

Mirrorless cameras

We recommend that you only consider purchasing a mirrorless camera rather than a DSLR camera if your project involves digitisation within an institution or locations with a reliable electricity supply.

Mirrorless cameras are perfectly suitable for some EAP projects but much less suitable for others. The best models are excellent cameras and suited to a wide range of photographic uses: including digitisation projects in an archive with a reliable electricity supply. Because of the significantly heavier drain on batteries that mirrorless cameras make when compared to DSLR cameras, mirrorless cameras are much less suitable for projects where electricity supplies are unreliable. Whether you prefer the ergonomics and handling of mirrorless cameras is a matter of personal taste. You should try both kinds of camera before purchasing equipment.

- * Mirrorless cameras are perfectly suitable for digitisation within an institution or locations with reliable electricity supply.
- * If a mirrorless camera is used in a project moving from location to location, extra care should be taken to avoid dust entering the camera body when changing lenses: the delicate sensor is significantly more exposed than in DSLR cameras.
- * Given their greater reliance on battery-draining electronics than DSLRs, spare batteries and alternative power sources are even more essential in projects where electricity for recharging is unpredictable. N.B. Most mirrorless cameras have a USB socket that enables them to be powered from separate USB power packs. You should carefully check with suppliers which kind of USB cable is needed for this and check functionality well before starting fieldwork. AC adaptors to recharge batteries and power the camera directly are also available for most camera models.

Sony, Canon, and Nikon manufacture very high quality mirrorless cameras. Some are full frame; others are APS-C format. The design and specification of mirrorless cameras is advancing very quickly, matching top-level DSLR cameras in many ways. Several models are now manufactured to professional levels, with excellent weather sealing and robust build quality.

As a rule, mirrorless cameras are smaller, thinner and lighter than DSLR cameras of the same format and similar build quality. The greater bulk of DSLR cameras arises from them being designed around a direct optical viewing system, comprising an optical viewfinder, pentaprism and mirror housing. Mirrorless cameras, in contrast, use an electronic viewfinder or LCD screen, taking a signal direct from the sensor. With no instant return mirror, they are naturally quieter too. The best mirrorless cameras are capable of producing image quality to match or exceed equivalent DSLR cameras and are equally sophisticated in design.

Because of the necessity of using either an electronic viewfinder or the LCD screen, the battery life of a mirrorless camera cannot match that of a DSLR when used with the (non-electronic) optical viewfinder. When employing the optical viewfinder of a DSLR camera, the sensor is only switched on when the exposure is made. In a mirrorless camera, the sensor is on continuously if the camera is switched on, using battery power all the time. The difference between the number of exposures that can be made on a single battery charge in these circumstances is very substantial. For example, the Nikon D780 can make 2250 exposures using the optical viewfinder compared to the Sony a7III making 6-700 shots using either the electronic viewfinder or the LCD. This difference in battery life

would be a significant negative factor for projects in locations with unreliable electricity supplies, even more so for projects in very cold conditions where battery life is further reduced.

However, when a digital camera is attached to a copy stand or to a tripod and the image is viewed on a tilting LCD screen rather than through the viewfinder, the difference in battery life between DSLR and mirrorless cameras disappears. Equally, if the digitisation set up utilises the process of tethered shooting, with the camera in Live View mode, the differences in the battery life between mirrorless and DSLR camera is again insignificant.

Finally, DSLR cameras have a mirror inside the throat of the camera. This covers the camera sensor when you change lenses. Though all interchangeable lens digital cameras are vulnerable to dust and dirt when the lens is removed, and great care should always be taken to change lenses quickly and away from potential airborne dust, the mirror and shutter of a DSLR offers a degree of protection. Mirrorless cameras are much more vulnerable: when you change lenses, the delicate camera sensor is completely exposed. However all good digital cameras have a sensor cleaning function, using vibration to shake off dust particles.

APS-C Mirrorless cameras

A suggested Canon APS-C Mirrorless camera and lens kit

A kit comprised of a high quality Canon APS-C Mirrorless camera body, macro lens and a close-focussing wide-angle to standard zoom would make a good digital camera kit for documentation projects based in institutions with reliable electricity. The kit would also need UV protection filters for the lens, at least one spare camera battery and possibly a spare camera battery charger.

