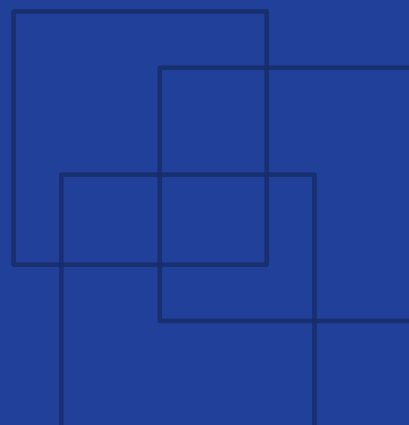




International  
Labour  
Organization

# Better ergonomics

Working conditions



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First published 2019

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ISBN: 9789220327173 (web pdf)

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Printed in Thailand

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# Factory Improvement Toolset

The Factory Improvement Toolset (FIT) is an innovative self-facilitated, activity-based learning approach designed by the International Labour Organization (ILO) to create more decent and sustainable employment. FIT supports manufacturers in global supply chains to improve productivity, competitiveness and working conditions by upgrading production systems and factory practices.

FIT has been developed to be a sustainable, time- and cost-efficient option for supporting factories to enhance productivity through improved business practices and working conditions. FIT focuses on areas of production improvement and actions to be taken specific to each participating factory. It can be utilized as stand-alone learning tools or to complement other training programmes.

With each module lasting no more than 2.5 hours, FIT enables factories to train personnel, whilst minimizing interference with production realities. The easy-to-use methodology makes it possible to rapidly scale the implementation to reach a large cohort of trainees across multiple production facilities.

Working in small groups, participants review real-life situations and engage in discussions to determine improvements to be made in factory without an external trainer or specialist. This self-facilitated, activity-based and highly participatory learning approach positions participants as both student and teacher and makes the toolset self-tailored to the needs and interests of each group.

## About this module

This FIT module on Better ergonomics is a training for garment manufacturers to improve working conditions in the factory. Participants will work on the topics of workstation design, factory lighting and lifting techniques. This module takes about 2 hours to complete.

## Upon completion of the training, participants should have:

- Understood the meaning and importance of ergonomics in their factory.
- Learnt good practices in terms of workstation design, factory lighting and lifting techniques.
- Identified how and where to apply good practices in order to improve ergonomics.

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The **Factory Improvement Toolset** of the **International Labour Organization (ILO)** are developed and provided by the ILO's **Enterprises Department**.

**Authors:** Alix Machiels, Sara Andersson, Charles Bodwell.

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# Guidelines for successfully using the training tool

## Read out-loud

The FIT tool is designed for participants to take turns reading the instructions in the modules out loud to the group. At least one member of the group should be selected in the beginning of the session to take this responsibility.

## Work as a group

Always work in groups of 5-7 during a FIT session. The programme will not be successful if participants work independently or do not collaborate with each other.

## Be active

Encourage everyone in the group to actively contribute to the discussion. Ensure that no group member dominates the discussion or does not participate at all.

## Monitor the time

Select one member of the group to monitor the time for each activity and remind the group when it is time to move to the next exercise.

## Complete the action plan

Complete the action plan at the end of the session. This will help ensure that FIT results in improvements in the factory. Review the plan a while after the session to make sure that actions in the plan has been completed accordingly.

# Icons

A set of icons is used throughout the modules to provide easy to recognize reference points for different tasks within each session and activity.



## Read out loud

One member of the group should read out loud to the rest of group.



## Knowledge link

Knowledge and skills are linked to other FIT learning resources and support.



## Time allotted

Indicates how much time each sessions and activity should take.



## Supplies needed

Indicates that supplies may be necessary to complete the session.



## Begin step-by-step instructions

Indicates that the step-by-step instructions for an activity are beginning.



## Think about it

Indicates additional information for the participants to think about.

# Measuring your performance

Measuring operational efficiency is a key aspect of running a productive factory. The box(es) below guides you in understanding which measurement indicator(s) can be used to measure and evaluate the performance of your factory in relation to the topic of this FIT module.

