



# Non-Stop Optical Illusions

## A Teacher's Guide to the Empire State Plaza Art Collection

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## Introduction

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### Teachers:

This resource kit on Optical Illusions is a guide for helping your students look at and understand Modern art. It contains four slides of works from the Empire State Plaza Art Collection. Accompanying each slide is a page of information that will help you and your students decipher the optical illusions. Each page is set up in question and answer format. While looking at the slide, ask your students the questions and help them to discover the answers. When you visit the Empire State Plaza Art Collection, you and your students will see and interpret these works and more. Begin by reading the story of *Zeuxis and Parrhasius* to your students and view the slides as follows.

## Zeuxis and Parrhasius



### 5th Century A.D.

In ancient Greece, there were two famous painters, Zeuxis and Parrhasius, who challenged each other to a contest to see who was the best painter in all of Greece. Zeuxis painted a picture of grapes and hung it up in open air. It was so natural looking that birds pecked at the picture believing the grapes were real. Parrhasius painted what looked like a curtain hanging over his painting. Zeuxis, proud of his success with the grapes, entered the studio and asked Parrhasius to withdraw the curtain. When Zeuxis realized the curtain had been painted, Zeuxis admitted his defeat. Although Zeuxis deceived the birds, he himself a painter, had been deceived by Parrhasius, a fellow artist.

According to the story, the best artist was the one who could paint the most **realistic**, or life-like, picture. Because there were no cameras to take pictures, painting was the only way to pictorially record life. For hundreds of years before photography, artists like Zeuxis and Parrhasius experimented with ways to paint the illusion of real life. Once photography was invented, artists no longer needed to paint imitations of nature. Many artists abandoned realism and began to paint abstractly. Some artists left object-based art altogether in order to focus on basic elements such as color, line, shape, and texture. With **non-objective** art, the artist fused together these elements into designs or patterns to create optical illusions. Optical illusions are based on the science of visual sensory perception, or how images are received and interpreted by the brain. In many cases, the illusion is movement. Thus, the advent of so-called optical art, or **op-art**. Explore each work of art included in this kit and learn the ways modern artists create optical illusions.

**Image One:**  
**Lawrence Calcagno**  
***Red-Black, 1967***

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Begin looking at each slide by engaging in an in-depth description of each work of art. Talk about lines, shapes and colors and how the elements interact with one another.

It is important to note that the painting is made of two separate panels: a solid black panel and a panel of horizontal bands of red. A space where the wall is visible separates the two panels.

**Q.** Why do you think the artist used two panels instead of one? What illusion does this create?

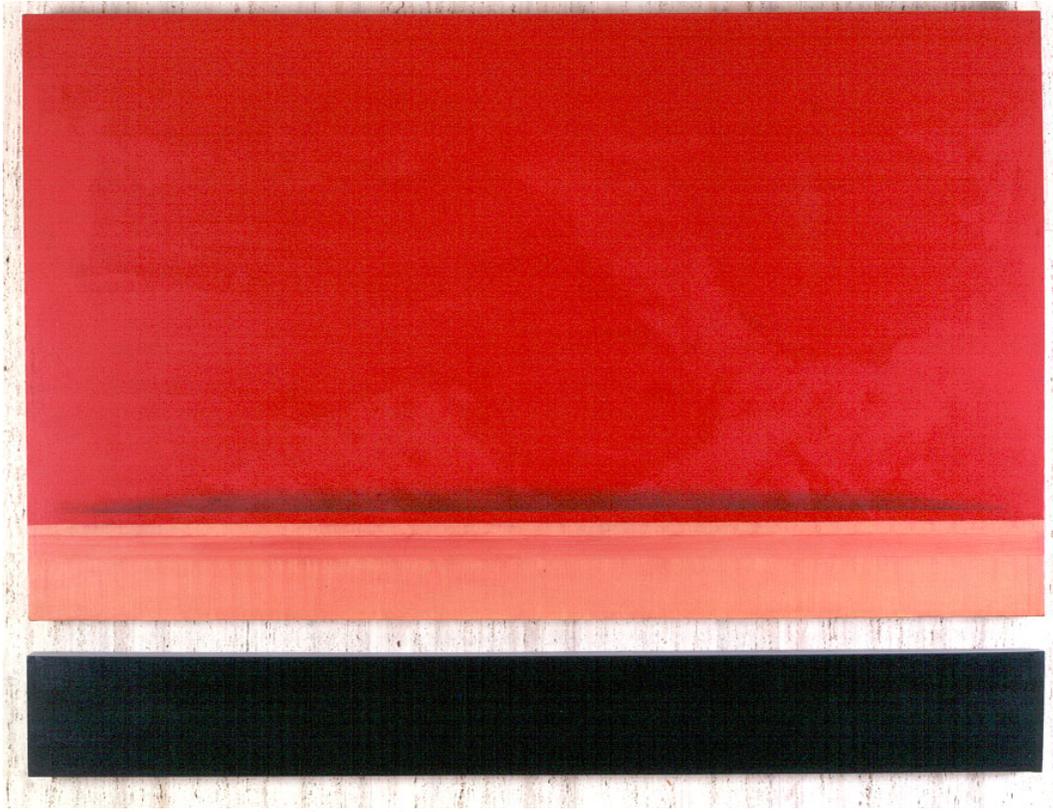
**A.** The gap between the two panels casts a shadow on the wall that is “real” whereas the shadows created in the bands of orange and red are not “real”. However, if we view the work of art at a distance, it looks as though it is a single panel. Only after we see it up close do we see two panels and the illusion they create.

