



## Background

### General didactic background

The idea can be used as a wonderful intuitive introduction to parabola, especially, if we want to make a geometric emphasis or connect geometric properties of parabola with its more common analytic consideration. A skilful teacher can use the idea to approach students and attract their attention by referring to everyday concepts which are known to everybody. Interesting and challenging questions can be put out at the very beginning. Essential didactical principles of 'questioning and challenging what we know' in order to deepen the knowledge and understanding, can be developed.

### Mathematical background

The idea can be applied at different mathematical levels. It is based on an old (Archimedean) geometric property of a parabola: *A parabola is the set of points in the plane that are equidistant from a point (the focus) and a line (the directrix.)* The idea can be used even at an earlier stage, without abstract definitions, as an interesting introduction and observation of „different curves“, especially by the use of modern interactive computer programs. Later, when students already know the analytic expression of a parabola or are even familiar with derivative, the idea can be used to demonstrate the beauty and power of geometry. Namely, explanation of the car lights is easier by the use of geometry as by differential calculus.

### The idea of teaching implementation

The lesson has been successfully presented to different audiences. Especially high school teachers have shown great interest on the idea. Parts of the lesson have been presented to general population of 15-19 years old students, who were very interested and surprised by the applicability of (already ancient Greek) mathematical ideas in modern car and communication technology.