Section 4
Ergonomics Made Simple

After completing this section, the learner will be able to:

- Give examples of ergonomic risk in a familiar work or learning environment.

Ergonomics made simple

Vocabulary

Look up explanations for the keywords below.

animate	**categories**	**eliminated**	**ergonomics**
efficient	**equipment**	**inanimate**	**manual handling**
obscure	**pivot**	**posture**	**principles**
reduced	**safe lifting**	**storage box**	**balance**

Ergonomics made simple

In this section of the manual, the following topics will be discussed-

- ✓ What is ergonomics?
- ✓ Manual handling

What is ergonomics?

Workplace ergonomics is the 'study of work.' It involves studying all the factors involved in the workplace in order to reduce any **physical or mental stress** for employees.

Workplace ergonomics helps to increase the level of employee comfort. It is a set of ideas on how to design tasks, tools and equipment to allow for comfort and safety.

Ergonomics are divided into two categories:

- ✓ Physical aspects of work (*postures and equipment*)
- ✓ Logical aspects *(decision-making and stress handling)*

The core principles of ergonomics are:

- ✓ Plan and always complete a risk assessment before work begins
- ✓ Avoid over-stretching joints (*for example, elbows*)
- ✓ Limit the weight of any load that requires lifting
- ✓ Avoid repetitive bending and twisting of the upper body
- ✓ Vary your posture as often as you can
- ✓ Avoid over-reaching or working above shoulder height
- ✓ Keep loads close to your body when lifting
- ✓ Ask for training in manual handling techniques

Activity

The following images show a workplace scenario **before** and **after** ergonomic improvements were made. Explain how the work system has been improved in the lower image by applying the principles of ergonomics.

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Manual handling

Manual handling is an example of an ergonomic risk familiar in all work places.

Accidents associated with manual handling account for 33% of accidents reported to the HSA.

Manual handling involves using the human body to:

- ✓ lift, lower, fill, empty, or carry loads (*which can be inanimate or animate*)
- ✓ climb, push, pull and pivot

All of these activities pose the risk of injury to the back.

Loads can cause injury because of weight. However, they may also cause injury for the reasons listed in this table.

Load Description	Details
Too large	If the load is large, it is not possible to follow the basic rules for lifting and carrying.
Difficult to grasp	If a load is difficult to grasp, the object can more easily slip and cause an accident. Also, loads with sharp edges or with dangerous materials can injure workers.
Unbalanced or unstable	Unbalanced or unstable loads lead to fatigue and uneven loading of muscles. This is because the object's centre of gravity is not in the middle of the worker's body.
Difficult to reach	Reaching with outstretched arms, or bending or twisting the trunk takes greater muscular force. This increases the risk of injury.
Shape or size that obscures the worker's view	If the load is shaped or sized in a way that obscures the worker's view, the possibility of slipping/tripping, falling or colliding with something is increased.

Reducing manual handling risk

Manual handling injuries occur in most industrial sectors including manufacturing and warehouses, retail, construction, agriculture and the health care sector.

Where possible the risks from manual handling should be eliminated or reduced through the following.

- ✓ Using lifting aids
- ✓ Reducing the load
- ✓ Sharing the load
- ✓ Providing training in ergonomic lifting techniques
- ✓ Using the principles of safe lifting

Activity

Research the HSA website to find the recommended maximum lifting weights for men and women. Make some notes here.

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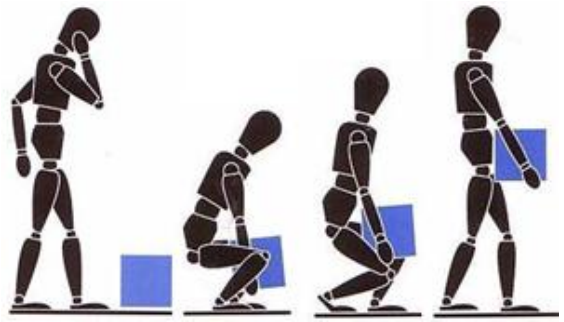
Principles of safe lifting



Safe lifting is very important in workplace safety. The principles of safe lifting are as follows. They can be divided into four key stages:

1. Think and plan
2. Stand with good posture
3. Keep a good grip
4. Move carefully

Stage	Principles
1. Think and plan	✓ Clear the area of obstacles ✓ Give yourself plenty of room ✓ Consider the weight and shape of the load
2. Stand with good posture	✓ Keep your feet hip-distance apart ✓ Stand with feet in direction of where you are going ✓ Place your feet firmly on the floor ✓ Bend your knees, not your back ✓ Grip firmly using palm of your hand
3. Keep a good grip	✓ Keep close to the load, arms in line ✓ Keep the load close to your centre of gravity
4. Move carefully	✓ Move slowly and steadily

Example
Mack works in a parcel depot. A lot of his time is spent moving packages from the floor onto tables or a conveyor belt. He is about to lift some boxes. Follow his steps.

He stops and thinks first. ***Always plan*** *your lifts. Where is the load going to be placed? Will you need help? Remove obstructions such as discarded wrapping materials.* ***Never*** *lift or handle more than you can manage safely.* ***If in doubt****, seek advice or get help.*

He starts his lift with a good posture. His feet are slightly apart with one leg slightly forward to maintain his balance. His back, hips and knees are bent but he takes care not to stoop. You ***must always avoid*** *twisting your back or leaning sideways, especially while the back is bent. Turning by moving the feet is better than twisting and lifting at the same time.*

Move smoothly. The load should ***not be jerked*** *as this can make it harder to keep control and can increase the risk of injury. Mack keeps the load close to his body whilst carrying it. A good secure hold is very important but don't grip too tightly.* ***He keeps*** *his head up and looks ahead not down at the load, once he has a secure hold.*

Finally, Mack puts the parcel down. His shoulders are level and facing in the same direction as his hips. Once the load is down he makes slight adjustments and slides it into the desired position.

Activity

Look at this image and discuss the following questions.

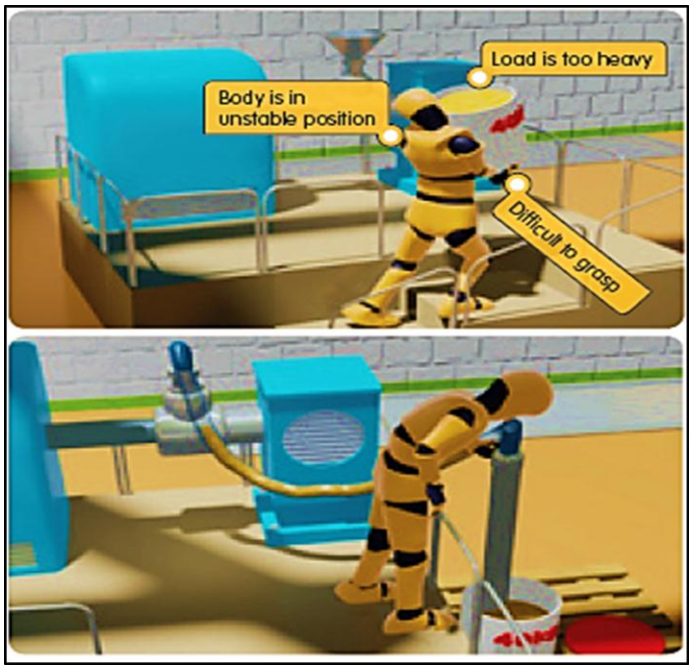
1. What is happening here?
2. Is the instruction given correctly?
3. Comment on the other health and safety matters that you notice in this picture.
4. Do you consider the warehouse to be a safe working environment?
5. List the hazards and risk of injury in such a workplace

Activity

Go to www.hsa.ie. Watch the Manual Handling Risk Assessment Case Study videos. They illustrate good task-specific manual handling approaches.

Activity

The following images show a workplace scenario **before** and **after** workplace improvements were made. Explain how the work system has been improved in the lower image by applying the principles of safe manual handling.



