The Australian Archaeology Skills Passport

Introduction

The Australian National Committee for Archaeology Teaching and Learning (ANCATL) is proud to launch the first iteration of the *Australian Archaeology Skills Passport* in 2020. In the same way that a passport shows where you have been on your travels, so too does a skills passport; it provides a record of your journey through your archaeological training. It also offers advice on the next steps in your professional journey.

Based on the highly successful UK model developed by David Connolly, our approach has been broad-scale, integrative and discipline wide. Informed by the continuing skills gaps identified in ANCATL’s Profiling the Profession surveys, the passport provides greater transparency to trainers, students and employers on what practical skills are needed within the discipline and when and how these are to be provisioned.

The passport will be available in both hard copy and open access digital form. Digital *skills sheets* will be housed online with the Australian Archaeology Association, providing guidance on how a candidate is to be assessed for each skill within the three tiers of experience: that a skill can be completed under *full* supervision, *moderate* supervision, or *no* supervision.

**Students and Practitioners**
- Provides students with a [clear guide](#) as to what is expected of them as a professional archaeologist.
- Directly linked to the national [benchmarks](#) for archaeology honours degrees.
- Emphasises [critical skills shortages](#) within the sector that professionals can target for professional development.

**Indigenous Site Officers and Rangers**
- [Recognition](#) of the importance and value of practical experience and knowledge.
- Encourages the [equal weighting](#) of experience gained during *life* and *study*.
- Supports [alternate entry methods](#) into the discipline.
- Can be used to support applications for further [employment](#) in the sector.

**The Public**
- Can be used in primary and secondary school contexts.
- The open access format can [contribute to curriculum](#) focusing on Australian archaeology, the First Australians and contemporary Australian culture.
- The passport can contribute to promoting [greater understanding and appreciation](#) of the longevity and complexity of Australian culture.

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GROUP A SKILLS

PRINCIPLES AND TECHNIQUES OF EXCAVATION AND SURVEY
Awareness of site types and distribution

Before going out into the field it is essential to understand what sites you might expect to come across. Firstly, you need to consider what constitutes a site – a place which in the past has been the focus of human activity. This might be on short or long-time scales (the *temporal* scale) and can cover both small and large areas (the *spatial* scale). A site may be a physical place, such as an historic building, or intangible heritage such as a place that features in creation (‘Dreaming’) stories. It is important to understand the location of sites and their relationship to one another to be able to interpret past landscape use and understand contemporary heritage values.

Within Australia, archaeological sites are generally categorised into two broad groups. **Indigenous sites** are those associated with Indigenous Australians, whether they be pre- or post-contact in age. These sites may include (but are not limited to) stone artefact scatters, quarries, culturally modified trees, shell middens, stone arrangements, rock shelters, rock art, burials and hearths. Indigenous historic sites and Indigenous ethnographic sites are also important site types to consider. **Historical sites** broadly describe sites associated with European contact (including early Dutch naval landings) and sites associated with contact with Macassan fishermen. Types of historic sites may include houses, industrial sites, mining works, survey boundary markers and landscape features such as fences and water races.

Much literature exists on the development of predictive models for site distribution within the Australian archaeological context and it is important that such research is undertaken before any fieldwork has begun. Another critical consideration is that of contemporary Indigenous knowledge of any tangible and/or intangible sites your study area. Evaluating Indigenous knowledge may require other specialists (e.g., anthropologists) to be involved in the work. Another essential point to consider is the effect of the sampling program on discovery rates. In open landscapes, the search for buried sites usually involves test-pitting. The size and spacing of the test-pits has a fundamental bearing on the success of discovery. For example, small, widely-spaced test pits are unlikely to detect small concentrations of stone artefacts.

**Principle:**
The candidate understands the nature and location of different site types and their geographical predictors within the landscape.

**Outcomes:**
The candidate can identify site types likely to be located within specific landscapes and assess their expected location.

**Constant supervision**
The candidate has a basic understanding of a range of different site types and with the help of an instructor/colleague can create a predictive model for a defined area.
Moderate supervision
The candidate has a good understanding of the range of different site types expected for various landforms and can develop a comprehensive predictive model for a defined area with some additional input from an instructor/colleague.

No supervision
The candidate has a thorough understanding of different site types and can confidently write a comprehensive predictive model for a defined area without additional external input.

Professional Tips
- Take some time to look at the distribution of site types in the broader area around where you will be doing your survey. A good place to start is by looking at the relevant state register of archaeological sites, after you have gained the appropriate permissions.
- Be aware that heritage registers often only represent where people have looked (usually in response to development) rather than an exhaustive map of where all the sites are.
- Another good source of information on site distributions in the broader area are archaeological reports (both published and unpublished) and research papers.
- Make sure that all relevant literature is assessed before undertaking fieldwork as this will help inform your thoughts on site management, significance assessments and future research potential.

Further Resources
- A Netlogo model for designing an optimal sampling program can be downloaded for free from https://digittools.net
Built heritage survey

Historical and Industrial archaeologists are often called on to undertake field surveys to identify buildings and other structures. This requires basic skills in designing survey strategy, data recording methodology, building and structure identification and reporting. In surveying buildings, archaeologists utilise a range of skills, such as designing and completing surveys and recording sites. Archaeologists also bring methodologies for examining change through time by means of examining the fabric of a building. Archaeologists also need to understand how historical evidence can be used in building surveys.

There are no systematic and rigorous typologies for architectural styles, building methods and building materials and as a result, archaeologists need to develop their own or adapt ones to suit particular circumstances. Typically, a recording sheet is used to collect information during building surveys. Building surveys can draw upon Global Navigation Network Satellites (GNSS) based data logging on phones and tablets (for example Qfields) which can upload directly to Geographic Information Systems (GIS) software to produce databases and maps of site records.

Principle:
The candidate understands the methods and outcomes of undertaking a building survey and where relevant source material may be found.

Outcomes:
The candidate can record the location and nature of buildings and structures in a systematic and accurate way.

Constant supervision
The candidate can complete recording sheets, take basic photographs, download data in the office, and comply with WH&S requirements. Some knowledge of basic building types is needed.

Moderate supervision
The candidate can participate in the design of the survey methodology, undertake relevant historical research, comply with WH&S requirements, and prepare draft reports and maps. Familiarity with architectural styles, building types and building materials is needed.

No supervision
The candidate can design a building survey methodology, undertake a safe work assessment and comply with WH&S requirements, undertake the survey, direct other team members, download and organise data, prepare a report on the work undertaken. In-depth knowledge of building type and building materials and architectural styles is needed.
Professional Tips

- Remember, for a building survey to be successful we need to know: what it is being recorded (use photos, sketches, notes, etc.) and where it is (use GPS, mark on maps, record street addresses, etc.).
- Most building surveys use photography. Be aware of a photographer’s rights and responsibilities.
- WH&S requirements are important in built heritage surveys, particularly if you are working near busy roads, traversing uneven terrain and working long days.

Further Resources

Architectural styles in Australia

Apperly et al (1989) is the best overall text, supplemented by Burchell (2001) which is stronger for the late 1900 early 2000. More specialist works provide greater detail on specific topics and styles.


Building Materials

For building materials, you cannot really go past the work of Miles Lewis for its breadth and scope.


Building Survey Design

Little has been specifically published on building survey methodology, Hubka stands along in this respect.

Building Terms

A common language for describing building is provided by *The Glossary of Building Terms* which is the current edition (5th) of a series started in the 1970s. As an Australian Standard publication, it is obscenely expensive, but can be found in libraries or second hand. Each edition has illustrations are very useful well worth copying and can be carried around as a reference in the field.


For more specialist surveys a variety of specialist descriptions of building types, materials and modes for constructions should be consulted prior to going into the field. For example, Ritchie and Hooker on Mining Terminology or Pickard on fences.

Excavation trench layout

The laying out of your excavation trench/es in relation to a grid is essential for maintaining spatial control over the recording of stratigraphy, features and artefacts across the site. Archaeologists commonly establish a grid over the entire site and place excavation trenches in relation to this grid. The same method can be used for placing sample squares for detailed recording of surface artefacts. The resulting square recording units can be of any size. Each square within the grid can be assigned a unique code either using an alpha-numeric system or by using actual measurements as X, Y coordinates.

It is important that each of your excavation squares or trenches is strung prior to excavation, as this provides a constant reference point for ensuring, among other things, that the sides of the trench are kept vertical and that the excavation area can be related to the site grid. To lay out individual square or rectangular trenches, it is helpful to use Pythagoras’ theorem (in a right-angled triangle, the square of the hypotenuse equals the sum of the squares of the other two sides) to establish right angles.

Principle:
The candidate understands the theory and practice behind the placement and layout of excavation squares and trenches in relation to a grid.

Outcomes:
The candidate can correctly lay out and string an excavation area and can record relevant spatial data correctly.

Constant supervision
The candidate understands the theory behind the use of a grid system to control recording on a site and the importance of placement of excavation squares in relation to the site grid. The candidate can assist in laying out excavation squares using long and short tape measures.

Moderate supervision
With supervision, the candidate can lay out an excavation square or trench using tapes, correctly oriented to the site grid. The candidate can apply Pythagoras' theorem to ensure that the grid is square.

No supervision
The candidate can independently lay out and string an excavation square of trench to the requirements of the project.
Professional Tips

- It is useful to know that a 3 x 4 x 5 triangle is a right angle. Once you have established a right angle you can lay out a trench of any size. This method is also useful for accurately establishing a grid line in relation to a base line. The diagonal of a 1 x 1 metre square is 1.41m.

- Practise is the best way to be able to layout grids quickly and efficiently. Invest in a couple of tape measures and some pegs and practise in your yard at home or at the local park.

- For projects requiring the frequent use of 1m² or 50 cm² squares, a “clickable” system can be constructed from lengths of PVC plumbing tube and corner connectors. Drill out the corners to allow the pegs to be slotted in one the square is fitted together and aligned in the correct position.

- If you have access to a total station, it can be used to establish a grid over an entire site.

Further Resources

Field recording

An archaeological site is a place which in the past has been the focus of human activity and may be either tangible and/or intangible in its nature. Such human activity may have been on short or long-time scales (the *temporal* scale) and the site itself can cover both small and large areas (the *spatial* scale). The first step to recording a site in the field is to establish a site boundary. This is easier for some site types (e.g. rockshelters) than for others (e.g. stone artefact scatter), primarily as most archaeological sites are initially identified through exposed surface materials. Where cultural material is present on the surface within a discrete area, a site boundary can be rapidly established through the systematic survey of the area in combination with the use of pin flags. Where a site is more diffuse, density thresholds are often used to differentiate concentrations of material culture from ‘background scatter’ across the broader landscape. Whichever method you choose to employ, it is essential that the technique used to establish the site boundary be fully documented in your field notes including your definitions and assumptions.

At a minimum, the following information should be recorded for your site:

- Full grid coordinates to the specifications of state heritage legislation.
- A detailed written description of the location of the site.
- The conditions of ground surface visibility on and off the site.
- The basic characteristics of the site, including type, size, and environmental setting.
- Any distinctive features of the site and its contents.
- The landform and vegetation within and surrounding the site.
- Whether further research is warranted at the site, considering both current and future potential.
- A brief assessment of the condition of the site.
- A mud map.
- Photographs of both the site and its contents with suitable scales.
- Any additional legislative requirements to complete an archaeological site card.

**Principle:**
The candidate understands the range of attributes and minimum standards required to characterise and record different types of archaeological sites.

**Outcomes:**
The candidate can record different archaeological site types to a standard which meets both relevant legislation, stakeholder groups and research goals.

**Constant supervision**
With full supervision, the candidate can record basic features of a range of site types, including determining an appropriate site boundary, recording coordinates, written descriptions, appropriate photography and the completion of all legislated recording forms.
Moderate supervision

With moderate supervision, the candidate can record in detail a range of site types, including determining an appropriate boundary for the site, recording site coordinates, written descriptions, appropriate photography and the completion of all legislated recording forms. The candidate can identify areas of different sites which would benefit from more detailed recording and start to relate recording strategies to align with research questions and project management goals, such as recording budgets and timeframes.

No supervision

The candidate can record the site beyond the minimum criteria, providing meaningful and detailed descriptions of the context of the site, its preservation and future research potential. All legislative requirements are diligently met. The candidate can demonstrate the application of a range of considerations, including overall project aims, management thresholds, consideration of local and regional significance and management outcomes.

Professional tips

- It is essential that you understand what recording standards and attributes are required by the state in which you are working and that you meet those benchmarks. Do not put yourself in a position of coming back from the field and trying to retrospectively estimate ground surface visibility, slope, landform etc.
- Each state will have its own set of legislative requirements for field recording which are generally located on the relevant departmental webpage.

Further Resources

Geomorphology and site formation processes

To contextualise archaeological sites requires that they be accurately situated within their wider landscape context. Geomorphology, then, relies upon two aspects: 1) the investigation of the sediments, including those deposited by people and natural processes, preserved within the stratigraphy of a site; and, 2) integrating these results with the large-scale landscape features in the surrounding area. The outcome of this synthesis is an understanding of how the archaeological site was formed, known as site formation processes, and how these processes link into a dynamic and ever-changing landscape.

There are three general categories of processes that are important to archaeologists: cultural processes that create the site, cultural process that alter or obscure these deposits after they have been created; and natural processes that alter, obscure, destroy or preserve the archaeological record (Stein 2001, p. 39). It is through understanding these processes and their relationship to individual items and features within an archaeological site which leads us to be able to reconstruct its story; without this information, linking human behaviour with the development of a site can be very challenging. Thus, these questions should be considered from the initial development of the excavation methodology.

Principle:
To identify and record the sedimentary sequence preserved within an archaeological site and link these findings to determine local site formation processes and changes in the wider landscape.

Outcomes:
The candidate can effectively identify, classify, quantify and record preserved sediments within an archaeological stratigraphic sequence. Can interpret site formation processes and link these to the wider landscape.

Constant supervision
The candidate can understand the differences in sediment types, identify site formation processes and local landscape features but requires direct supervision and guidance to accurately link these aspects together.

Moderate supervision
The candidate can identify, interpret and record sedimentological changes within a site but requires further guidance to interpret processes of site formation and link these to wider landscape processes.
No supervision

The candidate can independently identify, interpret and record sedimentological changes within a site, infer possible site formation processes and identify how these are linked to changes occurring in the wider landscape.

Professional tips:

- Grain size, sorting and composition are the primary characteristics used for classification of sediment.
- Get yourself a laminated, “to scale” grain size chart to aid you in interpretations in the field.
- It is important that you feel the sediments in your hands when recording stratigraphic sections. Sediments dominated by sand feel gritty between the fingers, those primarily comprising of silts feel like flour, whereas greasy sediments have a high clay content.
- Remember that lateral variation in sediments relating to the same depositional event can occur. These should be classified together, not as separate units, as they represent a single depositional episode.
- Take time to just observe and record the landscape beyond the archaeological site. Note important features that may be useful for your interpretations (e.g., local rock outcrops, river channels, embankments) as well as site characteristics, e.g., type of site, local gradient, distance to nearest river channel, depth of cave system, etc.
- Ultimately, sediments within an archaeological site are deposited under four different mechanisms; running water, wind action, hillslope processes, or human agency. N.B., there are categories within each of these types.

Further Resources

Principles of excavation

While archaeologists need not excavate new material in order to practise their discipline, it is essential that an appreciation be gained for how such material culture was collected. All archaeological excavation is based around three principles: the Principle of Association, the Principle of Intrusion, and the Principle of Reversal (Burke et al., 2017, p. 242). In combination, these Principles suggest that through the application of archaeological techniques, we can reconstruct both human and natural events which occurred at that location in the past.

Excavation should always be reserved a last resort as, by its very nature, excavation is destructive. It is therefore essential than excavation should be undertaken in a controlled, systematic and robust way, allowing the greatest opportunity to identify and recover all evidence of human activity at the site. This will include both moveable (e.g. artefacts) and non-movable (e.g. hearths and post-holes) objects. Not only do these professional standards allow the identification of a range of natural features and material culture, but also ensures that such evidence is tied to contextual and spatial information (provenanced).

Principle:
The candidate understands the concept of physical and chronological stratigraphy and methods of determining relationships within an excavation.