A Canon EOS M6 Mark II body

Canon EOS M6 Mark II (£890)

* Recommended. A good choice of camera for tethered shooting in an institution with reliable electricity.

* A very good and inexpensive APS-C mirrorless camera, capable of producing excellent quality images.

* A camera suitable for a large amount of copying.

* LCD screen is not fully articulated but does flip up for viewing when attached to a copy stand

* No built in viewfinder but an excellent optional viewfinder (Canon EVF DC2) is available.

The Canon EOS M6 II is a very small APS-C mirrorless camera with good build quality making it perfectly suitable for EAP projects or pilot projects based in institutions with reliable electricity. It would be an excellent choice of camera for tethered shooting. Additionally, its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward. This is not a full-frame camera but an APS-C camera so the effective focal length of all lenses will be multiplied by a factor of 1.6, when compared to a full-frame camera.

(The even cheaper Canon EOS M50 Mark II APS-C mirrorless camera does include a built in electronic viewfinder but is of lightweight construction and is not recommended)

Canon EF-M 28mm f3.5 Macro IS STM lens (£319)

A very sharp, fixed focal length, true macro lens, which is optically and mechanically designed specifically for focusing close up and is therefore ideal for copying. It will copy objects and documents at close distances with minimal distortion. Its focal length on an APS-C camera approximates to the "standard" macro copying lens (the equivalent of a 45 mm lens on a full-frame camera). This makes it ideal for photographing most documents and objects. Combined with a wide-angle to standard zoom, this will form an excellent and flexible copying kit. The lens is lightweight and is not weather sealed so care should be used to guard against dust and moisture. This lens is designed specifically for Canon APS-C cameras and will not work on a full-frame camera. It should always be used with a UV protection filter.

N.B. This lens has an inbuilt pair of LED lights with an on/off switch, which should not be used as a light source for copying, but might aid focussing in low light

Canon EF 15-45mm f3.5-6.3 IS STM lens (£269)

A lightweight and small zoom lens. It focuses very close and is very sharp. The lens is best used in the 22-45 mm range for most copying with the wider angle settings restricted to more occasional use when subjects are too large to copy easily. The lens is lightweight and is not weather sealed so care should be used to guard against dust and moisture. This lens is designed specifically for Canon APS-C cameras and will not work on a full-frame camera. It should always be used with a UV protection filter.

Canon Mount adaptor EF-EOS M (£140)

Finally, it is possible to use any existing Canon EF or EF-S DSLR lenses with the inexpensive EF-EOS M Mount adaptor. These DSLR lenses should function perfectly but you should check functionality with your equipment supplier.

A suggested Sony APS-C Mirrorless camera and lens kit

A kit comprised of a high quality Sony APS-C Mirrorless camera body, macro lens and a close-focussing wide-angle to standard zoom would make a good digital camera kit for documentation projects based in institutions with reliable electricity. The kit would also need UV protection filters for each lens, at least one spare camera battery and possibly a spare camera battery charger.

A Sony A6600 or A6400 body

Sony A6600 body (£1250)

- * Highly recommended. A good choice of camera for tethered shooting in an institution with reliable electricity.
- * A camera suitable for a large amount of copying.
- * A very good APS-C mirrorless camera, capable of producing excellent quality images.
- * LCD screen is not fully articulated but flips up for viewing when attached to a copy stand

The Sony A 6000 series of cameras, of which there are several, are small, light and very compact APS-C interchangeable lens mirrorless camera bodies. They are all capable of producing very high quality images. All models have a built in off-centre electronic viewfinder and flip up LCD screen. The current top model the Sony A6600 has a large battery with twice the battery life of the other models in Sony's 6000 series and overall has a stronger build quality and weather sealing. It would be an excellent choice for EAP projects or pilot projects based in institutions with reliable electricity, a perfect camera for tethered shooting. Additionally, its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward. The design also allows the camera to be powered or the battery charged via USB or a USB powerbank. This is not a full-frame camera but an APS-C camera so the effective focal length of all lenses will be multiplied by a factor of 1.6, when compared to a full-frame camera.

