

Mirage

Mirage in the desert. Notice how the distorted image of the sky looks like water on the desert floor.

[Diagram of a superior mirage.](#)

Diagram of a superior mirage.

Superior mirage of Farallon Islands

[Sugar water "mirage"](#)

A "mirage" effect seen through sugar water.

A **mirage** is an image that is distorted by the [atmosphere](#) so that its form and location can look very different from the actual object. It is caused by the way light bends as it passes through layers of air of different temperatures.

The words "mirage" and "[mirror](#)" come from the same [root word](#), which means "to look at."

Cause

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Normally, light travels in a straight line, but it will change direction depending on what it passes through. This bending is called "[refraction](#)." [Gases](#), such as air, become [thinner](#) as they get warmer. As a result, light tends to curve (or refract) towards the colder layer of air. This makes the image appear to come from a different direction than the original object.

There are two basic types of mirage, depending on which direction the temperature changes, inferior and superior.

Inferior

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An inferior mirage is arguably the most common type seen over land. In daytime, air near solid ground is typically warmer than the air above it. When light from the sky passes through it, a shimmering, fragmented image of the sky may appear to come from the ground, resembling water.

Superior

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Sometimes a mirage can appear to come from higher up than the original object. When the colder air is lower (called an [inversion layer](#)), as it often is

over large bodies of water or ice, the apparent direction of the mirage will be opposite that of an inferior mirage. For example, the distorted image of a ship or an island may appear on or above the surface, even if the original object is hidden below the [horizon](#).

A "Fata Morgana" is a complex superior mirage whose appearance can change quickly and dramatically. Its name refers to [Morgan le Fay](#), a mythical [enchantress](#) strongly associated with [Arthurian](#) legends. In times past, the disturbing images seen as part of the mirage were attributed to [illusions](#) created by [magic](#).

Artificial

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A mirage-like effect can be achieved by allowing a [soluble](#) substance like sugar or salt to slowly dissolve in a deep container of water, so that there is more sugar in the water near the bottom than in the water above it. This can refract the image of an object seen through it in a similar manner as a superior mirage often seen over open water.

Other websites

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Wikimedia Commons has media related to ***Mirages***.

- [The Happy Scientist explains mirages.](#)
- [How to make a mirage with sugar water.](#) [*permanent dead link*]
- [Another way to make a mirage with salt water.](#)

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