

Qualities of Light

Presented by: John Loser, LPS Member

Qualities of Light

1. Intensity
2. Color of Light
3. Direction of Light
4. Hard Light vs. Soft Light
5. Diffuse Light vs. Specular Light

Intensity

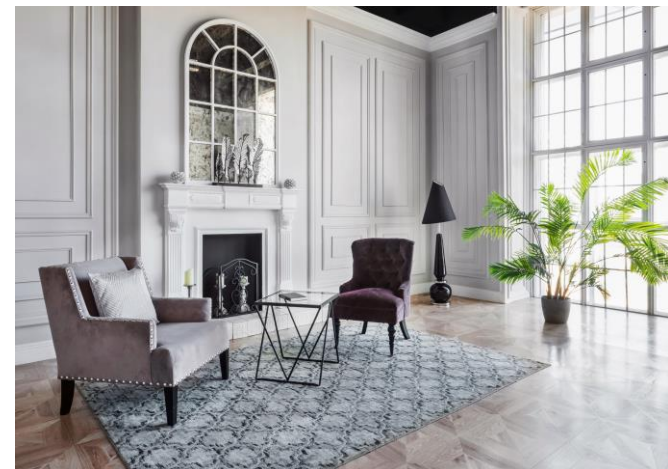
- How much light is hitting your subject
- **Natural light**
 - Natural Light
 - Time of day
 - Clear skies or Cloud cover
 - Outdoors
 - Open to sky
 - In Shaded area
 - Indoors
 - Orientation of Window
 - Curtain/Sheer/ No window covering



Source: Microsoft



Source: Microsoft



Source: Microsoft

Intensity

- **Artificial Light**
 - Architectural lighting



Source: circleandsquaredecor.com

Intensity

- **Artificial Light**

- Continuous light

Small Video Light



Source: Salarlo

High-wattage Studio Light



Source: Ambientful

Multi-bulb Studio Light



Source: EMart

- Flash (Strobe)

Mono Light



Source: Flashpoint

Intensity – The Light Source

- Light source power setting changes can be referred to as “Stops”
 - One stop down is $\frac{1}{2}$ of the previous power setting
 - One stop up is 2x the previous power setting



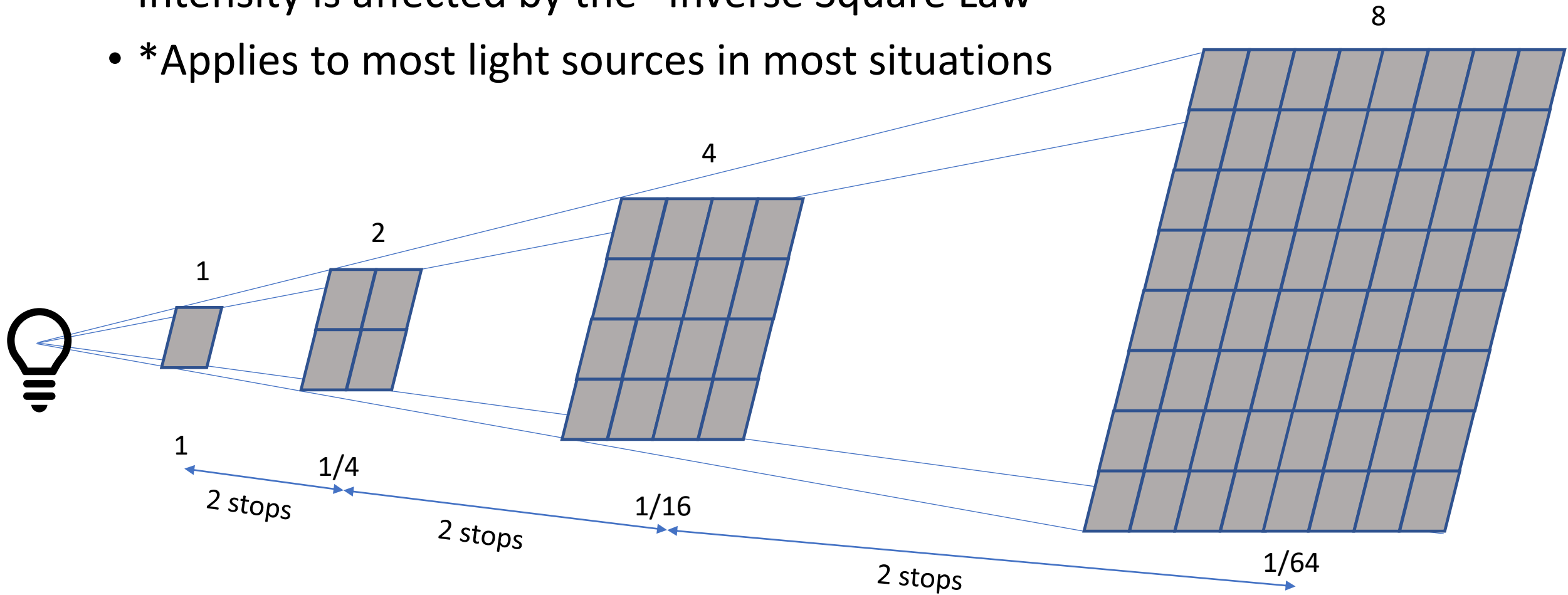
Intensity – Distance of Source to Subject

- Intensity is affected by the “Inverse Square Law”
- *Applies to most light sources in most situations

- Light decreases with distance from the source.
- The rate of decrease is equal to the square of the distance from the source

Intensity – Distance of Source to Subject

- Intensity is affected by the “Inverse Square Law”
- *Applies to most light sources in most situations



Intensity – Distance of Source to Subject

- Intensity is affected by the distance of the light source to the subject
 - The closer the light is to the subject the higher the intensity on the subject.

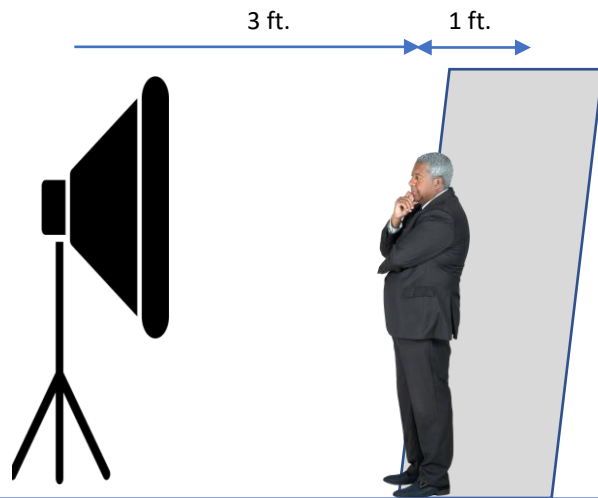


- The farther the light is from the subject the lower the intensity on the subject.