**Q.** What colors are used and what do you think they might represent?

**A.** The predominant colors are black, orange and red. One interpretation of the colors might be that the black could represent the Earth, the orange could represent the sea, and the red could represent the sky. The black shadow painted at the bottom of the red layer also implies a recession in space, or perspective. It is one of the single most important tools artists have to create the illusion of depth on a two-dimensional surface. Notice how it makes that area look as if it's far off in the distance. However, the artist is trying to fool us into what is real and what is not.

**Q.** What is the dominant color in this painting?

**A.** The color red dominates this painting. Many artists use color as a powerful tool for creating emotion. What emotions do you have while looking at this painting? Obviously, we are not looking at a realistic painting, but what kind of feeling do you get from these colors and their placement on the canvas? Is it inviting and appealing? Strange and eerie? Something else?



Lawrence Calcagno, *Red-Black*, 1967

**Image Two**  
**Gene Davis**  
***Sky Wagon, 1969***

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Again, begin looking at the slide by engaging in an in-depth description of the work of art. Talk about lines, shapes and colors and how the elements interact with one another.

**Q.** Are the colors randomly arranged?

**A.** Yes and No. Davis did select his colors randomly: however, in certain places he deliberately chose to place complimentary colors side by side. Complimentary colors are colors that are opposite one another on the color wheel. They are not related, so therefore they create distinct contrast when used together in a work of art. Color is an important aspect in the effect of optical illusions because when complimentary colors are placed side by side, they appear as if they are vibrating. If you stare long enough at this piece, it seems as if the lines do vibrate and shift; this is the illusion the artist is trying to create.

**Q.** Each strip of color is the same width, but viewing it from a distance, do they appear so? Why not?

**A.** This is another optical illusion. When two colors that are similar to one another are placed side by side, they do not create a contrast like complimentary colors, yet blend into one another. Therefore, when you view this piece from a distance, it seems as if it is made of blocks of colors, not tiny strips. The artist grouped similar colors together so that when viewed from a distance, they look as though they are blocks of color.

**Q.** How many strips of color are there?

**A.** 720

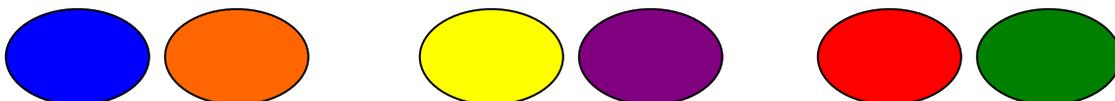
**Q.** Can you pick out spots in *Sky Wagon* where the artist placed complimentary colors next to one another?