Outcomes:
The candidate can show on either a sketch, Harris Matrix or in written form, the narrative of deposition, construction or collapse.

Constant supervision
The candidate can remove layers and fills in the correct order for structured excavation under supervision. The candidate can recognise where determining relationships between features is needed, however needs assistance to investigate.

Moderate supervision
The candidate can recognise new contexts but may need help in determining their boundary. The candidate can recognise where determining relationships between features is needed and choose the appropriate method to investigate this association, however requires some assistance to clearly identify the stratigraphic link.

No supervision
The candidate can confidently excavate each context with little to no supervision and demonstrates an understanding of the relationship of the context to those located above, below and horizontally adjacent. The candidate can confidently recognise and determine the physical and chronological relationships between features and chooses the appropriate method to investigate associations to resolve stratigraphic links.
Professional Tips
• Stratigraphic units should almost always be dug one at a time.
• The best place to record every physical stratigraphic relationship is in the field – you do not get a second chance.

Further Resources
• *Principles of Archaeological Stratigraphy*, Dr. Ed Harris (available free) [http://www.harrismatrix.com/harrisbook.html](http://www.harrismatrix.com/harrisbook.html)
Principles of field survey

Field survey is used here to describe the process of undertaking surface, or pedestrian, surveys to identify (or reidentify) items or areas of cultural heritage significance. Field survey is fundamentally about the collection of spatial data which can then be represented in either hard or soft copy format. Such data present the opportunity to then analyse the distribution of particular artefacts, sites, or features over a range of temporal and spatial scales. In archaeological field surveys, items or areas of cultural heritage are recorded in situ, that is, in their original location. Isolated artefacts or features are typically marked temporarily using flagging pins which can help to identify the boundaries of a site or highlight certain features in photographs.

A range of sources can be used to aid in targeting field survey before you go out into the field. Aerial images, both contemporary and historic, old maps, LiDAR data and old photographs and paintings all have the potential to significantly contribute to archaeological surveys. As such, surveys can be both targeted, such as in the case of trying to locate a known site or identify the location of an historic building, or broad. Broad landscape-based surveys are typically undertaken to cover a certain percentage of a study area (in some cases 100% surveys are required) or can in themselves target specific landforms which are known to have stronger associations with different site types - such as waterways. Sites are then recorded in accordance with state legislated requirements and should, at a minimum, include spatial data (GPS, DGPS, total station, etc), photographs with a scale, and the completion of a pre-prepared recording form.

**Principle:**
The candidate understands the theory behind site distribution on a range of spatial and temporal scales and the methods that can be employed to describe them.

**Outcomes:**
The candidate can develop and implement appropriate survey methodologies, record data and then collate these into an appropriate narrative.

**Constant supervision**
The candidate understands the purpose of field surveys and the different types of sites which may be encountered. The candidate can identify what techniques would be used to record specific sites. With supervision, the candidate can collate supporting material, including historic aerial photographs and maps. The candidate can identify some site types in the field and understands how to complete pre-prepared recording forms.

**Moderate supervision**
The candidate can collate relevant background information and develop an appropriate survey methodology with some assistance from a supervisor. In the field, the candidate can accurately identify and record a range of site types. Some assistance may still be needed on more specialized sites and artefact types. All survey results are correctly documented including written and visual records.
No supervision
The candidate can independently collate background data and design and implement a robust survey methodology. All site types can be correctly identified, and the candidate is aware of circumstances in which a specialist should be consulted to record specific site types. All survey results are correctly documented including written and visual records. The candidate can competently collate these data into a suitable narrative, incorporating other lines of evidence.

Professional Tips
• Get your eye in by visiting known sites in the environment.
• If undertaking a targeted landscape survey, make sure that you also incorporate landforms of low to moderate potential as well as those with high potential.
• For health and safety reasons - never undertake a survey alone, particularly in remote areas.
• A team of three can divide up the task of locating/drawing, photography and written record between them.
• Think about the end-product before starting the survey – you can only get out of the data what you put in.
• GIS mapping of your survey is a good way to visualise the landscape.
• When recording walls and banks, for example, remember that these are linear features and do not suit single points of GPS location. Polygons or tracklog can be useful in digitally recording these sorts of features.

Further Resources
Rock art recording

Rock art recording requires the collection of data relating to the characteristics of the encompassing site (shelter, boulder, outcrop, etc.) and the rock art motifs located there. Often prior to fieldwork, archival records and resources are examined and collated for the survey area, such as old photographs, and archival site records. Sites are regularly recorded using a handheld GPS, through photographs of the site and rock art itself (using an IFRAO scale) and characteristics of the rock art assemblage, are recorded on pre-prepared forms. This may involve an overall summary of the types of images present (description of technique and form, style, measurements) as well as any names, stories or narratives associated with the rock art or site shared by Indigenous Traditional Owners or site custodians. New and digital technologies are particularly important for widening the range of rock art recording methods available. The idea is to document the tangible and intangible information of the rock art to compare with other rock art studies for the area or region.

Principle:
The candidate understands the processes behind the collection of data on location, motif and site attributes through written and visual records.

Outcomes:
The candidate can assemble thorough and robust records required for post field work analysis.

Constant supervision
The candidate understands the purpose, but needs more practice in locating, identifying and recording rock art.

Moderate supervision
The candidate can work as part of a team to record rock art/sites but may need some supervision.

No supervision
The candidate can prepare the baseline data and work as part of a team to locate, record and create data for further use.
Professional Tips

- Always discuss rock art recording with Indigenous Traditional Owners prior to the work.
- Where possible, facilitate inclusion of Indigenous Traditional Owners in field work.
- Get your eye in by visiting known rock art sites in the environment.
- You can often anticipate the type of rock art you will find in the area (paintings, stencils, prints, drawings, engravings, beeswax)
- You can often “guess” where sites should be (higher or lower level sites in escarpment country, boulders, outliers) but do not ignore other areas.
- Never go alone on a survey such as this, as they are often in more remote locations.
- A team of three can divide up the task of identifying characteristics, photography and written record between them.
- Think about what you want to get out of the survey before you start.
- Mapping GPS locations is a good way to strategically survey an area for rock art sites.
- Keep a record of where you have been, to ensure you can continue to survey where you have not.

Further Resources

Site safety

Workplace Health and Safety (WHS) is an essential, and often overlooked, component of archaeological work. Whether in the field, office or laboratory, it is critical that the entire team is kept safe, not only due to personal and ethical responsibilities, but also because it is legislated. The Commonwealth *Work Health and Safety Act (2011) (WHS Act)* details that everyone has a duty of care to ensure the health and safety of workers who are either directly employed, or who are working under the direction of, a specific company or individual. These practices are best achieved by incorporating WHS into our everyday work habits. Each workplace and team will present its own safety risks and health concerns which need to be actively managed on a case-by-case basis. Safety plans and risk assessments (e.g. job safety analysis (JSA), Take 5, log books, etc.) are common mitigation strategies which can be used in a range of settings and will often be required by your client, employer, funding body or volunteer organisation. Visitors to the site also need to be kept safe under the same safety procedures.

Variables to be considered in outdoors work should include the climate (a consideration particularly important in Australia); landscape (working at heights, slips, trips, falls, etc.); wildlife (e.g., poisonous/dangerous animals); manual excavation (the use of tools, load limits, etc.); mechanised excavation (working at depth, moving machinery); physical stress (e.g., long surveys); and ongoing health concerns (e.g., asthma). Indoors, considerations could include safe protocols for lab chemicals and repetitive activities. Personal protective equipment (PPE) must be used at every opportunity where it is needed. PPE can include long pants and long-sleeved shirts in the field, broad brimmed hats, gloves, lab coat and safety glasses. Hazard mitigation equipment such as barriers may also be required in some circumstances.

**Principle:**
The candidate understands the elements of Workplace Health and Safety (WHS) and its consideration in a range of locations.

**Outcomes:**
The candidate can identify all relevant WHS considerations and can describe and apply a range of mitigation strategies, including the field, office and laboratory.

**Constant supervision**
The candidate understands the importance of considering WHS and can suggest some basic mitigation strategies.

**Moderate supervision**
The candidate can identify WHS concerns and suggest appropriate mitigation strategies. With some supervision, the candidate can implement mitigation strategies (verbal, written or other as appropriate) and adapt these, as appropriate, throughout the life of the project.

**No supervision**
The candidate can independently write a risk management plan and implement appropriate strategies for mitigating these risks. The candidate can adapt and modify both the assessment and
mitigation strategies throughout the life of the project as needed without prompting.

**Professional Tips.**

- Do not leave your WHS plans until the day before you go out in the field. It should be an active part of your proposal and methodology.
- Everyone on the team should have completed either a Certification CPR or Senior First Aid and have training for snake bite first aid.
- Ensure the team has a comprehensive First Aid Kit (including several extra snake bandages) on site.
- Always bring spare PPE in case anything is lost or destroyed.
- Consider utilising a satellite phone if you are going out into remote regions.
- A call-in-call-out system works well as it provides a daily check on the progress of your team.
- Ensure that your WHS plan contains all relevant phone numbers for the local hospital and driving directions on how to get there.
- Consider the type of vehicle that you will be using in the field – there is a significant safety risk if most of your group cannot drive a manual car and that ends up being the only way out in an emergency.
- A record should be kept of vehicle registration numbers to ensure recognition if vehicles become lost or delayed.

**Further Resources**

- An excellent general WHS guide has been provided by the University of New England and can be downloaded here: [https://www.une.edu.au/__data/assets/word_doc/0005/266981/whs-f010-fieldwork-planning-guide-checklist.doc](https://www.une.edu.au/__data/assets/word_doc/0005/266981/whs-f010-fieldwork-planning-guide-checklist.doc)
The use of excavation hand tools

Knowing which tool to use and how to use it safely and effectively is one of the basics of archaeological fieldwork excavation. Small hand tools, such as trowels, hand shovels, brushes, buckets and even delicate excavation tools, must be used appropriately. When to use wooden tools on soft artefacts or how much spoil to carry in a bucket affect both the collection of data from site and your own health and safety. For example, incorrect trowelling technique can damage your wrist or give you blisters, while using metal tools on soft bone may damage the skeletal material. Under appropriate circumstances, the use of larger tools such as spades, mattocks, shovels or wheelbarrows can be used to great effect in the right hands. A further consideration with larger tools is also site health and safety and their use should be included in the site risk assessment.

Principle:
The candidate understands the correct use of both small and larger hand tools, including their safe use and maintenance.

Outcomes:
The candidate can choose the correct tool for the task and to use it appropriately and safely while ensuring each item is properly maintained.

Constant supervision
The candidate understands when and where a range of different tools should be used on an excavation. The candidate needs to be supervised in how best to use each of these tools to ensure that data is not lost during recovery.

Moderate supervision
The candidate can select the appropriate tool for the task and can largely use it effectively unaided. Some guidance may be needed for more specialised tools such as those for small finds.

No supervision
The candidate can confidently use a range of excavation tools without prompting and maintains each with appropriate safety and maintenance procedures.

Professional Tips
• Wear padded gloves to prevent blisters and ensure you take care of your wrists by either wearing wrist support or ensuring you don’t trowel too vigorously.
• Never overfill a bucket. A good rule of thumb is to limit buckets to ½ each time, depending on the type of sediment that you are working in, the size of the bucket, and the type of bucket recording in use
• Brushes should not be used on soils that may smear.
• Do not undercut the sides of a trench with your hand tools.
• A hand shovel is not designed to dig, it is only to be used to clear up loose soil.
• All hand tools should be kept clean and maintained in good condition. They must be stored safely.
Further Resources

Artefact recovery, cataloguing and storage

Artefact recovery

Most artefacts are recovered during the sieving of excavated materials rather than during the excavation itself. As a result, it is very important that excavated material be clearly and accurately marked with its contextual information so that this information can in turn be transferred to any finds. Sieve size (and technique e.g. dry/wet and hand/mechanical) is also an important consideration when planning your excavation methodology. Material from sites where you anticipate many small finds, such as middens, should be sieved using a smaller gauge mesh. Your research questions will also guide how fine your sieves should be – if your aim is to recover a very fine-grained record from the site, then a large mesh will not help you to achieve this.

All artefacts recovered in situ should have their spatial location recorded and plotted on the excavation form for that context or spit. This spatial data should be as accurate as possible. Photogrammetry of sites is a technique being increasingly used to document sites as they are being excavated. By taking a series of high-resolution images of the site as the excavation processes – every 1-2 cm – a digital reconstruction is then possible. The spatial location of artefacts and features can then be superimposed over this to show the relationship between these items after the excavation has been completed.

Cataloguing

Some artefacts can be sorted into basic groups on-site, such as metal, glass, ceramic, bone, stone, etc. Labels for finds need to be both durable and legible as the record of context is critical to the use of these materials in future research. Plastic (Tyvek™) and aluminium labels are best as they will not readily degrade. Labels should be written in permanent ink or in a ballpoint pen so that the pressure creates a physical indentation on the label. An accurate inventory of all samples and finds should be maintained in the field by the site director and individual excavators. A system of multi-person checks on these contexts and labels is a good way to ensure than no incorrect information is recorded or forgotten about.

A core problem with artefact recording is a general lack of consensus about basic standards of cataloguing and description for many types of artefact (Burke et al., 2017, p. 294). While there is certainly scope for the incorporation of personal choice within the cataloguing of artefacts, it is important to consider what attributes have been recorded previously (so that your data is comparable) and what attributes you would like to make available for future comparative analysis. Another key consideration in cataloguing is the old saying “rubbish in, rubbish out”: your database is only going to be as good as the data that you put into it. It is important to consider which attributes need to be recorded to answer key research questions and provide evidence for the argument under consideration; it is too late to consider this at the cataloguing phase.

There are several good software programs available for use in cataloguing finds. At a basic level, Microsoft Excel will work just fine. MS Access is another program which will allow you to interrogate data from multiple sites. Both these programs can be used in conjunction with one another, so you could start in Excel and move into Access later if you wanted to.
Storage
Storage will depend on what form the artefacts take and how fragile they may be. In some cases, artefacts will need to go straight to a conservator to ensure that they are appropriately preserved and maintained. Organic (e.g. bone), ceramic, glass, ferrous and wet-sieved artefacts will need to be given special consideration for their transport and storage away from the site. Wrapping these types of items in aluminium foil can help to stabilise artefacts during transport. More robust artefacts and bulk sediment samples can be sealed in durable zip-sealed plastic bags. Artefacts which need further specialist analysis later, such as use wear and residue analysis, can be wrapped in foil or bubble wrap prior to storage. Be mindful of these later applications and wear gloves when collecting the artefacts to prevent contamination. Archive boxes are preferable for storing artefacts as their cardboard walls allow the artefacts to breathe. This is of concern for organic items, which can moulder quickly if left in sealed containers without being properly dried out.

Principle:
The candidate understands how to record, excavate and store artefacts of different materials and fragility. Understands what information is required for the construction of robust archaeological databases.

Outcomes:
The candidate can recover different artefact types, correctly catalogue all finds and use appropriate storage methods relevant to that material and artefact type.

Constant supervision
The candidate can recognise various artefact types but requires full supervision and instruction before attempting to recover more complex items. The candidate understands what information must be recorded for in situ finds and can assist in the collection and recording of this information. Most artefacts can be correctly identified in the sieve. The candidate understands what information should be recorded on finds bags and can help in writing these. The candidate can identify a range of different storage concerns for different artefact types.

Moderate supervision
The candidate can confidently recognise various artefact types and can identify (based on their own skill level) when it is appropriate to ask for specialist help in the excavation and removal of certain finds. The candidate can accurately record all necessary information on finds bags. Artefacts can be correctly identified in the sieve. The candidate can identify a range of different storage concerns for different artefact types and can suggest the most appropriate ways of transporting and storing a range of artefact types. The candidate can help catalogue a range of artefact types and understands the theory behind the construction of robust databases.

No supervision
The candidate is confident in independently excavating, lifting and recovering from the sieve a large range of artefact types. The candidate can accurately record all necessary information on finds bags and on a finds log for their square and the site more broadly. The candidate can confidently and appropriately manage, transport and store a range of artefact types. The candidate can catalogue a
range of artefact types and record this information in a suitable database.