<b>Indicator 1</b>	<b>Workers' perception of health &amp; safety in the factory</b>
<b>Definition</b>	Your workers' opinion on the level of safety and health (how safe and healthy they feel) in the factory.
<b>Purpose</b>	To understand your workers' opinion and situation, and identify what can be done to improve health and safety in your factory.
<b>Calculation</b>	Have your workers fill out the simple online survey (provided by the ILO – ask your FIT focal point for more information), and consult the results. Don't forget that surveys should be anonymous!
<b>Frequency</b>	Calculate every 6 months, or once a year.
<b>Responsible</b>	HR manager / OSH manager

<b>Indicator 2</b>	<b>Turnover rate (%)</b>
<b>Definition</b>	The amount of employees who leave the factory over a period of time and must be replaced, as a percentage of the total amount of employees.
<b>Purpose</b>	To understand how high your turnover rate is, set a turnover reduction target, and identify solutions to reduce turnover in your factory.
<b>Calculation</b>	$\left( \frac{\text{\# of employees who left and must be replaced}}{\text{average \# of employees}} \right) \times 100\%$ <p>Note:  <math display="block">\text{Average \# of employees} = \frac{\text{\# of employees at the start of the time period} + \text{\# of employees at the end of the time period}}{2}</math></p>
<b>Frequency</b>	Calculate monthly.
<b>Responsible</b>	HR manager





Session 1

# Business case study

## Goals

**Preparing you for the type of discussions you will have with other group members throughout the learning module and understanding the benefits of being exposed to different perspectives.**

**Understanding better why ensuring good ergonomics is important in the factory.**

# Session 1

## Overview



One member should read the full session out loud to the rest of group



15 minutes



Learning manual, pens, markers and poster paper

A business case study presents a real-life situation for learners to reflect on and discuss with other group members. By discussing the case, students learn from others' ideas and perspectives, and develop an understanding of the topic at hand within the workplace.



One group member reads the case study out loud



The whole group discusses the case study



Everyone develops a deeper understanding of the topic

# Activities

Activity

1



15 minutes

## Case study review and respond

The case study below presents a situation that could happen in real life.



### Instructions:

- 1) As a group, listen to one member read the case study below while following along in your learning module.

Rani is a new factory manager at the HS garment factory. She notices that the sewing room is quite dark. Operators sit on hard wooden benches that are too high for the table height. They need to bend down to use the machine and see the needle point clearly. As a result, many operators complain of eye fatigue, back strain, neck pain and headaches. These health problems force many workers to quit or to be transferred to other units. It also impacts sewing quality, as workers make more mistakes and lack precision due to bad sitting posture or eye strain.

To solve these issues, Rani consults workers and supervisors in the sewing room, then makes several low-cost changes to sewing workstations. Benches are replaced by cushioned stools with sturdy back support. Stools are adjusted so that tables are at elbow height. Shorter workers can ask for a portable foot rest. Small local lights directed towards needle points are added to each sewing machine. Some roof panels are replaced by translucent panels to allow natural light in. Every two hours, everyone practices stretching exercises for five minutes.

Thanks to these changes, workers no longer complain of neck, back and eye strain. They are more focused, work faster and more accurately. As a result, turnover is lowered, and work efficiency and quality improve.

- 2) Together, discuss Rani's situation by answering the three questions in table 1 on the next page.

**Table 1. Questions about Rani's situation**

1. What problems has Rani identified? What impact do these problems have on the factory and its workers?

2. What does Rani do or change in order to solve these problems?

3. What are the results of Rani's solutions for the factory and its workers?

This page has been intentionally left blank and can be used for note taking.



## Session 2

# Learning about the topic

### Goals

**Understanding the meaning, importance and benefits of having good ergonomics in your factory.**

**Learning how to improve workstation design and the consequences of bad design for workers and the factory.**

**Discussing factory lighting and identifying low-cost improvements to avoid eye strain and increase accuracy.**

**Learning about good lifting techniques and identifying ways to avoid or minimize manual lifting.**

# Session 2

## Overview



One member should read the full session out loud to the rest of group



90 minutes



Learning manual, pens, and markers

This training module aims to help you improve working conditions by improving ergonomics in your factory. Ergonomics refers to the position of workers when they work, and how they use tools and equipment in the factory. Bad ergonomics is a major source of illness and injury at work. Good ergonomics helps protect your workers' health and it also helps improve efficiency and quality in the factory. Throughout this module, you will work on the three topics below.

Improving  
**workstation design**

Improving  
**factory lighting**

Improving  
**lifting techniques**

First, you will learn more about the importance of good ergonomics for workers and the factory. Then, you will learn how to improve workstation design, factory lighting and lifting techniques in your factory, in order to protect workers from strain and injuries and increase work efficiency.



