# Photography [Source: Wikipedia, http://en.wikipedia.org/wiki/Photography]

**Photography** is the [art](http://en.wikipedia.org/wiki/Art), [science](http://en.wikipedia.org/wiki/Science) and practice of creating durable [images](http://en.wikipedia.org/wiki/Image) by recording [light](http://en.wikipedia.org/wiki/Light) or other [electromagnetic radiation](http://en.wikipedia.org/wiki/Electromagnetic_radiation), either chemically by means of a light-sensitive material such as [photographic film](http://en.wikipedia.org/wiki/Photographic_film), or electronically by means of an [image sensor](http://en.wikipedia.org/wiki/Image_sensor).[[1]](http://en.wikipedia.org/wiki/Photography#cite_note-1) Typically, a [lens](http://en.wikipedia.org/wiki/Lens_(optics)) is used to [focus](http://en.wikipedia.org/wiki/Focus_(optics)) the light reflected or emitted from objects into a [real image](http://en.wikipedia.org/wiki/Real_image) on the light-sensitive surface inside a [camera](http://en.wikipedia.org/wiki/Camera) during a timed [exposure](http://en.wikipedia.org/wiki/Exposure_(photography)). The result in an electronic image sensor is an [electrical charge](http://en.wikipedia.org/wiki/Charge-coupled_device) at each [pixel](http://en.wikipedia.org/wiki/Pixel), which is [electronically processed](http://en.wikipedia.org/wiki/Image_processing) and stored in a [digital image file](http://en.wikipedia.org/wiki/Image_file_formats) for subsequent display or processing.

The result in a [photographic emulsion](http://en.wikipedia.org/wiki/Photographic_emulsion) is an invisible [latent image](http://en.wikipedia.org/wiki/Latent_image), which is later chemically [developed](http://en.wikipedia.org/wiki/Photographic_developer) into a visible image, either [negative](http://en.wikipedia.org/wiki/Negative_(photography)) or [positive](http://en.wikipedia.org/wiki/Positive_(photography)) depending on the purpose of the photographic material and the method of [processing](http://en.wikipedia.org/wiki/Photographic_processing). A negative image on film is traditionally used to photographically create a positive image on a paper base, known as a [print](http://en.wikipedia.org/wiki/Photographic_print), either by using an [enlarger](http://en.wikipedia.org/wiki/Enlarger) or by [contact printing](http://en.wikipedia.org/wiki/Contact_print).

Photography has many uses for business, science, manufacturing (e.g. [photolithography](http://en.wikipedia.org/wiki/Photolithography)), art, and recreational purposes.

#### Precursor technologies

Photography is the result of combining several technical discoveries. Long before the first photographs were made, Chinese philosopher [Mo Di](http://en.wikipedia.org/wiki/Mo_Di) and Greek mathematicians [Aristotle](http://en.wikipedia.org/wiki/Aristotle) and [Euclid](http://en.wikipedia.org/wiki/Euclid) described a [pinhole camera](http://en.wikipedia.org/wiki/Pinhole_camera) in the 5th and 4th centuries BC.[[8]](http://en.wikipedia.org/wiki/Photography#cite_note-8)[[9]](http://en.wikipedia.org/wiki/Photography#cite_note-krebs-9) In the 6th century AD, Byzantine mathematician [Anthemius of Tralles](http://en.wikipedia.org/wiki/Anthemius_of_Tralles" \o "Anthemius of Tralles) used a type of camera obscura in his experiments,[[10]](http://en.wikipedia.org/wiki/Photography#cite_note-10) [Ibn al-Haytham](http://en.wikipedia.org/wiki/Ibn_al-Haytham" \o "Ibn al-Haytham) (Alhazen) (965–1040) studied the camera obscura and pinhole camera,[[9]](http://en.wikipedia.org/wiki/Photography#cite_note-krebs-9)[[11]](http://en.wikipedia.org/wiki/Photography#cite_note-Wade2001-11) [Albertus Magnus](http://en.wikipedia.org/wiki/Albertus_Magnus" \o "Albertus Magnus) (1193–1280) discovered [silver nitrate](http://en.wikipedia.org/wiki/Silver_nitrate),[[12]](http://en.wikipedia.org/wiki/Photography#cite_note-12) and Georges Fabricius (1516–71) discovered [silver chloride](http://en.wikipedia.org/wiki/Silver_chloride).[[13]](http://en.wikipedia.org/wiki/Photography#cite_note-13)

[Daniele Barbaro](http://en.wikipedia.org/wiki/Daniele_Barbaro) described a diaphragm in 1568.[[14]](http://en.wikipedia.org/wiki/Photography#cite_note-history-14) [Wilhelm Homberg](http://en.wikipedia.org/wiki/Wilhelm_Homberg) described how light darkened some chemicals (photochemical effect) in 1694.[[15]](http://en.wikipedia.org/wiki/Photography#cite_note-15) The fiction book [Giphantie](http://en.wikipedia.org/wiki/Giphantie" \o "Giphantie), published in 1760, by French author [Tiphaigne de la Roche](http://en.wikipedia.org/wiki/Tiphaigne_de_la_Roche" \o "Tiphaigne de la Roche), described what can be interpreted as photography.[[14]](http://en.wikipedia.org/wiki/Photography#cite_note-history-14)

The discovery of the 'camera obscura' that provides an image of a scene is very old, dating back to ancient China. Leonardo da Vinci mentions natural camera obscuras that are formed by dark caves on the edge of a sunlit valley. A hole in the cave wall will act as a pinhole camera and project a laterally reversed, upside down image on a piece of paper. So the invention of photography was really concerned with finding a means to fix and retain the image in the camera obscura.

