BRITISH COUNCIL

PREVENTIVE CONSERVATION FOR MUSEUMS

INTERNATIONAL MUSEUM ACADEMY MYANMAR

Contents

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Preventive Conservation for Museums
International Museum Academy Myanmar

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CHAPTER - 01
Introduction

In January 2019 the British Council, in collaboration with the Myanmar Ministry of Religious Affairs and Culture, held a 6 day Preventive Conservation course at National Museum Yangon. The course was attended by 15 participants from Myanmar with a responsibility for the care of museum collections.
The workshop was taught by conservators Jane Henderson and Amy Crossman, with heritage consultant Alex Dawson, and supported and interpreted by Kyaw Shin Naung, conservator and Assistant Director, National Museum Yangon.

The aims of the workshop were to:

- Improve participants' skills and knowledge in preventive conservation
- Increase participants' confidence in sharing their preventive conservation knowledge and skills with their peers

Sharing new knowledge after the course was an integral element of the course and since the course took place sharing knowledge sessions, delivered by the participants, have taken place in museums across Myanmar. This toolkit has been published to support the knowledge sharing element of the course.
It summarises some of the learning that took place on the course and will be of use to the participants and others who care for Myanmar museum collections.

A series of external training videos illustrating some preventive conservation techniques is available online. The videos can be found on a YouTube channel called Collections Care at https://tinyurl.com/ycj3twbj and are referred to, along with other useful online resources, in the text.

Identifying insect pests on the Preventive Conservation for Museums course, National Museum Yangon, 2019.

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What is preventive conservation?

The International Council of Museums (ICOM) Code of Ethics (https://tinyurl.com/rmba7mj) describes the ethics and values of people who work with museum collections worldwide. The code makes two specific references to the importance of preventive conservation and knowledge sharing:

> *2.23 "Preventive conservation is an important element of museum policy and collections care. It is an essential responsibility of members of the museum profession to create and maintain a protective environment for the collections in their care, whether in store, on display, or in transit."*

> *3.9 "Members of the museum profession have an obligation to share their knowledge and experience with colleagues, scholars and students in relevant fields. They should respect and acknowledge those from whom they have learned and should pass on such advancements in techniques and experience that may be of benefit to others."*

These two statements have been agreed by museums worldwide and describe the responsibility that all people who work in museums have for the care of collections and for sharing their knowledge and experience with others.

In museums, the term 'conservation' describes the measures and actions aimed at safeguarding museum collections while ensuring their accessibility for present and future generations. 'Conservation' includes 'preventive conservation', 'remedial conservation' and 'restoration'.

The conservation terms used in this publication are explained in the technical glossary in **Chapter 11**. *Look at* **Chapter 11** *and read the definitions for:*

- *Preventive conservation*
- *Remedial conservation*
- *Restoration*

Prevention is better than cure

'Preventive conservation' is the basis of good collections care and, in different ways, is the responsibility of all museum employees. The term describes a range of collections care activities which are applied across the museum, with the aim of preserving the present state of objects, slowing down the rate of deterioration and limiting the need for restoration. Prevention of damage to collections is more straightforward and less costly than the treatment of individual treatment of objects after damage has occurred. It is more ethical and financially sound to prevent damage and may help to protect your professional reputation. Prevention is better than cure.

Examples of preventive conservation

- *Checking stores for pests*
- *Handling museum objects correctly*
- *Packing museum objects so that they are not damaged*

Examples of remedial conservation

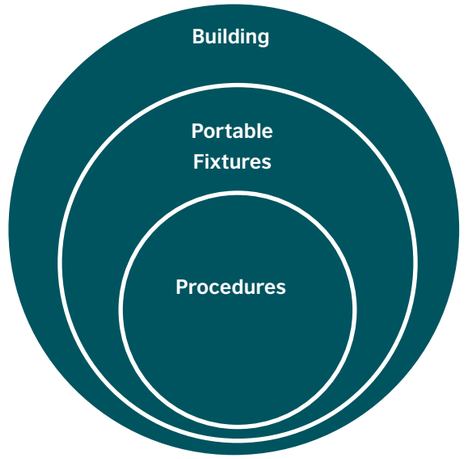
- *Removing stains from textiles*
- *Repairing corroded metals*
- *Removing wax from a wooden sculpture*
- *Repairing torn pages in a book*

Examples of restoration

- *Re-assembling a broken sculpture*
- *Re-shaping a basket*
- *Replacing a lost element such as a missing finger on a sculpture*

Look at the examples of different types of conservation above. Note how remedial and restorative conservation requires more specialist skills and equipment compared to preventive conservation.

Preventive conservation is often approached in terms of the museum building, the portable fixtures in the building and the procedures (or activities) carried out by members of staff – managing all three elements is essential to preventing damage and loss to objects.



The museum building

The structure of the building will help to preserve the collections inside it e.g. the roof will protect against rain; secure and strong windows and doors will protect against theft.

The concept of three basic requirements for conservation of objects comes from the Canadian Conservation Institute (https://www.canada.ca/en.html). You can find out more in Basic Requirements of Conservation (https://tinyurl.com/vmduy6f).

Portable fixtures

'Portable fixtures' describes the things that enclose or support objects e.g. shelving will support the weight of objects and keep objects off the floor, boxes will protect objects from sunlight or insects, locked display cases will prevent theft, polyester envelopes will enable handling of photographs, fire alarms will warn of fire and fire doors will stop the spread of fire.

Procedures

'Procedures' or 'activities' describe the work carried out by staff in the museum e.g. regular cleaning of rooms will help to prevent pest infestations, inspection rotas in collections areas will reveal damage to objects or theft, maintenance of the building will reveal leaks in pipes or windows that do not close.

Many museums maintain written documents which describe in detail how they manage buildings, fixtures, and procedures. This is often called a 'conservation strategy' and will contain the targets that the museum has for improvement in each of the three areas. For example, a museum might decide that there is a need, based on examination of the collection, to improve its portable fixtures by replacing wooden boxes with acid free boxes for stored objects. Or, it might decide to improve its procedures by implementing a cleaning schedule and training in cleaning for staff. Both of these would be recorded in the museum's strategy as aims which will improve the care of the collection.

CHAPTER - 02

How museum objects are damaged

1) What damages museum objects?

All objects will deteriorate and fall to pieces eventually. The rate at which an object will fall apart is increased by external factors known as ‘agents of deterioration’, a term used to describe the 10 agents that damage and destroy objects. See the Canadian Conservation Institute (https://www.canada.ca/en.html) for more about agents of deterioration.

The agents of deterioration are:

Physical forces	**Thieves and Vandals**	**Fire**	**Water**	**Pests**
Pollutants	**Light**	**Incorrect Temperature**	**Incorrect Relative Humidity**	**Dissociation**

Damage from agents can take place suddenly and be catastrophic, like damage from flood, or take place gradually over time, like damage from light. This toolkit explores some of the agents of deterioration and some techniques which will help you to limit the damage they can cause.

2) Organic and inorganic objects

When examining and caring for objects it’s important to be able to identify the materials they are made from, as this will help you to protect them from damage by the agents of deterioration. Materials in objects can be divided into ‘organic’ and ‘inorganic’. Organic materials have been alive at some point, inorganic materials have never been alive.

This copper alloy Buddha statue is inorganic because it is made from a material that has never been alive.

Examining a Buddha statue on the Preventive Conservation for Museums course, National Museum Yangon, 2019.

© British Council. 2019.

This Shan robe is both organic and inorganic. It is made from silk and has metallic threads sewn into the decorative binding. The silk came from a silk worm which was once alive, the metallic threads have never been alive.

Examining a Shan robe on the Preventive Conservation for Museums course, National Museum Yangon, 2019.

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This palm leaf manuscript is made from palm leaf and wood. It is organic because it is made from materials that were once alive.

Examining a palm leaf manuscript on the Preventive Conservation for Museums course, National Museum Yangon, 2019.

© British Council. 2019.

Walk around your museum and identify the organic and inorganic materials contained in the objects your collections.

3) The agents of deterioration

The agents of deterioration will affect objects in different ways depending on materials and circumstances. Here are some examples of how the agents of deterioration may affect objects:

- **Physical forces:** objects may be damaged by physical forces such as impact (e.g. a hard blow to an object) and pressure (e.g. pressure applied to an object inside a box). Objects can be deformed, cracked and crushed by forces such as impact or abrasion or pressure.

- **Thieves and vandals:** objects may be damaged and lost as a result of theft and vandalism.

- **Fire:** objects may be damaged partially or completely by fire. Fire damage might be so bad that an object is not recoverable.

- **Water:** water and damp damage can occur naturally (e.g. floods) or as a result of mechanical failures (e.g. leaking pipes). Objects may be distorted (bone, books, leather), corroded (metals), shrunk, stained or split (textiles, plant materials, wood), distorted (paintings).

- **Pests:** insects may disfigure, damage and destroy organic objects by feeding on them or using them as places to live and reproduce. Rodents may gnaw through objects. Birds and bats may roost near objects, causing damage from their faeces. See **Chapter 03** for more about pests.

- **Pollutants:** can be gases, liquids or solids; dust is considered a pollutant. Pollutants can reach objects through the air, or be transferred by materials that come into contact with the object. Pollutants can corrode metals, acidify paper, disfigure and discolour objects. Well intentioned attempts to conserve, for example when cleaning an object, can often cause more harm by leaving damaging pollutants on objects. See **Chapter 08**, for more about cleaning objects.

