**C229 Single Camera Production – Week 8**

Week 8 Agenda:

* Readings/watchlist
* Review camera framing, angle of view & f-stop
* Image Sensors, lensed, and mounts
* Intro to the Canon R5C & Continuity

**Readings/Watchlist:**

* [Canon R5C manuals](https://www.usa.canon.com/support/p/eos-r5-c?srsltid=AfmBOopmfshMHEY2lQwbCgYMZ9sSbNiETOXwqSVTqa70npRAtkT1ulqX)
* [Canon R5C Camera Controls and Menus – Part I](https://www.youtube.com/watch?v=ExsnfHh-OzY)
* [Canon R5C Camera Controls and Menus – Part II](https://www.youtube.com/watch?v=xFZsTWgLFS0)
* Review: [Lens Basics (Sony)](https://www.sony.com/ug/electronics/focal-length-angle-of-view-perspective) & [Camera Shot Types (B&H Explora)](https://www.bhphotovideo.com/explora/video/tips-and-solutions/filmmaking-101-camera-shot-types)
* [Continuity Editing in Film (Studio Binder)](https://www.studiobinder.com/blog/what-is-continuity-editing-in-film/)
	+ [The 180-degree Rule](https://youtu.be/iW0bKUfvH2c)
	+ [What’s the 30-degree rule?](https://youtu.be/1K8EUc98VoQ)
	+ [Match Cuts](https://youtu.be/ptXlYulVAsM)
	+ [Eye Trace](https://youtu.be/xUK64UkTmW0)
* [Cuts & Transitions 101 (Rocket Jump Film School)](https://www.youtube.com/watch?v=OAH0MoAv2CI)

**Framing –** Be sure you know your basic shot types. Review the [B&H Explora article on shot types](https://www.bhphotovideo.com/explora/video/tips-and-solutions/filmmaking-101-camera-shot-types) and the Cheat Sheet below from Studio Binder.



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| The Rule Of Thirds | What is it? Filmmaking & Photography Training - YouTube | Rule of thirds in Movies - Media Maker Academy | Rule of thirds, Framing  photography, Composition photography |
| When framing medium close-ups, close-ups, and extreme close-ups, it’s common practice to keep eyes positioned on the top line of the rule of thirds. See how the eyes are positioned on the top line and that lead room is given in both images? Lead room is extra space in the frame provided in the direction of a gaze or movement. |

When framing and setting up shots, keep in mind the camera lens’s focal length and angle of view. A telephoto lens has a narrow angle of view (E.g., 10°) while a *wide-angle* lens has (as it’s named), a wider angle of view (E.g., 180° on a fisheye lens). It’s possible to get a close-up with either lens below- but the angle of view and placement of the camera would be drastically different.

 

 Canon 70-200 mm telephoto Canon 8-15 mm wide-angle lens

**Variable focal length lenses vs Prime Lenses -** Both lenses above have *variable* focal lengths. Lenses with fixed focal lengths are called *prime lenses*, such as the 50mm lens below on the right. The lens below on the left has a variable focal length, from 24-105mm. (A good all-around lens.)

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| Canon RF 24-105mm f/4 L IS USM LensCanon EF 24-105 mm f/4 zoom lens | Canon EF 50mm f/1.2L USM Lens Canon EF 50mm f/1.2 prime lens |

**Introducing Interchangeable Lenses**

The Canon xf605 has a variable focal length lens (a *zoom* lens), which is permanently attached to the camera. Most cinema cameras use an interchangeable lens system- so a variety of different lenses can be used with a single camera body. You can use zoom lenses, prime lenses (which have fixed focal lengths) and specialty lenses like tilt-shift, fisheye/wide-angle, and macro.

**Image Sensors and Lens Mounts** (EF-S, EF, RF, PL, etc.) Lens mounts are precisely engineered to connect a lens’s electronics and optics to a specific type of camera body. (You’d attach an EF lens to a camera with an EF lens mount.) Lens mounts are designed to match the size of the camera’s image sensor. In the Media School we have Canon cameras with different sizes of image sensors (APS-C, Super 35, and 35mm). The Canon C100, C200, and C300 cameras use EF lenses, but the R5C uses RF lenses. [Wikipedia has a good comparison of sensors](https://en.wikipedia.org/wiki/APS-C#/media/File:Sensor_sizes_overlaid_inside.svg).

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| Sensor Type | Size (approx.) | Cameras | Compatible lenses |
| APS-C | 22.5 x 15 mm | Canon Rebel, 80D | EF-S, EF |
| Super 35 | 24.6/26.2 x 13.8 mm | C100, C200, C300 | EF |
| 35mm / Full frame | 36 x 24 mm | Canon 1D, 5D, 6D | EF |
| 35mm / Full frame | 36 x 24 mm | Canon R5, R5C | RF |

It is possible to attach lenses with a particular mount to cameras with different mounts using an appropriate lens adaptor. For example, I use an EF to RF adaptor, which (so far) works flawlessly. There are many other types of lens mounts (Canon RF, Nikon F, Sony A & E, Arri PL, etc.), which you may encounter.

