Mondrian design

<table>
<tr><td rowspan="5">Integration</td><td colspan="3">21st Century Theme: General knowledge</td></tr>
<tr><td rowspan="2">Concepts for STEAM Disciplines</td><td>Mathematics
Linear equation
Linear inequation
Graphic interpretation of linear inequations</td><td>Science Education
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<tr><td>Technology
Use of GeoGebra</td><td>Arts
Design
General culture</td></tr>
<tr><td colspan="3">Prerequisite Knowledge

Mathematics
Linear equation.
Systems of linear equations.

Information Technologies
Basic use of GeoGebra.

Arts
Primary colours.</td></tr>
<tr><td colspan="3">Learning Outcomes

Grade Level: 15-16 years old
Duration: 300 minutes

Learning Outcomes for Mathematics
Students are able to recognise the linear inequations.
Students are able to distinguish the difference between linear equations and linear inequations.
Students can establish relations between linear inequations and graphic representation.

Learning Outcomes for Information Technologies
Students are able to use GeoGebra.
Students are able to work in a shared document.

Learning Outcomes for Arts
Students may use art elements and design principles based on a recognized artist.</td></tr>
<tr><td rowspan="3">Real Life Situation</td><td colspan="3">Problem Situation
Design and paint a Mondrian-style shopping bag.</td></tr>
<tr><td colspan="3">Materials
● Computer with internet access
● Rules
● Colour pencil
● Plain white cloth shopping bag
● Fabric paint (yellow, red, black, blue)
● Brushes</td></tr>
<tr><td colspan="3">Preparation for the lesson
The following questions will be seeking answers for preparing the lesson plan.