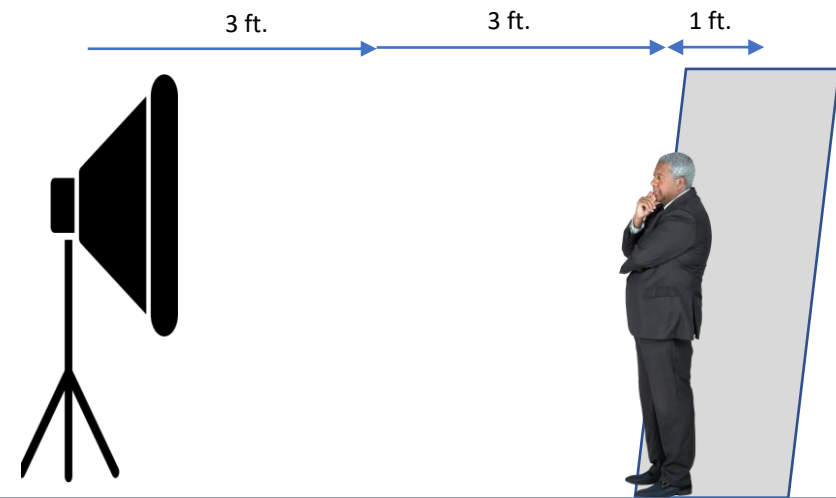


Intensity – Distance of Source to Subject

- “Inverse Square Law”
 - Falloff
 - Close to subject, falls off quickly
 - Far from subject, falls off more slowly



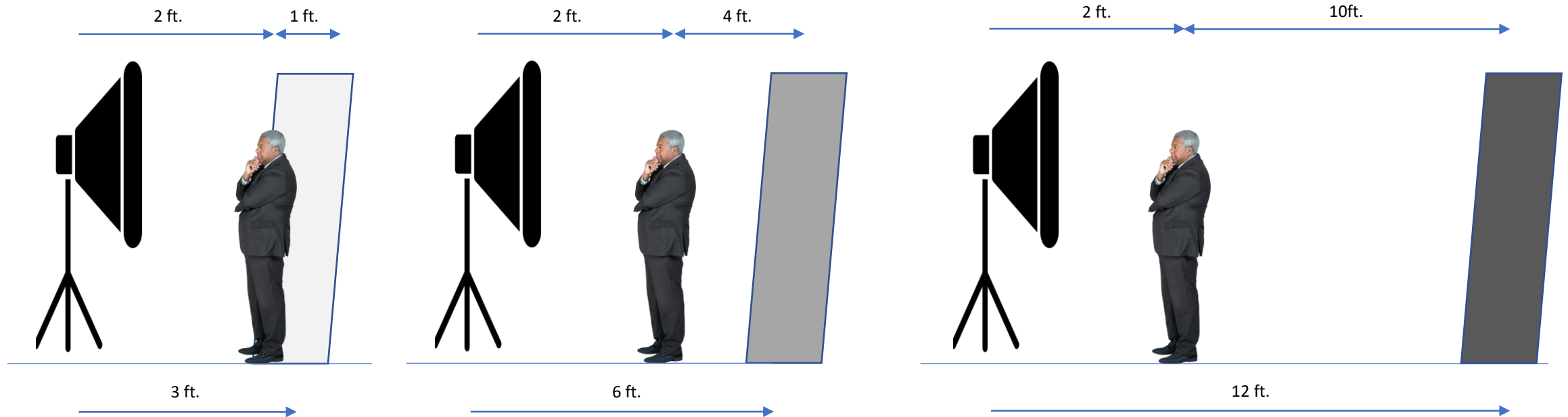
Set exposure for subject with background close behind the subject.



If Light output is adjusted to maintain exposure and subject-to-background distance remains constant, the light on the background should be very similar.

Intensity – Distance of Source to Subject

- “Inverse Square Law”
 - Can be used to control background brightness
 - Light source to subject vs Light source to background



Intensity – Distance of Source to Subject

- “Inverse Square Law”
 - Can be used to control background brightness
 - Light source to subject vs Light source to background
 - Light to subject = 2.5 feet



Light to background = 3 ft (x1)



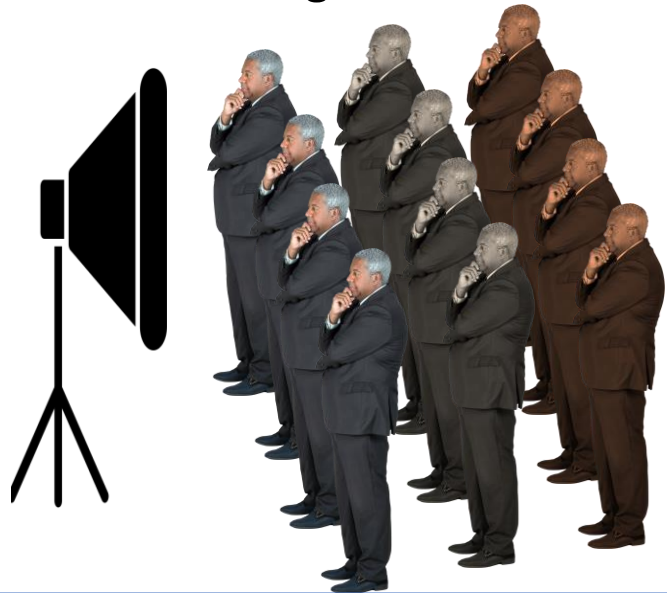
Light to background = 6 ft (x2)



Light to background = 12 ft (x4)

Intensity – Distance of Source to Subject

- “Inverse Square Law”
 - Important for group shots
 - Light close to multiple rows may have noticeable light fall-off
 - Light farther from multiple rows will have less noticeable light fall-off



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The Color of Light – The Light Source

- Color of light source influences the photograph
- You can use natural light to set a mood or tell a story
- You can use artificial light to set a mood or tell a story

The Color of Light – The Light Source

- Color of light source influences the photograph
 - Some sources are “warm” – have a yellow or orange tint
 - Incandescent lights
 - Sunrise / sunset
 - Some sources are “cool” – have a “less red” or blue tint
 - Mid-day sun
 - Strobe lights
 - Some constant light sources