Professional Tips:

- Never use a tool that is harder than the material you are lifting, always carry wooden tools or brushes for delicate finds.
- If you can’t lift it without breaking, then consider block lifting. This will allow it to be easier excavated off site where more controlled work can take place.
- Don’t forget that there is always the option is to call in a specialist conservator.
- Try not to put large flakes in with smaller ones – then tend to knock together and create more flakes!
- Get to know your pottery – it helps to know what and when you are digging!
- If it looks fragile, it more than likely is. Photograph it before trying to lift it.

Further Resources

- Artefact conservation guide: This guide has been produced by York Archaeological Trust, on behalf of the Portable Antiquities Scheme: https://finds.org.uk/conservation/index
Automatic dumpy level and staff

Three-dimensional survey data – data which has ‘x’, ‘y’ and ‘z’ coordinates – is commonly collected through the recording of *levels*. Here, levels refer to changes in the height of topographical or subsurface features relative to a benchmarked point on the landscape. Automatic Dumpy levels are commonly used in several ways within archaeological investigations including the creation of plans over a larger area than 2D techniques can easily cover, to record local high-resolution topography, and to record the depth of specific finds or features against a benchmark or datum during excavation (Burke et al., 2017).

Automatic Dumpy levels are set on a solid tripod and are used in conjunction with a stadia rod, a telescopic staff marked with units of height which are read through the telescopic lens of the level. Data from an automatic dumpy level must be recorded by hand and thus the ability to accurately record and process this information is a key component of this skill.

**Principle:**
The candidate understands the theory behind level data and their collection for a range of uses.

**Outcomes:**
The candidate can to set up an automatic dumpy level, identify a suitable benchmark and/or datum, take levels and bearings and manually record data.

**Constant supervision**
With assistance, the candidate can set up the dumpy level. The candidate understands the theory of how to take a level from both surface and subsurface contexts. The relationship between level data and local benchmarks and datum are understood in principle. With guidance, the candidate can take a level and record it correctly to the nearest millimetre on a recording form.

**Moderate supervision**
The candidate can independently set up the dumpy level with only final checks needed from a supervisor. Appropriate benchmarks and/or datum can be identified and established, and the candidate understands the principle of taking foresight and backsight readings. The candidate can independently take levels using the dumpy but may need initial levels to be checked to ensure they are taken correctly. Positive communication is used appropriately to ensure that spatial data associated with the levels are correctly recorded. The candidate understands how to complete the necessary plan drawing in the field as the spatial data are collected.

**No supervision**
The candidate can independently and confidently set up the automatic dumpy level, identify a suitable benchmark and/or datum, take levels and bearings and manually record data, including calculating reduced levels. Positive communication is used throughout the collection of data.
Professional Tips:
Burke, Morrison and Smith (2017, pp. 199–201) offer some valuable tips for successful levelling:

- Always check the initial calculations three times and write them in a levels book or on the plan or section.
- The most important point is to make sure that the instrument is properly level before you use it. If it isn’t, then none of your readings will be accurate.
- Once you have a level instrument, don’t kick or disturb the tripod. If you do, you will have to re-level the instrument before you continue, including taking a new backsight to the site datum and calculating a new line of collimation.
- If you are holding the staff, then you have several responsibilities.
  - First, you need to make sure that you are holding it vertically and upright. By looking through the telescope, the surveyor will be able to see if you have tilted it to the right or left and can indicate to you in which direction to move it. They won’t know whether you have tilted it forward or backwards however. To compensate for this, you can rock it slightly forward and backwards so that the person at the dumpy level can take the highest reading, which will be the horizontal.
  - To save some time, an alternate method for getting a straight ranging pole is to use a small carpenter’s line level, held against the back of the staff, to judge when it is upright.
  - Second, you must ensure that you have not rotated the face of the staff away from the telescope. Watch the direction in which the staff is facing and be prepared to adjust it if the surveyor can’t yet read it clearly.
- If the surveyor can’t see you or the staff (for example, if vegetation is obscuring the line of sight), then you will have to move it until it becomes visible. This is where radios are invaluable. Sometimes only a slight adjustment is necessary, but take care that as you move the staff, you keep it upright and vertical.
- To produce a contour plan, you need to grid the site and take spot height readings at each point on the grid. You then need to decide on the contour interval and join points of equal height across the site.

Further Resources
Data entry and Archiving

Data entry and archiving encompasses a range of fieldwork and post-fieldwork activities. This includes accurate recording of information manually or through specialist programs and databases such as spreadsheets, specialist artefact recording devices or apps, and museum catalogues. Data can range from notes, field recordings, drawings, measurements to digital outputs such as photographs, surveying data, oral history recordings and test results. The accuracy and traceability of data recordings is essential in ensuring the data is linked to relevant locations and artefacts. Storage and long-term archiving of data is an essential part of the continued viability and usability of archaeological assemblages and contributes to the significance of an archaeological collection.

**Principle:**
The candidate understands methods of data entry and archiving to ensure long term storage of records to support artefact accessibility, analysis, publication and communication of archaeological results.

**Outcomes:**
The candidate can identify and implement the requirements for high quality data entry and archiving of archaeological records to ensure record quality and longevity.

**Constant supervision**
The candidate has a basic understanding of data recording, including the importance of signing and dating of records, records accurate information, and under supervision ensures all necessary records (or data fields) are completed. The candidate ensures that datasheets, electronic files and site records are filed according to instructions. The candidate seeks direction from a supervisor on nature of information to be recorded, where and how data is recorded and degree of detail necessary.

**Moderate supervision**
The candidate is aware of and proactive in recording information and pays attention to accuracy and completeness of data recording. The candidate can complete data entry with minimal supervision and understands the nature and extent of data recording required. The candidate is effective in ensuring the careful filing/storage/digital upload of datasheets, recordings, electronic files with minimal prompting and instruction. The candidate is mindful of and can articulate the use of records post survey/excavation and has some understanding of possible future needs of data.

**No supervision**
The candidate can identify data recording requirements /needs, quality standards, and methods in different situations. The candidate proactively addresses record storage, and ensures all datasheets, recordings and electronic files are included. The candidate articulates and understands the importance of data to the significance and accessibility of artefact assemblages and understands how data records contribute to post-exavation analysis care of artefacts, and the importance of long-term data accessibility to potential research outcomes (known and unknown).
Professional Tips:

- Regularly check data, when carrying out data entry to ensure you haven’t “missed a line”
- Always proofread / check data recording sheets before filing them to make sure the date, location, unit, recorder etc are filled in.
- Set up a filing system suitable for field work records as part of fieldwork preparation, to help with archiving and storage of records in the long term.
- Digitise survey and excavation records as soon as possible.

Further Resources

- The Digital Archaeological Record (tDAR). Available online at: https://www.tdar.org
Global Navigation Satellite Systems

Satellite navigation using hand-held devices, commonly referred to as GPS (Global Positioning Systems), is used for a range of tasks in archaeological field survey and site recording. Global navigation satellite systems (GNSS) is a term used to encompass both Global Positioning Systems (GPS) and the Russian-based Global Navigation Satellite System (GLONASS). Together, these create a positioning system based on orbital satellites linked to local GNSS receivers, that is, devices that will provide spatial location data to users. On GNSS receivers, colloquially referred to as GPS units, location coordinates can be viewed in real time and stored as waypoints and tracklog. These data can be exported to file for use in spreadsheet and/or mapping software. All coordinates derived from a GNSS receiver will include a positional error. Real-Time Kinematic (RTK) and Differential GPS systems reduce these errors in real time and/or during post-fieldwork processing and can achieve levels of accuracy high enough to produce site plans.

Principle:
The candidate understands the theory and practice behind global positioning navigation satellite systems (GNSS) and their use in archaeology.

Outcomes:
The candidate can use a GNSS device in the field, download the data and undertake post-fieldwork processing.

Constant supervision
The candidate has a basic understanding of the theory behind GNSS and can take waypoints and track log in the field with step-by-step help from a supervisor using a basic handheld GPS and/or a DGPS/RTK device.

Moderate supervision
The candidate has a good understanding of the theory behind GNSS and can undertake a range of tasks using a GNSS device (both basic handheld and DGPS/RTK) in the field with some input from a supervisor. Tasks should include marking waypoints and tracklog in the field and navigating to preloaded waypoints. Downloading data can be accomplished with supervision.

No supervision
The candidate can correctly utilise a range of functions on a GNSS device (both basic handheld and DGPS/RTK) without the input of a supervisor. This should include marking waypoints and tracklog in the field, preloading waypoint information and navigating to these points in a field setting. The candidate can edit waypoints and logged data using the GNSS device and can confidently export the data to file. The candidate can import the data to spreadsheet software and basic mapping applications or database.
Further Resources

Historical artefact identification

Historical archaeology sites consist of a range of features and artefact types related to post-contact heritage. Surface and subsurface scatters of artefacts are very common and, in many areas, form the bulk of the archaeological record. In historical archaeology, features are also quite frequently encountered. In-situ remnants include features such as industrial machinery, furnaces and foundations, tanks, and structures. Built structures can encompass building remnants, foundations, drains, pads/floors, pylons, and roads and fences. Places of incarceration and conflict might, in addition to built structures, feature gun emplacements, banks and ditches, fence and wall foundations or remnants and subterranean features. A range of artefact types can be anticipated including: glass, ceramic, metal, bone and other faunal material, organic material such as seeds, building material including bricks, timber and sheet metal, and miscellaneous or small finds normally consisting of complete and identifiable specific objects (e.g. thimble, medallions, coins, pipes etc).

Recording and identification of landscape is an element of historical archaeology. This encompasses landforms, routes, broader networks of transportation and movement, evidence of resource extraction, agricultural or pastoral activities, water management including dams and water races, together with (at both a site and landscape level) vegetation, such as exotics, floral and fruit species, and deliberate plantings (such as barriers or hedges). Historical archaeology also encompasses Indigenous artefacts that might be evidence of prior or contemporaneous occupation, for example at campsites, pastoral leases, or conflict sites. These may constitute shared landscapes. [See the skill sheet for Lithic Artefact Identification.]

As historical archaeology has written primary evidence available such as newspaper reports, letters, diaries, maps and plans, and photographs, it is important that sufficient background research is undertaken before going in the field. This allows informed targeting of potential remnants and assists with on the ground identification of sites, features and artefact.

The analysis of artefacts is an important part of researching historical archaeological sites and there are varied theoretical approaches. Research questions drive the development of different recording systems and the selection of attributes to record relies on understanding the type of analysis that can be generated by recording particular attributes or sets of attributes (e.g. form or function recording vs size or weight). However, basic site recording should always include information about artefact spatial distribution, including density, as well as material types, primary forms/technological categories, and artefact counts. For features, dimensions, components, relationships to other features, technology, orientation and position are all important considerations.
The Australian Archaeology Skills Passport

Principle:
The candidate understands the context in which historic archaeological sites and material culture may be present, their recognition and how to record them appropriately.

Outcomes:
The candidate can identify and record a range of historic material culture and record key attributes, distributions and associations.

Constant supervision
The candidate can recognise key artefact types and obvious features. Typical glass and ceramic forms are recognised based on large fragments or complete artefacts; requires practice in recognising artefacts in unfamiliar materials or forms, or incomplete or atypical artefacts.

Moderate supervision
The candidate can confidently identify major artefact classes, including broken artefacts, and a range of glass, ceramic, metal and faunal artefact types. The candidate works under supervision as part of a team to record features and artefacts in the field.

No supervision
The candidate can confidently identify a range of artefacts and features, regardless of material type, or degree of fragmentation or completeness. The candidate can accurately record artefacts and features without supervision.

Professional Tips
- A predictive model of expected artefact types can be done prior to fieldwork.
- Recording details (e.g. small lettering, patterns or markings) are important in identification.
- Consistent recording is important for post survey/excavation analysis.
- Be critical in evaluating primary documentary evidence such as painting, drawing, maps, diaries and newspapers as they may represent a stylised or biased account or depiction.

Further Resources
Lithic artefact identification

Aboriginal people made a wide range of stone tools using both percussive (knapping) and grinding techniques. Surface and subsurface scatters of stone artefacts are very common in Australia and in many areas form the bulk of the archaeological record. Stone artefacts are also key components of other site types including rockshelters, shell middens and quarries. Stone artefact scatters may include discarded tools, but typically comprise large quantities of waste material generated by stone percussion flaking or knapping. Stone artefact identification is a key skill in identifying Aboriginal sites. Detailed field recording may be undertaken to record surface artefact scatters for research or, commonly, prior to salvage or destruction. Field recording of stone artefacts thus often constitutes the primary source of information about sites that no longer exist.

The analysis of stone artefacts is a specialised field and there are varied theoretical approaches. Research questions drive the development of different recording systems and selecting which attributes to record relies on understanding the behavioural information that can be generated by recording particular attributes or sets of attributes. However, basic site recording should include information about artefact spatial distribution, including density, as well as raw material types, primary forms/technological categories, presence/absence of cortex, presence of edge modification (retouch/use wear) and a range of size parameters. It is also important to be able to recognise reduction areas/knapping floors.

**Principle:**
The candidate can recognise both flaked and ground stone artefacts and record them in the field.

**Outcomes:**
The candidate understands principles of conchoidal fracture, can identify basic technological categories of flaked stone, as well as edge-ground tools and grinding implements and record key technological, morphological and metric attributes.

**Constant supervision**
The candidate can recognise key features associated with conchoidal fracture, distinguish between cores and flakes, and identify some formal flaked stone artefact types, in fine-grained siliceous raw materials; can identify the main types of ground stone artefacts; requires practice in recognising artefacts in unfamiliar raw materials, incomplete or atypical artefacts.

**Moderate supervision**
The candidate can confidently identify major artefact classes, including broken artefacts, and a range of formal flaked stone artefact types made from different raw materials and can work under supervision as part of a team to record stone artefact attributes in the field.

**No supervision**
The candidate can confidently identify a range of products of both flaked and ground stone tool making, regardless of raw material type, and can accurately record attributes of stone artefacts without supervision.
Professional Tips

- The manufacture of stone artefacts is a reductive technological process and the different classes of artefacts recognised by archaeologists are different products created by this process.
- There is often a very big difference between ‘ideal types’ – whether illustrated in books or handled in the lab – and the appearance of actual artefacts encountered in the field. There is no substitute for plenty of practical experience in handling and observing a wide range of stone artefacts in different raw materials!
- Unless you are a geologist, raw materials can be difficult to identify. Become familiar with local raw materials and accepted archaeological terminology for these. Unfamiliar materials can be described in terms of such attributes as grain size, colour, inclusions and fracture characteristics.
- In Australia, there are substantial regional differences in stone artefact technology, including methods of manufacture, formal types and raw materials.
- Size parameters should be consistently recorded, preferably with reference to a standard methodology.
- A good way to learn skills in lithic artefact identification is to make some of your own.

Further Resources

- Wright (1983) is an excellent basic introduction to flaked stone artefacts.
Map use

A map is a graphical representation of the land as seen from above. Maps are essential tools for archaeologists, both in field work and for desktop analysis. There are numerous different types of maps including topographic maps, thematic maps (such as geological maps, vegetation maps) and cadastral maps. Topographic maps are most commonly used by archaeologists. These may show various features of the landscape, such as roads, railways, water courses and lakes, buildings, as well as the shape of the land. The level of detail shown will depend on the scale of the map. Scale refers to the ratio between distances on the map and distances on the ground. Thus, a scale of 1:100,000 means that a unit of measurement on the map represents 100,000 of those units on the ground. The scale of the map should be printed on it and most maps also have a linear scale. Maps use coordinate systems to represent the location of specific geographic points by reference to an imaginary grid system projected according to a mathematical model of the earth’s surface. As well as the global system of latitude and longitude, there are local grid systems. This information is printed on the map. Maps use symbols to represent features. The legend will give you information about these.

Principle:
The candidate understands how to read and interpret maps and how to navigate and record spatial data using a compass.

Outcomes:
The candidate can read and interpret a map and be used to locate positions in space, plan and navigate routes. With the aid of a compass, the candidate can record spatial features.

Constant supervision
The candidate knows that there are different types of maps and can identify key features, such as scale, legend, north point. The candidate understands the basic principles of how a compass works and its key features, including the baseplate, index line, orienting arrows, needle, rotating bezel and direction of travel arrow.