● Who is Piet Mondrain?
● What are the Mathematical characteristics of his work?
● Why is he famous?
● What was Mondrian's artistic style known for?
● How did Mondrian's art reflect his spiritual beliefs?</td></tr>
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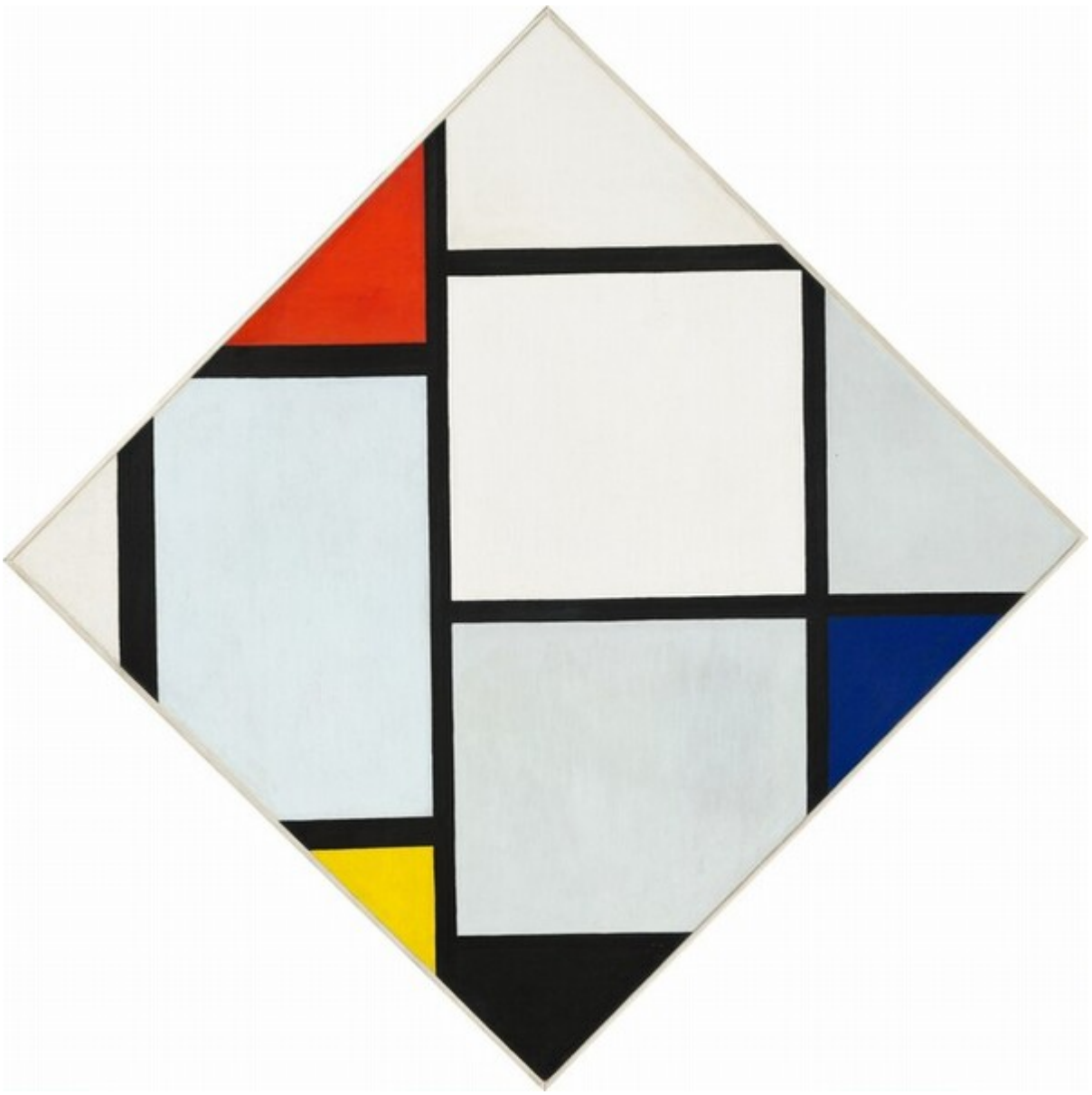
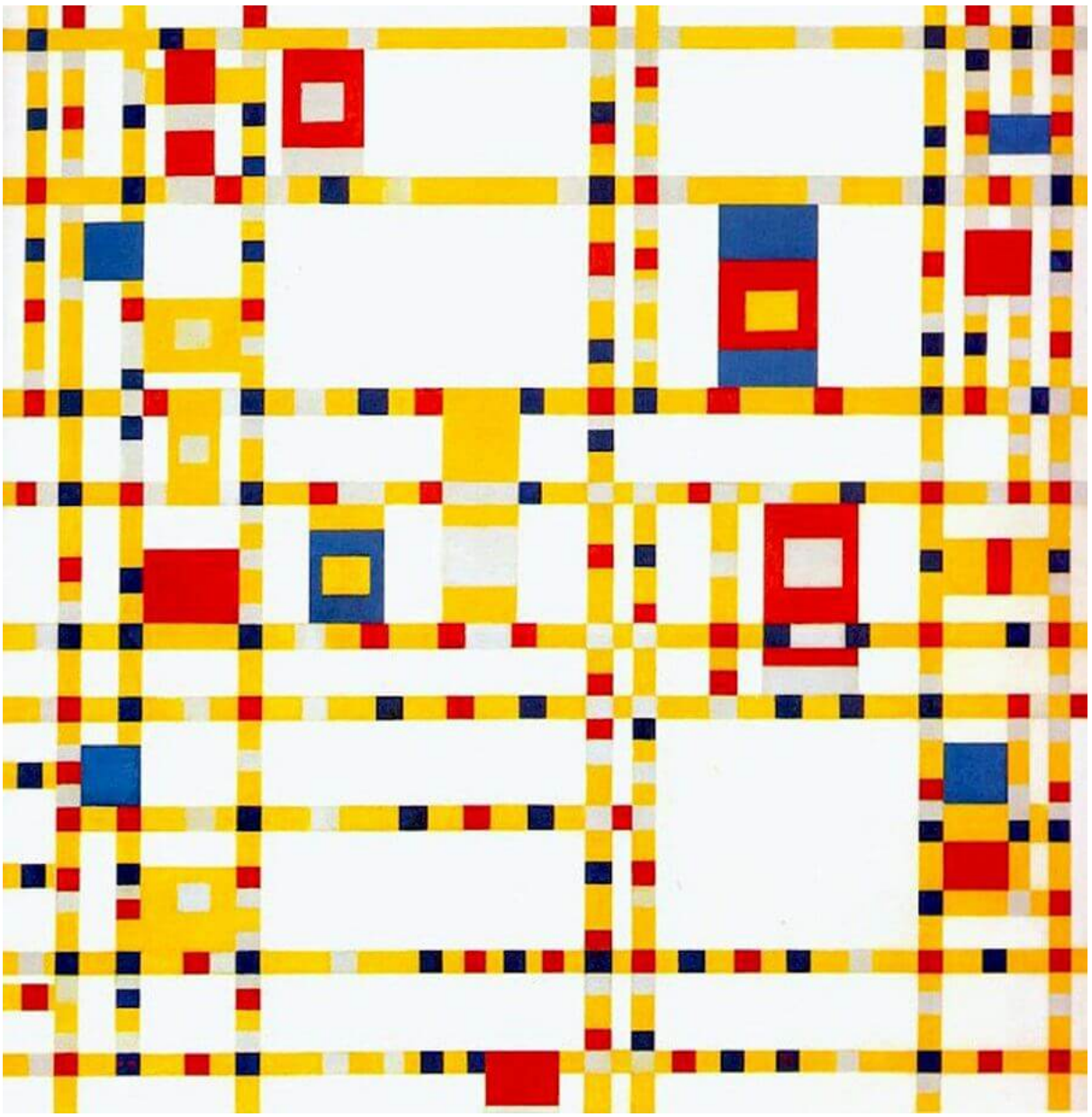
	Resources https://www.piet-mondrian.org/ www.geogebra.org Pictures at the end of this document.
STEAM Activity	**Ask** In the first class, the teacher will present a selection of Mondrian's artwork (see the pictures at the end). Students will have the opportunity to look at each image and describe it in their own words. Additionally, they will engage in a discussion focused on the following questions: ● What are the colours used in the artwork? ● What geometric forms are present in the artwork? ● What are the characteristics of the colours Mondrian uses in his artwork? ● What do you know about Piet Mondrian? ● Do you know the name of the artistic movement associated with Mondrian's work?
	Research Students will be asked to conduct independent research on Piet Mondrian, including his life, ideas, work, and the relationship between his work and geometry. Students are encouraged to use credible sources from the Internet to gather relevant information. After completing their research, students will work collaboratively in a shared document to create a poster that summarises the key information they have discovered about Mondrian. The poster should be visually engaging, including images of Mondrian's artwork and other relevant visual aids.
