

# Optical illusions



## 1. Name of the project:

Optical illusions

## 2. Subjects covered from STEAM areas:

Art,  
Math,  
Bio

## 3. Target group (age range and size of the group):

High School

## 4. Duration of the activity:

2 double lessons + homework (project)

## 5. Key words:

optical illusions  
- Color  
- Brightness & Contrast  
- Geometric- Angle illusions  
- Space/ three-dimensionality  
- Shape: e.g. invisible bird  
- Camouflage/ Nature  
- 'Asphalt Sea'

Art,  
Biology,  
Mathematics

## 6. Key sentence describing context of the activity, followed by short description (200 words):

Students learn about different types and contexts (math, bio, art, (physics)) of optical illusions. They explore them and note how the optical illusions can be explained or what the illusion is. optical illusions can be explained, or what the illusion is, by being able to match the optical illusion to the context. Then they choose context, plan, and realize (project-like) their own optical illusion. optical illusion. The presented optical illusions are

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partly given by the teacher. however, the students also have the possibility to find their own examples on the internet/ books/ nature. books/ nature to find examples. These examples are to be assigned, e.g., in tabular form, with These examples should be assigned to contexts and explained. In doing so it should be recognized that optical illusions, even if one knows 'how they work', they are still optical illusions. Furthermore, the students become aware that there is not only one kind of optical illusion. At popular examples (such as "blue-black dress, or gold-white?" or also auditory illusions), it becomes clear how exciting and popularly discussed the topic of topic of illusions, even outside the school context, is. All this was preparatory for the project work of planning and realizing an optical illusion. realize it. The choice of the type of optical illusion is left to the students. After completion of the project, the individual optical illusions will be presented and commented by the other students.

### **7. Description of the activity environment, including the list of materials and tools needed:**

Some of the material is listed in item 12. A larger collection of different optical illusions (with origins in mathematics, art, and biology) is provided to the will be made available to the students. These are to be explored (in EA or PA) and it is to be recorded what the optical illusion is (recognize and describe the optical illusion). recognize and describe). Different types of optical illusions will be optical illusions. In some cases optical illusions have to be explained (e.g. invisible bird) must be visualized by media, since they function only by movement. function.

### **8. Step by step, detailed description of the activity, including teaching and learning strategies:**

- Exploring different types of optical illusions (solo or with a partner).
  - o Color
  - o Brightness & Contrast
  - o Geometric- angle illusions
  - o Space/ three-dimensionality
  - o Shape: e.g. Invisible bird
  - o Camouflage/ Nature
  - o 'Asphalt Sea'
- Describe and explain different illusions (solo or with a partner)
- Classify in different subjects (origin) art, bio, math
- Knowledge Backup (Group)
  - o Experience: Optical illusion does not go away when it is recognized
- design and realization of own optical illusion (solo)

### **9. Learning objectives/competencies:**

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- Independent work/ - working out new issues
- Communication about what has been learned
- Linking what has been learned with own project

### 10. Evaluation/Assessment guidelines:

- Presentation of the own optical illusion
  - o Does the optical illusion fit the chosen type of optical illusion? -  
Implementation: Does the Ozobot arrive at the cat?

### 11. Lessons learned:

- Differentiation of optical illusions into the different areas/types
- Planning and realization of an own optical illusion
- Independent development of the topic with the help of (partly) given materials

### 12. Additional information/Links:

<https://michaelbach.de/ot/ang-KitaokaBulge/index-de.html>

<https://michaelbach.de/ot/ang-SkyeGrating/index-de.html>

[https://www2.klett.de/sixcms/media.php/229/ab\\_695271\\_2c4w6t\\_opt\\_tauschungen.pdf](https://www2.klett.de/sixcms/media.php/229/ab_695271_2c4w6t_opt_tauschungen.pdf)

<https://michaelbach.de/ot/cog-hiddenBird/index-de.html>

(all german)

### 13. Contact person:

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