Moderate supervision
The candidate can locate their position on a map but is not confident in using a map to navigate. The candidate can identify and locate features of interest on the map and write directions to satisfy state heritage legislation with assistance.

No supervision
The candidate can confidently read a map and use it to determine grid references, plot features and plan and navigate routes without supervision.
Professional Tips

- It is always a good idea to take some hard copy maps with you in the field - never just rely on digital ones or on your GPS.
- You should always bring a real compass - do not rely on the digital version on your phone!
- If you are unfamiliar with how to read or use maps, ask if you can borrow one and do some practice during your lunch break. There is likely to be someone in your workplace who could give you ten minutes of their day to help.

Further Resources

Photography

Photographs have long played an important investigative and archival role within archaeology. Due to the destructive nature of archaeology, photography provides a critical role in recording the site prior to and during excavation, as well as its context in the surrounding landscape. Systematic photography of sites and landscapes also plays a vital role in the management of sites, such as monitoring rock art within caves and rock shelters and vulnerable sites such as coastal middens and burials. A detailed visual record of surface surveys and subsurface work can also fill inevitable gaps in the field notes of even the most diligent archaeologist. Photographs may also serve a legal role, such as in the case of contested finds where your field images provide the formal verification of your field technique.

Burke, Morrison and Smith (2017, p. 221) identify three basic elements of archaeological field photography:

1. Learn to ensure you can take photographs which show enough technical detail in a range of situations.
2. Always include a scale, because there is no point in photographing a site or artefact without also indicating how big or small it is.
3. Always record the details of every photograph on a written recording form, as well as recording it as part of the metadata attached to each digital image file. Because all photographs will (or should) ultimately become part of the permanent site archive, it is important that no detail of any photograph is lost.

Principle:
The candidate understands how to build a robust visual record of heritage sites and landscapes and record all relevant metadata for long-term archiving.

Outcomes:
The candidate can set up and take high quality photographic images in a range of contexts, including the correct use of scales, north arrows and photo boards as appropriate.

Constant supervision
The candidate can use automatic settings to take general images and can complete a written recording form under supervision.

Moderate supervision
The candidate understands the basic functions of manual modes on a DSLR or equivalent and can take both general and macro images using a tripod with some assistance of a supervisor. The candidate can complete a recording form with little to no supervision.

No supervision
The candidate can use both digital and manual media, such as DSLRs and fully manual 35mm cameras. The candidate understands the appropriate use of film types and can prepare, prioritise and produce a photographic record without supervision.

Professional Tips
Burke, Morrison and Smith (2017, p. 225) offer a range of useful tips of taking good archaeological photographs, including:

- Always keep the plane of the camera (its back) in the same plane as the subject to avoid distortion. This may mean using a spirit level to make sure. This will be particularly difficult when photographing long or deep trenches or upright features, such as buildings.
- Always include a scale.
- Always record the details of each photograph in a log book or on photographic recording forms (or both).
- Photograph your notes and your photographic log book or recording forms, so that if they’re lost, the original downloaded image files will contain details of what you photographed.
- Make sure there is no extraneous material intruding on your shot.
- Always take twice as many photographs as you expect to use, since photography is far cheaper than the cost of returning to a site.
- If you doubt your choice of aperture and shutter speed will give you the correct exposure, try bracketing your photographs. Take one shot at the exposure which you think is correct, and then take additional shots either side of this to give more or less exposure.

Further Resources

- Photography in Archaeology – Site Specific Lisa Jayne Fisher examines the best practice in archaeological photography onsite, from trench to section, and a guide to the equipment you should consider essential for best practice.
- Photography in Archaeology – the basics With over 30 years of field experience in photography in archaeology, David Connolly provides a basic guide to getting the best image that meets the standard requirement for site photography.
- Photography in Archaeology – Artefacts Professional photographer Lisa Jayne Fisher provides an in depth but easy to use guide to the best way to photograph a selection of finds, from ceramics to glass.
Sample collection procedures

A common component of archaeological field work is the collection of samples for later analysis in a laboratory. These can include, but are not limited to, organic samples (including charcoal, wood or bone) for radiocarbon dating, samples for Optically Stimulated Luminescence and Thermoluminescence dating, bulk soil samples (for the recovery of materials such as pollen and seeds), faunal remains (such as shell, bone and teeth) for isotopic analyses and stone artefacts for residue and use-wear analysis. Samples can not just be collected at random; they should be sourced from in situ contexts, especially if they are to be used for chronometric dating. It also essential that samples be correctly described, recorded and spatially linked to any relevant archaeological features. When collecting samples, be particularly mindful to avoid contamination and ensure that your sample is large enough for proper analysis to be completed.

Principle:
The candidate understands sampling and quality control requirements of a range of different sample types and how best to collect these in the field.

Outcomes:
The candidate can correctly collect and store a range of chronometric, archaeological and environmental samples for future analysis.

Constant supervision
The candidate understands what kinds of data can be produced from a range of different sample types and can identify opportunities to collect samples in the field. The candidate does not yet have the skills necessary to correctly collect samples without contamination but is able to confidently assist a supervisor to do so.

Moderate supervision
With moderate supervision, the candidate can correctly identify when samples should be taken during an excavation and can actively participate in the collection of these samples. Some sample types which the candidate does not yet have much experience with may require additional supervision. Correct recording methods are used, and the sample is appropriately stored.

No supervision
The candidate can correctly collect and store a range of chronometric, archaeological and environmental samples for future analysis without supervision.
Professional Tips

• Samples can come in many forms, including individual finds, bulk samples of sieve residues, excavation unit samples, section samples and column samples.

• Consider what kinds of samples you would like to take before you start your work. Consider what kinds of questions you are wanting to ask and how you would go about getting that information.

• If you are looking to get a type of sample that you have not previously collected, consult with someone who has experience before you get in the field. You may even like to invite them along so that they can show you in person.

• Consult with the relevant radiocarbon lab to find out how much organic material you will need to date.

Further Resources

Section drawing

One of the primary records of stratigraphic information – the visible soil layers – and archaeological features from a site is the drawing and annotation of a scale plan of the vertical walls of each trench described as either a section or a profile. Stratification allows archaeologists to interpret the relative timing of events evident within the archaeological record and without this information, the site cannot be appropriately interpreted. Sections may also be drawn for individual features (such as post holes, pits and ditches). Sections for individual trenches are normally drawn after excavation. However, in some cases, cumulative sections may be drawn.

Much the same techniques are required for drawing sections and site plans. While site plans are drawn in the horizontal plane, section drawings are drawn in the vertical plane. Objects or areas of interest such as layers, contexts, artefacts and features are plotted to scale in relation to a baseline. Identifying the separation of contextual/stratigraphic units is one of the hardest parts of drawing sections and is a skill which can only be developed and honed through practice on a range of different sites and sediment types. It also helps if you have excavated at least some of the trench yourself, as you are more likely to remember the characteristics and locations of different sediment types that will help you to interpret the section.

**Principle:**
The candidate understands the elements that must be present on a section drawing including the use of conventions and how it is located/levelled.

**Outcomes:**
The candidate can create a fully annotated, correctly measured section drawing that accurately represents the section.

**Constant supervision**
The candidate understands the basic information required for a section drawing, including scale, necessary information and grid coordinates and can create a section drawing with the assistance of a supervisor.

**Moderate supervision**
The candidate can set up a section drawing and create an accurate representation of the feature/s and is able to capture all relevant information with minimal supervision. All features are drawn to scale and the stratigraphy is accurately represented.

**No supervision**
The candidate can easily draw any section drawing and is able to enhance the drawn record with appropriate drawing conventions. All stratigraphic units are accurately interpreted and represented. The candidate can utilise a range of scales to best suit specific features.
Professional Tips
Burke, Morrison and Smith (2017, p. 263) provide excellent tips for drawing a trench profile (section):

- The first step in section drawing is to establish a horizontal baseline from which all your measurements must be taken. This is done by setting up a level string line. The 3D coordinates for each end of the string line is recorded to correctly locate the section within the site.
- Do not take measurements from the ground surface or from the string line that indicates the edge of the trench.
- Remember, when you are measuring, that you are projecting the features observed on the section onto a vertical 2D surface.
- As with drawing a site plan, first draw the main features and stratigraphic boundaries beginning with the trench outline; then fill in the details.
- It is important to label all observed features, stratigraphic layers and objects according to the recording system in use at the site.
- Ensure that all sections drawings are labelled correctly, particularly if more than one section of the trench is to be drawn.
- Like site plans, section drawings must include all relevant information, including site name, scale, scale bar, orientation, name(s), date.

Further Resources
Site plans

An accurate site plan is one of the most important archaeological illustrations that you will do in the field. The main outcome of a site plan is to accurately convey spatial information about a site or landscape quickly and easily. A range of techniques are available for use in the construction of site plans, including tape and compass surveys, the baseline/offset technique, automatic dumpy levels and total stations. The plan itself will be a representation of these spatial points projected onto a 2D plane, usually on graph paper, at an appropriate scale. Mud maps recorded in your field note book are also a good accompaniment to the scale site plan, providing both a quick reference and a record of how your impression of the site may change over time.

Principle:
The candidate understands the methodology and techniques used to create a 2D scale site plan.

Outcomes:
The candidate can accurately draw a plan view of the site at various scales.

Constant supervision
Under full supervision, the candidate can identify what scale would be appropriate for the plan drawing and can assist in creating the spatial data on which it is based.

Moderate supervision
The candidate can correctly choose an appropriate scale and can draw a site plan with some help from a supervisor. All relevant data are included as well as a scale, scale bar, north arrow, legend and title. With assistance, the candidate can digitise the site plan during post-field processing.

No supervision
The candidate can independently create an accurate scale plan of a site with all relevant information shown correctly. The candidate can digitise the site plan during post-field processing without supervision and to a high standard.

Professional Tips
• Before you start, decide on the amount of detail that you need your plan to show. This will help determine the size of your plan, the scale which you need to use, and the level of accuracy required in measurement.
• Work out some rough dimensions of the site and scale accordingly so that you can fit it all in on the page.
• Mark the baseline or the edges of the planning frame lightly onto the drawing and indicate the measurement gradations.
• Bring a scale ruler out into the field with you – it makes drawing plans much easier and reduces the potential for human error in converting spatial data to the correct scale.
• Work out where north is using a compass to measure the bearing of the baseline, then transfer this to your plan using a protractor.
• Draw in the larger features first then infill the others.
• Draw in connecting lines for measured points of features as you go. A page full of dots will not make sense later!
• Remember that the site plan is drawn as if it the features are projected onto a plane. All measurements should therefore be horizontal rather than following slopes. A plumb bob is useful for accurately determining the position of measured points in relation to a plane.
• Use positive communication techniques. If you are working as part of a team and are drawing the plan while someone else reads off the data, repeat back the reading to make sure that you have got it right.
• Your plan should include the site name, date, scale, a drawn scale bar, north arrow, legend, name(s) and any relevant annotations.

Further Resources
Total station

Total stations – surveying instruments that combine a rotating telescope (a theodolite), a built-in computer processor and an electronic distance meter – have largely replaced automatic dumpy levels in archaeological field work. This is largely the result of their flexibility in the field, the increased recording speed and spatial precision of the data, and the ease with which this data can be incorporated into GIS software. The onboard software automatically calculates the 3D coordinates for measured points in real time, allowing the archaeologist to focus on what is being recorded rather than spending time on calculations. These data are stored on the device’s internal memory or an inserted storage media (e.g. SD card) and can also be displayed on a small screen on the device itself.

Total stations can be used, amongst other things, to generate high-accuracy digital elevation models of the ground surface and to record the precise location of artefacts, sites or features on the landscape and those identified in situ during excavations.

Principle:
The candidate understands the theory behind how total stations generate high-resolution spatial data and how these data can be collected in the field and processed using Geographic Information Systems (GIS) software.

Outcomes:
The candidate can set up a total station in different contexts, can accurately record survey points and check the consistency of survey data.

Constant supervision
The candidate can identify an appropriate location for the total station and with supervision, can set up the station. The candidate can assist with the collection of field data and understands the principles behind checking the data in the field and processing it afterwards.

Moderate supervision
The candidate can set up the total station independently and can take measurements with some assistance. Data can be checked in the field and during post-fieldwork processing with some supervision. The candidate can independently transfer data from the total station to a computer.

No supervision
The candidate can confidently and independently identify an appropriate location for the total station, set it up and record coordinates using the total station in both prism and reflectorless modes. All data can be competently checked in the field and during post-fieldwork processing. The candidate can independently transfer data from the total station to a computer and can also load data onto the total station when required.
Professional Tips:

- Always time to set up the machine properly – your setup must be exact, or all your measurements will be wrong.
- Resection setups are typically quicker than backsight setups, so if you have the luxury of setting three or more control points at your site, consider doing so.
- Always check the height of the machine and the height of the staff. If the staff height needs to change between measurements, be sure to change the value in the machine and change it back again.
- Always use the prism staff at minimum height and raise it if you need to, as this limits the potential for the pole height slipping down over time and thus making all subsequent readings wrong.
- If you knock the tripod legs, take the time to set up again.
- Use whatever coordinate system you like but remain consistent. Consider whether there is a standard coordinate system used by regulators in your state or territory.

Further Resources

Analytical writing

Clear, accurate and concise writing is not a skill that comes easily to many of us. Archaeologists use data compiled from research, field work and specialist analyses to document and report on archaeological sites, surveys or research. Being able to transmit our findings in both formal and informal ways is an essential part of practising archaeology, as without this transmission, our capacity to understand the human past along with our ability to protect the material evidence is significantly diminished. The standards and guidance for archaeological documentation can be dependent on both the target audience and the body who required the report or publication and it is important to consider these variables when writing your document.

**Principle:**
The candidate understands the importance of effective written communication and a range of methods and techniques to accomplish this.

**Outcomes:**
The candidate can synthesise data into an analytical document and can communicate effectively in written form with a variety of audiences.

**Constant supervision**
The candidate can contribute to the writing process but needs supervision. Some sections can be completed independently but need significant editing before they are suitable for inclusion.

**Moderate supervision**
The candidate can complete a draft independently and actively seeks help where necessary. The writing is well crafted and suitable for the intended audience. No grammatical errors are present, and the tone is appropriate. With some help, a central argument becomes evident in the writing.

**No supervision**
The candidate can formulate the completed report or publication with confidence, including an overall argument which runs throughout the text. The candidate can assemble the required sections for a document or article with accompanying figures and images that can be submitted for editing. No grammatical errors are present, and the tone is appropriate.
Professional Tips:

- Before you begin writing, decide what argument you are trying to make with your writing – you are never just reporting that “we came, we walked for 10 km, we found six sites”. Why did you go there in the first place and what do your results mean in the bigger picture?
- Once you have your argument, you can begin to develop a framework upon which to scaffold it.
- It is good at this stage to consult an experienced colleague. Organise a time when you are both free for a decent amount of time, possibly over lunch. Invest some time in having a good chat about what your plans are and how you will go about it.
- It is also important for employers and supervisors to understand that these skills do not come pre-made and must be fostered. Investing time in new staff to make sure that they understand the process will reap rewards down the line.
- Under each heading, go through and make some dot points about what you want to have in each section and how they relate to the argument that you are making.
- Layout your figures. This also forces you to get your results sorted out and for you to understand them.
- Go through and flesh-out your dot points into full paragraphs.
- Once you have a draft, ask an experienced colleague to read through and make some comments. Do not send your draft for review until you have proof read it several times – the reviewer’s job is not to correct your spelling and grammar!
- Allow time in your budget and project timeline for the review process. Scrounging at the end and rushing to get it done will not make for a good read!

Further Resources

- There are several formats which can be used for heritage impact statements and reports.
- Publications in journal articles will provide their own specific format requirements. For example:
  - *Archaeology in Oceania*: [https://onlinelibrary.wiley.com/page/journal/18344453/homepage/ForAuthors.htm](https://onlinelibrary.wiley.com/page/journal/18344453/homepage/ForAuthors.htm)
Collaboration

Collaboration requires the ability to employ interpersonal and communication skills to work alongside more than one partner to achieve a shared vision for an archaeological investigation or project. This requires consultation and engagement with collaborators, to gather information on the shared vision and objectives of the project. The collaboration also requires a range of methods to be recognised, which will involve each partner identifying the methods relevant for their contribution to the project either individually or collectively. The resulting data collected and analysed to meet this shared vision/objective will then be documented as a collaborative report, publication and/or conference presentation/public seminar. The idea is to work together from the conceptualisation of the project to its completion, sharing all stages and co-owning the process and outcomes to achieve the highest level of potential impact.