Source: Flashpoint

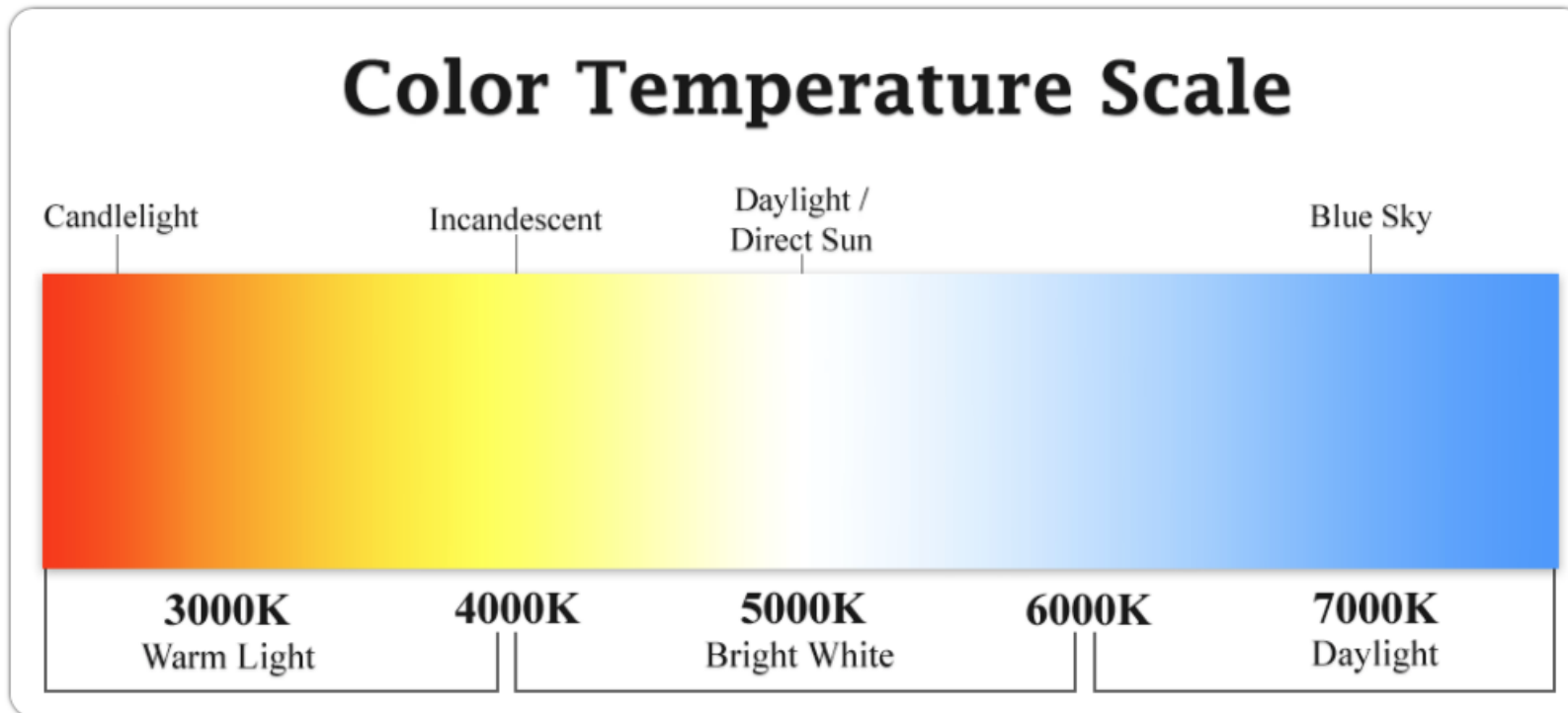


Source: Microsoft

- Shade and Overcast skies are “bluer” than noon-time direct sunshine

The Color of Light

- Light color is measured in degrees Kelvin



Source: commercialledlights.com

The Color of Light – The Light Source

- Tungsten Incandescent Bulbs
 - Orange to Yellow



Source: freepngimg.com

- CFL Bulbs
 - “Warm” Yellow to “Cool” Blue



Source: homedepot.com



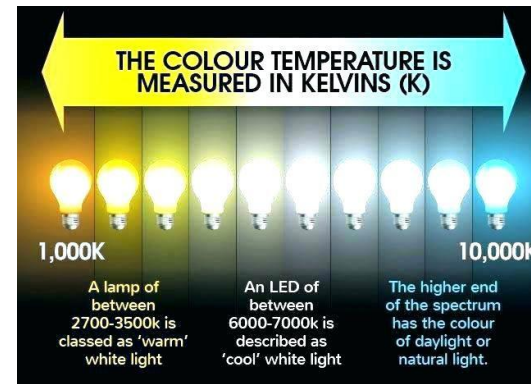
Source: wayfair.com

- Tungsten Incandescent Bulbs
 - Orange to Yellow



Source: lampsplus.com

- LED Bulbs
 - “Warm” Yellow to “Cool” Blue



Source: superbrightleds.com

The Color of Light

- Human eyes adjust to color shifts to “normalize” the color
- Cameras using film have a “fixed” color perception
- Digital cameras can have variable color perception
 - Camera White Balance setting influences the photograph
 - Generally, White Balance should match light source color



Source: etsy.com



Source: uniquephoto.com

The Color of Light – The Light Source

- Flashbulbs
 - Infrared
 - “Standard” bulb – incandescent
 - “Daylight” bulb – blueish tint



Source: filmphotographyproject.com

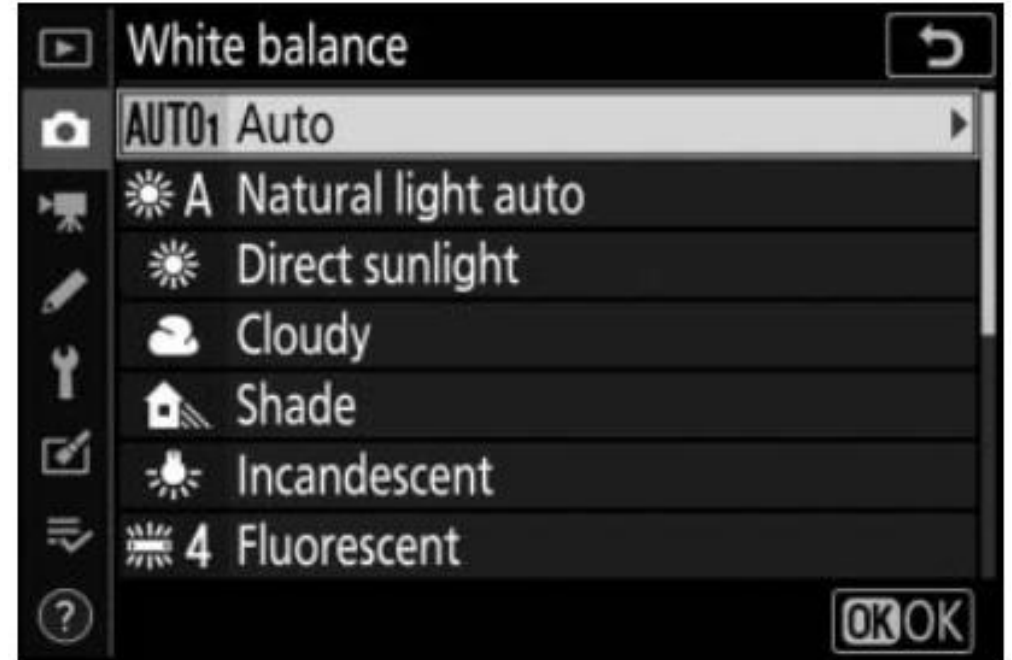
- Electronic Strobe
 - Generally, “Daylight” color
 - 5000K to 6000K
 - Most seem to be around 5500-5600K