**A.** Three sets of primary colors are as follows:

Blue-Orange

Yellow-Violet

Red-Green





Gene Davis, *Sky Wagon*, 1969.

## **Image Three**

### **Richard Anuszkiewicz**

#### ***Grand Spectra, 1968***

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Again, begin looking at the slide by engaging in an in-depth description of the work of art. Talk about lines, shapes and colors and how the elements interact with one another.

**Q.** How does the artist use the square to create an optical illusion?

**A.** Within the large format of a square, the artist composed four quadrants. Within each quadrant, there are nine smaller squares. Surrounding each square are bands of color. The bands of color are key to understanding the optical illusion the overall work creates.

**Q.** Look at the four squares in the center of the work. Are these squares the same shade of yellow?

**A.** Yes. But, the two squares on the left appear lighter than those do on the right. The white border around the left squares creates a contrast to the yellow's interior whereas the yellow border around the right squares adds to the intensity of the yellow interior.

**Q.** What other squares in the painting look as if they are altered by the color of their borders?

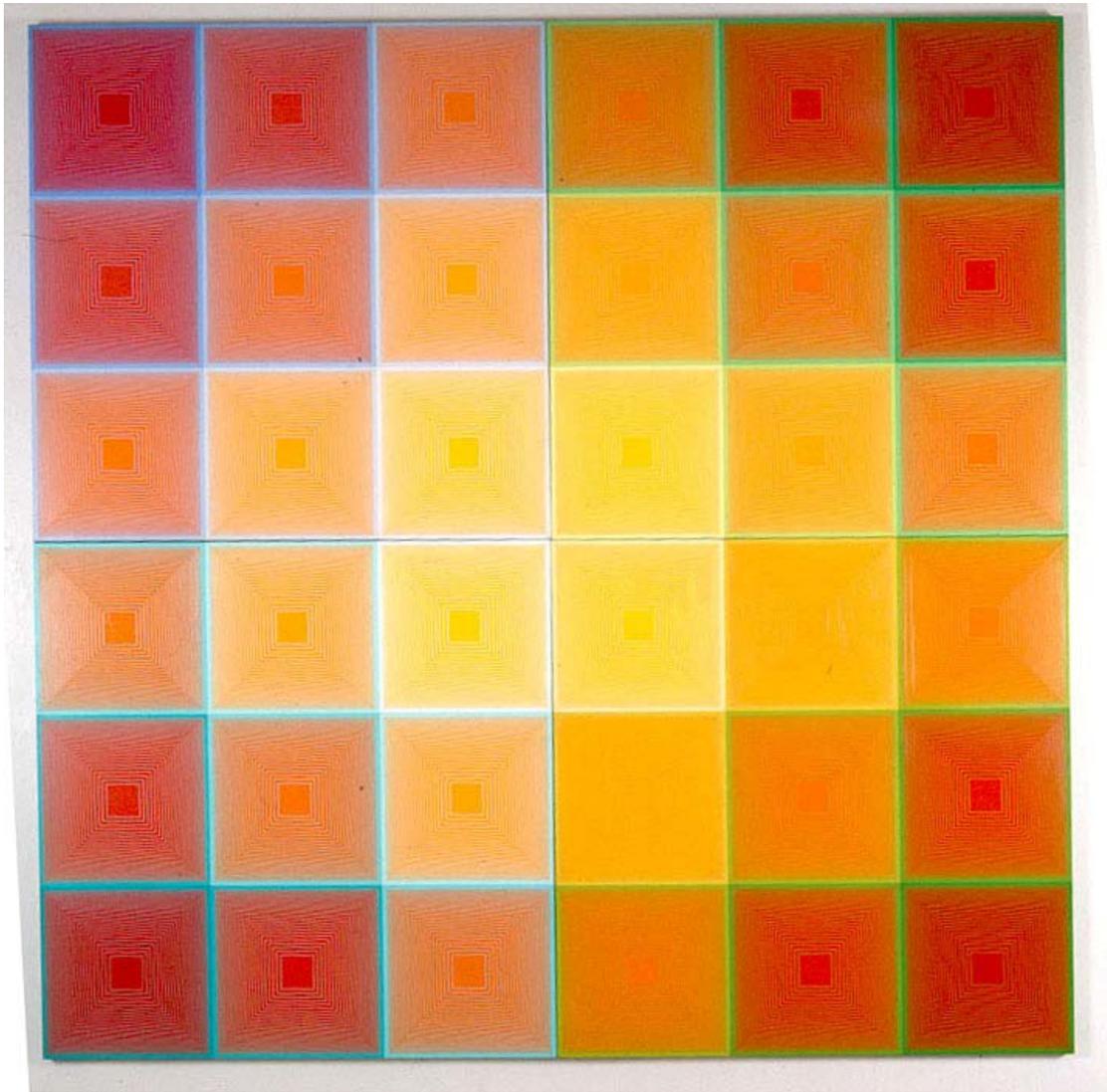
**A.** Basically, they all are. Each quadrant is a mirror image of the other, but many of the squares appear different shades of their mirror image because of the different color of their borders. If the artist decided to leave a white border around all the squares, this relationship would be easier to detect. Color is a powerful tool for creating an illusion.