- **Light:** light damages some objects, particularly organic objects such as paper, wood and textiles. It can cause fading, cracking, yellowing. See **Chapter 04** for more about light.

- **Incorrect Temperature:** different types of objects have different sensitivities to temperature. Some will deteriorate rapidly under high temperatures e.g. some types of film will shrink and crack, newsprint and low quality paper will become brittle and yellow. See **Chapter 05** for more about temperature.

- **Incorrect Relative Humidity (RH):** levels of RH and fluctuating RH may damage some objects. For example, damp will cause surface growth of mould and fluctuations in RH will cause organic materials, such as wood, to expand and contract, causing cracking and distortion. See **Chapter 05** for more about RH.

- **Dissociation:** this term describes situations where museum systems have broken down with a resulting risk to the collections. Dissociation can occur when procedures in a museum are not operating effectively, resulting in the loss of objects or information about objects. Examples of dissociation are: misplacing objects; recording information about objects in a way that is illegible and failing to act when objects are under threat. Dissociation compromises collections and puts them at risk.

4) How do we prevent damage to collections?

Although collections are deteriorating all of the time; conservation gives us the ability to intervene in order to prevent, slow down and repair deterioration. The agents of deterioration can be thought of as risks; preventive conservation aims to manage these risks so that they cause minimal damage to the collections. Five levels of action, or steps, are often used to plan the management of risks from the agents of deterioration:

These steps are increasingly interventive – for example it is better to avoid, block and detect fire rather than try to recover and restore objects once they have been burned. You might avoid fire by asking people not to smoke in the building; you might block fire by installing fire doors and fire extinguishers, you might detect fire by using smoke detectors.

Think about your museum in terms of the building, the portable fixtures that house your collection and the procedures you carry out when managing your collection. Can you identify ways that you currently avoid, block and detect risks from fire, water and theft?

How might you improve the ways you currently protect your collections from fire, water and theft?

CHAPTER - 03

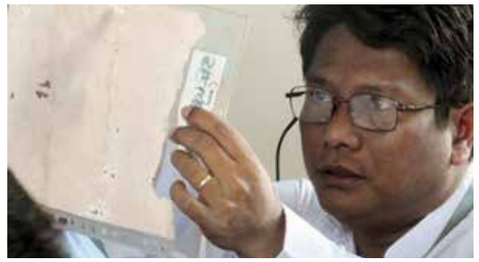
Agents of deterioration: pests

1) Pests in Myanmar that may damage museum collections

Pests are living organisms that are able to disfigure damage and destroy objects. Research so far has indicated that the following pests may be found in Myanmar museum collections:

- **Insects such as beetles and moths**
- **Rodents such as rats and mice**
- **Birds**
- **Bats**

This chapter focusses particularly on insect pests.



Examining damage to paper which has been eaten by mice and silverfish on the Preventive Conservation for Museums course, National Museum Yangon, 2019.
© British Council. 2019.

2) How do pests damage museum collections?

Pests can damage collections by eating them, shredding them for bedding and staining them with urine and faeces. Objects made from organic materials are particularly at risk from insect attack.

Managing pests in your museum is best achieved using a range of different techniques and procedures often referred to as Integrated Pest Management (IPM). An IPM programme is an integral part of a museum's collections care strategy and planning. When IPM is well planned and practised across the museum it will help to prevent pest problems arising. In the long term it is more effective, cheaper and safer for collections, staff and the environment than large scale use of pesticides and chemicals.

Damage to a book caused by insects.
© DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac)

3) What do pests need to survive?

Pests need specific conditions to survive and thrive.
The main principle of IPM is to deny pests the conditions that encourage them to survive.

To exist and thrive pests need food, harbourage, warmth and humidity.

Food

Pests can find food in:

- The fabric of buildings, collections, fixtures and fittings
- Dust and dirt
- Dead animals that have become trapped inside buildings

Harbourage

- 'Dead spaces' like voids in the floor, false ceilings, closed spaces in display cases, and spaces that are difficult for humans to reach, proviode harbourage for pests
- Pests can enter buildings through open windows, vents and cracks in buildings
- Crowded cluttered spaces provide homes for pests

Warmth

- Some pests will thrive in higher termperatures

Humidity

- Different types of insect pests will thrive at different levels of relative humidity
- Some woodborer beetles will feed on mould that develops in high humidity

This bird has entered a building and died. It may have caused damage to the collections when it was alive. Once dead, it provides food for rats and some insects.

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Are there ways that pests might get into your museum?
Can you find areas in your museum that might harbour pests?

4) Monitoring your museum for insect pests

Museums monitor the pests in their museums by:

- **Training all staff to recognise signs of insects**
- **Carrying out regular inspections of all areas, with an emphasis on collections areas and specific objects which may be at risk**
- **Collecting signs of insects, such as dead insects, larvae, frass**
- **Using 'insect traps'. The purpose of these traps is to find out if insects are present, not to eradicate them.**

Insect traps fall into two categories:

- **Sticky blunder traps**
- **Pheromone traps**

A sticky blunder trap. This will give you an indication of which crawling insects are passing. Place on the floor against a wall in stores, in and under display cabinets.

© Alex Dawson 2019. Published under a Creative Commons lince CC-BY-SA http://tinyurl etc © British Council. 2019.

A pheromone trap. This will attract and capture moths. Hang in areas of high risk of moth attack e.g. textiles stores.

© Amy Crossman. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac).

See **Chapter 10** for more information about insect traps.

Watch these videos:

- *How to put construct a blunder trap at https://tinyurl.com/y7t6sk6t*
- *How to construct a pheromone trap at https://tinyurl.com/ycllf6nr*

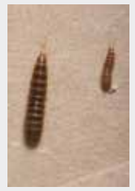
5) Identifying insect pests in museums in Myanmar

When you find signs of pests you will need to identify them in order to understand why they are thriving in your museum; you can then develop an IPM programme to control them. When looking for signs of pests look for:

- **Insect bodies, alive and dead**
- **Larvae**
- **Frass and detritus - small, hard pellets**
- **Damage caused by pests – holes, frass, stains**

Different types of pests will be attracted to different types of collection. The table below gives examples of pests to look for in Myanmar museums.

Pests which attack wool, fur, feathers and textiles

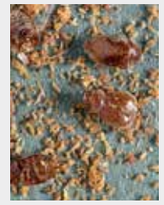
Pest name	What the pest looks like	Look for:
Black carpet beetle *Attagenus unicolor (megatoma)*	 Black carpet beetle. © Darren Mann. 2019.  Black carpet beetle larvae © CSL Crown Copyright/DBP Entomology 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac)	Insects Larvae Cast larval skins Frass
Brown carpet beetle or vodka beetle *Attagenus smirnovi*	 Brown carpet beetle © CSL Crown Copyright/DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac).  Brown carpet beetle larvae © CSL Crown Copyright/DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac).	Insects Larvae Cast skins Frass

Pest name	What the pest looks like	Look for:
Indian bookworm beetle *Gastrallus indicus*	 Indian bookworm beetle, side view © Darren Mann 2019.  Indian bookworm beetle frass © Darren Mann 2019.  Damage to wood by the Indian bookworm beetle, © Amy Crossman 2019. Published under a Creative Commons CC BY-NC-SA licence. (https://tinyurl.com/nrek8ac).	Insects Pupae Frass Holes in organic materials
Furniture carpet beetle *Anthrenus flavipes*	 Furniture carpet beetle © DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac).  Furniture carpet beetle larva © DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA lic ence (https://tinyurl.com/nrek8ac)	Insects Frass Cast skins Holes in organic materials

Pests which attack wool, fur, feathers and textiles

Pest name	What the pest looks like	Look for:
Biscuit beetle or drug store beetle *Stegobium paniceum*	 Biscuit beetle © CSL Crown Copyright/DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac).	Insects Holes in organic materials Frass  Holes in dried food and frass made by biscuit beetles © DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence. (https://tinyurl.com/nrek8ac)

Scavenger pests which feed on detritus and mould

Pest name	What the pest looks like	Look for:
Cigarette beetle *Lasioderma serricorne*	 Cigarette beetles © CSL Crown Copyright/DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac)	Insects Detritus Holes Frass
Silverfish *Lepisma saccharina*	 Silverfish © DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac).  Holes made in paper by silverfish © DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac).	Insects Scraped surface and holes in paper

Woodborer beetles

Pest name	What the pest looks like	Look for:
Powder post beetle *Lyctus brunneus*	 A powder post beetle and hole made by the beetle © DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence. (https://tinyurl.com/nrek8ac).	Insects Very fine frass Holes
False powder post beetle or Bamboo borer *Sinoxylon*	 False powder post beetle © DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac)  Exit holes in hardwood made by the beetle. © DBP Entomology. 2019. Published under a Creative Commons CC BY-NC-SA licence (https://tinyurl.com/nrek8ac)	Insects Very fine frass Holes

Termites

Pest name	What the pest looks like	Look for:
Drywood termites *Cryptotermes and Kalotermes*	 Drywood termites. © Patrick Gleeson. 2019.	Galleries and tunnels through timber Frass pellets Holes

Moths

In addition to the insects above, there are signs of the household casebearer moth (Phereoeca uterella) in Myanmar collections. This moth needs high humidity to complete its lifecycle; you may find its pupal cases stuck onto walls and fixtures. Although it doesn't cause high levels of damage to objects, it does leave detritus which will provide food for other insects. It can be discouraged by regular and thorough housekeeping routines.