	Imagine The teacher will summarise the information that students have gathered about Piet Mondrian and his unique artistic style. The teacher will then guide students through an exploration of how Mondrian's use of geometric forms and primary colours relate to mathematical concepts like linear equations and linear inequations. After this theoretical work, students will work in groups of 2-3 people to create a design based on Mondrian's artwork. They will be encouraged to use their knowledge of mathematics and geometry to inform their designs, experimenting with different combinations of lines, and colours to create a unique and visually striking composition.
	Plan Each student group creates a design based on Mondrian work. They use paper, rules and colour pencils. It is recommended to use Cartesian axes during this process. After that, the students have to describe their design in mathematics language using: ● linear equations ● linear inequations ● equations or inequations systems They can use colour references. When they finish the mathematical design, they have to create a GeoGebra file to compare with the original design. The work finishes when all designs are the same (paper, mathematics and GeoGebra) When each group has finished, the teacher exchanges the mathematics designs.
	Create Each group gets a design from another group. They have to interpret the design and paint it in a shopping cloth bag for each member. They can use GeoGebra as an intermediate step.
	Test Students will use their information to create a visually appealing poster that includes some of Mondrian's artwork pictures. They will compare their original design with the final paint on the cloth shopping bag that they have created based on Mondrian's artwork. Finally, the posters and some pictures of the students´ experience will be displayed in the classroom, allowing their classmates to learn from their work.
	Improve Students should paint or print the design in different objects. For example notebook covers, cups, t-shirts, etc…