# Activities

Activity

## 2a



25 minutes

## What is ergonomics?

With **good ergonomics**, workers are able to work, sit, stand and use equipment in a way that protects them from injury and makes their work faster and more efficient. Ergonomics is important for both health and productivity. In this activity, you will discuss the importance and benefits of ergonomics for workers and the factory.



### Instructions:

- 1) Together, discuss: Do you think ergonomics is important for your factory to think about? Why, or why not?
- 2) Together, look at table 2, then discuss: Which image shows good ergonomics, which image shows bad ergonomics – and why? Indicate your answer by circling (✓) or (X) next to each image. Solutions are at the bottom of the page.
- 3) Together, for each (X) image, discuss:
  - What could be the consequences for the worker's health? Think about eyesight, back and neck strain, fatigue, etc.
  - What could be the consequences for work efficiency or quality? Think about speed, lighting, accuracy, etc.
- 4) Together, work through the self-assessment in table 3 to identify what your factory could do to improve ergonomics. Discuss and summarize key improvements that could be made in your factory.



**Ergonomics** concerns everyone in your factory. Therefore, workers and their representatives should be consulted and participate actively in improving ergonomics. They may have noticed things that are not immediately obvious to supervisors or managers!

Table 2. Good or bad ergonomics?

1.  
(✓)  
(X)



2.  
(✓)  
(X)



3.  
(✓)  
(X)



4.  
(✓)  
(X)



5.  
(✓)  
(X)



6.  
(✓)  
(X)



Solutions: 1. X, 2. ✓, 3. ✓, 4. X, 5. ✓, 6. X

**Table 3. Self-assessment**

Questions	Response	
1. Are equipment, tools and materials within easy reach of workers?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2. Does the height of equipment or work surfaces allow for avoiding bending postures or high hand position?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
3. Is there any break after several hours of work, so that workers can rest and change their position?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4. Are chairs and benches of correct height provided, with a sturdy backrest and comfortable footrests?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
5. Are appropriate containers provided to avoid workers bending, twisting, or lifting heavy charges unnecessarily?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
6. Are stable and smooth work surfaces provided for all workers?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
7. Is sufficient lighting provided everywhere in the factory, with special attention for tasks that require constant visual attention or particular precision?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
8. Do you ensure that glare (bright uncomfortable light) and light reflection is eliminated to avoid eye strain?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
9. Do you design the work area or provide equipment to avoid lifting operations or keep them to a minimum?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
10. Do you teach workers how to perform manual lifting and carrying in a safe way?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Activity

# 2b



25 minutes

## Improving workstation design

Each workstation should be designed to suit the needs of the worker, the machine and the task. A **well-designed workstation** reduces material handling time, improves efficiency and reduces worker fatigue. In this activity, you will learn how to improve workstation design.

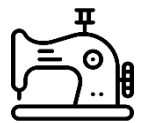


### Instructions:

- 1) Together, read the two rules for workstation design in table 4 below, then discuss: Why are these rules important for both your workers' health and work efficiency?
- 2) Together, go through the good practices for workstation design in table 5, and tick ✓ on the right if you do these things in your factory. Then, discuss and summarize improvements that could be made.
- 3) Different tasks require different workstations. Together, look at the four types of workstations in table 6, and match each one with specific ergonomics improvement that may be needed on the right. Solutions are at the bottom of the page.
- 4) Together, look at the three images below table 6. For each image, discuss and identify what has been done well (good practices) and what could be improved (bad practices).

Table 4. The 2 rules of workstation design

1. Position materials, tools and other equipment within easy reach of workers.



2. Ensure a good work posture for every worker.



Special consideration should be given to pregnant women: Allow them to alternate sitting and standing or give them more opportunities to stand up to allow them to stretch their limbs and back.