**Principle:**
The candidate understands the principles of co-designing archaeological investigations with one or more partners for mutual objectives and outcomes.

**Outcomes:**
The candidate can work with project partners to develop, implement, deliver and evaluate an archaeological project/research program.

**Constant supervision**
The candidate understands the purpose but needs more practice in consulting and engaging with collaborators.

**Moderate supervision**
The candidate can work as part of a collaboration, to facilitate the development and implementation of a shared investigation but may need some supervision.

**No supervision**
The candidate can work with one or more project partners on a collaborative investigation across all stages of the research/project.

**Professional Tips**
- Start collaborative processes right at the beginning of a project, as an idea is being formed.
- Listen to all perspectives on the vision, objectives, methods required, if possible, through a workshop process that allows for the group to develop it together.
- Develop communication strategies (such as regular meetings, blogs or newsletters, etc) to ensure that all involved in the collaboration know the progress of the investigation/project.
- Work collectively on the documentation of the outcomes, with input from all parties to varying degrees during the process. While this may involve one to two key authors, working as a group to identify structure and content contributed as well as review and editing ensures the collaboration remains strong.

**Further Resources**
Cultural awareness

Cultural awareness requires the ability to understand and value Indigenous knowledge and ways of working; respecting and engaging with Indigenous people, communities and organisations through archaeological investigations and research. This would require the ability of the individual to work alongside Indigenous communities in a professional and courteous manner at all stages (before, during and after completion) of the archaeology project in question. In line with the Guidelines for Ethical Research in Australian Indigenous Studies (GERAIS), all archaeologists who work in Indigenous Archaeology in Australia must have a level of cultural awareness embedded within their archaeological investigations or research. This includes the fundamental step of working collaboratively with Indigenous people, through free, prior and informed consent. This process should commence at the inception of the investigation or project. The idea is for non-Indigenous and Indigenous people to work together on archaeological programs, being aware of and sharing knowledge, values and respect for cultural differences.

Principle:
The candidate understands the principles of engagement in a respectful and professional manner with an awareness of cultural diversity and implications for collaboration.

Outcomes:
The candidate demonstrates cultural awareness while working respectfully and professionally with Indigenous people, communities and organisations.

Constant supervision
The candidate understands the purpose, but needs more experience engaging with Indigenous communities.

Moderate supervision
The candidate can work as part of a team to increase their cultural awareness through collaborative processes but may need some supervision.

No supervision
The candidate can work with respect and professionalism with a range of Indigenous communities and an awareness of cultural diversity across all stages of the research/project.

Professional Tips
• Start engaging in cross-cultural collaborative processes right at the beginning of a project, as an idea is being formed.
• Show respect and listen to Indigenous people as they share their cultural knowledge with you and assist you to move through and work within often complex cultural landscapes.
• Identify opportunities to increase your cultural awareness such as attending cultural or arts centres, Indigenous exhibitions and festivals, social events with communities.
• Work collaboratively with Indigenous people on archaeological investigations from the
development of initial investigations through to the publication of reports and/or academic papers, sharing the knowledge and journey.

Further Resources


• Australian Institute of Aboriginal and Torres Strait Islander Studies, 2011. Guidelines for ethical research in Australian Indigenous studies. Australian Institute of Aboriginal and Torres Strait Islander Studies.


Desktop assessment

Desktop assessment describes the process of reviewing existing data without conducting additional field work. This type of review, which forms a critical part of all heritage investigations, may be undertaken prior to the start of a research project or, in a statutory context, to assess whether a proposed activity in a study area will require additional, field-based assessment/s to be undertaken prior to approval. A desktop assessment should include:

- **Heritage registers and previous archaeological work.** A good place to start is to identify a relevant geographic region for conducting background research with your desktop assessment. This may be refined further during relevant searches of state and national heritage registers. This will not only give you an idea of the heritage sites which have previously been registered in the local and regional area but will also refer you to relevant reports and/or papers which detail the results of previous heritage work.

- **The landscape context of the study area.** This should include a review of local soils, topography, landforms, geomorphology and climate, and should specifically discuss how these variables relate to the presence/absence of archaeological sites in the study area or broader region. It is important to consider not only the current context of the land surface but also what the area would have been like in the past.

- **Ecology and cultural heritage.** Vegetation types and evidence of their use in local ethnography should also be considered as this can contribute to the development of a predictive model for cultural heritage site distributions. For assessments of Aboriginal heritage, special consideration should be given here to areas of remnant vegetation which may contain scarred trees.

- **Disturbance and modification of the land surface.** The assessment of disturbance and modification is critical in understanding the context of both surface and subsurface finds. Each state has a repository of historic maps and aerial images which can be searched and purchased (in some instances these are freely available).

- **Local history.** Related to a review of local disturbance and modification is the documented history of the local area. This is of particular relevance to studies of built heritage.

- **Ethnography.** Are there ethnographic accounts which describe cultural practices in the study area? These might include travel routes, discussions of ceremonial grounds, meeting places, harvesting systems, etc.

- **Predictive modelling/statements.** Usually the final component of a desktop assessment will involve making predictions about any cultural heritage that is likely to be present in the study area. This brings together the various lines of evidence to suggest where within the landscape you might expect to find different cultural heritage sites, and where sites might be absent.
**Principle:**
The candidate understands the different components of a desktop assessment, why they are necessary and how to undertake them.

**Outcomes:**
The candidate can produce a comprehensive desktop assessment report for a range of investigative outputs.

**Constant supervision**
The candidate has a basic understanding of how to undertake a desktop assessment and can collate various lines of evidence under full supervision.

**Moderate supervision**
The candidate has a good understanding of the processes and strategies of preparing a desktop assessment report. They can source and analyse at least half the necessary data independently and to a high quality and understand where to source the remainder.

**No supervision**
The candidate can correctly source and analyse all necessary data for a desktop assessment without external input from a supervisor. The assessment report is always well written and appropriately targeted to the aims of the study.

**Professional tips**
- Ask colleagues within the discipline to show you good examples of desktop assessments so that you can see how they are structured, the resources that were used, and how the information is synthesised to provide useful predictions.

- The heritage legislation of most states and territories describe the required structure and content for desktop assessments which you must meet. Make sure that you familiarise yourself with the legislative requirements.

**Additional resources**
Stakeholder engagement

Stakeholder engagement requires the ability to develop and use good communication skills to consider the opinions and views of more than one group of people who have an interest in the archaeological investigation or research. This may range from Indigenous communities, to townships or regions, non-government organisations and government agencies who have links to the activity. This can also include ownership of lands on which the archaeological investigation is taking place; an interest in participating directly; a cultural connection to place; and will be involved with any impact associated with the project at its conclusion relating to the ongoing management of place and knowledge, and/or policy or procedural implications. This would require consultation and engagement with groups, to gather information on their interests to consider them in the overall research/investigation. The idea is to consult with groups from the beginning of the investigation/project, across the various stages to its completion, reporting the results and recommendations back to all stakeholders engaged through the process.

Principle:
The candidate understands the importance and value of consulting with a wide range of interested groups in your investigation.

Outcomes:
The candidate can liaise with multiple stakeholders to consider a range of interests in the development, implementation, delivery and evaluation of an archaeological investigation.

Constant supervision
The candidate understands the purpose but needs more practice in identifying stakeholders and consulting with them.

Moderate supervision
The candidate can work as part of a team, to facilitate the identification and consultation with one or more stakeholders as part of an investigation but may need some supervision.

No supervision
The candidate can consult with one or more stakeholders on an investigation across all stages of the research/project.

Professional Tips
• Start contacting stakeholders at the beginning of a process so that everyone has an equal opportunity to communicate their interests and values to an investigation/project.
• Listen to all perspectives shared during the consultation on the various interests and values relating to an investigation/project.
• Develop communication strategies (such as regular meetings, blogs or newsletters, etc) to ensure that stakeholders know the progress of the investigation/project.
• Share the results and recommendations with stakeholders as appropriate.
Further Resources

Working knowledge of relevant legislation

In Australian archaeology, it is important to understand the various standards, legislations and guidelines that govern best practice, particularly those which relate to the region in which you are planning to work. There are both Federal and State Acts in Australia to protect heritage sites against destruction from the activities of people. The Federal Acts mostly protect places of national or international significance, whereas most states and territories have legislation covering European and Aboriginal heritage separately. These Acts provide the framework within which cultural heritage is managed in Australia. It is the responsibility of all archaeologists to know the legislation applicable to the states or territories in which they work and to know their obligations under these Acts. For public archaeologists, it is also necessary to know the deficiencies or problems of the heritage legislation so that they are aware of the constraints under which they work. There is also a National Heritage System, which lists heritage items of national significance.

**Principle:**
The candidate can identify relevant international, federal and state heritage legislation applicable to archaeological work in your region.

**Outcomes:**
The candidate has knowledge of the relevant Acts, Regulations and associated guidelines; can develop an appropriate methodology to meet these legislative parameters; and can apply relevant legislation to archaeological investigations.

**Constant supervision**
The candidate can identify which legislation is broadly relevant to their region of work. With supervision, the candidate can identify what standards are required for field recording and reporting.

**Moderate supervision**
With moderate input and supervision, the candidate can identify and apply all relevant legislative requirements to each step of the project, including the project proposal, methodology, fieldwork and reporting.

**No supervision**
The candidate can independently identify a range of relevant legislation and apply these thresholds to their methodologies and contingency plans. The candidate can record and report on data appropriately to meet all legislative requirements. The candidate applies the principle of best practise in both the design, implementation and reporting of their project.
Professional Tips

• Before you go in the field, make sure that you print a copy of a site recording form relevant to the state or territory in which you are working. Your recording form must match these requirements. It is no good going in the field only to come back and not be able to complete all necessary fields on the site recording form.

• In planning to meet legislative requirements, always consider what type of sites you might encounter. Some states and territories have specific legislation to deal with specific finds, such as human remains. Make sure that consideration is given to such encounters and that each member of your team knows what to do.

• Many states and territories provide a guide as to how your report should be laid out. Make sure that this is followed carefully before you submit you report for review.

• Make sure that you plan for a timely submission of all relevant site cards and reports to relevant state authorities in the budgeting of time and money in your research or compliance project.

Further Resources

Federal:

• Full list of heritage legislation in Australia List of Federal Laws:

State:

• For list of State Indigenous Heritage Laws see:

• For State European heritage see p. 8 of the following document:

• Some other useful guides to heritage laws and implementation
  • Ask first: a guide to respecting indigenous heritage places and values
  • Australia ICOMOS Heritage Toolkit: https://australia.icomos.org/resources/australia-icomos-heritage-toolkit/
  • Ruins a guide to conservation and management:

• AAA Codes, Standards and Guidelines:
  • AAA has developed a Code of Ethics which includes Principles relating to the Archaeological Record, Indigenous Archaeology and Conduct that are binding on all members to ensure that AAA members work to high ethical and professional standards. These documents are listed here: https://www.australianarchaeologicalassociation.com.au/about/code-of-ethics/
GROUP B SKILLS

FIELD SKILLS AND TECHNICAL EQUIPMENT
Geophysics and remote sensing

Depending on the type of survey undertaken, archaeologists need an ability to understand the specific principles and theoretical applications of each instrument, the environment best suited for each method, how to set-up each instrument and process field data. Different techniques could be used on the same site, each providing a layer of data to interpret. Even if you do not intend to become a specialist in this field, understanding the relevant and appropriate techniques will be useful.

**Principle:**
The candidate understands the principles and techniques used in the collection of geophysical data for archaeological imaging or mapping.

**Outcomes:**
The candidate can demonstrate the skills to set up and process field data gathered through geophysical or remote sensing technologies.

**Constant supervision**
The candidate can participate in the process of data collection, but would not be able to set up, survey and process data without full supervision.

**Moderate supervision**
Depending on the geophysical survey technique used, the candidate can assist in all aspects of the process but may need some supervision.

**No supervision**
The candidate can confidently assist or carry out a geophysical survey without prompting for the correct procedures.

**Professional Tips**
- Always locate your survey area with grid coordinates.

There are various kinds of remote sensing:
- **Gradiometer** survey (also known as magnetometry or magnetic gradient survey) is a passive geophysical method that detects local variation in the strength of the Earth’s magnetic field. Different materials below the ground can cause local disturbances in the Earth’s magnetic field that are detectable with sensitive magnetometers. The chief limitation of magnetometer survey is that subtle features of interest may be obscured by highly magnetic geologic or modern materials. Every kind of material has unique magnetic properties, even those that we do not think of as being “magnetic”.
- **Resistivity** survey uses devices similar to the ohmmeters used to test electrical circuits. Archaeological features can be mapped when they are of higher or lower resistivity than their surroundings. A stone foundation might impede the flow of electricity, while the organic deposits within a midden might conduct electricity more easily than surrounding...
soils. Survey usually involves walking with the instrument along closely spaced parallel traverses, taking readings at regular intervals. In most cases, the area to be surveyed is staked into a series of square or rectangular survey “grids”

- **Resistivity tomography (ERT)** survey is a technique most commonly used in geological and environmental investigations but has been applied to archaeology. Unlike standard resistance surveys, which maps shallow sub-surface features, ERT can measure features at greater depths such as tells which have deeply buried structures.

- **Electromagnetic induction (conductivity and magnetic susceptibility)** survey is used to detect differences in the conductivity of subsurface materials by measuring the ease with which current flows through or the ease with which a material can be magnetised in an induced magnetic field. Both components can be measured simultaneously, providing a quick and rapid assessment, with each equally suitable for mapping brick and stone foundations, house structures, walls, ditches, pits, extinct river channels and mound remnants.

- **Ground-penetrating radar (GPR)** survey is a geophysical method that uses radar pulses to image the subsurface. This non-destructive method uses electromagnetic radiation in the microwave band (UHF/VHF frequencies) of the radio spectrum and detects the reflected signals from subsurface structures. GPR can be used in a variety of media, including rock, loose soil, floors and structures. It can detect objects, changes in material, and voids.

- A copy of unprocessed raw data must be retained and archived in order to check results for each of the methods listed.

**Further Resources**

- [Geophysical Survey in Archaeological Field Evaluation](http://example.com) 2008, English Heritage (pdf)
Geographic Information Systems (GIS), spatial analysis and data management

Geographic Information Systems aim to create a digital dataset and help produce a geo-referenced plan with various shape file layers and metadata. The object is to create a digital dataset that is easily accessible and transferable between specialists and disciplines.

Managing large and complex data sets is a challenge of archiving and online delivery which must be considered prior to collation. Digital material can be extremely fragile and ephemeral. With the volume of information that exists in digital form increasing rapidly, there is a growing awareness of the importance of digital preservation and effective data management. Archaeological information in digital form is often the only record of archaeological work. Work which cannot subsequently be repeated, so digital information is therefore of importance in the development of the archaeological record. Access to digital data is also extremely important. If data is not accessible or findable it cannot be reused to contribute to future research. As a result, digital accessibility and preservation is now a major concern for all institutions that deal with data. Research Councils are increasingly demanding that digital data be archived in a suitable repository, and policy frameworks require that archaeological organizations and practitioners must institute good practices to ensure the long-term preservation of and access to digital data.

Principle:
The candidate understands the theory and techniques behind the collection and production of digital and non-digital data and its use in archaeological enquiry.

Outcomes:
Can create a digital dataset of information and the creation of a geo-referenced site plan using shape files or other spatial data with associated metadata.

Constant supervision
The candidate can prepare data consistent with the requirements of the system. The candidate ensures that datasheets, electronic files and site records are filed according to instructions. The candidate seeks direction from a supervisor on nature of information to be recorded, where and how data is recorded and degree of detail necessary.