Adult Household casebearer moth

© Leyo. 2019. Published under a Creative Commons CC BY-SA 3.0 licence (https://tinyurl.com/pdbjwcw).

Household casebearer larval case

© Leyo. 2019. Published under a Creative Commons CC BY-SA 3.0 licence (https://tinyurl.com/pdbjwcw).

Many museums build up their own library of insects that they have found in their museums. This is very useful for training staff, and as a reference for identifying insects that you find.

A museum insect library. Evidence of insects is stored in plastic containers, inside a plastic case. Once identified the insect name is written on sticky tape on each of the small cases.

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Inspect the collections in your museum. Can you see signs of pests? Look for frass, holes in wood, damage to organic materials, live insects, carcasses, pupae, droppings.

If you have a hand lens you will be able to look at evidence of pest infestation more closely.

6) Finding solutions to pests and setting targets

If you find pests in your museum, you have various treatment options depending on:

- **Your collections**
- **The type of pests**
- **Your museum buildings, fixtures and fittings**
- **Your museum procedures**

When looking for solutions to pest problems think in terms of Avoid/Block/Detect/Respond/Recover and remember to think in terms of your building, your fixtures and your procedures. It may be tempting to use a chemical or highly technical solution; however it is advisable to try other cheaper and less specialised methods first. Chemicals may be harmful to humans and collections.

Here are some examples of some solutions to pest problems. Deciding on the right solution for your museum will help you to set targets in your collections care strategy.

Avoid	• **Building** - mend all windows so that they close properly • **Fixtures** - design any new dispaly cases so that dead spaces are accessible
Block	• **Building** - set up a quarantine area so that newly arrived objects can be inspected before coming into contact with the collections • **Procedures** - set up a cleaning schedule in all high risk spaces; request that food and drink is not taken into high risk areas; keep all spaces tidy
Detect	• **Procedures** - inspect insect traps regularly; record your catch data from insect traps; mark boxes that contain vulnerable material and inspect regularly; train all staff to recognise signs of pests record all insect catch data and use it to inform your planning
Respond	• Vacuum individual objects to remove pests and pests and detritus • Wrap individual objects and freeze or place under high temepratures • Reduce oxygen levels (anoxia) by creating a closed environment or using nitrogen and carbon dioxide to lower oxygen levels.
Recover	• Recovery may take place once an object has been damaged. Recovery may be expensive and specialisd .

CHAPTER - 04

Agents of deterioration: light

1) Why is light important for museum collections?

Light is necessary so that humans can see; it's all around us, it's part of the way that buildings are designed and it's important to people and how they feel. We need light to see objects in collections, but natural and artificial light damages objects, and when that happens, the damage is permanent and irreversible. The effects of light damage are cumulative; there is no 'safe' level of light exposure for an object, light will always cause damage to organic materials.

Light presents museums with a difficult situation. Objects would be completely protected from light damage if kept in total darkness; however we would then not be able to see them. How do we strike a balance between protecting museum objects from light damage and ensuring that ensuring that objects are available for future generations? The only solution is to manage an object's exposure to light and to do this we need to understand what light is, how it damages objects and how it is measured and monitored.

2) What is 'light' and how does it damage objects?

Light can be natural (the sun) or artificial (lights and lamps). Light is electromagnetic radiation and can be described as a family of wavelengths, known as the electromagnetic spectrum. This family contains:

- **Visible light – visible to the naked eye**
- **Ultraviolet light ((UV) – not visible to the naked eye.**
- **Infrared light (IR) – infrared light feels warm. It is not visible to the naked eye**

Whether visible or not visible, all three types of light cause damage to objects.

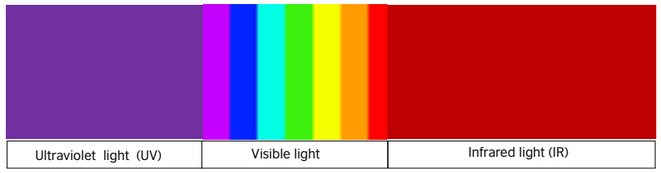

Diagram showing the electromagnetic spectrum

Light causes damage to objects depending on:

- **The type of light (UV is the most harmful)**
- **The materials from which objects are made**
- **The time that objects are exposed to light**

When light waves hit molecules, the molecules vibrate more quickly and begin to spread out, expand, split from each other and bond again, leading to damage. The degree to which this damage takes place, and the type of damage, depends on the object and its materials.

Objects and materials will be harmed by light in different ways, for example:

- **Textiles will fade and their structure may weaken, become brittle and split**
- **Wood will turn grey or yellow**
- **Drawings, watercolours, pastels will fade, and the paper may discolour and become brittle**
- **Plastics and waxes will crack, discolour and change shape**

Highly light sensitive objects and materials	Moderately light sensitive objects and materials	Objects and materials which are not very light sensitive
Organic objects and materials such as: • Watercolour paintings • Textiles and costume • Palm leaf manuscripts • Old photographs • Stamps • Drawings • Dyed leather • Fur and feathers • Newspaper	Organic objects and materials such as: • Colour photographs • Lacquer ware • Plastics • Wood • Furniture • Horn • Bone • Ivory • Undyed leather • Modern black and white photographs	Inorganic objects and materials such as: • Ceramics • Stone • Metal • Glass Some natural dyes: • Earth pigments • Indigo dye on wool

This photograph shows light damage to a textile rosette as a result of display in sunlight. The original dark blue fabric has faded to a lighter blue along the ribbons. The damage is irreversible.

©Jane Henderson. 2019.
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Look around your museum galleries and stores. Can you identify any objects that might be at risk from particular light sources?

3) Do I need special equipment to measure light levels?

Yes, light is measured using light meters andblue wool fade cards.

Watch this short YouTube video:

How to take a light reading using a light meter at https://tinyurl.com/yd8cq8z8

Go to **Chapter 10**, *The Contents of a Basic Preventive Conservation Kit. Under Equipment for monitoring and managing light look for and read the information about using:*

- *Universal light meters*
- *Blue Scale Textile Fading Cards*

Follow the internet links and look at the examples.

4) Measuring and monitoring light levels in your museum

Measuring and monitoring the exposure of objects to visible light and UV is the first step to understanding how light is affecting your collections. By measuring light levels you will begin to collect data, and from that data you will be able to identify solutions to light damage.

Visible light

The intensity of visible light is measured in ‘lux’. One lux is the measure of light intensity falling on a surface of one square metre.

Generally, the human eye needs:

- 50 lux minimum to see the shape and colour of an object
- 200 lux for good vision

300 lux is the maximum recommended in a mixed display area

UV

UV radiation is normally measured in museums as a proportion of the light, expressed in microwatts per Lumen (µW/Lm)

The effect of light on an object is cumulative; broadly, the equivalent amount of damage will be done by low lighting levels for a long period of time or higher lighting levels for a shorter period of time.

A painting like this watercolour on paper by Paw Oo Thett will suffer the same amount of damage whether it is exposed to:

- 50 lux for 132 eight hour days (53,000 lux)
  OR
- 100 lux for 66 eight hour days (53,000 lux)

Ancient Monastery by Paw Oo Thet. Watercolour on paper.

©National Museum Yangon. 2019.

Once you know the levels of light that your collections are exposed to, you can identify targets for spaces and objects. Here are some examples of acceptable light levels for displayed objects from one museum’s collections care strategy:

Highly light sensitive objects and materials	Moderately light sensitive objects and materials	Objects and materials which are not very light sensitive
• Visible light: a maximum of 50 lux Exposure: a maximum of 150,000 lux/hours per year • UV: as low as possible, deally less than 35 µW/lumen	• Visible light: a maximum of 200 lux Exposure: a maximum of 600,000 lux/hours per year • UV: no more than 75 µW/ Lumen	• No levels set as damage from exposure is minimal.

5) Finding solutions to light damage and setting targets

There are three ways you can limit the amount of light damage to museum objects:

- **Reduce the amount of visible light or light intensity that an item receives**
- **Reduce the time an object is exposed to visible light to counter cumulative damage**
- **Block unnecessary invisible radiation**

Here are some examples of measures you can take to manage or control light in collections areas. These are just examples, and will differ between museums depending on the building, its location and collections:

Avoid	• Avoid direct sunlight, use north facing spaces, consider rotating some objects to limit their exposure • Consider duplication or digitisation for some objects • Switch off electric lights if no-one is looking at an object • Diffuse light and use low wattage bulbs
Block	• Pack or enclose objects in stores • Add UV film on windows and skylights • Use screens, curtains, calico blinds to block windows • Cover cases if no public are present
Detect	• Look for signs of light/UV/IR damage on objects • Monitor light using light and UV meters • Record and analyse data from light monitoring
Respond	• Act if light damage is noticed on objects, or meters show high levels. Where is the light source? how can you block or reduce it? • Set appropriate targets for light levels
Recover	• Recovering after light has damaged an object is often not possible, and restoration, if possible, requires high skill levels

Draw up a list of objects that you think might be at risk from light damage in your museum. Identify ways that you could avoid and/or block light damage to these objects.

CHAPTER - 05

Agents of deterioration: incorrect temperature and incorrect relative humidity

1) What do we mean by 'relative humidity' (RH) and 'temperature' and how do they damage objects?

Most objects are not greatly affected by temperature, however incorrect RH can cause many sensitive objects quite significant damage.

This cabinet has fractured down the centre of the door as a result of incorrect RH.

Inlaid wooden cabinet showing how organic materials in the cabinet have reacted to changes in RH causing the door to distort and split.