Sony A6400 (£900)

- * Recommended. A good choice of camera for tethered shooting in an institution with reliable electricity
- * A good APS-C mirrorless camera, capable of producing excellent quality images.

* LCD screen is not fully articulated but flips up for viewing when attached to a copy stand

The Sony A 6000 series of cameras, of which there are several, are small, light and very compact APS-C interchangeable lens mirrorless camera bodies. They are all capable of producing very high quality images. All models have a built in off-centre electronic viewfinder and flip up LCD screen. The Sony A6400 has good overall build quality. It would be an excellent choice for EAP projects or pilot projects based in institutions with reliable electricity, a perfect camera for tethered shooting. Additionally, its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward. The design also allows the camera to be powered or the battery charged via USB or a USB powerbank. This is not a full-frame camera but an APS-C camera so the effective focal length of all lenses will be multiplied by a factor of 1.6, when compared to a full-frame camera.

Sony E 30mm f3.5 Macro lens (£210)

A very small, sharp, fixed focal length lens. This is a true macro lens, which is optically and mechanically designed specifically for focusing close up and is therefore ideal for copying. It will copy objects and documents at close distances with minimal distortion. Its focal length approximates to the "standard" macro copying lens making it ideal for photographing a variety of documents and objects. Combined with a wide-angle to standard zoom, this will form an excellent and flexible copying kit. This lens is designed specifically for Sony APS-C cameras and will not work on a full-frame camera. The lens is lightweight and not weather sealed so care should be used to guard against accidental damage, dust and moisture. It should always be used with a UV protection filter

Sony E 16-70mm f4 ZA OSS lens (£700)

A high quality zoom lens made by Zeiss for Sony. Lightweight but well-constructed, optically very sharp and with good build quality. It focuses close. The zoom range when on a Sony A 6600 body (or other Sony APS-C mirrorless body) is the equivalent of approximately 24 - 105mm on a full-frame camera. The lens is best used in the 28-40mm range for most copying with the wider angle settings restricted to more occasional use when subjects are too large to copy easily. This lens is designed specifically for Sony APS-C cameras and will not work on a full-frame camera. It should always be used with a UV protection filter.

A suggested Nikon APS-C Mirrorless camera and lens kit

A kit comprised of a high quality Nikon APS-C Mirrorless camera body, and a close-focussing wide-angle to standard zoom would make a good digital camera kit for documentation projects based in institutions with reliable electricity. The kit would also need UV protection filters for the lens, at least one spare camera battery and possibly a spare camera battery charger.

A Nikon Z50 body

Nikon Z50 (£830)

- * A good APS-C mirrorless camera, capable of producing excellent quality images.
- * A good choice of camera for tethered shooting in an institution with reliable electricity.
- * LCD screen is not fully articulated but flips up for viewing when attached to a copy stand
- * An inexpensive camera, especially when bought together with the 16-50mm f3.5-6.3 lens (below) in kit form

The Nikon Z50 is a small, inexpensive APS-C mirrorless camera with good build quality making it perfectly suitable for smaller EAP projects or pilot projects based in institutions with reliable electricity. It would be a good choice of camera for tethered shooting. Additionally, its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward. This is not a full-frame camera but an APS-C camera so the effective focal length of all lenses will be multiplied by a factor of 1.6, when compared to a full-frame camera.

There is currently no true fixed focal length macro lens available for Nikon APS-C mirrorless cameras: consequently, the Canon M6 would be a better choice.

Nikon Z 16-50mm f3.5-6.3 DX VR lens (£330)

A very small and lightweight zoom lens. It focuses very close and is very sharp. The lens is best used in the 22-45mm range for most copying with the wider angle settings restricted to more occasional use when subjects are too large to copy easily. The lens is not weather sealed so care should be used to guard against dust and moisture. This lens is designed specifically for Nikon APS-C cameras and will not work on a full-frame camera. It should always be used with a UV protection filter.

Full-frame Mirrorless cameras

A suggested Canon full-frame Mirrorless camera and lens kit

A kit comprised of a high quality Canon full-frame Mirrorless camera body, macro lens and a close-focussing wide-angle to standard zoom would make an excellent digital camera kit for documentation projects based in institutions with reliable electricity. The kit would also need UV protection filters for each lens, at least one spare camera battery and possibly a spare camera battery charger.