**WARNING** – Changing lenses should only be done in a clean, dust-free environment. Make sure your hands are clean, you have a good surface to place the camera on, and you have caps for both sides (front and rear) of the lens and the camera body itself. Do NOT change lenses without first getting proper guidance. [The Black and Blue Guide to Changing Camera Lenses.](https://www.theblackandblue.com/2011/03/31/how-to-exchange-camera-lenses/)

**REVIEW: The Relationship of Aperture and Depth of Field**. Larger apertures (E.g., f-2) have a shallower depth of field than smaller apertures (E.g., f-22).



**Lens Speed** – Lenses can be categorized as *slow* or *fast*, which can be confusing. This pertains to the maximum size of the aperture. Slow lenses may only open to f-4 or f-5.6. A fast lens may open to f.1.4. Photographers must use a slower shutter speed with a slower lens but can use a faster shutter speed with a fast lens. With their larger apertures, fast lenses make it easier to get shots with a shallow depth of field. Fast lenses are also essential for photographers who must capture crisp shots of action (racing, sports, dancers, animals in motion, etc.). Fast lenses are more expensive than slower lenses. Check out the price difference of these two telephoto lenses:

* Tokina EF SZX 400mm f/9 [($270 at B&H](https://www.bhphotovideo.com/c/product/1580877-REG/tokina_szxmf400_c_szx_400mm_f_8_reflex.html))
* Canon EF 400mm f/2.8 [($12,000 at B&H](https://www.bhphotovideo.com/c/product/1433721-REG/canon_ef_400mm_f_2_8l_is.html))

**Continuity -** It’s important to understand continuity, its variations, and the many ways it’s used in film production. The underlying concept in continuity is this: Within a scene, we expect people and props to remain faithful to their spatial positions, motion, and for time to move forward. We do not want to take viewers out of the moment by introducing distractions, unintentional jump cuts and continuity errors. Here are some ways to look at continuity:

* **Spatial Continuity** - the 180-degree axis has been crossed or eyelines don’t match.
* **Time Continuity** - if a clock, candle, or position of the sun appears in more than one shot, the time must be consistent within the scene.
* **Physical Continuity** - props and clothing change from shot to shot. If your talent has a jacket or sunglasses on in one shot, they need to be on in the next shot.
* **Technical Continuity** - shots don’t match in texture, image quality or sound.
* **Story Continuity** – A story point or character action doesn’t make sense

**Spatial Continuity** - This can be established by maintaining a 180-degree line, matching eye lines, and following the 30-degree rule.

* **180-degree line** – Keep the camera(s) on one side of the line- unless you have an intentional way to cross it. (Introducing a neutral shot, a cutaway, an insert shot, a new character or vector, or by shooting down the line, etc.). A **cutaway shot** is a shot of something new, outside the action of a scene. **Insert shots** are often captured from the point of view of the character and can be a close-up detail of something inside the scene they are looking at.
* **Match eye lines** – This takes planning and thoughtful camera placement to make sure character’s eye lines match.
* **30-degree rule** – Change the shot by at least 30 degrees. It’s also important to vary the framing for adjacent shots of the same subject to avoid unintentional jump cuts. **Jump cuts** are back-to-back similar shots of the same subject (E.g., going from a MCU of a character to another MCU of the same character).

**Time and Physical Continuity** - Pay attention to attire, hair, clocks, candles, time, and anything else that changes over time. Even the amount of liquid in a glass someone is drinking needs to be monitored. On set, the Script Supervisor is usually tasked with tracking props and continuity issues.

**Technical Continuity** – Using two cameras that don’t match, varying lighting conditions in the same scene, and mismatched audio recordings are common problems.

**Attendance Question**: What is the two-letter lens mount that works with the Canon R5 and R5C cameras?

**Intro to the Canon R5C**

The Canon R5C is a 45-megapixel mirrorless camera with a full-frame CMOS sensor and an RF lens mount. It requires an LP-E6N battery and can record HD, 4K, and 8K. ([B&H R5C info page](https://www.bhphotovideo.com/c/product/1684244-REG/canon_5077c002_eos_r5_c_full_frame.html/specs))

* Unlike the Canon xf605, which has a fixed lens, the R5C uses interchangeable RF lenses.
* Unlike the Canon xf605 (and like most DSLRs) there is no direct way to capture audio from a microphone via an XLR cable. While you can attach an external mic with the right connectors (mini-phone plug), it is best to record audio via a separate device (E.g., a Sound Device MixPre), which has phantom power to work with professional microphones).

**Vocabulary:**

* Angle of view
* Aperture
* Continuity (How to maintain in production and editing)
* Cutaway Shot
* Depth of field
* DSLR Camera (Digital Single Lens Reflex Camera)
* EF lens mount
* F-stop
* Focal length
* Jump Cut
* Insert shot
* Lens speed
* Prime lens - A lens with a fixed focal length.
* Zoom lens - A lens that has a variable focal length