Lens Perspectives

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Understanding Camera Lenses

- Understanding camera lenses can help add more creative control to photography. Choosing the right lens for the task can become a complex trade-off between cost, size, weight, lens speed and image quality.
- Specialty lenses are also an option for creative images. Lens like macro's, tilt shifts and prime lenses often have advantages over the standard zoom lenses most people shoot with today.

What is focal length

- While a photographic lens comprises multiple lens elements, it can be regarded as a single convex element. The focal length is defined as a distance from the center of such a convex element (principle point) to the focal point (image plane) and is one of the most decisive factors that determines the characteristics of a lens.
- The focal point of a photographic lens is established with the subject positioned at the infinity point.

Angle of View

- The area size captured by a photographic lens can be expressed as a diagonal angular field called Angle of View. Generally speaking a focal length range that provides a similar perspective to the human eye is considered to be a focal length equivalent to the diagonal measurements of the film or sensor format of your camera. A 35mm film camera or a digital camera with a full frame sensor has a diagonal measurement of 47mm. Thus a 50mm focal length would be considered normal. Any lens with a focal length shorter would be a wide angle lens and any with a longer focal length would be a telephoto lens.
- The shorter the focal length of a lens the wider the field of view.
- The longer the focal length of a lens the narrower the field of view.

Zoom Lenses

- A zoom lens is simple a single lens that has multiple focal lengths.
- Some zooms are only wide angle zooms
  - 16-35mm zoom
- Some zooms are both wide angle and telephoto
  - 28-70mm zoom
- Some zooms are only telephoto
  - 75-300mm zoom

Perspective

- A photographic lens provides a visual effect, making closely located subjects larger while remotely located subjects smaller.
- As the focal length becomes shorter in a wide-angle lens, this perspective difference expands making closely located subjects even bigger and remotely located ones even smaller (exaggerated perspective)
- In contrast, in a telephoto lens, as focal lengths become longer, less difference is observed between close and distant subjects, making it appear as if they are closer regardless of the distance between them (compressed perspective)

Depth of Field

- When focused on a subject there are area's in front of and behind the main subject where details are sharp. This area is referred to Depth of Field. When the sharp are is narrow it is expressed as shallow depth of field. When it is wide it is expressed as deep depth of field.
- The depth of field becomes shallower as the lens aperture goes toward a full open position. It becomes deeper when the aperture gets closer to the fully stopped sown position. Also a wide angle lens delivers a deeper depth of field than a telephoto lens.