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Go to the technical glossary in **Chapter 11** *and read the definitions for:*

- *Temperature*
- *Absolute humidity*
- *Relative humidity*

Note how RH is expressed e.g. 50% RH indicates the air is holding half the amount of water vapour it could hold.

RH is driven by temperature in a closed environment.
RH and temperature move in opposite directions:

If air is too dry or too damp for the material in an object, or fluctuates, it is referred to as 'incorrect RH'. Incorrect RH in objects can cause damage. If an object is made up of different materials, those materials can react in different ways to incorrect RH. Here are some examples of the ways some materials react to RH levels:

If RH is low	If RH is high	Objects and materials which are not very light sensitive
• Organic materials contract and shrink as moisture is lost • Textiles can become brittle • Wood may break and veneers lift • Glues can dry out and break	• Painting canvases will change size and distort • Mould will flourish at 75% RH • Pests may flourish • Metals will corrode	• Organic materials, such as ivory and wood, will go through cycles of swelling and contracting causing splitting and distorting • Salts in inorganic materials like plaster and stone, may crystallise or dissolve • Objects made from organic and inorganic materials may expand and contract differently, setting up stresses between them

2) What are the causes of incorrect RH?

Causes of low RH	Causes of high RH	Causes of fluctuating RH
• Heaters • Sunshine • Lighting	• Water leaks • Cooking, washing floors • Wet clothing • Lack of ventilation in sealed areas of microclimates such as boxes and display cases	• Systems in the museum such as air conditioning units switching on and off • Doors opening and closing • People coming into spaces

3) Do I need special equipment to measure temperature and RH?

Yes, temperature and RH are measured using data loggers of different kinds.

Look at the contents of a basic preventive conservation kit in **Chapter 10.** *Read the information and follow the links to websites and a YouTube video for:*

- *Tiny Tag loggers and Tiny Tag starter pack (continuous loggers)*
- *Spot RH and temperature readers (spot loggers)*

There are advantages and disadvantages in using continuous data loggers and spot data loggers. Can you list some of them?

Tiny Tag data loggers measure temperature and RH in a single space over time. This logger has been placed in a case displaying the state attire of King Thibaw and Queen Supayalatt, National Museum Yangon.

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Measuring temperature and RH reading using a spot reader. This can be used to measure temperature and RH in different spaces.

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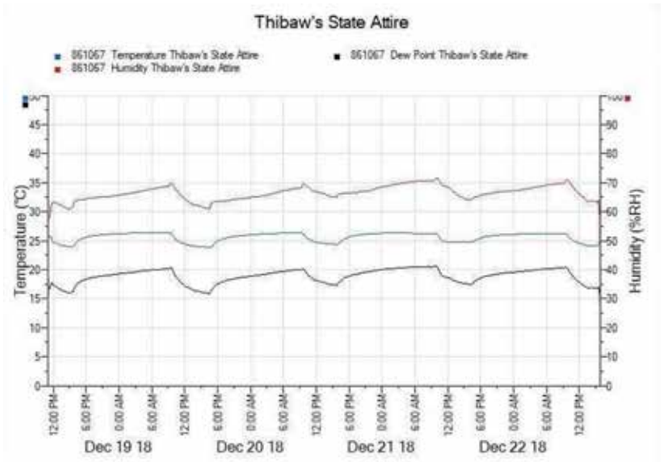

Tiny Tag data reading taken next to a painting by U Ba Nyan at National Museum Yangon over a two month period. In this example the RH is meeting the target set by the museum i.e. the RH is not going above 70% and remains at 60% +/- 10 for 90% time, with no change greater than 20% RH in a single day.

Watch this short YouTube video:

- *How to take temperature and RH readings at https://tinyurl.com/y9mwnyav*

Does your museum log data about RH and temperature? If so, how is it logged, where is the data shared and how is the data used?

If your museum does not use data loggers, can you identify areas of your museum containing sensitive objects where it might be important to monitor temperature and RH?

4) Finding solutions to incorrect temperature and RH and setting targets

Damage from incorrect temperature and RH can be limited by modifying or controlling the museum environment. However, the action you take to control the environment needs to be taken using data so that you have a picture of what is happening in your museum over time. Once you know what is happening to the environment in your museum you can set targets for managing temperature and RH.

Museums in the UK generally aim for an RH target of 55% +/- 10. Targets for RH for Myanmar should be different because objects have acclimatised to a consistently higher humidity. A reasonable target might be:

- **No RH above 70%**
- **RH 60% +/- 10 for 90% time, with no change greater than 20% RH in a single day**

Here are some examples of measures you can take to manage or control the temperature and RH in collection areas. These are just examples, and will be differ between museums depending on the building, its location and surroundings and collections.

Avoid	• Move RH sensitive objects away from areas with poor RH • Prevent microclimates from building up e.g. hang pictures so that there is space betwen them and the walls • Ask visitors to leave wet umbrellas at the door on wet days
Block	• Introduce blinds to reduce the effect of temperature rises from the sun
Detect	• Look for signs of RH/temperature damage on objects • Monitor temperature and RH over time • Record and analyse data from temeprature and RH monitoring
Respond	• Act if damage is noticed on objects, meters show incorrect levels or extreme fluctuaions • Set appropriate targets for temperature and RH levles • Intervene to manage temperatures by using fans, ventilating with cool evening air and monitoring the impact of air conditioning • Create cotained microclimates in cases or storagee boxes
Recover	• Recovering after temperature or RH damamge is often not possible, and restoration, if possible, requires high skill levels

CHAPTER - 06

How to handle and move museum objects

1) When will I need to handle museum objects?

Generally, museums try to limit handling and moving objects from the collections because it can cause damage. However, as part of the management of the collection, there will be occasions when you have to handle and move objects, such as when objects are:

- **Cleaned**
- **Packed**
- **Examined e.g. in a condition check**
- **Used for research or in an exhibition**

2) Do I need special equipment to handle and move museum objects?

Yes, in many cases you do. See **Chapter 10** for examples of equipment that will help you to handle and move objects safely.

Gloves are an important part of a museum's preventive conservation kit and will prevent damage to objects.
Watch **Why aren't you wearing gloves?** *(https://tinyurl.com/wzjuljb) a British Museum film which explores different types of specialist gloves and when to wear them*

Watch this short YouTube video:

- *Using gloves to handle museum objects at https://tinyurl.com/y9n9kpqd*

3) How do I handle and move a museum object?

It is important to follow a step by step sequence when handling and moving a museum object. If you do not, you may damage the object, and possibly harm yourself.

The 5 steps in a handling and moving workflow are:

1.Think → **2.Look** → **3.Prepare** → **4.Handle** → **5.Record**

Here are some of the things to think about as you go through the workflow:

1.Think

Take your time; think about what you are going to do and how you will do it. Think about why you are going to move the object.

2.Look

The environment:
Where does the object need to go? Are there steps, tripping hazards, doors? Will the object move through different environments?
The object:
Look at the object – what is it? How will you hold it? How will you move it? Will you need equipment? Will you need help? What is its natural orientation?
You:
Remember your own safety. Is there a possibility that you might hurt yourself or others when you lift/carry the object?

3.Prepare

The environment:
Prepare your work space; is it clean, is it big enough? Exclude food, drink, smoking and pens from the working area. Prepare the path you are going to take when the object is moved.
Collect the equipment you need.
You:
Check you have gloves if needed, check yourself for jewellery, tools, pens in pockets, pendants that may damage the object.

4.Handle

The object:
Inspect the object carefully for signs of damage before picking it up. What material or materials is it made from? Are there signs of damage? How will you pick it up? How will you set it down?
Always use two hands to hold an object, one to support the main body of the object and one to balance it. Do not carry more than one object at once. Get help if you need it. Do not pick up objects by vulnerable parts such as rims and edges, handles, arms, legs, heads or restored areas

5.Record

Museums aim to be accountable for their collections and know the location of all objects in the collections. If an object is moved you should record the fact that it has been moved and its new or temporary location in its catalogue record.

Teaching museum colleagues to move an object without causing damage
© British Council. 2019.

4) Do objects of different materials and types have special handling requirements?