Table 5. Comfortable & efficient workstations

<b>Rule 1: Materials &amp; tools position</b>		✓
1. Place frequently used tools and materials in a location where they can be easily reached without leaning – especially for heavy items.		
2. Attach tools that are constantly used to the machine table with a stretchable cord or hung around the worker's neck.		
3. Place small tools or materials (e.g. buttons) in labeled boxes or cases attached to the sewing machine.		
4. Place material inputs or work-in-progress next to the worker to reduce standing and walking.		
5. Place materials and work-in-progress in containers that are not too deep and are movable (e.g. on wheels) to prevent the worker bending/twisting.		
<b>Rule 2: Good work posture</b>		✓
6. Provide a stable, smooth work surface where items can be firmly placed.		
7. Use platforms so that smaller workers can be at proper work height (especially standing workers); Raise equipment to better suit tall workers.		
8. Give workers regular opportunities to change posture and stretch – for example by scheduling 2 minute exercise breaks every hour.		
9. Provide enough leg space to allow easy leg movement or stretching.		
10. Provide a footrest (on stool or portable), particularly for seated workers.		
11. Adjust table height to make sure operations with hands are performed are the same height as elbow height.		
12. Provide firms chairs with adjustable height and adjustable, sturdy back support (horizontally and vertically) to fit worker height.		
13. Give standing workers the opportunity to alternate between standing and sitting postures – for example by providing high chairs.		
14. Provide inclined work tables for inspection and marking operations, to improve visibility and avoid workers having to bend down.		

Table 6. Your workstations

Workstation type	Specific needs
1. Ironing workstations	a. Allow workers to alternate between seating and standing postures by providing high stools with a footrest and making sure there is enough leg-room.
2. Marking, inspection workstations	b. Ensure work surface is at elbow height, and provide adjustable chairs with backrest and a foot rest. Make sure there is enough leg room, and provide opportunities for workers to get up and stretch.
3. Bundling, ticketing, folding workstations	c. Provide inclined tables to improve visibility, and adjustable high stools with a backrest to allow workers to sit every now and then if they want to.
4. Sewing workstations	d. Provide a foot platform so that shorter workers can perform their task at a comfortable height, and a “fatigue mat” to reduce foot strain from prolonged standing.

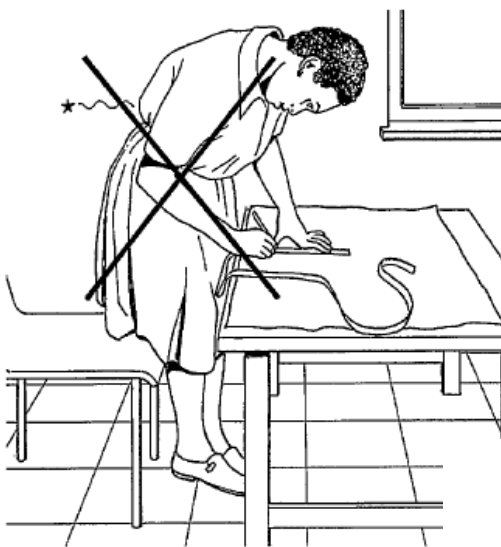


Image 1

Image 2

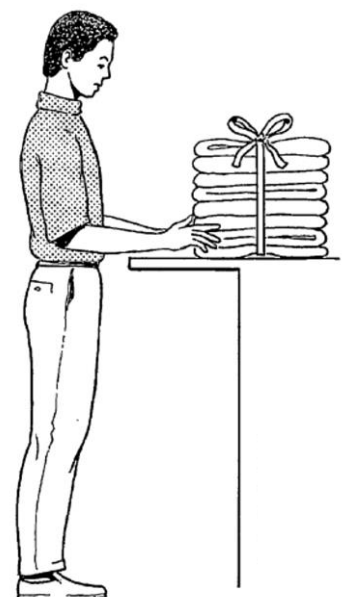
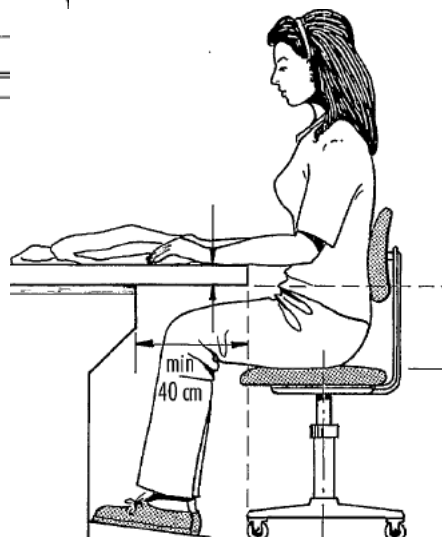


Image 3

Activity

# 2c



20 minutes

## Improving lighting

Bad **lighting** leads to eye strain, fatigue and headaches for workers, as well as mistakes, poor quality and low productivity. Better lighting does not mean higher electricity costs – natural light is better than artificial light! In this activity, you will learn ways to improve lighting.



