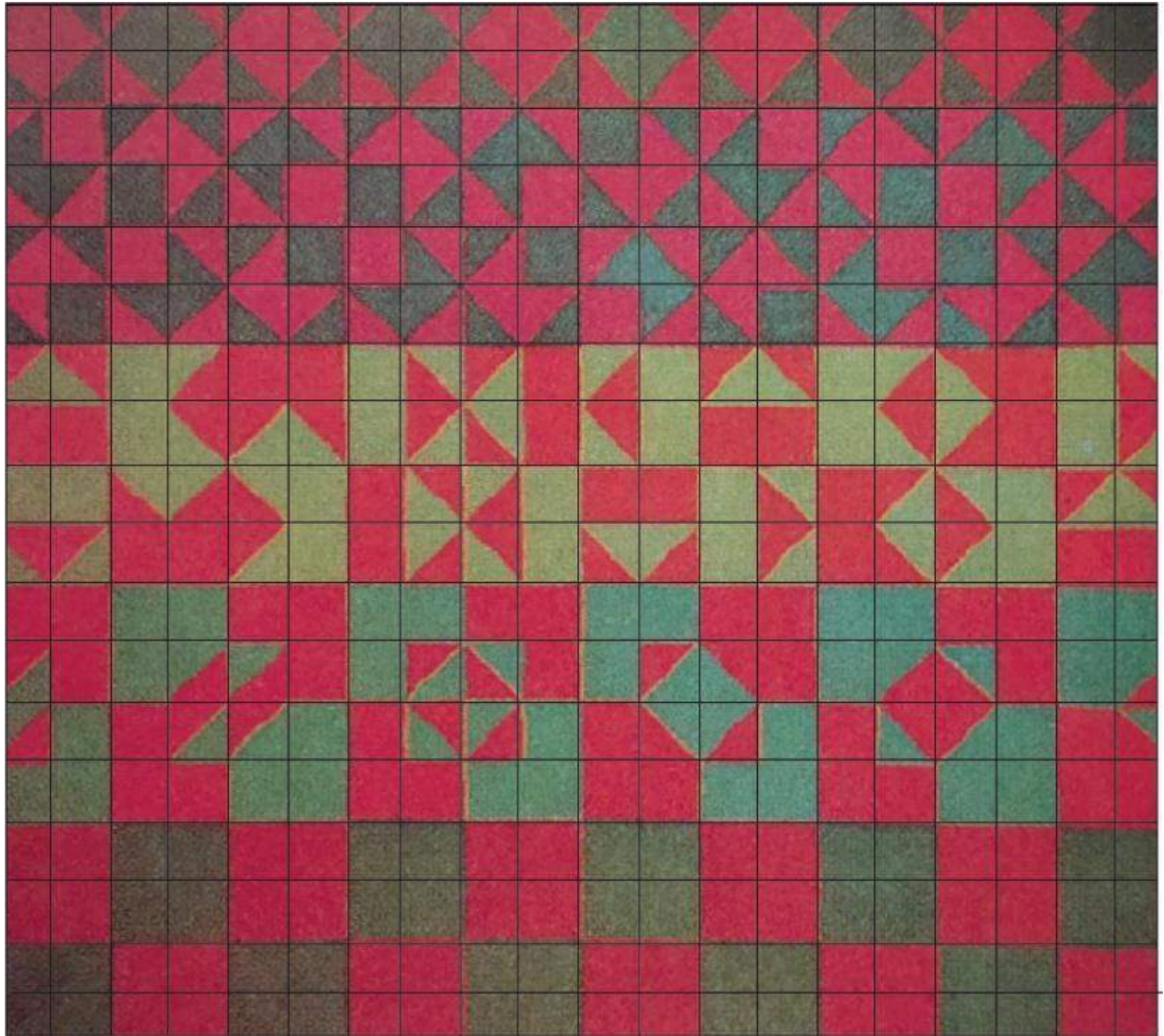
Vasarely created his paintings from geometric forms and used various materials in his works. However, he used a minimal number of shapes and colours.

