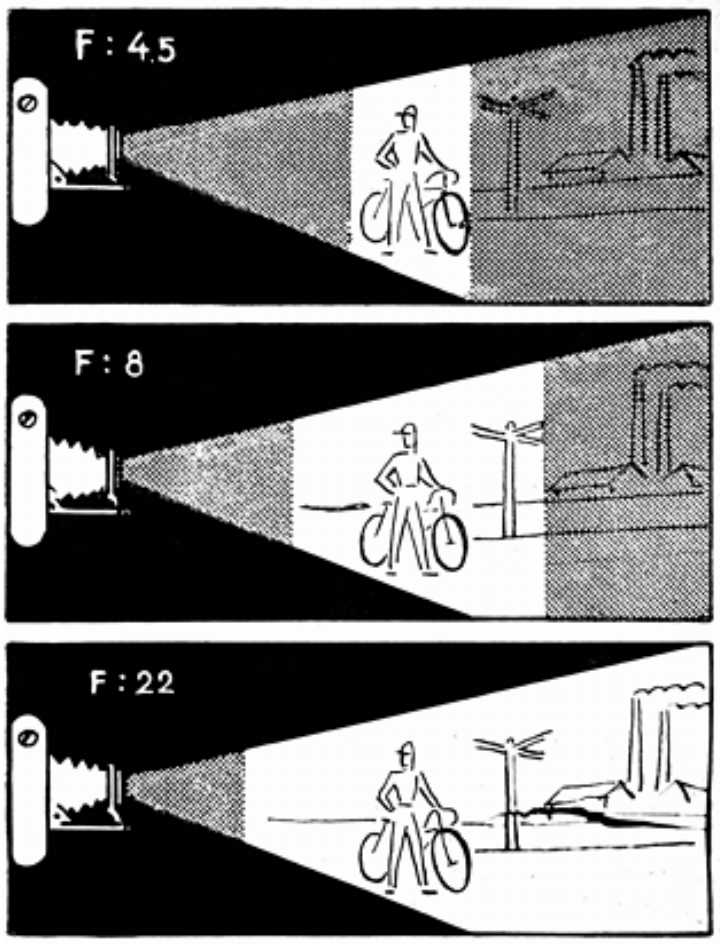
Depth of Field

Why Are Some Parts of My Picture Sharp and Others Blurry?

What is depth of field?

A photographic lens renders a sharp image of points at one given distance, measured along the lens axis. This distance can be adjusted (the process of focusing). Any points at a different distance will be rendered more or less unsharp, and this unsharpness increases gradually as we move away from the "sharp" focus plane. Within some limits it will be small enough to consider the image of our point "sharp enough" for a given purpose.

The term depth of field (DOF) is often used to refer to the fact that points not exactly in focus are rendered acceptably sharp in the image. Quantitatively, DOF is often defined as the distance between the closest acceptably rendered point on the lens axis and the furthest such point. Obviously, this value will depend on how much unsharpness we are willing to accept.



Basic facts

Assuming the image frame size (film, sensor) stays the same, the following is true:

1. At any given focal length, depth of field increases as the lens is closed down (i.e., the F-number increases).

2. At the same lens aperture and the **same subject distance**, depth of field is greater for short focal lengths (wider lenses) than for long ones. This difference is quite dramatic.

3. At the same lens aperture and **image magnification** (i.e., subject appears the same size in the frame), depth of field remains approximately constant for various focal lengths.

4. At the same focal length and aperture, depth of field increases with the subject distance (even if measured as a percentage of that distance).

The Hyperfocal Distance

Setting the focus to the hyperfocal distance (which is a function of the aperture) will result in the DoF extending from half that distance to infinity.

Two Rules of Thumb:

1. To get the maximum depth of field in a landscape where objects in the mid to distant background may be most important, set your aperture to the highest f-number it will go, and focus on a point about 1/3 of the way into the scene.

2. To optimize sharpness for close to middle ground distances, pick the closest object you want to appear in sharp focus, then focus on a point twice as far away. Again, use the smallest aperture possible (highest f-number).

Depth of Field Calculator

http://dl-c.com/content/view/26/51/

Scroll to bottom and click on the link for the program you want.