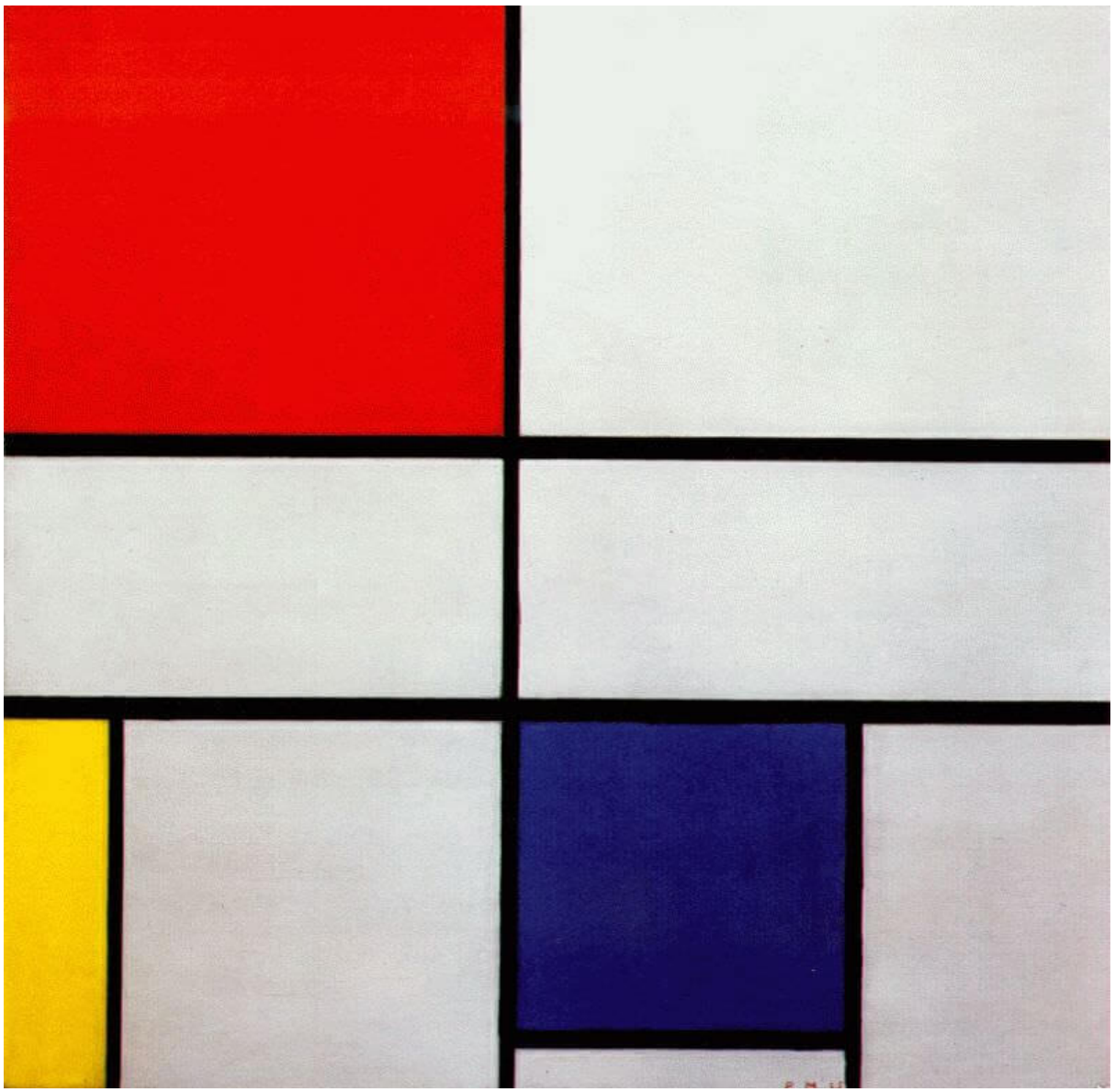
Materials	This part will be decided by the teacher and students according to their ideas.
Test	This part will be completed by the teacher.