**Q.** Does the artist use any complementary colors?

**A.** Yes. In the lower right quadrant, the green around the red corner square is a complementary color. Its mirror quadrant, the upper corner of the left quadrant, has a violet border. These are not complementary colors. Red and violet are both "warm" shades, next to one another on the color spectrum. Because of their similarities, violet and red do not contrast with one another but appear to merge. The violet border of the red square makes the square to appear darker than its mirror opposite in the lower right quadrant.

**Q.** Are there any other optical effects in this piece?

**A.** Yes. Within each separate square, you probably noticed that there are many squares painted within the square, creating a layering or stacking effect. Depending on how you perceive the work, it could look as if each square is concave, or caving into the painting surface, or convex, or popping out from the painting surface. Which way do you see it? You may even allow your eyes to shift focus so that it appears as if the squares are popping in and out, thereby creating movement.



Richard Anuszkiewicz, *Grand Spectra*, 1968

## Image Four

### Al Held, *Rothko's Canvas*, 1969-1970

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Again, begin looking at the slide by engaging in an in-depth description of the work of art. Talk about lines, shapes and colors and how the elements interact with one another.

**Q.** What important element is missing in this work that wasn't in the others?

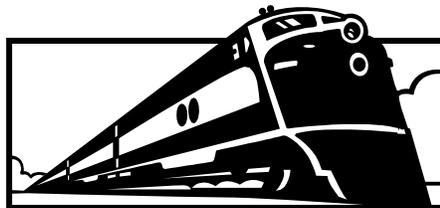
**A.** Color!

**Q.** What are the two main elements of this painting?

**A.** Shapes and lines.

**Q.** Does this painting have linear perspective?

**A.** No. Part of the illusion created by the artist is the absence of **linear perspective**. Linear perspective is a technique used by artists to create the illusion of three-dimensional space on a two-dimensional surface. For example, look at the image of the train. When perspective is applied, it looks as though the object has depth. You can see depth by the fact that the train becomes smaller and smaller until it disappears. The place on the horizon where the train disappears from our sight is called the **vanishing point**.



Linear perspective is used to organize a composition and give it a sense of gravity. The artist Al Held was experimenting with a work of art composed without organization or gravity. The shapes appear as if they are randomly floating in space. They have no gravity, and no horizon line or vanishing point.

**Q.** If there is no perspective, then why does it seem as if some of the shapes are popping out of the picture while others are in the background?

**A.** Because the artist overlapped the shapes. In some places, the artist decided to only paint a portion of a very large shape, overlapped by smaller ones. So, some of the shapes appear as if they are closer to us and others appear far away. But, there is no one single point by which all the shapes are joined, or recede to.



Al Held, *Rothko's Canvas*, 1969-1970

## Activity

Decipher the optical illusion below and explain how the illusion is made. Using this design as a model, create your own optical illusion on the grid paper provided. Remember, you may use different colors, shapes, and lines to enhance your work. You may also try to experiment with varied or repeating patterns.