Source: godox.com

The Color of Light – The “right” camera setting

- Digital Camera White Balance
 - Many Preset white balance settings
 - Auto (2 or 3 settings, 3500-8000K)
 - Sunny (5200K)
 - Cloudy (6000K)
 - Shade (8000K)
 - Incandescent (3000K)
 - Fluorescent Warm (2700-3700K)
 - Fluorescent Cool (4200-7200K)
 - Flash (5400K)
 - Manual Adjustment (Color Temperature K)



Source: Nikon USA – Nikon Z5 Reference Manual

The Color of Light – White Balance

- Manually Setting White Balance

White Card – calibrated white source



Source: Xrite.com

Collapsible Gray/White Target



Source: amazon.com

The Color of Light – White Balance

- When White Balance is set correctly:

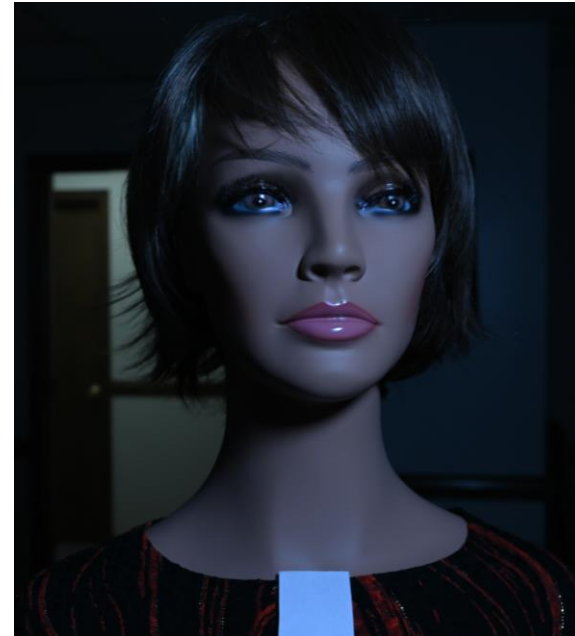


The Color of Light – The Light Source

- Effect of incorrect White Balance Settings



“Daylight” White Balance under incandescent light



“Incandescent” White Balance under “daylight” or electronic flash

The Color of Light – Using Light Color

- Landscape photography

Golden Hour



Source: Mark Denney

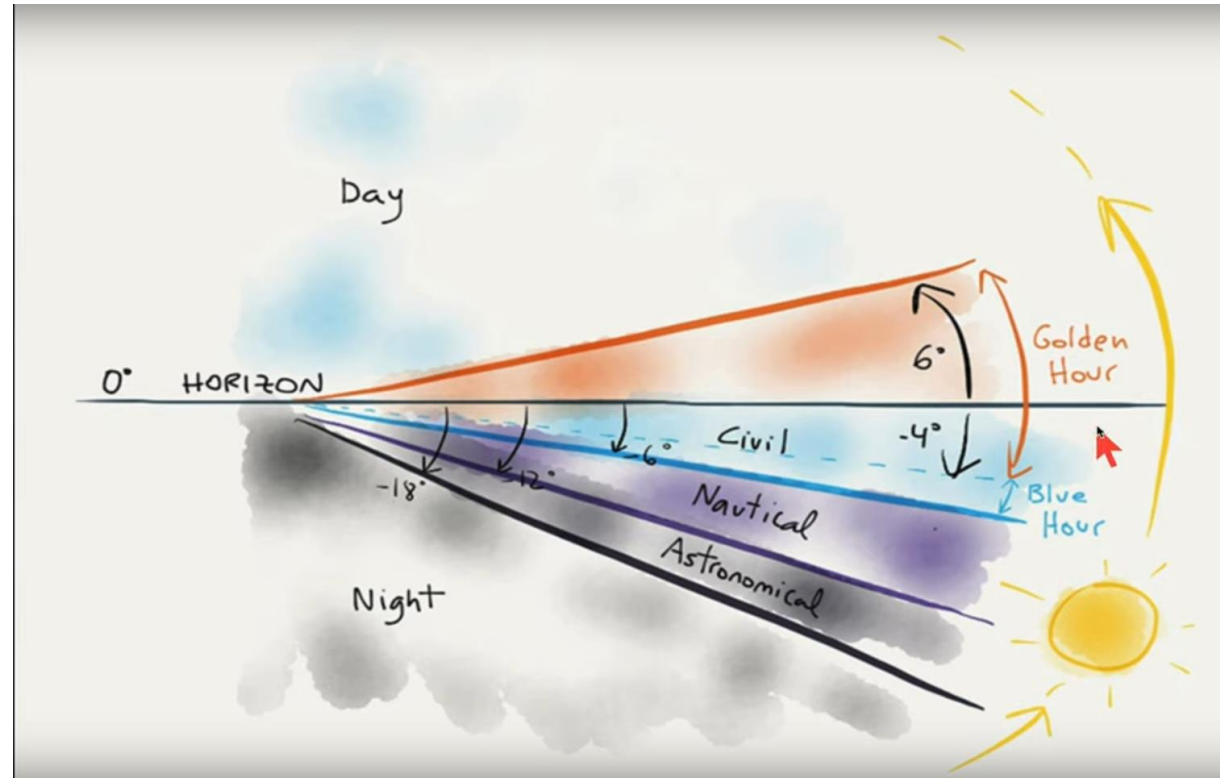
Blue Hour



Source: Mark Denney

The Color of Light – Using Light Color

- Landscape photography – When are the Blue /Golden Hour?



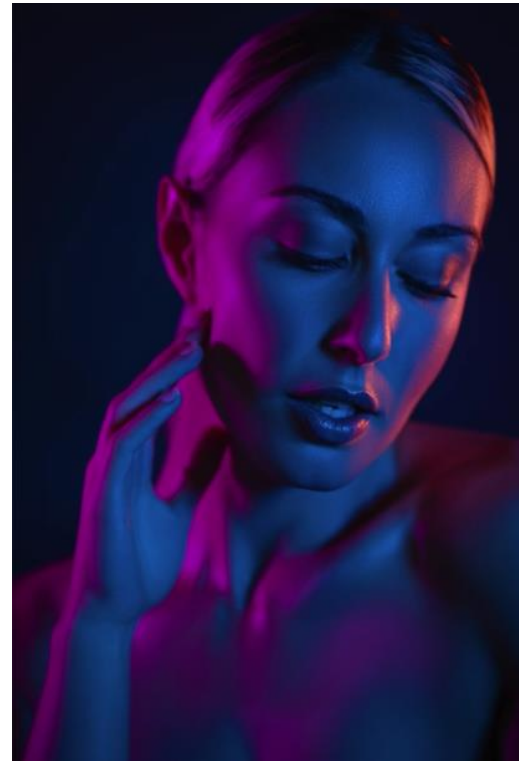
Source: Mark Denney

The Color of Light – Using Light Color

- Color for effect – Gels for lights on background and on subject



Source: Gavin Hoey



Source: Manny Ortiz

These photos were taken using “Daylight” white balance and color gels on studio lights for effect.