## **Task 2**

**Practical work or solving an artistic problem**

Ask pupils to view the artwork:

Look at a famous work of art and find out which complementary pair of colours the artist used. Then, consider the quantitative ratio of these two colours on the painting surface.



Picture 2: Victor Vasarely, "Quadries No. 2" (1963)

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The teacher shows the pupils a photograph of the work of art in A4 size. Photography – the work of art is divided into parts. The grid is shown in the photo as well.

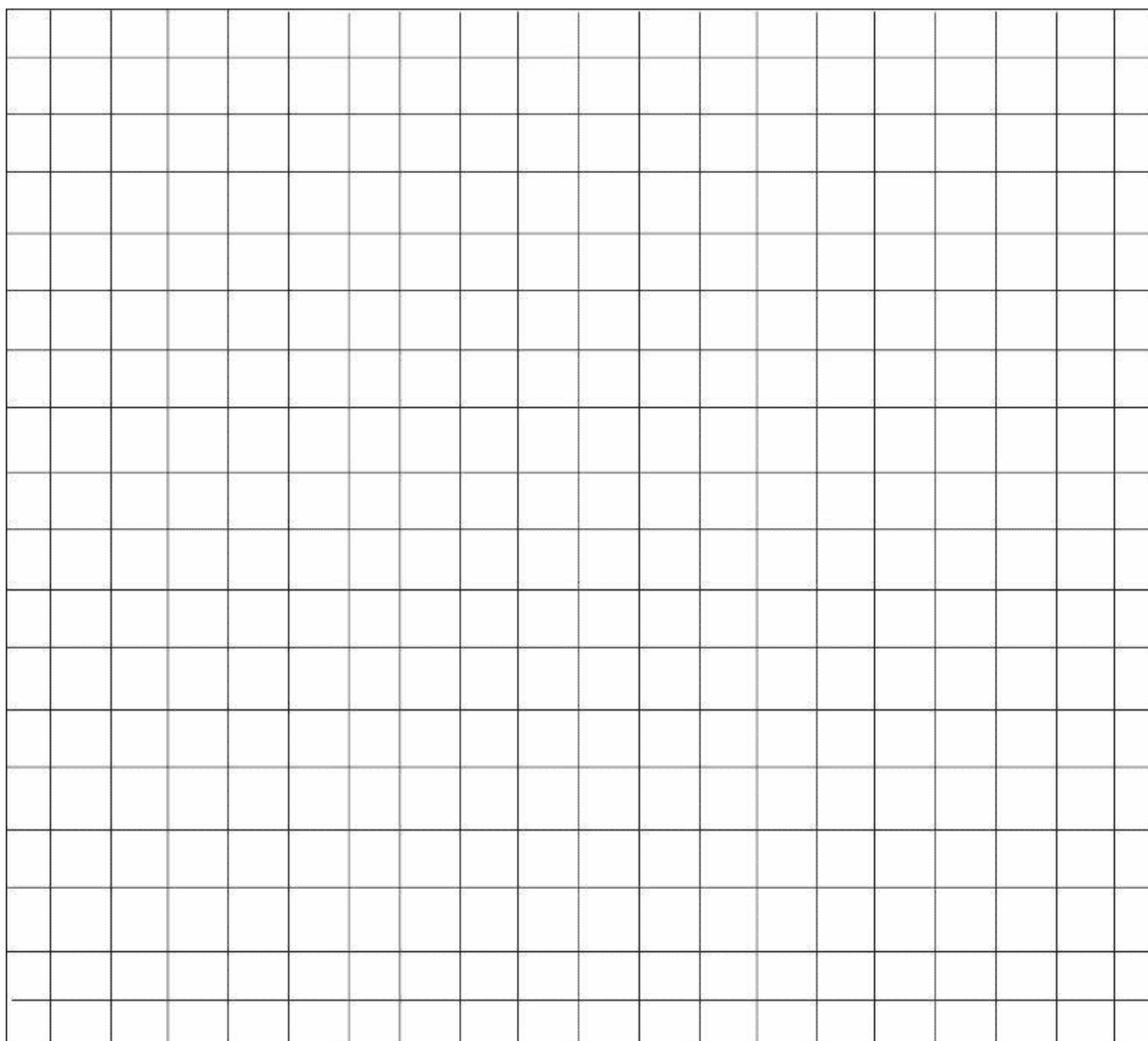


Picture 3

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Ask pupils:

After observing, you will recreate the work of the artist V. Vasarely. First, divide your A4 sheet, with a pencil, into the same parts as the divided photo. You create a grid on your sheet of paper with 360 squares (20 x 18 squares), you can print file Net.pdf from additional downloadable materials.



Now, after observing, transfer the individual parts in the photo of the artwork onto your sheet of paper with colour pencils, paying attention to the shades of different colours.

Explain:

When we finish the colouring, we'll start calculating.

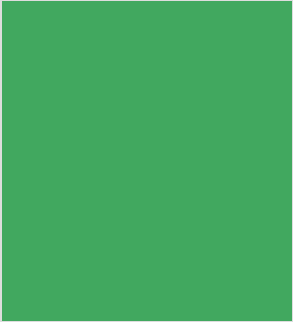
Ask pupils:

With the percentage calculator, you will calculate the share or complementary couple relation - green and red colours on a piece you recreate yourself.

Explain:

There are several shades of green and red in the picture. For each shade, paint a square in the table, count how many squares you have painted on the grid, and fill in the table (found at the end of the activity).

Example:

Colour	Number of squares	Calculation
	36	

The sum		

Ask pupils:

When you have counted all the squares for each colour, add the number of squares and check if they were counted correctly. The sum must match the base (360 squares).

Now let's do some calculations. First, let's look at what we need to know to calculate the percentages.

Explain:

$$\frac{d}{o} = p \%$$

**Percentage calculation**

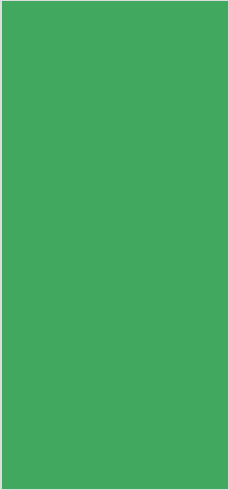
Where p is the percentage (proportion), o is the whole or a base, and d is the share.

We can calculate the third quantity from two other quantities:

$$\frac{d}{o} = p \% \quad \frac{o}{d} = \frac{100}{p \%} \quad \frac{d}{o} = \frac{p \%}{100}$$

$$o = \frac{d \bullet 100}{p \%} \quad d = \frac{p \% \bullet o}{100} \quad p \% = \frac{d}{o} \bullet 100$$

In the table, calculate how many areas of the picture are represented by the particular colour you used. Then, write the data for each colour and calculate as shown in the picture.

Color	Number of squares	Bill
	36	<p>d=36</p> <p>o=360</p> <p>p%=36/360</p> <p>p=10%</p>

Then add up all the percentages (proportions) you have calculated.

Ask pupils:

What should the sum of the whole be?

Explain:

Finally, you add the percentages (proportions) of green and red shades for each colour separately. If you redrew, counted and calculated correctly, the ratio between green and red is 50% : 50%.

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## Task 3

### Summary

Explain: Quantitative relations between complementary colour pairs:



GREEN : RED

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Green and red are equally bright colours, so we use them in equal amounts when combining them. Ask pupils to determine the proportion by measuring and calculating the percentages of pairs of complementary colours.



YELLOW : VIOLET

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When using this colour combination, we should choose a quarter of yellow and three-quarters of purple for balance.