Images at different focal lengths shot from the same location

- 300mm

Same location

- 200mm

Same location

- 135mm

Same location

- 100mm

Same location

- 70mm

Same location

- 50mm

Same location

- 35mm

Same location

- 28mm

Same location

- 24mm

Same location

- 20mm

Same location

- 20mm vs. 300mm

Subject remains the same size

- 16mm

Subject remains the same size

- 20mm

Subject remains the same size

- 24mm

Subject remains the same size

- 28mm

Subject remains the same size

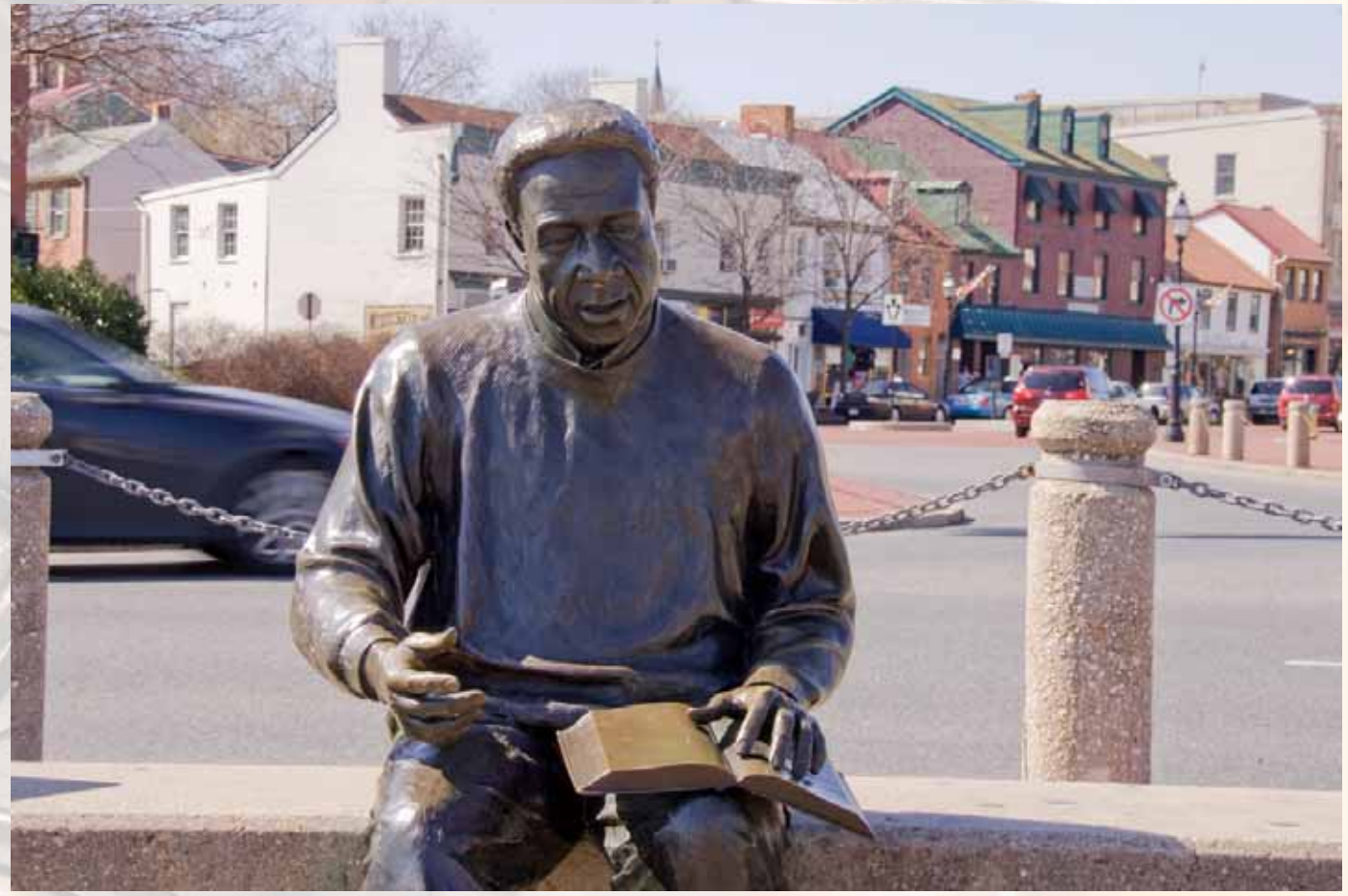
- 35mm

Subject remains the same size

- 50mm

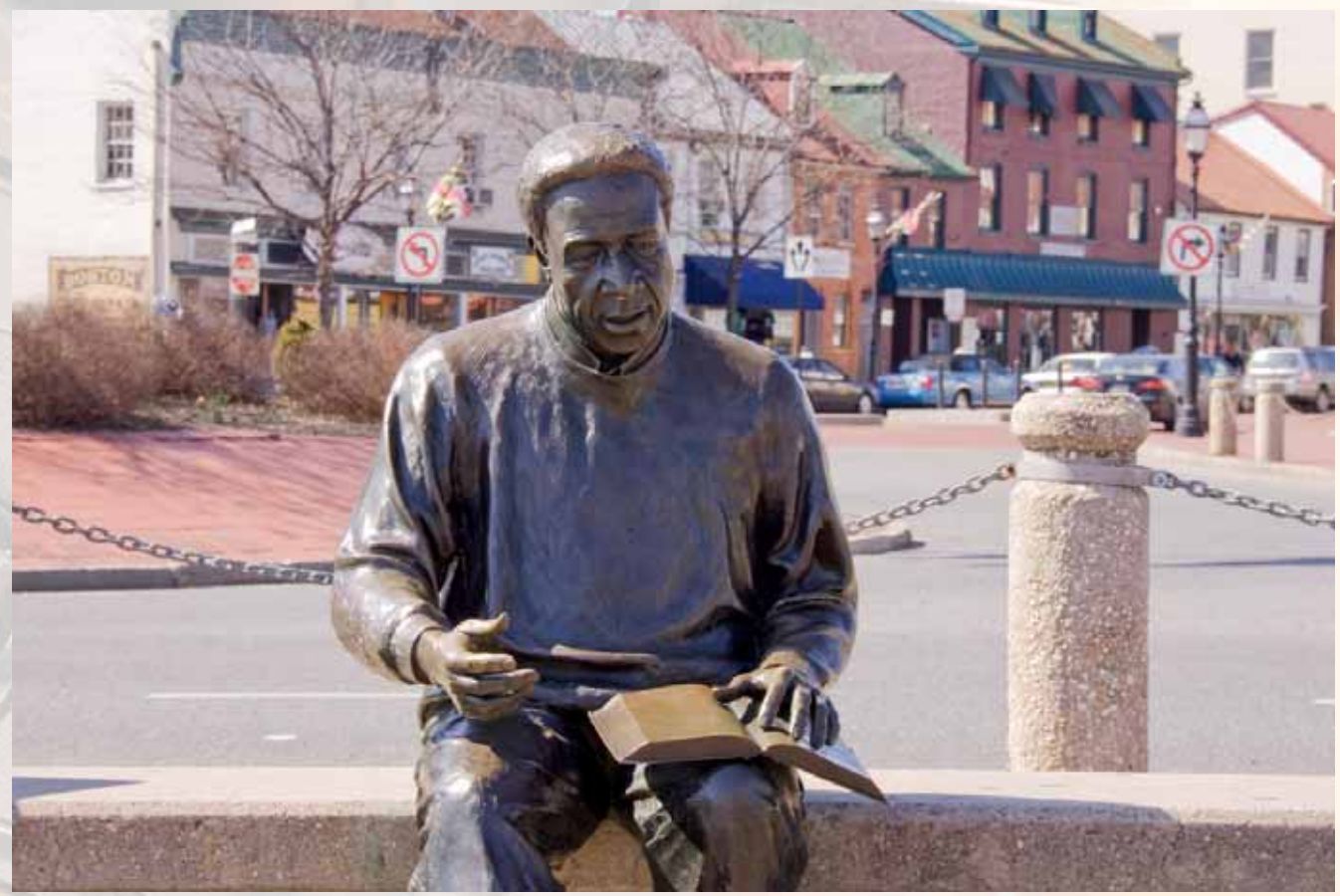
Subject remains the same size

- 70mm



Subject remains the same size

- 100mm



Subject remains the same size

- 135mm

Subject remains the same size

- 200mm

Subject remains the same size

- 300mm

Subject remains the same size

- 16mm vs. 300mm