Moderate supervision
The candidate can prepare data consistent with the requirements of the system and flag possible issues, errors and integrate with GIS. The candidate can complete data entry with minimal supervision and understands the nature and extent of data recording required. The candidate is effective in ensuring the careful filing/storage/digital upload of datasheets, recordings, electronic files with minimal prompting and instruction.
No supervision
The candidate will independently prepare all data and flag possible errors or inconsistent cross referencing and then collate these issues in order to rectify them. Integrate data onto a GIS system or similar data management system such as IADB. The candidate can identify data recording requirements /needs, quality standards, and methods in different situations. The candidate proactively addresses record storage, and ensures all datasheets, recordings and electronic files are included.

Professional Tips
• Keep and share up-to-date information
• Establish a data-sharing plan
• Continually seek out training to improve your GIS capabilities and data management
• Integrated Archaeological Database system, or IADB for short, is an open source web-based application designed to address the data management requirements throughout the lifespan of archaeological excavation projects, from initial excavation recording, through post- excavation analysis and research to eventual dissemination and archiving.
• Although the industry standard is ESRI ArcGIS or ArcPro, do not forget that you can practice on opensource systems such as QGIS and Open Office databases. The principals are the same, and if you can link datasets and interrogate spatial data then you will have no difficulty in translating this to commercial packages. Familiarity breeds ability.
• At this level you are expected to understand the procedures and concepts, such as interoperable systems and meta data – do not fear organisation.
• QGIS is a free, open source GIS application for Windows and Mac that provides a great starting point for archaeologists who want to learn to explore data with maps. http://www.bajr.org/BAJRGuides/42_QGIS_StarterGuide/42_BAJR_Guide_QGIS.pdf
• Understanding how to visualize map data is an important skill but it can be intimidating. This tutorial will guide you through the basics, covering how GIS files work, how to edit them and how to join them with external data for analysis. It will also give you the tools to make simple, interactive data maps that work on every platform.

Further Resources
Physical conservation and management

The physical conservation and management of archaeological sites requires the identification of issues impacting on the condition of the fabric of a site and/or its values. This process will require detailed planning to be undertaken prior to the introduction of any mitigation or management works. Relevant Aboriginal people and other stakeholders will need to be consulted during this process. Once the planning has been undertaken (see associated skill “Heritage management planning”), this will be used to guide the introduction of mitigation and management methods to the site. This can include the installation of infrastructure (boardwalks, fences and the like), the production and inclusion of interpretative material (such as signage), the fortification of sites (e.g. if eroding) in addition to the management of access via car parks, walking trails, etc. All conservation and management activities should be developed and introduced to a site so that they are ‘reversible’ or at least removable. Ongoing long-term monitoring and evaluation strategies should be designed during the planning phase and implemented during the works program to address any deterioration or damage that may result inadvertently from the conservation and management program. The idea is to conserve and manage the tangible fabric of the site to the best possible standards to ensure the protection and preservation of the archaeological site into the unforeseen future.

Principle:
The candidate understands the theory and practices of archaeological conservation and management and how to embed these within ongoing monitoring and evaluation frameworks.

Outcomes:
The candidate can identify potential impacts and develop and implement strategies to mitigate and manage problems, conserving the values and fabric of the cultural material present.

Constant supervision
Understands the purpose, but needs more practice in identifying impacts, planning mitigation strategies and implementing them.

Moderate supervision
Can work as part of a team to identify impacts and to plan associated mitigation and management strategies but may need some supervision to implement them.

No supervision
Can identify impacts to an archaeological site, plan mitigation strategies and implement them to conserve the values and fabric of the cultural material present.
Professional tips:

- Always involve Indigenous Traditional Owners in the process from the commencement of the planning phase through to the identification of roles they can play in the ongoing monitoring and evaluation process.
- Where possible, facilitate inclusion of Indigenous Traditional Owners in the works program.
- Involve other stakeholders in the process where possible, incorporating their views into long-term monitoring programs.
- Always follow best practice methods and if a conservation or management program begins to have a detrimental effect on an archaeological site, then remove this and address the resultant problem as soon as possible.
- Keep a record of what you have done so that future generations can be informed of the decision-making processes and works programs introduced.

Further Resources:

- [https://australia.icomos.org/](https://australia.icomos.org/)
  - This is the website of the Australian branch of the International Council on Monuments and Sites. It contains a downloadable copy of the Burra Charter and practice notes and the seventh edition of The Conservation Plan (Kerr, 2004). Both are standards for conservation practice.
Rock art analysis

Rock art analysis requires the investigation of data relating to the characteristics of a single rock art site or a group of sites within a local area/or broader region. This can include both archival and recently recorded data for a site/area/region. Data sources will include field recordings of tangible elements (such as characteristics and contents of rock art within a site/s; geospatial and mapped information; photographs), in addition to intangible values (including Indigenous narratives, names, languages, connections, cultural ontologies/components, oral histories, etc.), as well as archival records (such as old photographs, archival site records etc.). The idea is to investigate all elements of the records of the rock art in question and to place this within a local/regional/national context in comparison with other rock art studies for the area or region.

Principle:
The candidate understands the principles and practices of incorporating tangible and intangible values and narratives into the analysis of rock art.

Outcomes:
The candidate understands the analysis of field data developed utilising archival data within the relevant area or region.

Constant supervision
The candidate understands the purpose but needs more practice in comparing the data within both a micro (local – group of sites) and macro (regional/national) context.

Moderate supervision
The candidate can analyse rock art within a micro (local – group of sites) context but needs to improve abilities of analysis within a macro (regional/national) context.

No supervision
The candidate can analyse rock art within both a micro (local – group of sites) and macro (regional/national) context.

Professional Tips
• Always discuss rock art analysis with Indigenous Traditional Owners prior to the work.
• Where possible, facilitate inclusion of Indigenous Traditional Owners in this process, including confirming information recorded and disseminating results of the conducted analysis.
• Get your eye in by reviewing information on known rock art traditions within any given local, regional or national context.
• Identify similarities and differences across these contexts that may be useful as part of future investigations.
• McDonald, J. and Clayton, L. 2016. Rock art thematic study: Report to the Department of the Environment and the Australian Heritage Council. Centre for Rock Art Research and
Management, University of WA.

Heritage management planning

Heritage management planning involves the collection of a range of data on the values and fabric of an archaeological site or heritage place, in addition to potential threats and impacts, in order to identify strategies to mitigate and manage these. This can include information on the physical layout, content and characteristics of a site; archival information about the heritage place; the articulation of intangible values, narratives and oral histories; as well as identification of issues that can damage these. The planning process uses this information relating to the fabric of the place and its heritage values to articulate management strategies to protect, preserve and conserve the heritage place for the future.

**Principle:**
The candidate understands the planning process supporting the preservation, protection and conservation of the values of an archaeological site while managing threats and impacts.

**Outcomes:**
The candidate can assemble the required information to develop a plan to manage the heritage values and fabric of an archaeological site.

**Constant supervision**
The candidate understands the purpose and can identify and compile relevant information under supervision but needs more practice in developing planning strategies to manage heritage places.

**Moderate supervision**
The candidate can work as part of a team, to develop a heritage management plan, but may need some supervision.

**No supervision**
The candidate can prepare a heritage management plan either as an individual or work as part of a team to develop one.

**Professional Tips**
- Include all relevant stakeholders, particularly Indigenous Traditional Owners, at all stages of the planning process, wherever possible.
- Get your eye in by reviewing other heritage management plans to see how other processes have been undertaken and the plans created as a result.
- Include information on the proposed management works as well (e.g. the type of equipment that will be required) as these may also have an impact on the heritage place.
- Think about the end product before starting the heritage planning process, to allow for incorporation of stakeholder views and requirements from the commencement phase.
- Build in monitoring and evaluation programs as part of the planning process, to ensure any works undertaken are maintained and/or mitigated in the long term.
- The Burra Charter is a key reference for assessing significance for Australian heritage places.
- The Burra Charter and practice notes: (https://australia.icomos.org/publications/burra-charter-practice-notes/)
Policy Development

A policy is a guiding principle developed and adopted by an organisation that sets direction and actions within that organisation. For instance, Government heritage policies are rules which guide Government decisions, outlining reasons why things are to be done a certain way, and leading to official procedures and protocols. Government policies are not laws but can lead to legislation.

Policies are formally adopted by organisations and people within the organisation are required to behave in accordance with these policies. On becoming a member or employee of an organisation you agree to abide by the organisation’s policies. For example, the Australian Archaeological Association has policy governing sexual harassment and discrimination. ICOMOS Australia has a range of policy that governs how decisions are made in the organisation. AACAI has a policy for consulting with Aboriginal communities. Most commercial archaeology companies have policy for workplace safety when undertaking fieldwork activities or handling hazardous materials.

Principle:
The candidate understands the role of policy in an organisation and be competent in developing, seeking approval for, adopting and evaluating policy.

Outcomes:
The candidate can develop and evaluate heritage-related policy.

Constant supervision
The candidate has a basic understanding of the process for policy development and evaluation. The candidate can collect information relevant to the problem or issue the policy will address including existing policy, governance and legislation documents. The candidate can identify stakeholders to be engaged in the development and evaluation of a policy.

Moderate supervision
The candidate has a sound understanding of the process of policy development and evaluation. The candidate can analyse current policies within the organisation and externally that are relevant to the issue and identify policy options to address the issue. The candidate can evaluate policy options and propose the most effective, efficient, and feasible option. The candidate can develop and implement an engagement strategy for stakeholders.

No supervision
The candidate can lead the development and evaluation of policy in an organisation by identifying the problem, issue or gap that the policy will address; analysing and evaluating a range of policy options; drafting and presenting policy to the organisation and stakeholders for comment; leading the process for approval and adoption and subsequent review of policy. The candidate can develop and lead an effective communication strategy for stakeholders in relation to new or revised policy including relevant messages and materials.
Professional Tips:
There are many useful online guides to developing policy. These may include guidance on writing policy and issues to consider when evaluating policy options however they are not specific to archaeology and heritage management. Researching and becoming familiar with the structure, content and aim of current policy in archaeology and heritage management provides the best foundation for skills development.

- [https://australia.icomos.org/members/p-p-manual-for-members/?highlight=policy](https://australia.icomos.org/members/p-p-manual-for-members/?highlight=policy)
Project management

Managing a project is an essential and highly transferable skill. Regardless of whether your project is blue sky research or a legislative requirement for a client, managing all the different project components will be vital to getting the job done right. The first experience many archaeologists have with managing their own project is during their honours year. An honours project is a great starting point as you not only have the benefit of input from your supervisor/s but can also have many resources and support persons to draw upon. You should not abandon this approach when you enter industry or go on to postgraduate study. Bigger, more complex projects require a suite of new management skills to be brought into play and the best way to learn is through experience and seeking advice from mentors.

Good project managers will be able to do the following:

- Clearly define the **scope** and desired/required outcomes of the project – why is the project being done and what does it aim to achieve?
- Identify a **realistic timeframe** for the project, both in terms of calendar days/weeks/months and personnel hours that need to be provided for in a fee proposal. It is important to provide your client and employer with realistic expectations about when the project will be completed and what the cost will be.
- Develop an effective strategy to deliver the project outcomes within the scope of the prescribed **budget**. Sometimes you will be able to develop your own budget (see above); other times an existing budget will be imposed upon you. It is essential that you can work out a practical way of achieving the best outcomes within these constraints.
- Managing **field/lab work** logistics. Organising and overseeing field or lab work can be challenging, particularly when there are large numbers of people or stakeholder groups involved. When starting out, it is advisable to ask for support in doing this so that you can learn the many varied approaches and decide what will work best for you.
- **Time management** is another essential skill that you will need to master in your role as a professional archaeologist. Whether this is meeting a client’s deadline, submitting a grant application on time or balancing multiple projects, time management is something that you will use every day. Frequently, this is not a skill that is strongly developed by the time you finish your qualifications and thus is something that many people initially struggle with. Mastery of time management however is well worth the effort.
- **Quality control** is a strong focus of all good project managers – you may produce a complete project on time but if it is not well written or produced, its timeliness will be negated by problems that arise down the track. Make sure that you allow enough time within both your timeline and budget to get each aspect of the project reviewed by a senior colleague.
- **Administration.** The final essential part of project management is administration – all the fiddly, time-consuming activities that need to be done to ensure that the project runs smoothly and is completed. Administration encompasses invoicing, organising or paying wages, document control, logging and storing receipts and workplace health and safety. Records need to be kept up to date and be well organised in case someone else needs to pick up and continue your project at short notice.
Principle:
The candidate understands the different aspects of project management and how they contribute to project completion and implementation.

Outcomes:
The candidate can effectively manage a range of projects.

Constant supervision
The candidate can identify some of the different aspects of project management and has a good appreciation of how each should be done. With supervision, they can manage small scale projects.

Moderate supervision
The candidate can manage a small to medium sized project competently with little supervision but still requires moderate supervision for larger, more complex projects. The candidate is not yet completely comfortable with all aspects of project management (e.g., field logistics, client liaison or budgeting).

No supervision
The candidate can manage projects of different scales competently and independently.

Further Resources
Significance assessment

The management of cultural heritage is built on the underpinning assessment of significance, that is, the different parts of a place – both tangible and intangible – which make it of value to communities through contributing to our understanding or appreciation of the human story (Pearson and Sullivan, 2013). The central question in assessing cultural heritage significance for any site or place should always be: who values this heritage and why, and how much do they value it? (Johnston, 1992). The archaeological profession is just one interested party and we must ensure the views of other sectors are also considered. Due to the inherent importance of community interaction and value in the assessment of cultural significance, consultation is a fundamental component.

A key driver of significance assessments is the knowledge that not all sites can be preserved. Thus, our capacity to relate community significance, in all its many forms, to a physical site and then compare these characteristics across spatial and temporal scales, requires some means of separating different types of significance, understanding their overlap and measuring their relative importance (Burke et al., 2017). In Australia the Burra Charter (ICOMOS, 2013) is widely accepted as the standard means for achieving this, being equally applicable to both Indigenous or European sites.

Using the Burra Charter model, cultural significance is normally assessed considering: aesthetic significance, historical significance, scientific research (in many cases archaeological) significance, social significance and spiritual significance. A site is not limited to significance in only one area, nor is it required to have significance to only Indigenous or European people. You must also be aware of different legislative requirements for significance assessments within the country or state in which you are working and how these diverge from, or complement, the Burra Charter categories. Ultimately, the assessment process becomes one of objectively establishing the nature of a place’s significance, and the degree and scale of that significance. To do so, three additional moderators of cultural heritage value must be considered: representativeness, rarity and integrity (Burke et al., 2017). It is only once you have done this that it is possible to develop strategies to manage the place.

**Principle:**
The candidate understands the criteria for assessing and evaluating cultural heritage significance.

**Outcomes:**
The candidate can write a statement of significance for a range of heritage contexts, including national and state criteria, and can recommend a range of appropriate management measures accordingly.
Constant supervision
Under supervision, the candidate can identify what significance criteria are applicable to an area. This should include those of the Burra Charter, consideration of the site’s relative representativeness, rarity and integrity and any additional state significance criteria. Identification of and consultation with a range of stakeholder groups can be achieved with the help of a supervisor. The principles of taking relevant oral histories are understood but do not necessarily need to be applied at this stage.

Moderate supervision
The candidate can apply all relevant significance criteria to a site with moderate supervision and develop a preliminary statement of significance under moderate supervision and review. The candidate can independently identify the scope of stakeholder groups and under supervision, is able to consult with these groups and record relevant oral histories.

No supervision
The candidate can independently write a statement of significance for a range of site/landscape contexts without supervision. The statement fulfils all relevant legislative criteria and includes detailed consultation and oral histories, where relevant.

Professional Tips
• Make sure your report recommendations appropriately reflect the significance assessment. For example, it is not appropriate to recommend destruction of a site of high significance with no mitigation.