Yes, different types of object will require different skills and equipment. You may need to make a written condition check of the object before moving it. Here are some guidelines for handling and moving different types of objects:

Furniture	• Wear gloves if grease from your fingers can be absorbed into the surface • Find the centre of gravity before lifting • Never pick an object up by its arms or legs • Be careful of fringing, fabrics or decorations • When lifting marble or glass table tops, lift and turn them to a vertical position immediately • Don't drag furniture – make sure that there are enough people to move carefully
Large objects	• Fix moveable parts, e.g. tie down a handle. You may need to separate loose parts - if you do, attach a number to each piece • Remember that the item may not be as robust as it was when it was in use • Marks, dirt and stains might tell you a lot about the object and its use – protect them • Check that the object won't harm you!
Small objects like toys	• Support the object from below • Do not 'play' with moveable parts • Plastic decay makes newer items very vulnerable to light damage and therefore delicate
Archaeology	• Wear gloves • Archaeological objects may be more fragile than they appear • Check if boxes are heavy before moving • There may be lots of pieces or pot sherds in one box
Coins and medals	• Always wear gloves • Do not leave for long periods of time in cheap packaging materials • Pay attention to the possibility of theft while in transit
Textiles and costume	• Make sure that everything is clean and dry (surfaces, packaging, trolleys) • Provide support across the whole of the object • If necessary roll large textiles objects around tubes and carry by the edge of the tube • Check for loose parts or separate pieces • Check for weakness such as splits, tearing or failing stitching
Ceramics and glass	• Sometimes it is better not to use gloves but to thoroughly wash hands instead • Support the object from below • Look for restoration • Separate any parts • Protect objects from hard work surfaces
Paintings	• Wear gloves • Inspect the picture and frame for damage • Do not move if loose paint fragments can be seen, place horizontally with face up • Check to see if the picture is loose inside the frame • Check wedges are secure and will not drop out • Carry framed works by the frame with both hands and unless the picture is small make sure there are two people to carry it • Support pictures from below and at the sides, never carry by the top of the frame or stretcher • Carry vertically, usually with the image facing inwards
Photographs	• Wear gloves • Work on a clean surface and cover the surface with a safe material • Support a photograph with a piece of acid free card to examine • Never touch the surface film, support at the edges • Remove envelopes from negatives not vice versa • Do not stack or attempt to flatten • Use copies where possible (i.e. for display) • NEVER USE STICKY TAPE
Books	• Never pull a book from a shelf by the top of its spine, push volumes on either side gently towards the back of the shelf and remove book by holding it at either side • Support old books with cushions, foam wedges or a cradle

5) The ‘natural orientation’ of objects

When moving an object or placing it at rest, retain the ‘natural orientation’ of an object unless directed otherwise.

An object’s ‘natural orientation’

Think about how you would hold a kitten. A kitten has a ‘natural orientation’ and you would pick it up by supporting it underneath the stomach with one hand, and balancing its side or feet with the other.

The natural orientation of this jug is upright; that is how it was designed to sit on a surface. Think about how you would hold this jug, supporting its main body with one hand and balancing it at the neck or side with the other hand. Think about the possible damage that might occur if you picked the jug up by one handle which then broke.

The principle of natural orientation helps when you are displaying or examining objects. Objects are more secure in their natural orientation. If they are to be looked at outside their natural orientation, then they might need extra support e.g. if a book is to be displayed at an open page, it will need extra support for the spine and covers.
Find objects in your museum and plan how you would handle and move them.

CHAPTER - 07
How to pack museum objects

1) When will I need to pack museum objects?

Museum objects are packed when they are moved or transported and sometimes when they are in storage. In both cases the packing adds a layer of protection from physical damage and from the environment around the object.

2) Do I need special equipment to pack museum objects

Yes. It’s important that packaging does not harm the object. For that reason museum packaging materials are chemically stable and ‘inert’. This means that the materials do not contain any substances that may cause an adverse reaction with objects and damage them. See **Chapter 10**, The Contents of a Basic Preventive Conservation Kit for examples of equipment that will help you to pack objects without damaging them.

3) Are there materials that I should not use when packing museum objects?

Yes. Many materials traditionally used for packing are harmful to museum objects. Do not use:

- **Tissues - they will have been bleached and will contain harmful chlorides**
- **Cotton wool – pieces will come off and may attach to the object**
- **Newspaper – the cheap wood pulp is acidic and will harm objects**
- **Coloured tissue or card – will contain harmful dyes**
- **Cheap cardboard, sweet boxes - the cheap wood pulp is acidic and will harm objects**
- **Plastic holders and envelopes (especially if they smell) – the plasticisers are harmful to objects**
- **Rubber bands – will cut into objects and give off sulphur gases**

4) How do I pack museum objects?

If you are going to pack a museum object you will probably need to handle and move it. Make sure that you have read and understood **Chapter 06,** How to handle and move museum objects before you start to plan your packing.

The same sequence that you learned in **Chapter 06** will apply when you start to pack. The 5 steps in the sequence are:

1.Think | 2.Look | 3.Prepare | 4.Handle | 5.Record

In the **Prepare** stage you will need to prepare materials specifically for packing:

Watch these short YouTube videos:

- *How to Make Tissue Puffs at https://tinyurl.com/y8alj7p3*
- *How to Make Tissue Sausages at https://tinyurl.com/yc6nelvz*

Teaching museum colleagues to use acid free tissue paper for packing.

© British Council. 2019

Using acid free tissue, practice making some tissue puffs and tissue sausages. If you don't have any acid free tissue, you can practice using ordinary tissue paper instead, but don't use it to pack museum objects.

In the **Handle** stage there are several useful techniques for packing which will help to protect objects from damage.

Watch this short YouTube video:

- *How to Pack a Box at https://tinyurl.com/ybvpv79b*

Teaching museum colleagues to pack objects in a box so that the objects are not damaged.

© British Council. 2019.

Looking at the diagram below, use the tissue puffs and sausages that you have made to pack some objects (that are not part of your collection!) in a box. When you shake the box you should not be able to hear the objects moving.

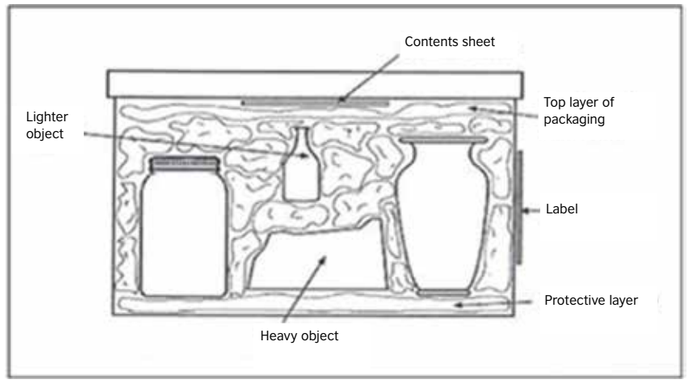

Diagram showing objects packed in a box.
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In the **Record** stage, depending on your reason for packing, you may need to record a new location, or information about the packing technique in your documentation system

CHAPTER - 08

How to clean museum objects

1) When will I need to clean museum objects?

Museum objects are not cleaned in order to restore them to their original condition. Cleaning is a balance between removing dirt so that you can see the object better or so that it is not harmed by the dirt, and preserving the integrity of the object. Preserving integrity is an important consideration when cleaning. In the case of archaeological objects for example, the 'dirt' may contain valuable archaeological evidence, or In the case of a textiles, marks might indicate how an object was worn or used.

Individual objects need to be cleaned with care, paying attention to:

- **The history of the object**
- **The material(s) it is made from**
- **Its physical condition**

The wrong type of cleaning, or too much cleaning, may cause harm.
It might be better to protect the object from further harm than attempt to clean it.
If in doubt, seek advice. If you cannot find anyone to advise you, do not clean the object.

2) Do I need special equipment to clean museum objects?

Yes. It's important that cleaning does not harm the object. See **Chapter 11**, The Contents of a Basic Preventive Conservation Kit, Equipment for cleaning museum objects.

3) How do I clean museum objects?

If you are going to clean a museum object you will need to handle and move it. Make sure that you have read and understood **Chapter 06, How to handle and move museum objects,** before you start to plan your cleaning.

The same sequence that you learned in **Chapter 06** will apply when you start to clean. If the object has already been moved to a space where it can be cleaned, you will still need to take your time and follow the steps. The 5 steps in the sequence are:

1.Think → **2.Look** → **3.Prepare** → **4.Handle** → **5.Record**

In addition, you will need to consider:

- Carrying out a condition check of the object as described in **Chapter 09** of this toolkit. A condition check will probably be carried out when the object has been moved to your working space and will help you to arrive at a decision about appropriate cleaning techniques and, if you decide not to clean, how to care for the object in the future. The condition report should be stored in your museum documentation system.

- If you do not carry out a condition check, you will still need to record the decision you have made about cleaning, or not cleaning, in your museum's record about the object.

Are there objects in your collection that could be cleaned? Identify one object. Identify reasons for cleaning and for not cleaning the object.
If you decide that the object should be cleaned, think through the equipment and help you might need and the techniques you would use.

Watch this short YouTube video:

- *How to clean museum objects using brushes and a vacuum at https://tinyurl.com/ybn7u27d*

If you have a vacuum cleaner with attachment and brushes, practice the cleaning technique demonstrated in the video, using an object that is not part of your museum collection.

CHAPTER - 09

How to check the condition of museum objects

1) What is 'condition checking'?

A condition check is a detailed observation of a museum object resulting in a written report which includes an assessment of the condition of the object. Some condition checks are very detailed, for example if an object is going to be transported a long distance; in this case a detailed report will be prepared which includes a technical assessment. Other checks may not be as detailed. For example, if an object is offered to the museum as a donation, a member of staff might write a short statement about the condition of the object when it arrives at the museum.

Examining the condition of a longyi from National Museum Yangon.

© British Council. 2019.

2) Why do I need to check and record the condition of objects in my museum?

Museums do not have detailed condition records for every object in their collections, however, condition checks are essential if:

- **Your museum is lending an object to another museum**
- **Your museum is borrowing an object from another museum**
- **An object in the care of your museum is of high significance or financial value**
- **The way an object is going to be used places the object under some risk (e.g. if a particularly fragile object is going to be moved to a different location)**
- **Observation of an object has indicated that the object has been damaged or is deteriorating**
- **Your museum is considering cleaning an object**

In cases like these it is important to carry out a condition check to:

- **Create a written record of the condition of the object at a given point in time**
- **Build up a picture over time of changes to the object**
- **Help you make decisions about the use and care of the object**

3) When does my museum need to check on the condition of objects, who carries out the check and what skills do they need?

