International Labour Organization

Ensuring marker efficiency

Cutting room operations

Factory Improvement Toolset

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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 Ensuring marker efficiency is a training for garment manufacturers to improve cutting room operations. Participants will work on optimizing marker planning by ensuring marker efficiency and waste minimization. This module takes about 2 hours to complete.

Upon completion of the training, participants should have:

- Learnt how to calculate and maximize marker utilization.
- Learnt how to calculate and maximize fabric utilization.

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, Jayantha R. de Silva.

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 topics covered by the FIT cutting room series.

Indicator 1	**Fabric utilization (%)**
Definition	The proportion of total spread fabric that is actually used for garments. It is calculated for each cut (for each marker). The higher the most efficient.
Purpose	To understand how efficient your marker planning and cutting operations are, how much fabric gets wasted, and to begin to identify how to improve marker efficiency and reduce fabric waste.
Calculation	(Marker area used for garments in *sqm* / total fabric area in *sqm*) x 100% Marker area used for garments = Fabric (in sqm) actually used for garments Total fabric area = The total amount of fabric spread on the cutting table for a cut = Fabric length (mts) x Fabric width (mts)
Frequency	Calculate for each marker, then do a monthly average of all markers.
Responsible	Cutting room manager / Senior marker maker

Indicator 2	**Marker utilization (%)**
Definition	The proportion of the marker area that is actually used for garments. It is calculated for each cut (for each marker). The higher the utilization, the most efficient.
Purpose	To understand how efficient your marker planning and cutting operations are, how much fabric gets wasted, and to begin to identify how to improve marker efficiency and reduce fabric waste.
Calculation	(Marker area used for garments in *sqm* / total marker area in *sqm*) x 100% Notes: Marker area used for garments = Fabric (in sqm) actually used for garments Total marker area = Marker length (mts) x Marker width (mts)
Frequency	Calculate for each marker, then calculate the monthly average for all markers.
Responsible	Cutting room manager / Senior marker maker

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 marker efficiency 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.

Huynh is a new Senior Marker Maker at the HS garment factory. He reports to the merchandising department but works in the cutting room. During his first week at the factory, he spots several problems. No attention is given to marker efficiency, which means that a lot of fabric is wasted later during cutting. Since efficiency is not considered important, it is not calculated for each cutting order. So, there is no way of evaluating how much fabric is wasted, and how much money could be saved by making markers more efficiently and consuming less fabric.

To solve these problems, Huynh consults the cutting manager and the head of the merchandising department. Together, they organize a training on marker efficiency for marker planners, in order to teach them the importance of marker efficiency, and how to maximize, calculate, and record marker efficiency. Marker planners in the cutting room can now directly report marker efficiency to merchandising and ask for approval before finalizing markers.

Thanks to these changes, marker planners now know how to make more efficient markers. Fabric use is maximized, and fabric waste is minimized for each lay. This saves HS factory thousands of dollars in fabric costs. So, overall, merchandising and cutting room operations are more efficient and coordinated than before.

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

Table 1. Questions about Huynh's situation
1. What problems has Huynh identified? What impact do these problems have on the factory and its workers?
2. What does Huynh do or change in order to solve these problems?
3. What are the results of Huynh's solutions for the factory and its workers?

