

The Science of Photography

Photography · Answer Key · 4 Questions

1. What is chromatic aberration in lenses, from a scientific perspective?

- A) It is a distortion where straight lines appear curved at the edges of the frame.
- B) It is the failure of a lens to focus all colors of light to the same convergence point due to variations in refractive index.**
- C) It refers to the loss of image brightness towards the corners of an image.
- D) It is an electrical interference pattern produced by the camera sensor.

2. How does a Bayer filter array contribute to color imaging in digital cameras?

- A) It physically blocks all light wavelengths outside the visible spectrum.
- B) It stabilizes the sensor against vibrations during long exposures.
- C) It arranges microscopic color filters (red, green, blue) over individual photosites to capture specific color information.**
- D) It enhances the overall sharpness by applying an anti-aliasing filter before image capture.

3. What fundamental optical principle allows a pinhole camera to form an inverted image without a lens?

- A) Total internal reflection of light within the camera body.
- B) The diffraction of light waves around the edges of the pinhole.
- C) The rectilinear propagation of light, where light rays travel in straight lines and converge at a point to form an image.**
- D) The magnetic field generated by the pinhole opening.

4. Scientifically, what primary process is enhanced when increasing the ISO sensitivity on a digital camera sensor?

- A) The physical size of the sensor's individual pixels to gather more light.
- B) The signal amplification from the photosites before analog-to-digital conversion, making the sensor more responsive to light.**
- C) The speed at which the lens elements can physically move to achieve focus.
- D) The chemical reaction rate of a photosensitive emulsion on the sensor's surface.