Events that might trigger a condition check	Why is the condition check carried out?	How is the condition check carried out?	Who carries out the condition check and what skills do they need?
A member of the public brings a puppet to the museum and offers it as a donation.	*If the museum does not want the object for the collection it needs to record the condition of the object on its arrival so that the object can be returned to the owner in the same condition.* *If the museum wants the object for the collection they need to know its condition when it arrived so that they can begin to care for and use the object appropriately.*	*A trained member of staff will record the arrival of the object using the museum's* **object arrival form.** *There should be space on the form to write a brief assessment of the object's composition and condition.*	*A member of staff who has been trained in communicating with the public about possible donations and in using the museum's* **object arrival form.** *This member of staff will have curatorial skills in observation.* *They are usually not highly skilled in preventive conservation but will be skilled enough to spot potential issues about the condition and care of the object.*
A highly significant painting by a local artist has been acquired for the museum collection.	*So that the museum knows the condition of the object when it joined the collection and will be able to:* *• Advise on its care (such as storage, display, handling, packing) in the future* *• Monitor any changes in its condition over time*	*A trained member of staff will make a detailed technical assessment of the object using the museum's* **condition report form.** *Information recorded may include the object's history and previous use, and may come from the museum's records, such as* **catalogue records**, **accession register and object arrival form.**	*A member of staff with curatorial expertise who is trained in observation, preventive conservation and in using the museum's* **condition report form.**
A carved sandstone pillar top is going to be loaned to another museum for a temporary exhibition	*So that the lending museum can:* *• Record the condition of the object at the start of the loan* *• Agree appropriate care for the duration of the loan and during transport with the borrower* *• Assess the condition of the loan on its return to ensure it has not been damaged* *So that the borrowing museum can:* *• Check the object on arrival to make sure it hasn't been damaged in transit* *• Provide the agreed level of care during transport and for the duration of the loan* *• Monitor its condition during the period of the loan*	*At the lending museum a trained member of staff will make a detailed technical assessment of the object using the museum's* **condition report form.** *Information recorded may include the object's history and previous use, and may come from the museum's records, such as* **catalogue records, accession register and object arrival form.** *The* **condition report form** *will include a technical assessment of the condition of the object and recommendations for its care and transport.*	*At both museums: A member of staff with curatorial expertise who is trained in observation, preventive conservation and in using* **condition report forms.**

Events that might trigger a condition check	Why is the condition check carried out?	How is the condition check carried out?	Who carries out the condition check and what skills do they need?
A silk shirt in the collection has been on display for many years. It is dirty and the silk has cracked along folds in the garment. It has been suggested that it should be cleaned and restored because it is a highly significant object.	*In this case the decision to carry out remedial conservation needs to be made after a detailed assessment of the object, and consideration of possible remedial conservation techniques and the risks involved.* *It's important that the history of the object is not removed by cleaning.*	*A trained member of staff will make a detailed technical assessment of the object using the museum's* **condition report form.** *Information recorded may include the object's history and previous use, and may come from the museum's records, such as* **catalogue records, accession register and object arrival form.** *A professional conservator will make a detailed technical assessment of the object and proposed remedial conservation techniques usually in the form of a* **specialist report.** *This report might include testing and analysis, treatment proposal, evidence of past conservation treatments.*	*A member of staff with curatorial expertise who is trained in observation, preventive conservation and in using the museum's* **condition report form.** *AND* *A professional conservator with specialist expertise in textile conservation, usually producing a* **specialist report.** *Remedial conservation is highly skilled requiring specialist skills and equipment. It is carried out by a professional conservator.*

4) How do I carry out a condition check?

THINK

- Why are you carrying out the condition check?
- Who else might need to be involved?
- Will you need specialist equipment? e.g. for viewing or moving
- Does the object need to be quarantined from other objects?
- Are there any health and safety implications?

PREPARE

- Find all your museum's records about the object.
- Prepare the space, including specialist equipment, where you will carry out the check.
- Prepare your museum's condition report form.

LOOK

- Look at the object and think about your technical assessment
- Do you need any advice from anyone else about the object at this point?

RECORD

- Record your technical assessment of the object on your condition report form.
- Make recommendations for the care of the object (these recommendations will be based on why you are carrying out the condition check e.g. if the object is being considered as a loan to another museum, and it is in a good enough condition to be loaned, you will make recommendations about the handling, packing, transport and display of the object.

RETURN

- Return the object to its location if appropriate
- Return all museum records to their locations and update any records, such as the catalogue record, with a cross reference to the condition report
- File the condition report in your documentation system so that it can be found by the number of the object

5) Do I need any special equipment?

Yes, you will need equipment to make sure that you do not damage the object when it is handled and moved.

Look at Equipment for handling and moving museum objects in **Chapter 11**, *The Contents of a Basic Preventive Conservation Kit. Do you have any of this equipment in your museum?*

6) What information do I record in a condition report form?

There are no standard templates for museum condition report forms. Museums make their own forms, and will often have different forms depending on the reasons for the check and the type of collection. For example museums with a large number of artworks in their collections will often have forms that prompt the recorder to collect very detailed information about artworks. There are no 'right' or 'wrong' forms – a condition report form is either suitable for your purposes or not. If it isn't suitable, you can change it.

Look at other museums' condition checking forms on the Internet. If you enter 'museum condition checking form' using a search engine like Google or Firefox you will find many examples.

It's easy to make forms using software like Word. Forms can be printed out and filled in by hand, or completed digitally on a pc or laptop. If you fill in forms digitally make sure that you have a backup routine for your files. Here is an outline for a very basic condition check form:

This is information that is taken from your museum's records. You should include the object number (this is usually the object's accession number) and the object name so that you can link this report to the correct object and other records you may have about it.

This is information about the object from your observation. The fields you include on your form in this section can be expanded, for example for this fragment of a longyi you may want to add a field for the 'dimensions' of the cloth, or add 'dimensions' to the 'notes' field.

This is background information about the assessment. You will need to state why the assessment is being carried out, who made it and when.

This is where you will make your technical assessment of the condition of the object. See **section 7**) below for more about making a technical assessment. You may also want to include photographs or drawings showing the location of damage.

This is where you will make recommendations for the future care of the object based on your technical assessment and the reason for the assessment.

The notes field can be useful if there is more information you want to record and you do not have a field for it. If you find that you always have a large amount of further information stored in 'notes', it may be an indication that you need to design a new form.

[Museum name]

Object Condition Report Form

Field name	Example text
Object number	2019.46
Object name	Longyi
Detailed description	A section of the upper part of a longyi. Dark blue woven wool with a single band of silk chevrons embroidered across the lower edge, and the remains of one tie on the upper right hand corner.
Material (s)	Wool and silk
Completeness	Incomplete. Only a small part of the longyi remains.
Reason for the Condition check	To be moved to new store location [insert old and new store location]
Recorder	[name of person making the assessment]
Date of assessment	[date of the assessment]
Technical assessment	In poor condition and fragile; moth damage at top right hand corner; stitching at waist has frayed; discolouration on centre front edge; abrasion across the centre of the piece is causing instability in the weave.
Display recommendations.	Not suitable for display at present.
Environmental recommendations	Store flat in archival box, support with acid free tissue rolls. Store in textile store
Handling recommendations	Wear gloves. Move flat in a box on on a trolley.
Packing and storage recommendations	Pack and store in acid free box and tissue. Store flat with support to stop movement
Notes	[add any further notes]

7) Making a technical assessment.

Be as thorough as you can be when making your technical assessment. Your aim should be to help someone else see if further damage has occurred after your assessment.

It is helpful to carry out your technical assessment looking for three types of damage:

Biological damage	e.g. damage by pests or mice. This kind of damage will be found particularly on organic objects
Physical damage	e.g. missing parts, scratches, dents
Chemical damage	e.g. corrosion, tarnishing. This kind of damage will be found particularly on inorganic objects

When you are making your assessment, give an indication of where the damage is located on the object e.g:

'Cracked on the rim'
'Corrosion on the surface'
'Insect damage throughout'

Does your museum need to condition check objects? Revisit the reasons for condition checking at the beginning of this chapter. If you decide that you do need to carry out some checks draft a simple condition checking form by following these steps:

- *Start by drafting a simple basic form. As a starting point, use examples from other museums and the outline in section 6 of this chapter. It is up to you how you want to lay out the form.*
- *Test your form and remember you can improve it over time*

CHAPTER - 10

The contents of a basic preventive conservation kit.