Qualities of Light

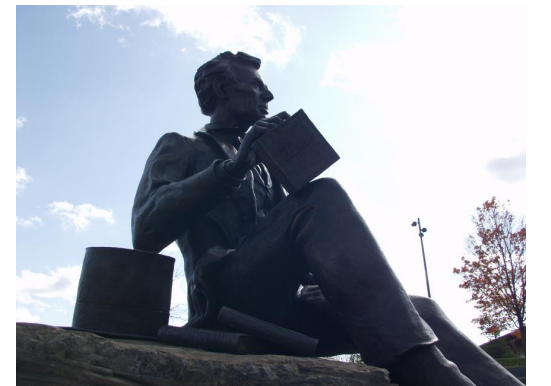
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The Direction of Light

- What is the subject?
 - Landscape/Cityscape
 - Commercial/Products
 - Food
 - Portraits
 - Pets/Animals
- What is the goal?
 - Set a mood
 - Accuracy of appearance

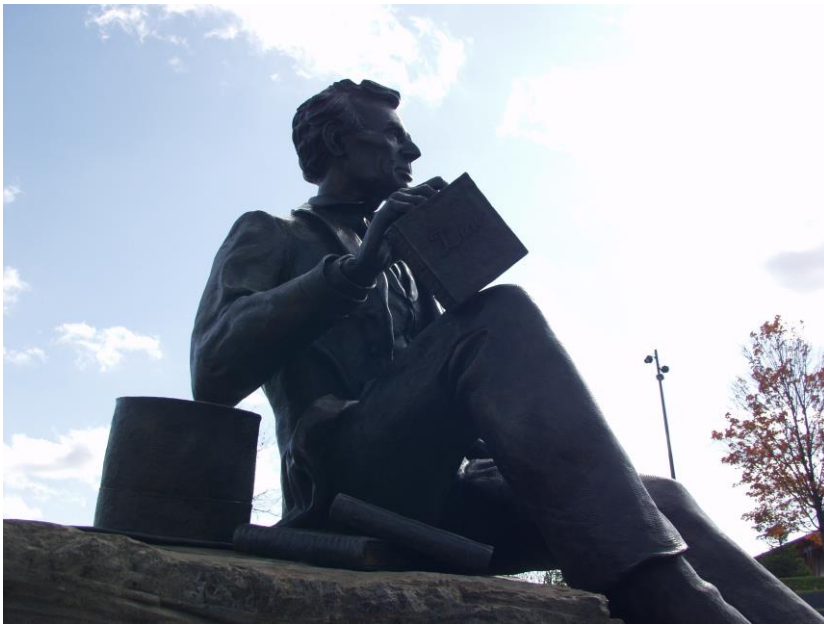
The Direction of Light

- Where is the light coming from?
- Why is that important?
 - Light creates shadows
 - Shadows add depth and dimension to the photograph
- Beginner photographers usually focus on composition
 - Don't notice where the light is coming from
 - Don't notice the effects until looking at the images



The Direction of Light

- Knowing where the light is coming from and using it can improve the photo.



The Direction of Light

- Shadows create depth, texture, mood

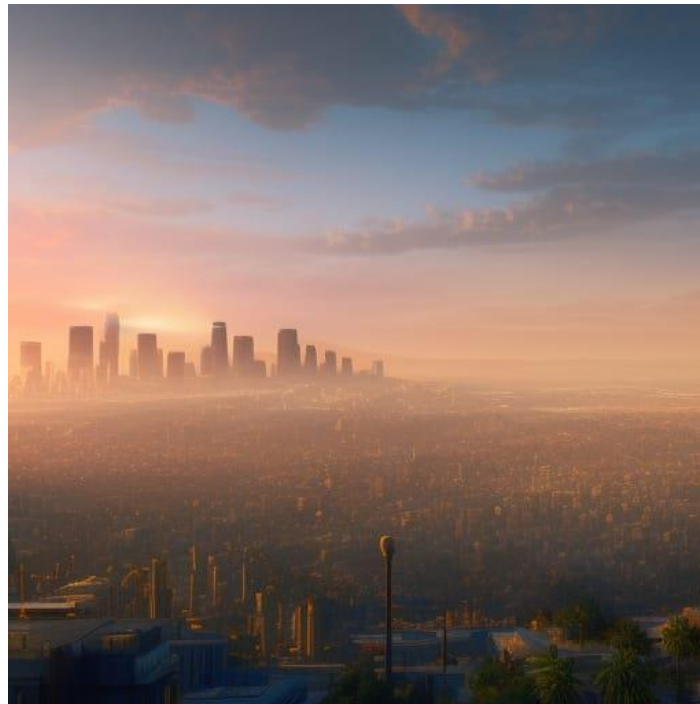


The Direction of Light

- Most landscape and cityscape photos-
 - Get up early
 - Stay up late
- Low-angle sunlight
- Long shadows



Source: John Loser



Source: AI-Generated at [Creator.NightCafe.studio.com](https://creator.nightcafe.studio.com)

The Direction of Light

- Portraits – Lighting directions for Key light

7 Directions in Portrait Lighting



Flat
Overhead
Butterfly
Loop
Rembrandt
Split
Broad

Source: AdoramaTV; Pye Jerza

The Direction of Light

- Where do you want the light to originate?
 - Landscape
 - Birds/Animals
 - Still Life
 - Product Photography – Cars – Real Estate
 - Food Photography
 - Portraits
- What mood are you creating?
- What story are you telling?



Source: Microsoft

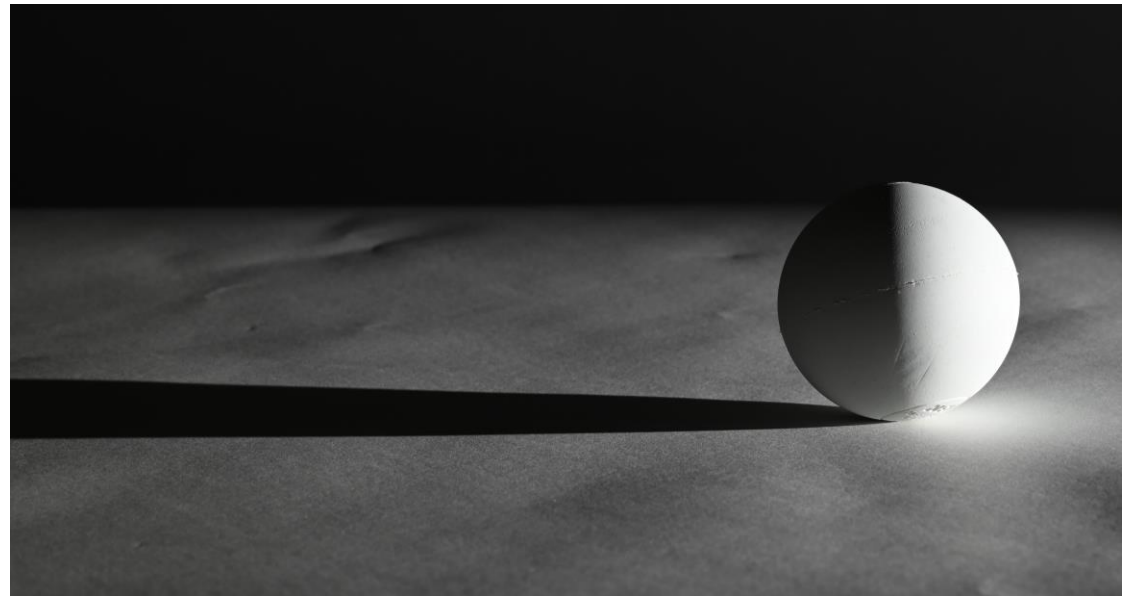
In a sense, you are capturing a painting of light.