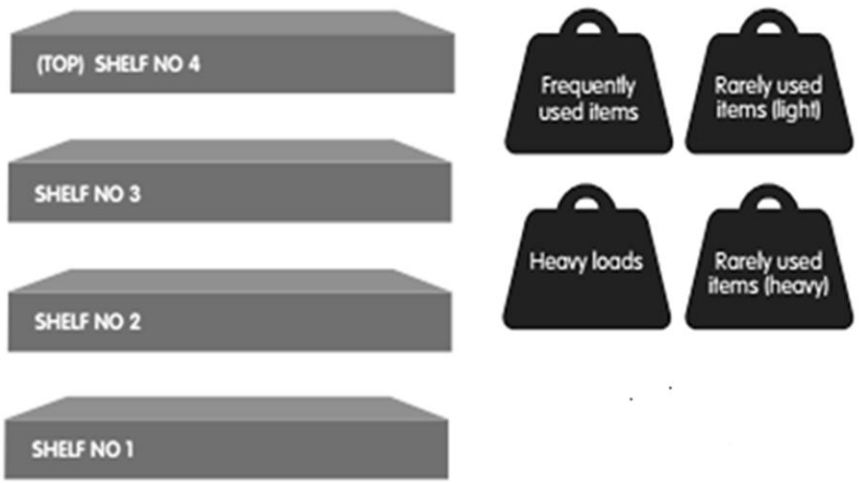
Activity

Source an awkward load (*not a heavy one*) in your workplace. Nominate four volunteers from the group to demonstrate the safest way of picking up the load and carrying it a distance around the room.

See how each volunteer lifts and carries the load. Are they efficient and safe?

Activity

This shelving unit in a storage area consists of four shelves. The unit reaches eight feet from floor level. Decide where the following categories of storage boxes should be placed. Draw lines to match them correctly.



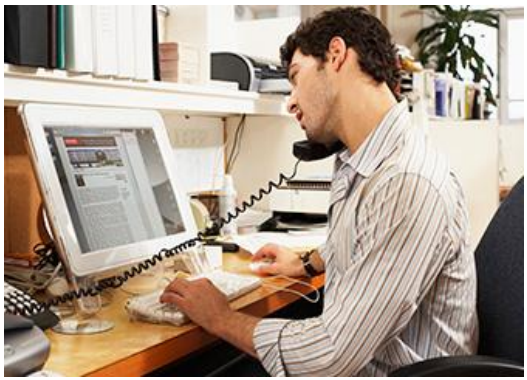
Manual handling tip!

The question in your mind should not be 'How do I lift this?'

It should be, 'Do I need to lift this? Is there another way of doing this work?'

For examples on manual handling go to www.hsa.ie and search for 'manual handling case studies'.

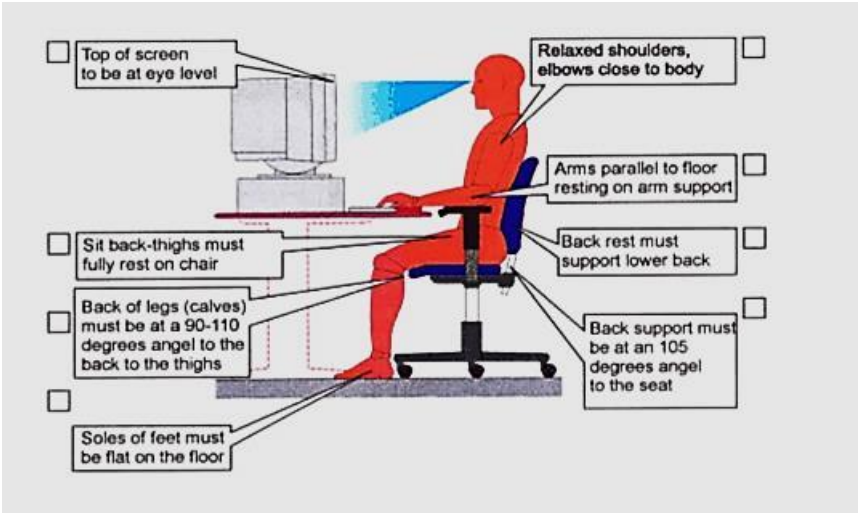
Office ergonomics



Almost every workplace has a computer workstation. In addtion, many jobs now require long hours at computers. Employees can experience significant long-term damage if their workstations are not well designed. Common problems include eye strain, shoulder, back and neck pain or damage, and arm or wrist pain or damage.