https://www.piet-mondrian.org/tableau-no-iv-lozenge-composition-with-red-gray-blue-yellow-and-black.jsp



https://www.piet-mondrian.org/broadway-boogie-woogie.jsp



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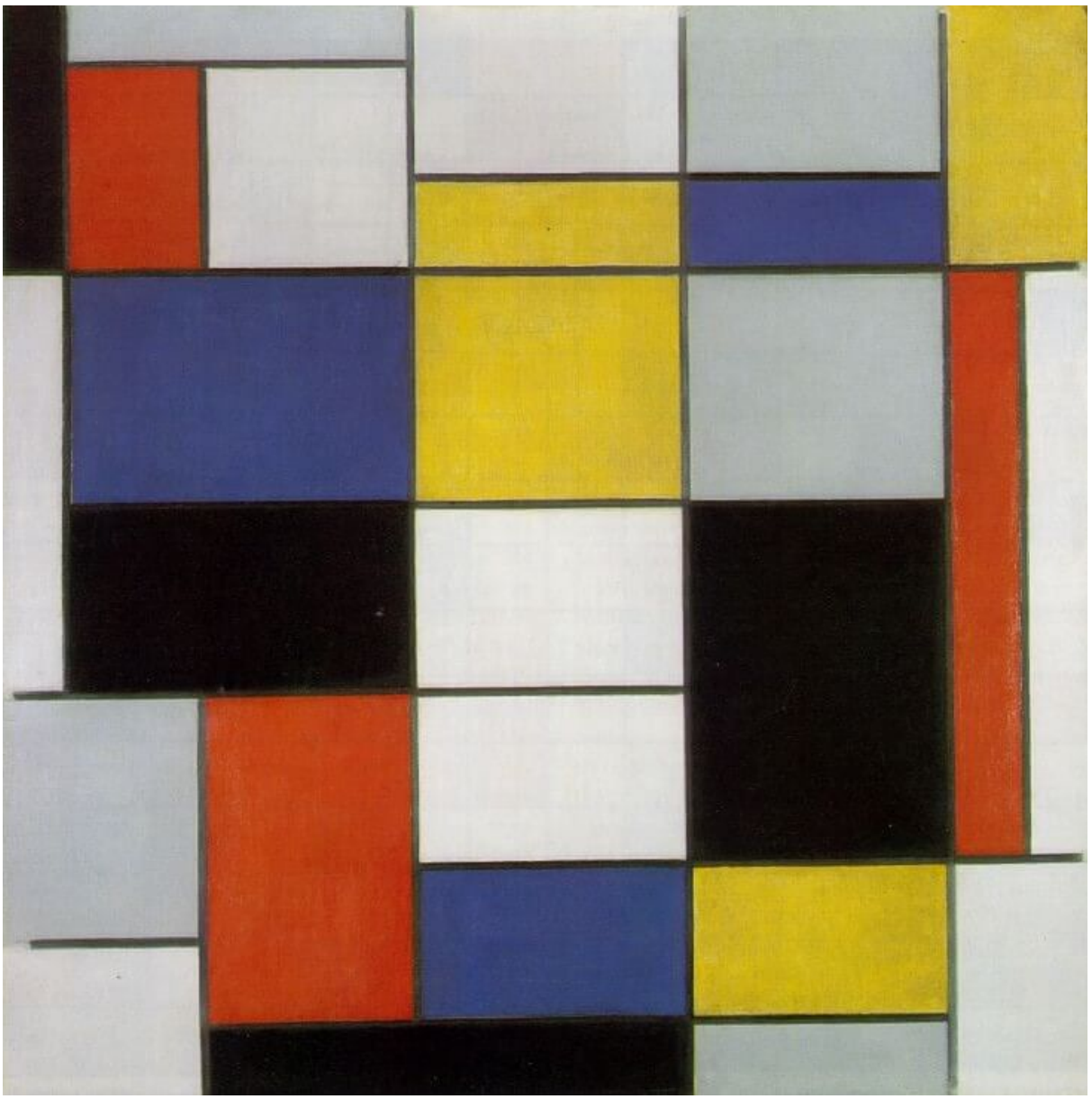

https://www.piet-mondrian.org/composition-number-2.jsp