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Hard Light vs. Soft Light

- Hard light
 - Fast transition from light to shadow
 - Created by small light source relative to the subject



Source: John Loser

Hard Light vs. Soft Light

- Hard light
 - The Sun
 - A big object, more than 865,000 miles in diameter
 - Its distance from Earth (~93,000,000 mi) makes it a “small” light source



Source: John Loser

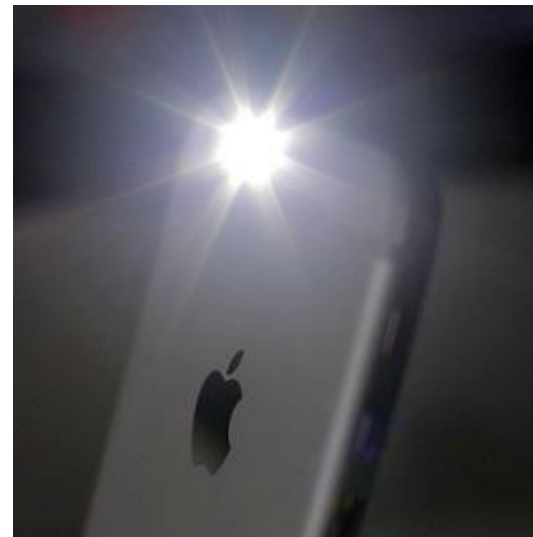


Hard Light vs. Soft Light

- Hard light
 - Light bulb or LED light source
 - Typically small, physically
 - iPhone LED light



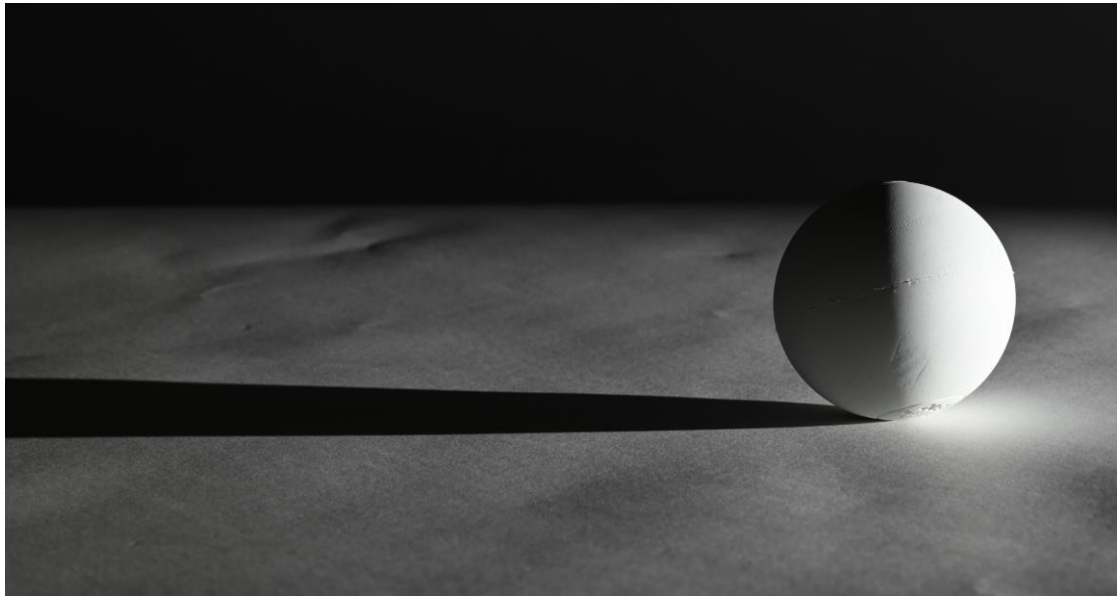
Source: Microsoft



Source: iPhoneTricks.org

Hard Light vs. Soft Light

- Hard light
 - Photo Flash
 - Small light source
 - Monolight/Studio Strobe with bare light
 - Speed Light



Source: John Loser



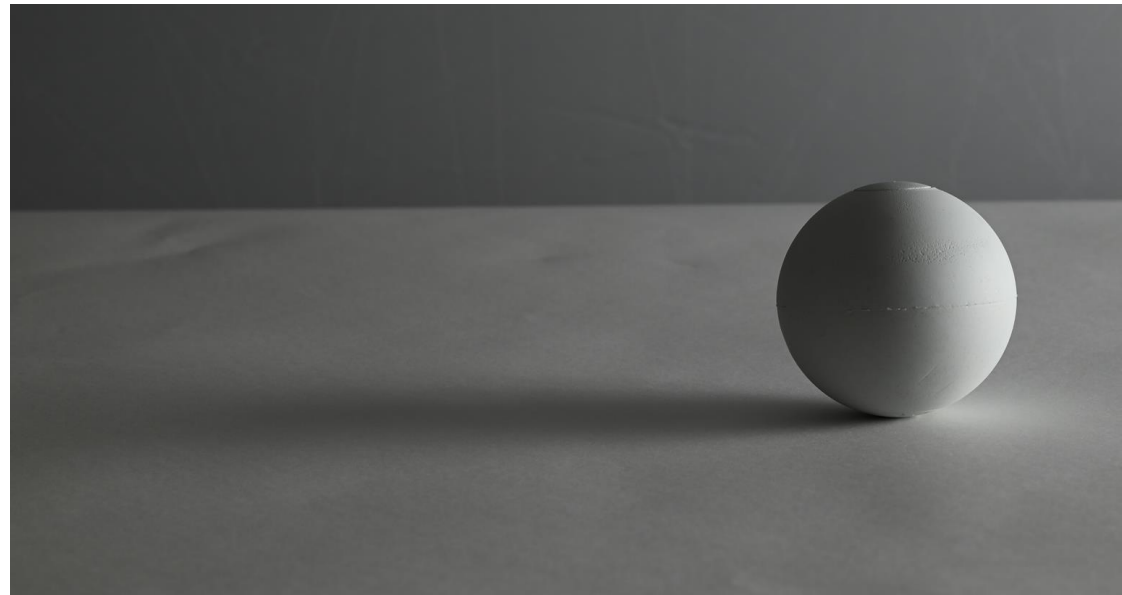
Source: Godox



Source: Godox

Hard Light vs. Soft Light

- Soft light
 - Slow transition from light to shadow
 - Created by large light source relative to the subject