Further Resources
• This resource contains all the former Australian Heritage Commission publications.
• https://australia.icomos.org/
• This is the website of the Australian branch of the International Council on Monuments and Sites. It contains a downloadable copy of the Burra Charter and practice notes and the seventh edition of The Conservation Plan (Kerr, 2004).
• The NSW Heritage Office has a wide range of free guides containing general principles on assessing and managing heritage places, historical research on heritage places and preparing thematic histories.
• NSW Office of Environment and Heritage (OEH) provides a good reference for the investigations and assessment of Aboriginal cultural heritage.
Statistical analysis

Statistics is a diverse form of mathematics that enables researchers to explore and evaluate patterns of scale, abundance and difference in the world. In archaeology all discussions of classification, chronology, comparison and coincidence employ concepts and methods that have been explored through statistics. Archaeologists obtain far greater analytical power by employing statistical reasoning when they plan or evaluate sampling, describe the physical properties of objects, estimate the value of a target event from uncertain or inherently variable observations, determine whether archaeological patterns are likely to be real or merely reflect chance, appraise the magnitude of difference between things, and many other common concerns. The application of statistics has improved greatly in recent times because of access to greater computing power, the proliferation of effective software, as well as greater training of archaeologists in at least the basis of statistics. Increasingly there are specialised applications of statistical practice, in GIS, in modelling systems, and so on.

Principle:
The candidate understands the operation of common descriptive statistics, their applicability and limits, and understands the range of practices and their potential use in archaeology.

Outcomes:
The candidate can validly apply relevant statistical methods described in archaeological literature to enhance the quality of archaeological inferences.

Constant supervision
The candidate has a basic understanding of descriptive statistics, including the fundamentals of statistical probability and model testing. The candidate can understand the theory behind sampling and the application of common sampling methods, the statistical requirements for robust data collection, and techniques for data transformation and post-hoc testing. The candidate can display competence in statistically exploring datasets and is familiar with options for the display of statistical results.

Moderate supervision
The candidate has a good understanding of the theory behind common statistical practices, including a range of multivariate techniques including classification and data reduction. They should have an awareness of analytical options using robust statistics and be familiar with options for non-parametric tests. The candidate can operate standard statistical packages to carry out analyses and can write text describing the results and to prepare well-designed scientific/data visualisations.

No supervision
The candidate can correctly carry out a range of quantitative analyses without the input of a supervisor. This should include design of sampling and data collection, subsequent data cleaning and transformation, descriptive and inferential tests, regression and ANOVA and their multivariate versions. At this level the capacity to use statistical skills in different contents is desirable (e.g. GIS, Geometric morphometrics).
Further Resources

Teaching and training

All of us are called on at one time or another to explain something to a friend, colleague or trainee. Developing expertise in teaching and training are key skills for developing leadership and responsibility. Teaching and training activities take place in many venues (e.g., the classroom, field, lab or office) and comprise many different activities, from formal lecturing or development of lesson plans to guidance in professional skills and general mentoring. As a teacher or mentor, your goal is not just to transmit knowledge but also to help your students and trainees develop confidence, critical thinking skills and the ability to solve problems.

Principle:
The candidate understands the principles of information transmission and how to support and enable this in a range of settings.

Outcomes:
The candidate can develop, organise and deliver different teaching, learning and training opportunities specific to a wide range of audiences.

Constant supervision
The candidate can aid in the organisation of teaching activities as a tutor, assistant or peer-mentor, using lesson plans or training activities developed by someone else.

Moderate supervision
The candidate can develop training activities around specific topics (e.g., workplace health and safety, finds identification, excavation methods), though they might require some support. The candidate can deliver occasional formal lectures on their area of expertise but would require supervision to run a full course or teaching program. The candidate is confident in their peer-mentoring and ability to support colleagues as a similar level.

No supervision
The candidate can confidently develop, organise and deliver comprehensive teaching or training activities, such as courses for professional accreditation, skills master classes or university courses on archaeological topics. The candidate is confident to mentor students, peers and others. The candidate can supervise tutors or assistants as they learn to teach and train others.

Professional Tips
• Teaching is a surprisingly hard skill to master because it requires you to take information you know intimately and break it down so that a complete beginner can absorb it and apply it to their own context and life experience.
• Classroom teaching is sometimes intimidating because of the public speaking aspect, but with some experience, most lecturers find running a classroom is much more of a give-and-take activity than a singular, stand-up performance.
Further Resources:

- Burke, H. & Smith, C., eds. 2007. *Archaeology to delight and instruct active learning in the university classroom*, One world archaeology series; v. 49. Walnut Creek, CA: Left Coast Press.
- Cosgrove, R., Frankel, D. & Thomas, D. 2013. From the moat to the Murray: Teaching practical archaeology at La Trobe University, Australia. *Australian Archaeology* 76 (1):44-51.
GROUP B SKILLS

LABORATORY SKILLS
Archaeobotany

Wood charcoals, seeds and other plant macrofossil remains are commonly preserved and recovered from archaeological sites by flotation, wet/dry sieving and other methods. Sorting using a binocular dissecting microscope is the essential first step in identifying the assemblage, involving sub-sampling, sieving and physical removal of the macrofossils from the matrix, classification of types of remains present and quantification by counting before storage in appropriate media for later detailed analysis. This process requires use of appropriate equipment, recognition of plant remains, labelling, recording or observations and development of an archive for later researchers.

Principle:
The candidate understands the techniques for recovery and preparation of archaeobotanical macrofossil remains for analysis.

Outcomes:
The candidate is effective at laboratory processing, classification, quantification, recording and storage of the major classes of plant macrofossil remains from archaeological samples using a microscope.

Constant supervision
The candidate can understand the process but requires direct supervision of many stages and during the sorting process.

Moderate supervision
The candidate requires supervision of some aspects of the sorting process, including checking the classification of remains into groups including wood, charcoal, flowers, seeds and leaves.

No supervision
The candidate can independently process samples to storage, noting problems and uncertainties in classification and fully recording the process and finds as NISP.

Professional Tips

- Sub-sample large bags of remains to maximise the efficiency of your sorting time – you can waste a lot of time sorting unnecessary quantities of material!
- Use a geological sample splitter (riffle box) or ‘coning’ method for sub-sampling NOT grab sampling with a spoon or other instrument.
- Use flexible foil (entomological) forceps which minimise damage to fragile remains and not plastic or stiff metal forceps.
- Sieve your samples into different size fractions to aid recognition of different sized remains.
- Use standard quantification approaches to record NISP in a way that allows MNI and other measures to be calculated.
- Always use permanent/archival quality pens for labels and label all sub-sample bags and tubes with durable labels.
- Record all your processing methods and decisions plus observations of plant remains on a paper or electronic pro-forma in a database as you process the sample.
Ceramic analysis

Ceramic artefacts are among the most abundant, ubiquitous and significant components of historical archaeological assemblages. While most archaeologists in Australia deal with ceramic material from the late 18th-20th century, there also exists opportunities to study wares from Mediterranean, Near Eastern and Asia-Pacific contexts. Local pottery manufacture was widespread in colonial Australia, producing kitchen-ware, bottles and large storage vessels, along with bricks, tiles and drainage pipes. Most ceramics in the Australian archaeological record, however, were mass-produced in Britain, with Chinese, and later, Japanese, material also represented on many sites. An important subset of ceramic artefacts includes clay tobacco pipes. Archaeologists have adopted a wide range of approaches to ceramic analysis, including ware, form (shape), function, decoration and date. Ceramics are used to investigate a range of social, economic and cultural questions, including domestic consumption and household economy, trade patterns at multiple scales, and expressions of class, gender and ethnicity. Ceramics are also important for understanding site formation processes and for dating archaeological deposits.

**Principle:**
The candidate understands the diversity, complexity and significance of archaeological ceramic assemblages.

**Outcomes:**
The candidate can identify, analyse and interpret the range of ceramic artefacts commonly encountered in archaeological assemblages.

**Constant supervision**
The candidate has a basic understanding of sorting, counting, measuring and processing commonly occurring ceramic artefacts.

**Moderate supervision**
The candidate has a well-developed capacity to identify common ceramic ware types, vessel forms, decorative motifs and patterns, and makers’ marks. The candidate can also undertake minimum vessel counts.

**No supervision**
The candidate can independently analyse and interpret substantial and diverse assemblages of ceramic artefacts. This includes using ceramics to understand site formation processes and date complex deposits; detailed historical and contextual analysis; intra-site and inter-site analysis of assemblage composition; and interpretation of the symbolic and cultural meanings of ceramics.

**Professional Tips:**
- Significant technological changes in fabric and ware type occurred during the late 18th and early 19th centuries, while changes in ceramic production from the mid-19th century onwards are most visible in decorative techniques and styles.
- Ceramics in domestic contexts often have a long use-life and may only be discarded many
years after their manufacture and purchase.

Further Resources

Dating Techniques

Dating techniques is a term used to encompass both relative dating and absolute dating conducted on-site and in the laboratory. Together, relative and absolute dating techniques establish the chronology of sites and underpin their interpretation. While there are many absolute dating techniques available to archaeologists, the term ‘absolute dating’ here encompasses the techniques most commonly used in the Australian context: radiocarbon dating and trapped-charge dating (thermoluminescence and optically stimulated luminescence (OSL)). As archaeological excavation is a destructive process, it is important to correctly curate samples taken for absolute dating so this can be performed at a subsequent time (months or even years later), if necessary.

Principle:
The candidate understands the theory and practice behind relative and absolute dating techniques and their use in archaeology.

Outcomes:
The candidate can use, and date samples for, relative and absolute dating in the field and in the laboratory.

Constant supervision
The candidate has a basic understanding of the theory of relative dating on-site including stratigraphic interpretation with step-by-step help from a supervisor. The candidate has a basic understanding of the theory behind radiocarbon dating and trapped-charge dating and has observed samples being taken for these absolute dating techniques.

Moderate supervision
The candidate has a good understanding of the theory behind relative dating on-site including stratigraphic interpretation with moderate supervision. The candidate has a good understanding of how to take samples for radiocarbon dating and trapped-charge dating and can take appropriate samples with moderate supervision. The candidate has a good understanding of storage/curation requirements for samples taken for the purposes of absolute dating.

No supervision
The candidate can correctly utilise relative dating on-site including stratigraphic interpretation without the input of a supervisor. The candidate can competently take appropriate samples for radiocarbon dating and trapped-charge dating without supervision and has a thorough understanding of storage/curation requirements for relative dating samples. The candidate can competently combine relative and absolute dating information to provide a comprehensive site chronology.

Professional Tips:
• Record the three-dimensional position of samples taken for absolute dating.
• The excavation planning stage should include planning the types of absolute dating that will be conducted on the archaeological material from the site, as well as making sure that enough sample containers are available on-site for the correct curation of absolute dating.
Further Resources

Field conservation of artefacts

Conservation of artefacts in an archaeological context relates to the care, handling and treatment of artefacts in the field. Specialist conservators might be required in certain circumstances and advice should always be sought if you are unsure of how to proceed.

Basic principles of conservation of artefacts include: identifying artefactual material types and the conditions they are found in; establishing appropriate methods and materials for storing and transporting artefacts; planning the handling of artefacts; identifying if any stabilising treatment is required; and carrying out the treatments. Stabilising treatments might include: maintaining conditions the artefacts were found in; controlling environments that artefacts are stored in; or cleaning and drying artefacts to avoid further damage. Any treatment undertaken should be recorded and general principles of conservation indicate treatments (for example reassembling broken artefacts such as glass or ceramic) should be reversible. Handling methods, and storage methods and materials, should also ensure no further damage or condition deterioration of artefacts occurs.

**Principle:**
The candidate understands the principles of conservation in the field to prevent deterioration of artefacts prior to specialist treatment.

**Outcomes:**
The candidate can effectively treat, package and store a range of artefact types in different conditions and recognise when specialist advice is required.

**Constant supervision**
The candidate has a basic understanding of bagging and handling of artefacts. The candidate can identify major material types (stone, glass, ceramic, bone and shell, wood, cloth or paper). The candidate requires supervision in handling and packing artefacts; supervisor provides instruction on any treatment or conditions (e.g. cleaning, drying, ventilating bags, keeping material damp if necessary).

**Moderate supervision**
The candidate can suggest and articulate handling and storage approaches and can identify appropriate treatment for major material types. The candidate ensures common artefact types and materials adequately packed and stored with in appropriate manner minimal input from supervisor. The candidate requires advice and supervision for treatment and appropriate packing and storage of unstable or fragile objects. The candidate understands and complies with labelling and recording requirements with minimal prompting.
No supervision
The candidate can correctly identify archaeological material types and correctly determine storage and packing approaches based on object condition. Adequate planning in preparation for removal and storage of artefacts can be appropriately articulated which includes approaches based on material type and conditions. The candidate identifies stability or otherwise of artefacts and appropriately selects packing method and material to ensure no further damage can occur. Candidate identifies where specialist storage conditions are required (e.g. keeping waterlogged organic artefacts wet or damp). Candidate identifies when specialist conservation is required. All material is appropriately labelled, and any specific treatments are recorded.

Professional Tips
- When in doubt separate the artefact out.
- When in doubt seek specialist advice.
- Ziplock bags can be “blown up” like balloons to provide extra cushioning in the field.
- Ferrous metals should be stored in breathable storage (e.g. paper or raffia mesh bags) in order to reduce the humidity in the bag which may cause rusting.

Further Resources
Glass artefact analysis

Glass artefact analysis is a term used to encompass the analysis of all objects made from glass including beads, decorative objects, tools and packaging for beverages, condiments, medicines and beauty products. In the Australian context, glass artefact analysis most commonly refers to the analysis of glass bottles and containers.

Principle:
The candidate understands the methods of glass artefact analysis and their application in archaeology.

Outcomes:
The candidate can analyse glass artefacts in the field and in the laboratory.

Constant supervision
The candidate has a basic ability to recognise glass artefacts during excavation and recovery, and to provide basic information regarding manufacturing technique, with step-by-step help from a supervisor.

Moderate supervision
The candidate has a good understanding of the use of manufacturing technique and glass bottle finishing techniques and can provide relative dating information on-site, in consultation with a supervisor.

No supervision
The candidate can correctly identify and relatively date glass artefacts based upon their method of manufacture and finishing technique, as well as provide contextual and dating information based upon additional features such as registration marks, colour, embossed decoration or paper labelling. The candidate can analyse glass artefacts without supervision in the laboratory using documentary sources and instrumental analysis to provide a comprehensive interpretation of the artefact’s place in broader theoretical narratives.

Professional Tips
• Surface or near-surface deposits of glass artefacts may have been disturbed by recreational bottle collectors, making it likely that the assemblage is not complete. Caution should therefore be exercised when offering dating information or interpretations of these deposits.

Further Resources
• Harrison R. 'Nowadays with Glass': Regional Variation in Aboriginal Bottle Glass Artefacts
Excavation of human skeletal remains

The study of human skeletal remains from archaeological assemblages may provide unique insights into the lives of past people. From the analysis of the human skeleton it may be possible to attain biological information about who the person was (i.e., their age, sex, ancestry and stature) and how they lived (e.g., their health, diet, lifestyle and cultural practices). The excavation and analysis of archaeological human skeletal remains is a specialised field of training that should be undertaken by a professional archaeologist together with a biological anthropologist.

The excavation of human skeletal remains in Australia requires appropriate permits. Depending on the antiquity of the remains (which is typically determined from contextual information), permits may be issued by state heritage organisations or the State Coroner.

The excavation of human skeletal remains is a complex and timely process that requires specialist archaeological excavation techniques; a thorough knowledge of human skeletal and comparative anatomy; an ability to accurately document burials; and appropriate ethical considerations for working with human remains and the local community.

**Principle:**
The candidate understands general skeletal anatomy and appropriate excavation methods within Australian legal and ethical frameworks.

**Outcomes:**
The candidate can identify human and non-human bone and can excavate and record burials using appropriate techniques. Is familiar with the ethical and legal requirements under which the reporting, excavation, analysis and storing of human remains should/ can occur.

**Constant supervision**
The candidate has a basic knowledge of human skeletal anatomy but is not familiar with relevant legislative requirements and has minimal comprehension of appropriate excavation techniques for human remains. They can assist with a burial excavation under direct supervision.

**Moderate supervision**
The candidate is familiar with the legislative requirements and has a basic understanding of the appropriate excavation techniques for burials and the basics of human skeletal anatomy. They can take an active role in the documentation and excavation of a burial under partial supervision.