This in fact occurred first using the reproduction of images without a camera when [Thomas Wedgwood](http://en.wikipedia.org/wiki/Thomas_Wedgwood_(photographer)), from the famous family of potters, obtained copies of paintings on leather using silver salts. As he had no way of fixing them, that is to say to stabilize the image by washing out the non-exposed silver salts, they turned completely black in the light and had to be kept in a dark room for viewing.

Renaissance painters used the camera obscura which, in fact, gives the optical rendering in color that dominates Western Art. The camera obscura literally means "dark chamber" in Latin. It is a box with a hole in it which allows light to go through and create an image onto the piece of paper.

#### First camera photography (1820s)

Invented in the first decades of the 19th century, photography (by way of the camera) seemed able to capture more detail and information than traditional mediums, such as painting and sculpting.[[16]](http://en.wikipedia.org/wiki/Photography#cite_note-16) Photography as a usable process goes back to the 1820s with the development of chemical photography. The first permanent [photoetching](http://en.wikipedia.org/wiki/Photoetching" \o "Photoetching) was an image produced in 1822[[7]](http://en.wikipedia.org/wiki/Photography#cite_note-utexas-7) by the [French](http://en.wikipedia.org/wiki/France) inventor [Nicéphore Niépce](http://en.wikipedia.org/wiki/Nic%C3%A9phore_Ni%C3%A9pce" \o "Nicéphore Niépce), but it was destroyed by a later attempt to duplicate it.[[7]](http://en.wikipedia.org/wiki/Photography#cite_note-utexas-7)Niépce was successful again in 1825. He made the first permanent photograph from nature (his [*View from the Window at Le Gras*](http://en.wikipedia.org/wiki/View_from_the_Window_at_Le_Gras)) with a camera obscura in 1826.[[17]](http://en.wikipedia.org/wiki/Photography#cite_note-17)

[](http://en.wikipedia.org/wiki/File:Latticed_window_at_lacock_abbey_1835.jpg)Because his photographs took so long to [expose](http://en.wikipedia.org/wiki/Exposure_(photography)) (eight hours), he sought to find a new process. Working in conjunction with [Louis Daguerre](http://en.wikipedia.org/wiki/Louis_Daguerre), they experimented with silver compounds based on a [Johann Heinrich Schultz](http://en.wikipedia.org/wiki/Johann_Heinrich_Schultz) discovery in 1816 that a silver and chalk mixture darkens when exposed to light. Niépce died in 1833, but Daguerre continued the work, eventually culminating with the development of the [daguerreotype](http://en.wikipedia.org/wiki/Daguerreotype) in 1837. Daguerre took the first ever photo of a person in 1838 when, while taking a daguerreotype of a Paris street, a pedestrian stopped for a shoe shine, long enough to be captured by the long exposure (several minutes). Eventually, France agreed to pay Daguerre a pension for his formula, in exchange for his promise to announce his discovery to the world as the gift of France, which he did in 1839.

Meanwhile, [Hercules Florence](http://en.wikipedia.org/wiki/Hercules_Florence) had already created a very similar process in 1832 in Brazil, naming it *Photographie*, and English inventor [William Fox Talbot](http://en.wikipedia.org/wiki/William_Fox_Talbot) had earlier discovered another means to fix a silver process image but had kept it secret. After reading about Daguerre's invention, Talbot refined his process so that portraits were made readily available to the masses. By 1840, Talbot had invented the [calotype](http://en.wikipedia.org/wiki/Calotype" \o "Calotype) process, which creates [negative](http://en.wikipedia.org/wiki/Negative_(photography)) images.[[18]](http://en.wikipedia.org/wiki/Photography#cite_note-18) Talbot's famous 1835 print of the Oriel window in [Lacock Abbey](http://en.wikipedia.org/wiki/Lacock_Abbey" \o "Lacock Abbey) is the oldest known negative in existence.[[19]](http://en.wikipedia.org/wiki/Photography#cite_note-19)[[20]](http://en.wikipedia.org/wiki/Photography#cite_note-20)

## Technical Aspects

*Main article:*[*Camera*](http://en.wikipedia.org/wiki/Camera)

The [camera](http://en.wikipedia.org/wiki/Camera) is the image-forming device, and [photographic film](http://en.wikipedia.org/wiki/Photographic_film) or a [silicon](http://en.wikipedia.org/wiki/Silicon) electronic [image sensor](http://en.wikipedia.org/wiki/Image_sensor) is the sensing medium. The respective recording medium can be the film itself, or a digital electronic or magnetic memory.[[21]](http://en.wikipedia.org/wiki/Photography#cite_note-21)

Photographers control the camera and lens to "expose" the light recording material (such as film) to the required amount of light to form a "[latent image](http://en.wikipedia.org/wiki/Latent_image)" (on film) or "raw file" (in digital cameras) which, after appropriate processing, is converted to a usable image. [Digital cameras](http://en.wikipedia.org/wiki/Digital_photography) use an electronic image sensor based on light-sensitive electronics such as [charge-coupled device](http://en.wikipedia.org/wiki/Charge-coupled_device) (CCD) or [complementary metal-oxide-semiconductor](http://en.wikipedia.org/wiki/Complementary_metal-oxide-semiconductor) (CMOS) technology. The resulting digital image is stored electronically, but can be reproduced on paper or film.

The camera (or '[camera obscura](http://en.wikipedia.org/wiki/Camera_obscura)') is a dark room or chamber from which, as far as possible, all light is excluded except the light that forms the image. The subject being photographed, however, must be illuminated. Cameras can range from small to very large, a whole room that is kept dark while the object to be photographed is in another room where it is properly illuminated. This was common for reproduction photography of flat copy when large film negatives were used (see [Process camera](http://en.wikipedia.org/wiki/Process_camera)).