A Canon EOS R or EOS RP body

Canon EOS R (£1850)

- * Highly recommended. A very good full-frame mirrorless camera, capable of producing excellent quality images.
- * Weather sealed against dust and moisture
- * A camera suitable for a large amount of copying.
- * Tilting LCD touch screen.
- * The same high quality battery used in the full frame Canon DSLRs.
- * Features a shutter, which closes when the lens is removed to protect the sensor from dust. An excellent feature

The Canon EOS R is a high quality, full frame mirrorless camera with very good build quality and weather sealing. It would be perfectly suitable for EAP projects or pilot projects based in institutions with reliable electricity. It would be an excellent choice of camera for tethered shooting. Additionally, its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward.

Canon EOS RP (£1049)

* Recommended. A good full-frame mirrorless camera, capable of producing excellent quality images.

* A smaller battery than the EOS R with even fewer shots per charge

* Tilting LCD touch screen.

The Canon EOS RP is a very capable small mirrorless camera with good build quality and some weather sealing. It is a lighter camera than the Canon EOS R, with a smaller electronic viewfinder. This is not an issue if using tethered shooting or the tilting LCD screen. It would be perfectly suitable for EAP projects or pilot projects based in institutions with reliable electricity, and an excellent choice of camera for tethered shooting. Additionally, its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward. Unlike the Canon EOS R, there is no extra shutter to protect the sensor from dust when the lens is removed.

Canon RF 35mm f1.8 IS Macro STM lens (£530)

Highly recommended. A very sharp, fixed focal length, true macro lens, which is optically and mechanically designed specifically for focusing close up and is therefore ideal for copying. It will copy objects and documents at close distances with minimal distortion. Its focal length is wider than the "standard" 50-55 mm macro copying lens, but this is an advantage, making it ideal for photographing a variety of documents and objects. Combined with a wide-angle to standard zoom, this will form an excellent and flexible copying kit. The lens is lighter and not nearly as robust as the Canon L Series lenses and is not weather sealed so care should be used to guard against dust and moisture. It should always be used with a UV protection filter.

Canon RF 24-105mm f4 L IS lens (£1150)

One of Canon's excellent L Series lenses which have robust build quality and weather sealing. It is heavier and bulkier than cheaper lenses but will better withstand the rigours of usage in remote locations. A good choice for projects digitising large quantities of material. It focuses very close and is very sharp. The lens is best used in the 35-60 mm range for most copying with the wider angle settings restricted to more occasional use when subjects are too large to copy easily. It should always be used with a UV protection filter.

Canon RF 24-105 f4-7.1 IS STM lens (£480)

A lightweight zoom lens. A cheaper alternative to the Canon RF 24-105mm f4 L series lens. It focuses very close and is very sharp. The lens is best used in the 35-60mm range for most copying with the wider angle settings restricted to more occasional use when subjects are too large to copy easily. Avoid using the "central focus macro" setting available through the camera menu, as it will blur all but the centre of the frame. Use the 105 mm setting in auto focus mode for extreme close ups. The lens is lighter and not as robust as the Canon L Series lenses and is not weather sealed so care should be used to guard against dust and moisture. It should always be used with a UV protection filter.

Canon Mount adaptor EF-EOS R (£120)

Finally, it is possible to use any existing Canon EF DSLR lenses with the inexpensive EF-EOS R Mount adaptor. They should function perfectly but you should check functionality with your equipment supplier.

A suggested Nikon full-frame Mirrorless camera and lens kit

A kit comprised of a high quality Nikon full-frame Mirrorless camera body, macro lens and a close-focussing wide-angle to standard zoom would make a good digital camera kit for documentation projects based in institutions with reliable electricity. The kit would also need UV protection filters for each lens, at least one spare camera battery and possibly a spare camera battery charger.

A Nikon Z6II or Z5 body

Nikon Z6 II (£2,000)

- * Highly recommended. A very good full-frame mirrorless camera, capable of producing excellent quality images.
- * Fully weather sealed against dust and moisture
- * A camera suitable for a large amount of copying.
- * Tilting LCD touch screen.