Equipment for managing and monitoring pests

Equipment needed	How the equipment helps you to manage and monitor pests	See examples at:
Dinolite digital microscope and software	• Software links your laptop/pc to the Dinolite microscope. You can view evidence of pests on your computer screen and capture images.	https://www.dinolite-uk.com/
Sticky insect traps	• Used to trap crawling insects so that you can monitor their presence	https://tinyurl.com/wg6jr7b
Webbing clothes moth pheromone lure inserts AND AF Demi Diamond traps to house the pheromone lure	• Used to trap moths so that you can monitor their presence	https://tinyurl.com/tq7ln57
Tweezers with a small point size	• For picking up insects, larvae, pupae	https://tinyurl.com/qqcx8yd
Varnish brushes	• For lifting insects off surfaces	Available at art suppliers, see: http://www.winsornewton.com/uk/shop/brushes
Hand torches	• For inspecting objects, catch, insects, surfaces, signs of insects	https://tinyurl.com/rjrmuz7
Hand lens, x 10 magnification	• For inspecting insects, objects	https://tinyurl.com/tx3xol9
Microscope slides	• For mounting insects to inspect them under microscope	https://tinyurl.com/rher4m7
Packs of 30mm plastic coin capsules	• For storing catch, insects, larvae, pupae, frass	https://tinyurl.com/svb4v58
Clip top plastic boxes	• For storing equipment and for building a museum reference library of evidence of insects from your museum (insects/frass/pupae/larvae)	https://tinyurl.com/4o4gxz
Vacuum cleaner	• For removing dead insects, larvae, frass, fluff, dust and dirt. For general cleaning any domestic vacuum can be used. For cleaning objects a vacuum with variable suction attachment is needed.	https://tinyurl.com/wlek5n3 https://tinyurl.com/ufptw3g

Equipment for monitoring and managing light

Equipment needed	How the equipment helps you to manage and monitor light	See examples at:
Universal light meter	• Measures and displays visible light (Lux), UV light (mW/M² or µW/lumen), temperature (°C or °F) and thermal infrared (W/M²). Available as a hand held device for spot monitoring and in a version which has the ability to capture and log data continuously.	https://tinyurl.com/ufxlzs6
Blue Scale Textile Fading Cards	• Blue Scale cards are inexpensive but will need to be replaced after time. They enable spot monitoring for light damage. Each card contains eight samples of blue-dyed wool, each with a different degree of fastness to light. Sample 1 is extremely light sensitive, while sample 8 is the most stable blue dye available. Sample 2 takes twice as long to fade as sample 1, sample 3 takes twice as long as sample 2 etc. The card is cut into strips, and one strip placed in total darkness as a 'control'. Other strips are placed in areas where you want to monitor light damage.	https://tinyurl.com/u39chhu

Equipment for monitoring and managing temperature and relative humidity

Equipment needed	How the equipment helps you to manage and monitor temperature and RH	See examples at:
Tiny Tag logger	• Measuring and recording indoor temperature and humidity. Tiny tag loggers provide continuous monitoring of temperature and RH. Loggers need to remain in one place.	https://tinyurl.com/yx6sch4z
Tiny Tag Starter Pack – software to download and use data from the logger and multiple user licence	• Viewing and using digital data recorded by the Tiny Tag logger. There is a video about setting up and using a tinytag logger at https://tinyurl.com/y8mq92dg	https://tinyurl.com/wkkhjgq
Rotronic Handheld instrument for humidity and temperature	• Measuring and recording indoor temperature and humidity manually. These can be used to take spot readings, and can be used throughout the museum.	https://tinyurl.com/u3l6qyv
Hair thermohygrograph	• Measuring and recording indoor temperature and humidity manually. Thermohygrographs provide continuous monitoring of temperature and RH manually. They need to remain in one place.	https://tinyurl.com/tc9udru
Bamboo skewers	• For making cotton wool swabs to use when labelling and marking or for cleaning	Kitchen shop
Cotton wool, medical grade	• For making cotton wool swabs to use when labelling and marking or for cleaning	https://tinyurl.com/uvsmwrc
Tape measures	• Measuring objects	Haberdashery shop
Silver polishing cloths	• Cleaning silver	https://tinyurl.com/vuolnvm
Metal Trolley	• For moving objects	

Equipment for handling and moving museum objects

Equipment needed	How the equipment protects objects	See examples at:
Gloves	• Gloves should be available in the museum for all activities involving the handling of the collections. Generally museums use nitrile gloves. Cotton gloves are not as easy to use and moisture can come through them on to the object. • Hands leave marks on objects (look at the screen of your phone) which may damage objects e.g. salts on your skin will sit on the surface of glass, stone, wall plaster and metals, and will attract grease and dirt. • Porous materials absorb contaminants from skin and may become marked. Fingernails and rings can scratch objects	https://tinyurl.com/y6y2jmal
Tables	• To prevent damage from dropping the object	Retail outlet
Trolleys	• To prevent dropping and damaging the object • To make it easier to move heavy objects	https://tinyurl.com/tkdk3mb
Support and protection for the object – boxes and acid free tissue (puffs and sausages)	• To prevent damage when moving objects • To provide extra protection to the object	https://tinyurl.com/st2aofa

Equipment for packing museum objects

Equipment needed	How the equipment protects objects	See examples at:
Unbuffered acid free tissue and card	• Tissue is used to support and add protective layers inside boxes. • Boxes give rigidity and add a further layer of protection • In acid free tissue and card all acidity in neutralised during manufacture and the tissue/card will be able to absorb external pollution. Over time, as the tissue absorbs pollution it will yellow and will need to be changed. Avoid tissue advertised as 'conservation grade' , look for the term 'unbuffered'.	https://tinyurl.com/vxrf9pb
Tyvek	• Adds an impermeable (i.e. unbreathable) protective layer around the object • Tyvek is a stable inert polyethylene plastic, bought in rolls. It can be wiped, washed by hand and sewn. Insects can't usually eat through it, impermeable to dust, so good for dirty environments. Can be made into bags for objects.	https://tinyurl.com/qkkb29u
Unbleached calico	• Adds a permeable (i.e. breathable) protective layer around the object • Easily obtained and inexpensive. Can be used to make bags for objects. Not generally eaten by insects.	Available from textile suppliers
Cotton tying tape	• An inert material that will not damage the object • Labelling objects and packing objects • Easily obtained, inexpensive and better than using string. Not generally eaten by insects. Used for tying, packing, and labelling objects.	https://tinyurl.com/qovzuqr

Equipment needed	How the equipment protects objects	See examples at:
Plastazote foam	• Plastazote is polyethylene made into a foam. Easy to cut and washable. Mainly used to package objects for transport. Do not use ordinary household foam instead, it emits harmful gases and will damage objects. Plastazote foam cannot be recycled. It will not decay in landfill. It can be re-used by shredding it into chips and using it as packing support inside boxes. • Gives support and protection to objects inside a box.	https://tinyurl.com/twwto7t
Polyester film like Mylar, Melinex and Secol	• These are plastics where the harmful plasticisers have been extracted. Usually bought in envelope form and used for handling photographs, flat paper objects. It is expensive and it is cheaper to store objects like photographs in boxes interleaved by acid free tissue. • Adds an impermeable (i.e. unbreathable) protective layer around the object	https://tinyurl.com/uln3yqe

Equipment for cleaning museum objects

Equipment needed	How the equipment protects objects	See examples at:
Brushes	• If used correctly will clean objects without damaging them. • Most museums aim to have a range of brushes for cleaning different types of objects, so that you don't cross contaminate from one object to another. Brushes look like artist's brushes but are usually conservation brushes of hogs hair and pony hair. • Generally soft brushes are used for gilded materials; firmer brushes for metals. Write the material for each brush on the wooden handle – glass, metal, wooden furniture, sculpture etc. • Tape around the metal section at the top of the brush, that holds the bristle, so that the metal doesn't scratch objects during cleaning.	Available at art suppliers, see: http://www.winsornewton.com/uk/shop/brushes
Vacuum cleaner and attachment	• Removing dust when cleaning objects with brushes, surface cleaning. If used correctly will clean objects without damaging them. • Used to vacuum away dust as it is gently flicked off the object with a brush. Special low suction vacuum cleaners for conservation are available, but if you have a domestic hoover you can buy an attachment which controls the suction strength.	https://tinyurl.com/wlek5n3 https://tinyurl.com/ufptw3g
Smoke sponge	• If used correctly will clean objects without damaging them. • Highly absorbent inert sponge used for cleaning the surface of paper, manuscripts and wood. Bought in blocks which are cut into small cubes about 2 cms across.	https://tinyurl.com/smw3t4w
Masks	• To protect yourself from particulates like mould spores when working with objects. Masks are disposable, however you can keep using them until you see dirt appearing on the inside of the mask.	https://tinyurl.com/u67mvg6
Hand torches	• Inspecting objects, insects, surfaces	https://tinyurl.com/rjrmuz7

CHAPTER - 11
Technical glossary

Absolute Humidity
The amount of water vapour contained in a quantity of air measured as a weight / volume

Agents of deterioration
A term used to describe the ten primary threats to museum objects. The ten agents of deterioration are: physical forces, thieves and vandals, fire, water, pests, pollutants, light, incorrect temperature, incorrect relative humidity, disassociation.

Calibrate
An activity where the accuracy of an instrument, such as a hygrometer is compared to a standard to determine the accuracy of the instrument. Calibration is sometimes, but not always, followed by adjustment to the instrument.

Collections Care
All conservation, preservation, training and management activities that contribute to the wellbeing of museum collections.

Collections care action plan
A plan to improve a museum's collection care activities, including environmental monitoring and control, pest management, cleaning stores and displays and inspecting the collections.

Collections management
The term used to describe the policies, procedures and plans used by museums when they look after their collections and collections information, and provide services using the collections to the public.

Condition survey
A condition survey is the planned and methodical assessment of the condition of a collection or part of a collection.

Condition report
A condition report is the planned and methodical assessment of the condition of a single object.

Conservator
A conservator is a professional with a recognised qualification and experience in conservation of museum collections.

Conservation
A term used to describe the measures and actions aimed at safeguarding museum collections while ensuring their accessibility to present and future generations. The term 'conservation' includes preventive conservation, remedial conservation and restoration. Conservation measures and actions should respect the significance and physical properties of the object being conserved.

Conservation grade materials
Materials that are chemically inert or acid free, and will not cause damage when used with museum objects. Conservation grade materials are used for packing, storing and transporting collections.