### Instructions:

- 1) Together, discuss:
  - What kind of lighting is provided in your factory?
  - Has anyone complained of insufficient lighting or eye strain?
- 2) Together, look at the five rules of good lighting in table 7, then discuss: Why are these rules important for both your workers' health and work efficiency?
- 3) Together, look at the statements on natural and artificial lighting, in table 8 and decide for each if it is true (T) or false (F) by writing down the corresponding letter on the right. Solutions are at the bottom of the page.

Table 7. The five rules of good lighting

- |   |
|---|
| 1. Make full use of natural daylight, and avoid shadows on workstations.  |
| 2. Avoid <u>glare</u> (bright points or shining areas in the field of vision that create discomfort and eye strain and contribute to errors). Eliminating glare increases visibility. |
| 3. Choose an appropriate background depending on the task at hand.  |
| 4. Find the right place, height and direction for light sources, and use the right lighting device and fixture.   |
| 5. Ensure regular cleaning and maintenance of windows, lighting devices and fixtures.   |

Table 8. Natural & artificial lighting

Statements	T / F
1. To benefit fully from natural light, you must have at least one-third as much window surface as floor surface.	
2. Low windows are better than skylights or translucent plastic roof panels.	
3. Matt, pale colours on walls and tables (stations) help avoid glare and resulting eyestrain – avoid bright colours, black and gloss paint.	
4. Ceilings should be as close to white as possible to better reflect and spread light throughout the interior.	
5. Workstations with high lighting requirements should be moved further from the windows, grouped together and given additional lighting.	
6. To avoid glare from windows, replace clear glass with translucent materials, change the orientation of workstations, or use blinds.	
7. To avoid glare from lamps, avoid naked light bulbs in the view of the worker by using shades or putting light bulbs higher.	
8. Backgrounds such as screens helps reduce eye strain and improve concentration, especially for visual work demanding close attention.	
9. Do not use fluorescent lamps – they produce less light per watt of electricity and have a shorter life.	
10. Position fluorescent lights directly above workstations rather than in between two workstations under in order to prevent shadows.	
11. Keep an average ratio of 6 light fittings to 7 machines for optimal lighting and to avoid shadows.	
12. Avoid positioning lights too low to avoid generating heat and glare. Avoid positioning them too high to ensure sufficient illumination.	
13. Do not add local lights on the workstation or at needle point (for sewing stations) for precision tasks such as embroidery and inspection.	
14. Clean windows and lamps regularly (at least monthly) to avoid dust or other deposits dimming the light.	

Solutions: 1T, 2F, 3T, 4T, 5F, 6T, 7T, 8T, 9F, 10F, 11T, 12T, 13F, 14T.



Activity

2d



20 minutes

## Improving lifting techniques

**Lifting** heavy loads can easily cause accidents, injuries, or damage to materials – if they get dropped for example. It is better to avoid manual lifting whenever possible. If unavoidable, it should be done safely. In this activity, you will learn how to make lifting and transport operations safer and more efficient.



### Instructions:

- 1) Together, discuss:
  - What kind of accidents or injuries could bad manual lifting cause for workers?
  - What damage could be caused to materials that are being lifted manually?
- 2) Together, look at the measures that can be taken to avoid or reduce lifting in table 9, and tick ✓ on the right if it is applicable in your factory.
- 3) Together, read through the eight tips for safe manual lifting in table 10. Then, discuss: How could you train workers in following these tips and ensure that they do?

Table 9. Avoiding / minimizing lifting

Measures	✓
1. Use platforms so that goods do not have to be lifted during loading and unloading operations.	
2. Design the loading area to match vehicle height (see image 1, next page).	
3. Provide multi-purpose trolleys on wheels (with low platforms) to reduce lifting and carrying operations.	
4. Use low-lift pallet trolleys to carry heavy loads for short distances.	
5. Carry fabric rolls using bars (one long one or two short ones) inserted into the fabric roll.	
6. If manual lifting is unavoidable, divide loads into smaller parts – maximum efficiency and safety is usually attained with weights below 20kg.	



Manual lifting of heavy loads should be avoided, and considered only as a last resort when mechanical aids are not available.

Table 10. Tips for safer manual lifting

1. Avoid lifting from the floor up. Lift from waist level. Set up elevated platforms or tables from which workers can lift loads more easily (see image 2 below).
2. When lifting, keep the load close to the body.
3. Don't twist to pick up or put down a load.
4. Minimize bending to pick up a load, or difficult reaching for heavy loads.
5. Handle loads between hips and chest level. Handle only light objects above or below chest level.
6. Keep the back straight and raise the load using leg muscle power rather than back strength.
7. If loads are too heavy, divide them into smaller loads. Maximum efficiency is attained with weights below 20kg!
8. Use good handles whenever possible to ensure a solid grip on the load.