ORANGE : BLUE

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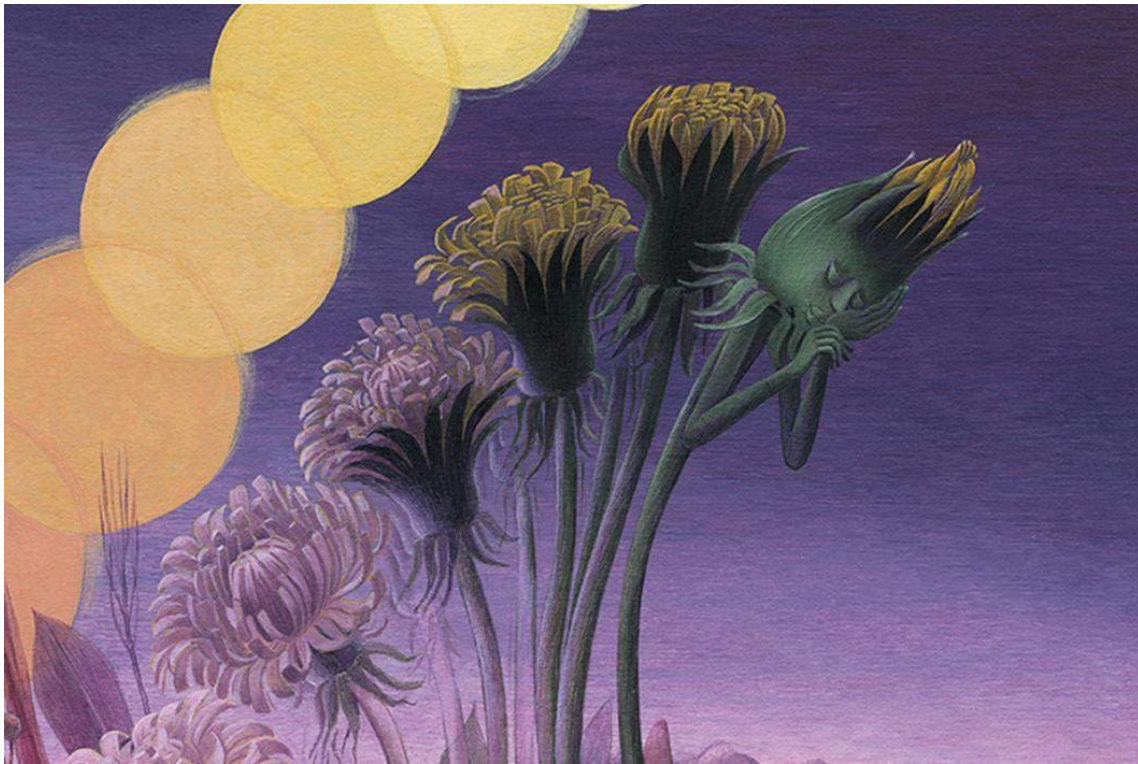
The orange colour is brighter than blue, even more glowing, and will work in balance if we use two-thirds of blue. <https://eucbeniki.sio.si/lum8/2260/index3.html>

Explain the examples in works of art:

### **YELLOW : PURPLE (1/4 : 3/4) —**

The yellow colour, three times stronger than purple, covers only a quarter of the entire surface. As a result, the balance of power and brightness is achieved.

[Picture 4: Ančka Gošnik Godec: Dandelion light, 1987, illustration from a picture book Lučka Regrat](#)



### ORANGE : BLUE (1/3 : 2/3) —

In a complementary pair, the painter achieved balance by painting one-third of the painting surface orange and two-thirds blue.

[Picture 5: Rihard Jakopič, Sava, 1922, Moderna galerija, Ljubljana](#)



### RED : GREEN (1/2 : 1/2) —

Between green and red, the painter achieved a balance in brightness or the power of colour by colouring half of the painting surface with green and half with red.

Picture 6: Raoul Dufy, Parasols, 1906, Museum of Fine Arts, Houston, public domain



## Step 3 - Consolidation Stage

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The pictures below determine the ratio and percentages for the other complementary pairs. Determine the proportion by measuring and calculate the percentages of pairs of complementary colours.





**DONE\_Worksheet proportions of complementary colours -  
PREGLEDANO.docx**

26.1 KB



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**End of the activity**

EXIT