Context
The 'context' of an object is a term used to describe the circumstances impacting on an object which contribute to the understanding of the object, for example its location, significance, history and current use.

Consolidation
'Consolidation' of an object describes the improvement of its condition or stability usually by the addition of a material.

Corrosion
'Corrosion' is a chemical degradation process normally used to describe metal decay.
For example, the term 'rust' is used to describe chemical degradation in iron and 'bronze disease' for degradation in copper alloys.

Deformation
'Deformation' describes changes in an object's shape or form due to the application of force.

Delamination
Separation into layers

Deterioration
'Deterioration' is a term used to describe a process where the physical characteristics of an object are lost through actions or failure to take action.

Embrittlement
The process of a material becoming more vulnerable to physical damage normally caused by chemical decay such as cross linking.

Emergency preparedness
A term used to describe the procedures and plans put in place to mitigate the impact and like lihood of a sudden and unexpected event (such as fire or flood) that might damage all or part of the collection. 'Emergency preparedness' is often described as having four components: prevention, preparation, response and recovery.

Environmental control
The control of environmental factors such as light, temperature, relative humidity and pollutants to create stable conditions for collections.

Environmental monitoring
The measurement and recording of levels of environmental factors such as light, temperature, relative humidity and pollutants to inform environmental control activities.

Environmental plan
A planned and agreed series of measures to manage the environmental conditions to achieve a desired goal.

Ethics
'Ethics' are moral principles that govern behaviour, usually set out in formal codes by professional bodies. For example, the ICOM Code of Ethics sets out professional standards and encourages the recognition of values shared by the international museum community.

Frass
The fine powdery refuse produced by activity of insects feeding.

Friable
A term used to describe a material that is easily crumbled.

Housekeeping
The planned and monitored practice of reducing threats to collections from pollutants and insect pests. 'Housekeeping' normally involves the regular cleaning of internal spaces such as display areas and stores using specialist equipment and the installation of preventive measures such as insect traps.

Inert
A term used to describe a material which is chemically stable ('inert') and does not cause adverse reaction when used with museum objects. For example, museums may use acid free tissue to pack museum objects; the tissue will not cause damage to the object because it is 'inert'.

Infestation
A term used to describe the presence of pests in the collection.

Inorganic
A material such as glass, metal, or stone formed from something that was never alive.

Insect trap
An inexpensive sticky trap to capture insects so that museums can monitor the type and number of insects in museum buildings.

Instability
A term used to describe an object which is prone to deterioration because of its materials or condition.

Integrated Pest Management Programme (IPM)
A term used to describe the monitoring of pest and environmental information combined with pest control methods to prevent pest damage to collections and cultural heritage.

Interventive
A term used to describe any action carried out on an object.

Isolation or Quarantine.
Terms used to describe keeping objects separate from the main collection for a period of time after they enter the museum. Objects are isolated or quarantined in a separate room or container until they have been examined and found to be free of pest infestation, dampness or mould.

Light
Light is a source of illumination, it may be natural (like the sun) or artificial (like a lamp). Light which can be seen by the naked eye is termed 'visible light' and light which cannot be seen by the naked eye is termed 'invisible light'.
All light causes fading and deterioration to organic materials but some sources of light (such as the sun and some artificial lights) emit an invisible light called ultraviolet light which is very harmful to museum objects. Light in museums is normally measured in 'lux' by a light meter

Light dosage
Light damage to objects is cumulative; the longer you leave an object exposed to light, the more the light will damage the object. 'Light dosage' is a term used to describe the exposure of an object to light over time and is measured in lux and hours; light dosage = number of lux x number of hours. Museums aim to limit light damage to objects by reducing light intensity [lux] and/or the duration of exposure. For example, a painting exposed to 50 lux for 100 hours will experience the same damage as if it was exposed to 100 lux for 50 hours.

Lux
'Lux' is the term used to measure of the intensity of light on a surface. For example, 100 lux might be bright enough for a stairway but more than 500 lux will be needed in an area where intricate design work is being carried out.

Moisture content
The term used to describe the amount of water within organic material. Water can be found in the substrate of the material of an object; removal of water can lead to physical and chemical changes and damage. High moisture content will lead to swelling and encourage biological decay of the object.

Minimal intervention
A term used to describe the least amount of intervention needed to deliver a conservation goal.

Organic
A material such as wood, paper, silk or ivory formed from something that was once alive.

Patina
A stable (or passivating) corrosion layer that forms on a metal surface normally associated with a desirable aesthetic.

Pests
A term used to describe birds, rodents, insects, moulds and bacteria which eat or soil objects, or leave detritus which could attract other pests. Insects are particularly dangerous to museum collections; common museum pests include wood borers, such as powder post beetle [lyctus and bostrychids] and other species, webbing clothes moth [Tineola bisselliella], silverfish [Lepisma], carpet beetle [Anthrenus] and biscuit beetle [Stegobium paniceum].

Polymer
A large molecule composted of many repeated subunits. Most coatings and consolidants used in conservation are polymers.

Pollutants
Pollutants are gases and particles in the atmosphere which can damage objects. Pollutants may come from external sources such as vehicle exhausts and industry or from sources within the museum such as dust and materials used for storage or display.

Preservation
A term used by some practitioners to mean preventive conservation and the word 'conservation' is used exclusively to refer to interventive work. This is not the accepted definition but is moderately common in use.

Preventive conservation
All actions aimed at avoiding and minimizing future deterioration of museum objects.
Preventative conservation is carried out within the object's context or on the surroundings of an object, or group of objects, whatever their age and condition. 'Preventative conservation' is 'indirect', it does not interfere with the materials and structures of the object or modify its appearance.

Psychrometric Chart
A chart which presents the properties of moist air allowing modelling of the relationship between air temperature and moisture.

Regularly
A term used to describe how often an activity takes place, for example, 'buildings are inspected regularly'. The frequency of activities will vary depending on various factors; vulnerable or sensitive objects might be inspected more frequently than stable objects.

Relative humidity (RH)
Relative humidity is a term used to describe the amount of moisture (water vapour) in the air, relative to the capacity of the air to hold water at a specific temperature. If no water is added to the air as the temperature rises, relative humidity falls, because warm air has the potential to hold more moisture. Relative humidity is expressed as a percentage. For example, 50% RH indicates that the air is holding half the amount of water vapour it could hold.

Remedial conservation
'Remedial conservation' describes all actions directly applied to an object or a group of objects aimed at stopping current damaging forces or reinforcing the structure of the object(s). Remedial conservation actions are only carried out when the objects are in such a fragile condition or deteriorating at such a rate, that they could be lost in a relatively short time. These actions sometimes modify the appearance of the objects.

Restoration
All actions directly applied to a single and stable object aimed at facilitating its appreciation, understanding and use. Restoration is based on respect for the original material and is only carried out when the object has lost part of its significance or function through past alteration or deterioration. It will often modify the appearance of the object. Restoration should only be undertaken with caution as there is a danger of destroying evidence about the past contained in the object.

Reversibility
Describes the extent to which a conservation activity can be undone. Professionals must balance the impact of reversing the treatment with maintaining the integrity of the object.

Risk
The likelihood of exposure of an object or collection to an agent of deterioration and the scale of the subsequent impact on the object.

Risk Assessment
An activity which quantifies risks to collections. A risk assessment is normally made in terms of the agents of deterioration.

Risk management
The plans and policies used to manage the risks to a collection, by reducing the likelihood or impact of the risks. Risk management is often described as having four components: treat, terminate, tolerate and transfer.

Sensitivity
A term applied to an object, when, due to the materials it is made from or its condition, it is likely that the object will deteriorate as a result of exposure to external conditions. For example, an iron object might be sensitive to moisture in the atmosphere and begin to corrode.

Significance
A term used to describe the values and meanings that objects and collections have for people and communities.

Temperature
Temperature has an impact on museum objects; it affects relative humidity, accelerates chemical decay, softens plastics and encourages the breeding of pests. Conservation activities aim to manage temperature to reduce its negative effect on objects.

Termites (Isoptera)
Termites are soft bodied insects that live in large colonies typically within a mound of cemented earth. There are three main types of termites: subterranean, dampwood termites and drywood termites. Subterranean termites live in contact with soil and drywood termites feed on wood. Both can be highly damaging to museum collections.

Tg or Glass transition temperature
The temperature at which a polymer changes from a brittle or glassy state to rubbery and more flexible one.

Ultraviolet light (UV)
Ultraviolet light is found in sunlight and some artificial light; it is very damaging to museum objects. As human beings do not need UV light to see objects it is usually eliminated from museums, for example by using blinds to screen out sunlight.

Vulnerability
An object is described as 'vulnerable' when it is susceptible to damage due to the materials from which it is made, its condition, history or current context. For example, a wooden table leg with a crack in it might be vulnerable to poor handling and may break if picked up incorrectly or a religious icon may be vulnerable to a politically motivated attack.

Warping
A term used to describe a characteristic of an object when it has bent or twisted out of shape in more than one dimension. Warping normally follows the application of an external force such as inappropriate levels of Relative Humidity.

This glossary has been compiled from the following sources:

Benchmarks in Collections Care
http://collectionstrust.org.uk/resource/benchmarks-in-collections-care-2-0/

CEN-EN 15898, Conservation of Cultural Property, Main general terms and definitions
CCI website
https://www.canada.ca/en/conservation-institute/services/agents-deterioration.html

ICOM CC
http://www.icom-cc.org/242/about/terminology-for-conservation/#.WpPSiufLg2w

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International Museum Academy Myanmar

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