The Nikon Z6 II is a high quality, full frame mirrorless camera that is replacing the similar Nikon Z6. It is a robust but lightweight mirrorless camera with very good build quality and weather sealing. It would be perfectly suitable for EAP projects or pilot projects based in institutions with reliable electricity. It would be an excellent choice of camera for tethered shooting. Additionally, its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward.

Nikon Z5 (£1299)

* Highly recommended. A good full-frame mirrorless camera, capable of producing excellent quality images.

* Weather sealed against dust and moisture

* Tilting LCD touch screen.

The Nikon Z5 is a very capable small full frame mirrorless camera with good build quality and some weather sealing. It is a slightly lighter camera than the Nikon Z6 II. It would be perfectly suitable for EAP projects or pilot projects based in institutions with reliable electricity. It would be an excellent choice of camera for tethered shooting. Its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward

Nikon Z MC 50mm f2.8 lens (£650)

A very sharp, fixed focal length, true macro lens, which is optically and mechanically designed specifically for focusing close up and is therefore ideal for copying. It will copy objects and documents at close distances with minimal distortion. Its focal length is the “standard” macro copying lens making it ideal for photographing a variety of documents and objects. Combined with a wide-angle to standard zoom, this will form an excellent and flexible copying kit. The lens is not weather sealed so care should be used to guard against dust and moisture. It should always be used with a UV protection filter

Nikon Z 24-70 f4 S (£1,000)

A professionally oriented lens with excellent build quality and weather sealing. It is very sharp, with exceptional performance in close up. A good choice for projects digitising large quantities of material. The lens is best used in the 35-60 mm range for most copying with the wider angle settings restricted to more occasional use when subjects are too large to copy easily. It should always be used with a UV protection filter.

A suggested Sony full-frame Mirrorless camera and lens kit

A kit comprised of a high quality Sony full-frame Mirrorless camera body, macro lens and a close-focussing wide-angle to standard zoom would make a good digital camera kit for documentation projects based in institutions with reliable electricity. The kit would also need UV protection filters for each lens, at least one spare camera battery and possibly a spare camera battery charger.

A Sony Alpha A7III or Sony Alpha A7II

Sony A7III (£1750)

* Recommended. A very good full-frame mirrorless camera, capable of producing excellent quality images. Dust and moisture resistant rather than fully weather sealed.

* Tilting LCD touch screen.

The Sony A7III is an excellent professional level, full frame camera with very good battery life for a mirrorless camera: it comes with a larger and longer lasting battery than in the Sony A7II. The camera is well build with some weather sealing and an excellent electronic viewfinder. It would be perfectly suitable for EAP projects or pilot projects based in institutions with reliable electricity. It would be an excellent choice of camera for tethered shooting. Additionally, its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward.

Sony Alpha A7 Mark II (£1000)

* Recommended. A very good full-frame mirrorless camera, capable of producing excellent quality images. Dust and moisture resistant rather than fully weather sealed. Lighter weight than the A7III

* Tilting LCD touch screen.

The Sony A7II is a very capable small mirrorless camera with good build quality and some weather sealing. It would be perfectly suitable for EAP projects or pilot projects based in institutions with reliable electricity. It would be an excellent choice of camera for tethered shooting. Additionally, its tilting LCD touch screen would help when used on a copy stand where the height of the camera can often make viewing a fixed LCD screen awkward.

Sony FE 50mm f2.8 macro lens (£449)

Recommended. A very sharp, fixed focal length, true macro lens, which is optically and mechanically designed specifically for focusing close up and is therefore ideal for copying. It will copy objects and documents at close distances with minimal distortion. Its focal length is the "standard" macro copying lens making it ideal for photographing a variety of documents and objects. Combined with a wide-angle to standard zoom, this will form an excellent and flexible copying kit. The lens is not fully weather sealed but has a dust and moisture resistant design. Nevertheless, care should be taken to guard against dust and moisture. It should always be used with a UV protection filter

Sony FE 24-105 f4 G OSS lens (£799)

An excellent lens with superb optical performance, mechanical construction and weather sealing. It is very sharp, with good performance in close up. A good choice for projects digitising large quantities of material. The lens is best used in the 35-60 mm range for most copying with the wider angle settings restricted to more occasional use when subjects are too large to copy easily. It should always be used with a UV protection filter.