Source: John Loser

Hard Light vs. Soft Light

- Soft light sources are large relative to the subject
 - Cloudy sky
 - Open window on North side of a building
 - Sun does not shine directly into the window
 - Sheer curtains may help make softer light



Source: MicroSoft

Hard Light vs. Soft Light

- Soft light sources are large relative to the subject
 - Shady area / Indirect light
 - Light with modifier
 - Soft box
 - Umbrella
 - Diffuser



Source: Impact



Source: Godox



Source: Impact

Hard Light vs. Soft Light

- Soft Light



Hard Light vs. Soft Light

- What is the subject?
- What is the goal?



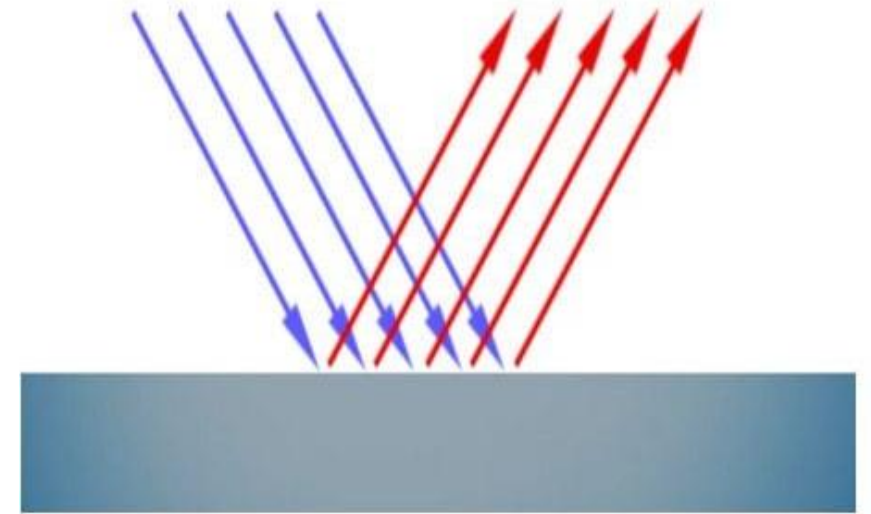
Source: John Loser

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Diffuse vs. Specular Light

- What is specular light?
 - Light bouncing off an object like a mirror
 - In photography, this produces highlights



Specular Reflection

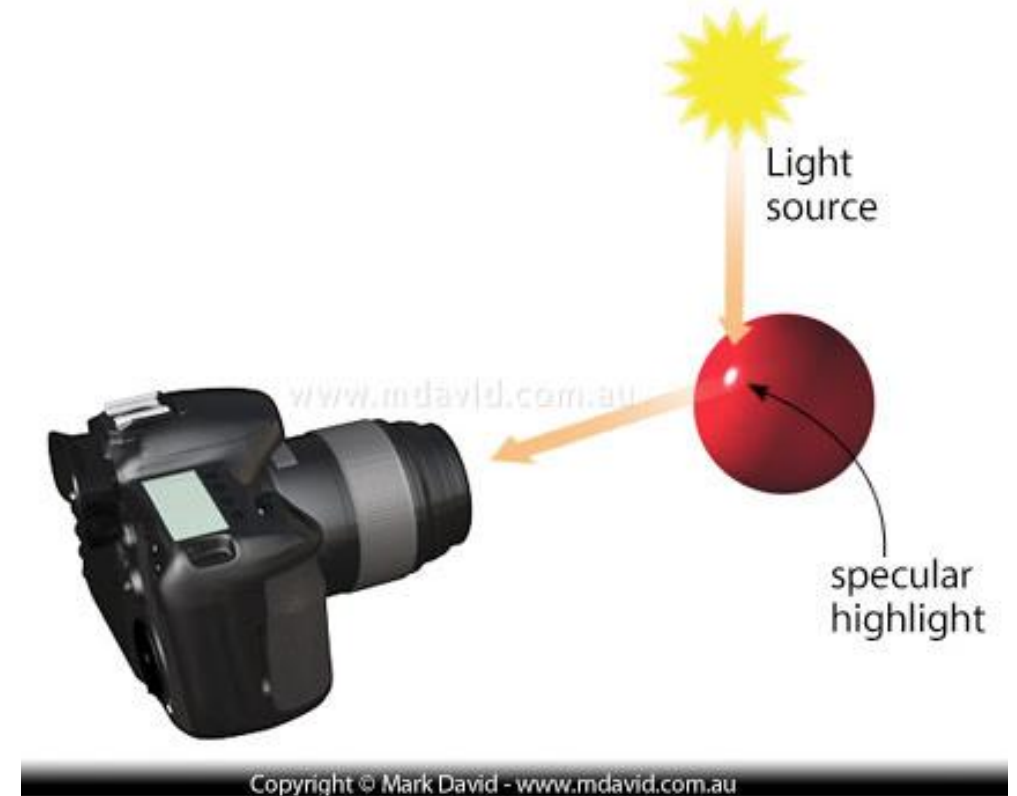
Source: scienceabc.com

The angle of incidence equals the angle of reflection.

On a hard, shiny surface, the light particles all reflect the same angle.

Diffuse vs. Specular Light

- What is specular light?
 - Incidence = reflectance
 - In photography, this produces highlights
- Specular highlights are reflections of the light source you use to photograph the subject.
 - Shiny objects
 - Oily skin
 - Eye glasses
 - Eyes (“catch light”)



Source: Mark David, www.mdavid.com.au

Diffuse vs. Specular Light

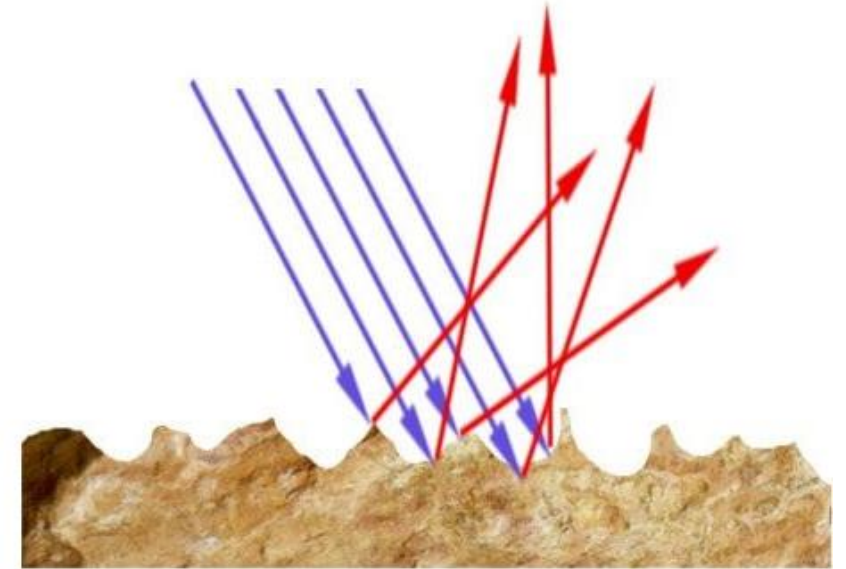
- Specular highlights are reflections of the light source you use to photograph the subject.