**No supervision**
The candidate is familiar with legislative requirements and has a thorough comprehension of burial excavation techniques and human skeletal anatomy. They can appropriately document the burial (including mapping and photography) and excavate human skeletal remains without supervision. The candidate has a thorough knowledge of the ethical and legal requirements for storing human remains.
Professional Tips

• Have the appropriate permits and legal permissions before beginning excavation.
• Always have a biological anthropology specialist involved from the beginning.
• Always treat the deceased with respect. Remember the remains are those of an individual who was once alive.
• Learn skeletal anatomy of human adults and sub-adults.
• Photograph and map the burial in situ and in context of the full burial site.
• Wear appropriate personal protective equipment as required.
• Wear appropriate protective equipment to prevent contamination during excavation if the remains are to be later sampled for DNA analysis.
• Metal tools can cause damage to bone. Use brushes and wooden or plastic tools for delicate work.
• Skull, hands and feet should be separated into individual bags and labelled skull, right hand / left hand and right foot / left foot.
• Don’t create situations where mixing skeletal material can happen (e.g., during cleaning).
• Do not wash the remains.
• Use appropriate bags and boxes for transporting and storing human remains.

Further Resources

• Roberts CA. 2019. Human Remains in Archaeology: A Handbook. 2nd ed. York, UK: Council for British Archaeology (Please note this book is in reference to the UK system, however it still has a lot of valuable content for general principles and practice)
• Brickely M, McKinley JI. 2004. Guidelines to the Standards for Recording Human Remains. Institute of Field Archaeology: BABAO (Please note this book is in reference to the UK system, however it still has a lot of valuable content for general principles and practice).
Lithic artefact analysis

The primary objective of lithic artefact analysis is to infer the behaviours of people who created the artefacts. This might be behaviour that involved making or using the artefacts, but it might also involve interpretations of their cognitive abilities, the economic and social context of their technological decisions, and the environmental costs and opportunities of their behaviours. To achieve those interpretations robustly, lithic analysis routinely applies a series of specialist technical analyses, some focus on issues such as geological sourcing or taphonomic alteration which go far beyond artefact manufacture to provide important information about the history of the specimen. In other words, there is no single or standard kind of lithic analysis; instead there are multiple specialised analytical approaches, all of which require dedicated knowledge and training. No researcher is expert in all specialisations, many analytical skills require significant investment to learn, and so a reasonable goal is to have a sound basic understanding of the analytical principles of many specialisations and if you plan to be a specialist to then develop competency in one or two specific analytical approaches. Note that there are some skills common to, and required by, all flavours of lithic specialisation, such as strong capacity in identifying stone artefacts and statistical analysis. Both of those skills have separate entries in this Passport.

Principle:
The candidate understands the approaches by which past behaviour can be reliably inferred from stone artefacts and to recognise the interpretative limits and complexities of each analytical system.

Outcomes:
The candidate can apply analytical approaches to lithic artefact analysis and knows how and when each can be used to yield reliable data.

Constant supervision
The candidate has a basic understanding of artefact recognition and specifically the identification of positive and negative fracture surfaces, as well as ground and battered surface modifications. The candidate can make reasoned and reasonably accurate judgments about whether such surfaces are natural or artifactual. They will also be able to sort material into raw material categories, as directed by a supervisor, using texture, colour and lustre criteria in conjunction with comparative specimens. The candidates should additionally be able to classify specimens into basic (high level) technological categories such as flake or core with reasonable accuracy. Similarly, the candidate should be able to make reasonably reliable classifications of specimen breakage and be able to use counts of each fragmentation category to estimate original assemblage size and composition using standard methods. The candidate should be familiar enough with lithic features to be able to take basic observations and measurements as directed. Finally, the candidate can make accurate photographs and diacritic drawings of specimens.
Moderate supervision

The candidate has a good understanding of artefact recognition and can reliably identify fracture features and sequences as well as ground and battered surface modifications. Consequently, they can make sound judgments about whether a piece is an artefact or a natural rock and reliably identify taphonomic modifications such as weather and thermal damage. They will be able to sort material into broad raw material categories, and to accurately classify specimens into technological categories such as flake or core, and especially to identify flake retouching in its many variations. Capacity to accurately sequence scars will allow the candidate to apply regional implement classifications under supervision. (Note implement classifications are not typically constructed from explicit rules and learning them may require prolonged mentoring). This capacity to sequence scars also makes it possible for the candidate to record reduction processes, including the application of metrical reduction indices, with reasonable accuracy. The candidate will be able to make reliable classifications of specimen breakage and estimate original assemblage size and composition using standard methods. The candidate will be able to make reliable measurements of dimensions and observations of commonly recorded features. The candidate will have the ability to make accurate photographs and drawings of specimens. Additionally, candidates will have the capacity to evaluate data patterns statistically and to develop reasonable behavioural inferences about their likely cause by reference to established theory in lithic analysis. Finally, candidates may develop familiarity and capacity in applying one or more specialisations in lithic analysis, such as reduction analysis, shape analysis, petrological analysis or functional analysis.

No supervision

The candidate can correctly carry out a range of lithic analyses without the input of a supervisor. They will have excellent abilities in artefact recognition and can make sound judgments about artifactualness and identify taphonomic modifications. They will be able to reliably record raw materials, technological categories, breakage categories, implement categories and to analyse patterns statistically to develop behavioural interpretations of past events with reference to established theory in lithic analysis. The candidate should be able to make reliable measurements of dimensions and commonly recorded attributes. The candidate will have the ability to make accurate records of the artefact properties, including photographs and drawings of specimens. Candidates may develop stronger capability in applying one or more specialisation in lithic analysis, such as reduction analysis, shape analysis, petrological analysis or functional analysis.

Further Resources

Metal artefact analysis

Metal artefacts are a frequent component of historical archaeological assemblages in Australia. These items are represented by a wide range of ferrous and non-ferrous materials and forms. The most common artefact types include nails and other fastenings, tools, building hardware, domestic containers, coins and clothing items. They have the potential to reveal important information on various aspects of personal, domestic, social and industrial life in 19th and 20th-century Australia.

Principle:
The candidate understands the diversity of metal alloys and artefact types and their role in material and social life.

Outcomes:
The candidate can identify, analyse and interpret the range of metal artefacts commonly encountered in archaeological assemblages.

Moderate supervision
The candidate has a well-developed capacity to identify, classify and catalogue most ferrous and non-ferrous artefact types.

No supervision
The candidate can analyse and interpret in writing, substantial and diverse assemblages of metal artefacts. This includes distinguishing metal types and alloys; determining minimum number of individual (MNI) counts; detailed historical and contextual analysis; and intra-site and inter-site analysis of assemblage composition. In addition, the candidate understands the principles and techniques of metal artefact materials conservation.

Professional Tips
• Repair, reuse and recycling of metal artefacts is commonly observed in both European and Indigenous archaeological contexts.
• Mass production of metal alloys and household metal items become commonplace by the late 19th century.

Further Resources
• Harrison, R., 2002, Australia’s Iron Age: Aboriginal post-contact metal artefacts from Old Lamboo Station: Southeast Kimberley, Western Australia. Australasian Historical Archaeology 20: 67-76.
Osseous and shell technology identification

On arrival in Australia, Europeans observed that more than 90% of the Indigenous technology was made from organic materials. The bones, teeth, shells, and quills of the native fauna were utilised to make a multitude of everyday tools, personal ornaments, and sacred objects and some of these survive in archaeological contexts. While plant raw materials were also common (as wood, fibres and gum), very few survive archaeologically. While bone, tooth, and shell tools might not be as archaeologically numerous as stone, they nevertheless require the same detailed analysis provided to the lithic counterparts. Furthermore, if we are to fully appreciate the diversity and richness of Indigenous Australia technologies over the millennia, they must be included.

Principle:
The candidate understands the characteristics that typically identify a shell, tooth, or bone fragment as a tool.

Outcomes:
The candidate can identify the signs of working and/or use on shell, tooth, or bone.

Constant supervision
The candidate has a basic understanding of the common types of osseous and shell technologies found on the Australian continent, as well as the most frequent signs that a faunal specimen has been altered for use as a tool.

Moderate supervision
The candidate has a good understanding of the common types of osseous and shell technologies found on the Australian continent, as well as the range of manufacturing and use traces that may be present on these artefacts. They can identify likely artefacts for further examination.

No supervision
The candidate can identify likely osseous and shell technologies without input of a supervisor and determine what types of further analyses may be required to complete the identification and comparison process.

Professional Tips
- The manufacture of artefacts is a reductive technological process and the different classes of artefacts recognised by archaeologists are different products created by this process.
- There is often a very big difference between ‘ideal types’ – whether illustrated in books or handled in the lab – and the appearance of actual artefacts encountered in the field. There is no substitute for plenty of practical experience in handling and observing a wide range of artefacts in different raw materials!
- In Australia, there are substantial regional differences in artefact technology, including methods of manufacture, formal types and raw materials (e.g. pointed bone implements).
- A good way to learn skills in artefact identification and usewear is to make some of your own.
Further Resources

Residue and use-wear analysis

Residue and use-wear analysis provides a means for identifying artefact use and tool function, and commonly involve actualistic experiments and reference collections comprising many kinds of tools and worked materials with associated microscope images and analytical data. Residues refer to the materials that have been transferred and attached to the artefact surface as a result of cultural and non-cultural processes. Of interest is the transfer of residues during use, as these potentially indicate the nature of the worked material. Microscopically visible residues can be categorised under three main groups according to their origin: plant, animal, and inorganic. These may be identified by comparison with reference libraries of particles, microscopic cell structures and features (sometimes made visible with biological stains) and by their molecular, chemical and elemental signatures.

The most common approach to residue analysis is with reflected light microscopes (e.g., stereo-microscopes, DinoLite or other USB microscopes, and compound, vertical incident-light microscopes). Reflected light microscopes permit observation of residues in situ, on the tool surface. Transmitted light microscopes commonly document residues in water extractions that are removed from the tool and mounted on glass slides.

*Use-wear* refers to the wear on the edges and surfaces of implements as a result of use, the specific patterning of which may be diagnostic of tool function. The main forms of use-wear on flaked-stone tools include scarring, striations, edge-rounding, abrasive smoothing and polish. The main forms of use-wear on ground-stone tools (e.g., grinding stones and hatchet heads) include surface levelling, abrasive smoothing, polish, striations and damage to phenocrysts or rock crystals, such as quartz grains in sandstone. The specific patterning of use-wear is determined in part by stone material, the morphology of the artefact edge, the duration of tool use, the material being worked (e.g., bone, wood, skin, shell, stone), and the mode of use/use-action (e.g., sawing, scraping, chopping and drilling).

Use-wear may be macroscopic (visible with the naked eye) but is more often only visible under a microscope. Two kinds of optical light microscope are commonly used for routine study of use-wear: a stereo-zoom microscope, usually with magnifications up to x180 and an external light source; and a compound vertical incident-light microscope (e.g., a metallographic microscope) usually with magnifications of x50, x100, x200, x500 and x1000.
Principle:
The candidate understands the qualitative and quantitative approaches to residue and use-wear analysis of archaeological tools.

Outcomes:
The candidate can record use-wear and residue traces on archaeological artefacts under a microscope; to be able to identify worked materials and how tools were used.

Constant supervision
The candidate has a basic understanding of optical microscopy and the main forms of use-wear. With help from a supervisor, the candidate can position and focus the artefact under the microscope, describe use-wear patterning and the distribution of residues, extract residue samples from the stone surface, prepare extracted material on glass slides, identify key residue traces (e.g., starch, phytoliths, hair, blood, etc.), apply selected stains to the extracted material and take focussed images of any use-wear/residue traces using the microscope camera attachment.

Moderate supervision
The candidate has a moderate understanding of optical microscopy, the main forms of use-wear and can position and focus the artefact under the microscope without supervision. Under moderate supervision, the candidate can identify key residue traces, record the patterning and distribution of the use-wear/residue traces, extract residue samples from the stone surface, prepare extracted material on glass slides, identify key residue traces, apply stains and take focussed images of any use-wear/residue traces using the microscope camera attachment.

No supervision
The candidate has a good understanding of optical microscopy, the main forms of use-wear and the physical appearance/optical properties of a range of residues. Microscopic examination, photography, residue extraction and slide preparation/staining can be done without supervision. The candidate can make written interpretations for worked material/mode of use based on the distribution and patterning of use-wear and residue traces.

Professional Tips
- All artefacts should be examined in a clean laboratory, handled with starch-free gloves and stored in individual zip-lock bags. This will reduce the accumulation of non-use contaminant residues transferred during handling and storage.
- Artefacts should be first examined unwashed, to ensure maximum recovery of residues.
- Artefacts should be thoroughly cleaned after residue analysis so that sediments/greasy films are not obscuring use-wear traces.
- The student should compile their own use-wear/residue reference library by examining a range of experimental tools made from different stone materials and used for different tasks and documenting their corresponding use-wear traces.

Further Resources
- Association of Archaeological Wear and Residue Analysts (AWRANA) [http://awrana.org/]
- Fullagar, R., 2014. *Residues and Usewear*. In J. Balme and A. Paterson (eds) Archaeology in...


Small finds analysis

Small or miscellaneous finds are a diverse and significant component of most historical archaeological assemblages in Australia. This group includes clothing fasteners, hair accessories, sewing tools, writing implements, toys, jewellery, religious iconography and items of personal and domestic health and hygiene. These materials have the potential to reveal important information about the private lives of individuals and households.

**Principle:**
The candidate understands the diversity and significance of small finds and their role in the personal lives of individuals.

**Outcomes:**
The candidate can identify, analyse and interpret the range of small finds commonly encountered in archaeological assemblages.

**Constant supervision**
The candidate has a basic understanding of sorting, counting, cleaning and processing common small finds.

**Moderate supervision**
The candidate has a well-developed capacity to identify, classify and catalogue most small finds.

**No supervision**
The candidate can analyse and interpret substantial and diverse assemblages of small finds. This includes identification of manufacturing techniques and production origins; artefact dating; determining minimum number of individual (MNI) counts; detailed analysis of social and cultural contexts; and integration of small finds analysis with other assemblage components.

**Professional Tips**
- Only identify each small find to a level at which you are confident. This will vary with the experience of the researcher, how well the material is preserved, and the completeness of comparative collection available.
- There are a few books and online resources that provide comparative material for some small finds (see below). These are good guides, but you may need access to a good comparative collection to provide confident identifications.
- Always use permanent/archive quality pens for labels and label all sub-sample bags and tubes with durable labels.
- Record all your processing methods and observations of small finds on a spreadsheet as you process the sample.
Further Resources

- Lawrence, S. 2014 Chapter 13 Artefacts of the Modern World, In Balme, J. and Paterson, A. Archaeology in Practice, Wiley
Zooarchaeology

Animal bone, shellfish and other faunal remains are commonly preserved and recovered from archaeological sites. Separation of these from other archaeological materials is the essential first step in identifying the assemblage. It may be necessary to remove adhering matrix and/or use chemical or physical preservation methods. Following this, the anatomical elements present are identified and classified according to the animals that they represent. These are then quantified before appropriately storing them for later detailed analysis. This process requires the use of suitable techniques and equipment, recognition of faunal remains, labelling, recording and may include the development of a reference collection for later researchers.

Principle:
The candidate understands the processes and techniques of recovery and preparation of faunal assemblages for analysis.

Outcomes:
The candidate can complete laboratory processing, classification, quantification, recording and storage of the major classes of faunal remains from archaeological samples.

Constant supervision
The candidate understands the process but requires direct supervision of many stages and in the sorting and classification process.

Moderate supervision
The candidate requires supervision of some aspects of the sorting process, including checking the classification of remains.

No supervision
The candidate can independently process samples to storage, noting problems and uncertainties in classification and fully recording the process and finds as NISP.

Professional Tips
- Only identify each animal part to a taxonomic level at which you are confident. This will vary with the experience of the researcher, how well the material is preserved, and the completeness of comparative collection available.
- There a few books and online resources that provide comparative material for some animals. These are good guides, but you will need access to a good comparative collection to provide confident identifications at a species level for most animal remains.
- Use standard quantification approaches to record NISP in a way that allows MNI and other measures to be calculated.
- Always use permanent/archive quality pens for labels and label all sub-sample bags and tubes with durable labels.
- Record all your processing methods and observations of animal remains on spreadsheet as you process the sample.
Further Resources

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