Where possible, do not assign heavy lifting jobs to women, and ensure that pregnant women do not lift heavy weights. If assigned, remember to reduce the weight of the loads.

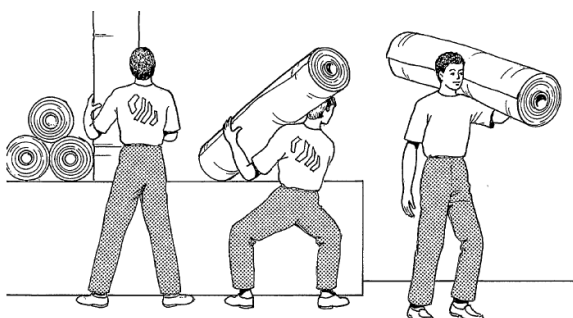
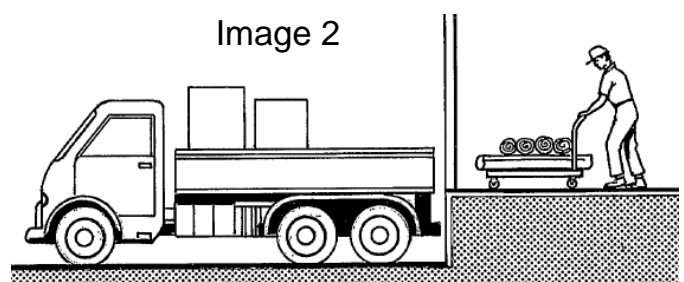


Image 1



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## Session 3

# Action items

### Goals

**Summarizing and revising the new knowledge gained.**

**Identifying concrete applications of the new knowledge that benefit your factory.**

## Session 3

# Overview



One member should read the full session out loud to the rest of group



20 minutes



Learning manual, pens, and markers

Throughout this module, you gained new knowledge on how to improve ergonomics in your factory by improving workstation design, lighting, and lifting techniques.

Improving  
**workstation design**

Improving  
**factory lighting**

Improving  
**lifting techniques**

In this session, you will think of ways to apply your new knowledge to your own factory by reviewing best practices and drafting your own ergonomics improvement action plan.

# Activities

Activity

# 3a



5 minutes

## Best practices checklist

In this activity, you will review best ergonomics practices as a next step for evaluating your own and implementing improvements.



### Instructions:

- 1) Together, look at the list of best practices in table 11, and put a ✓ in the column on the right if you use these practices in your factory.

Table 11. Better ergonomics

Best practices	✓
1. Management consults workers to better understand how ergonomics can be improved in the factory.	
2. Workstation design is improved depending on the type of task to perform, to protect workers from strain / injury and improve efficiency.	
3. The factory maximizes natural light use. There is sufficient lighting, and glare and reflection are eliminated in order to avoid eye strain.	
4. The factory invests in mechanical equipment to avoid manual lifting or minimize it, and workers are taught how to safely lift heavy loads.	
5. All workers are given opportunities to get up / sit, change posture, and stretch their limbs and backs regularly to avoid strain.	

Activity

**3b**



15 minutes

## Your action plan

In this activity, you will think of ways to apply your new knowledge to improve your ergonomics by drafting your own action plan.



### Instructions:

- 1) Together, fill in the action plan (table 12) on the next page. Identify a key problem that you want to solve and write down the solutions you identified while working on this module.



**Table 12. Better ergonomics – Action Plan**

<b>Problem identified</b>				
<b>Solutions identified</b>	<b>Action(s) to be taken</b>	<b>Person responsible</b>	<b>By when?</b>	<b>How will improvements be measured?</b>

# Better ergonomics

The Factory Improvement Toolset (FIT) is an innovative self-facilitated, activity-based learning approach designed by the International Labour Organization (ILO) to create more decent and sustainable employment. FIT supports manufacturers in global supply chains to improve productivity, competitiveness and working conditions by upgrading production systems and factory practices.

FIT is being piloted in Asia under the regional Decent Work in the Garment Sector Supply Chains in Asia project funded by the Government of Sweden.

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ISBN: 9789220327173 (web pdf)