Source: John Loser

Diffuse vs. Specular Light

- What is Diffuse light?
 - Light scattering after hitting a surface
 - Light scattering after going through a surface (such as cloth)
- Diffuse light makes large light areas on a surface, reducing strong reflections
- Diffuse light has lower contrast

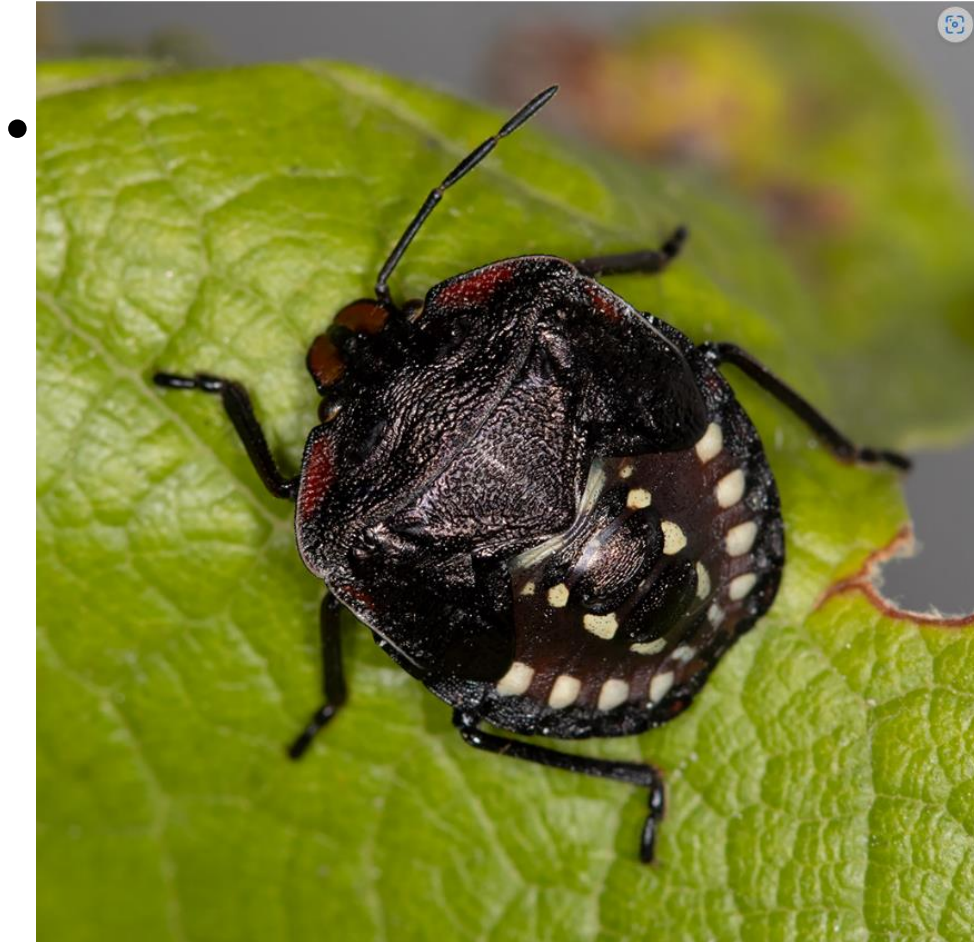


Diffuse Reflection

Source: scienceabc.com

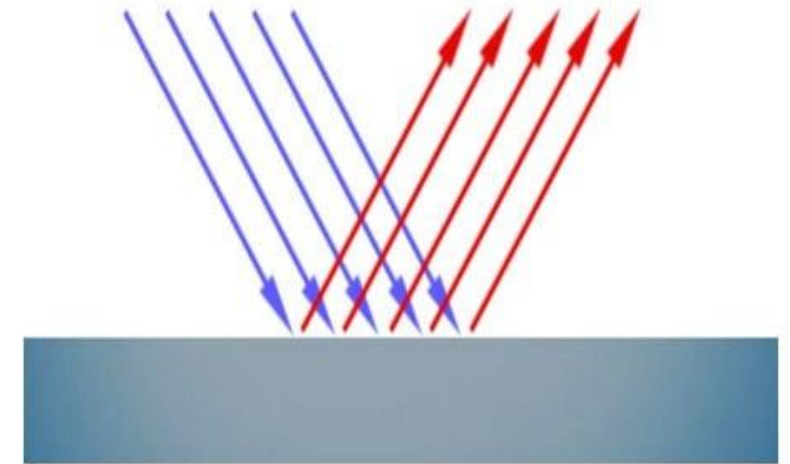
Angle of incidence still equals the angle of reflectance. However, the “rough” surface has many different angles for the light to bounce off.

Diffuse vs. Specular Light



Diffuse vs. Specular Light

- Controlling Specularity
 - Small, bare light sources are more specular
 - Highly reflective surfaces are more specular
- Pay attention to source light direction
 - Move/Rotate subject to change reflection
 - Change camera location to avoid reflection angle
 - Specialized tools & Techniques
 - Polarization filters
 - Cross polarization of light and lens



Specular Reflection

Source: scienceabc.com



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Source: Mark David, www.mdavid.com.au

Diffuse vs. Specular Light

- Controlling Specularity
 - Use diffusion
 - Flash diffusers help some
 - Larger diffusers also soften the light source



Bare, small light source

Diffuse vs. Specular Light



Bare, small light source



Silver reflective umbrella



Outside in the shade

Diffuse vs. Specular Light

Bare, small light source

- Photos taken in shade may need some “processing help.



Outside in the shade – Color Corrected



Outside in the shade – WB set to 10,000K

Diffuse vs. Specular Light

- Which is better?
 - Specular light
 - Diffuse light
- It goes back to the questions:
 - What is the goal of the photo?
 - What story do you want to tell?
 - What mood do you want to set?



Thanks to all who provided instruction to me:

- Gavin Hoey, AdoramaTV
- Daniel Norton, AdoramaTV
- Mark Wallace, AdoramaTV
- Pye Jirza, SLR Lounge
- Jay P. Morgan, The Slanted Lens
- Omar Gonzalez
- Karl Taylor
- John Gress
- And many other photographers on the internet/YouTube