Employers are required to actively assess health and safety at workstations. They should pay particular attention to eyesight, physical difficulties and mental stress.

This diagram illustrates good ergonomics at a computer workstation.



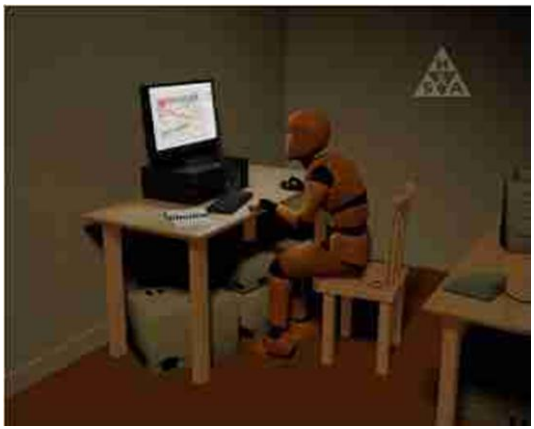
How should you carry out a workstation analysis or risk assessment?
Employers need to carry out an analysis of individual workstations. A competent person with the necessary skills, training and experience must complete this analysis.

There are four stages in the risk assessment process.

Stage	Details
Stage 1	*Initial consultation with the employee* ✓ Consult with the employee at the workstation and collect information on the main tasks completed at the workstation ✓ It is important to provide the employee with an opportunity to comment during the course of the assessment
Stage 2	*Observation of the employee working at the computer workstation* ✓ Observe the employee working at the workstation and record whether the workstation meets the minimum requirements
Stage 3	*Identify the issues that need to be addressed* ✓ Detail the issues to be addressed on the risk assessment form
Stage 4	*Review the implementation of the action plan* ✓ Revisit the workstation if there were issues to be addressed ✓ Consult with the employee and observe whether the issues have been addressed ✓ When everything is satisfactory, you and the employee should sign off on the risk assessment document

Activity

What does a suitable workstation look like? Compare the two pictures below. Indicate which workstation is correctly set up. List all the adjustments that were made.



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Ergonomics made simple - Worksheet 1 – Body injuries

Which parts of the body are most likely to receive injury from the following activities? Fill in the table.

Activity	Parts of the body at risk
Over- reaching for a box stacked high in a warehouse	
Carrying a load downstairs	
Working in a busy kitchen	
Driving a forklift truck	
Standing on a busy production line	
Replacing windows in a large office block	
Working as a caretaker in a school	

Ergonomics made simple - Worksheet 2 – Safe lifting

1. Fill in the missing words in the sentences below using the words in the box.

weight	knees	centre	area	shape	firmly
room	close	palms	direction	feet	

1. Clear the _____ of obstacles.
2. Give yourself plenty of _____.
3. Consider the _____and _____ of the load.
4. Keep your _____hip-distance apart.
5. Stand with feet in _____ of where you are going.
6. Place your feet _____on the floor.
7. Bend your _____ not your back.
8. Grip firmly using _____of your hand.
9. Keep _____ to the load, arms in line.
10. Keep the load close to your _____of gravity.

2. List the hazards involved in working in a busy catering kitchen.

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Ergonomics made simple - Worksheet 3 – Word search

Find the 11 words listed in this word search.

a	n	i	m	a	t	e	s	t	m	r	g	q	b
n	h	f	d	h	c	m	a	n	u	a	l	l	j
j	m	o	p	o	s	t	u	r	e	c	a	x	n
e	a	m	s	e	i	r	o	g	e	t	a	c	b
q	e	k	l	w	h	t	f	t	g	r	s	m	i
u	r	k	m	x	t	v	t	d	m	j	c	y	i
i	u	o	v	r	f	f	o	g	a	w	i	a	e
p	z	s	m	j	e	w	a	j	q	g	m	r	f
m	s	e	l	p	i	c	n	i	r	p	o	e	d
e	f	r	d	e	c	u	d	e	r	x	n	u	x
n	i	p	x	w	o	r	v	o	y	f	o	c	a
t	l	b	o	p	i	v	o	t	a	q	g	d	s
h	o	g	n	i	l	d	n	a	h	j	r	w	u
d	e	t	a	n	i	m	i	l	e	n	e	w	p

ergonomics
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