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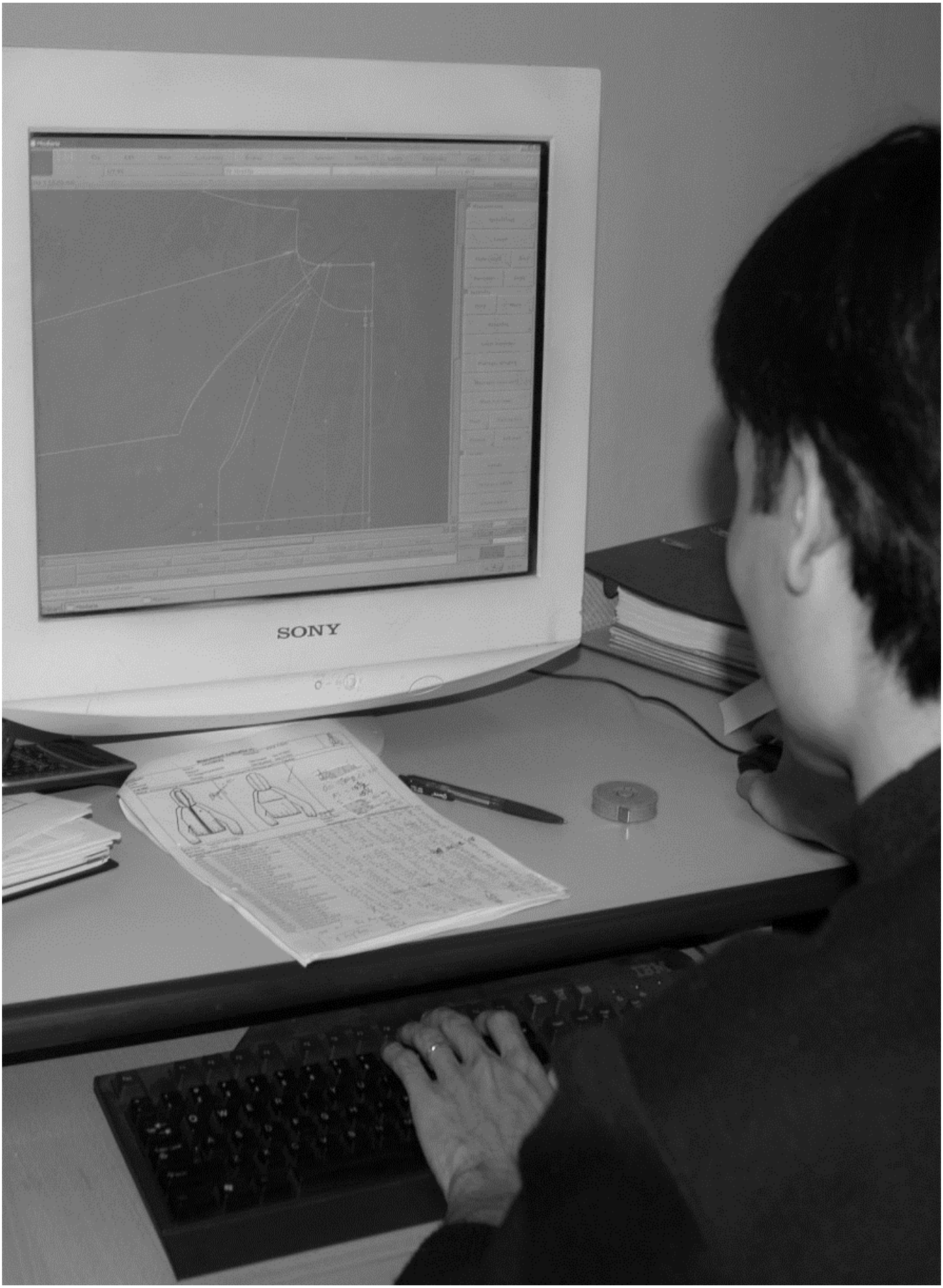

SONY

Session 2

Learning about the topic

Goals

Understanding the meaning and importance of marker efficiency.

Learning how to calculate marker efficiency.

Discussing how to improve and maximize marker efficiency.

Session 2

Overview

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

80 minutes

Learning manual, pens, and markers

This training module aims to help you improve the way your cutting room operates by focusing on ensuring marker efficiency. This is part of the marker planning process, which aims at determining the most efficient arrangement of pattern pieces on the fabric to be cut for each order. Good marker planning helps avoid fabric waste by ensuring that maximum fabric is used, and minimum fabric is wasted. Throughout this module, you will work on the two steps below.

Calculating efficiency

Improving efficiency

First, you will discuss the meaning and importance of marker efficiency, then learn how to calculate and maximize marker efficiency.

Activities

Activity
2a

20 minutes

Marker efficiency

Different markers can be more or less efficient. **Marker efficiency** should therefore always be calculated and recorded. In this activity, you will discuss what an efficient marker is, and why marker efficiency is so important.

Instructions:

1) Together, discuss: What makes a marker more efficient? List your answers in table 2 below.

2) Together, discuss:

- How can efficient markers help you minimize fabric waste?
- How can efficient markers help you save money?

3) Together, discuss:

- Do you measure marker efficiency in your factory? How?
- Do you record marker efficiency in your factory? How?

Table 2. Efficient markers

What makes a marker more efficient? Example: Length.

The more pattern pieces you can fit into a marker, the more fabric you can save, and thus the more efficient the marker is. This is why wide, long, multi-size markers are usually more efficient.

Activity

2b

30 minutes

Calculating marker efficiency

In order to maximize fabric use and minimize fabric waste and thus fabric cost, **marker efficiency** should be as high as possible. In this activity, you will learn how to calculate marker efficiency.

Instructions:

1) Have a participant read aloud the information box below about two ways to calculate marker efficiency, and make sure everyone understands.

2) Together, discuss the three questions in table 3, and write down your answers in the space provided. Solutions are provided at the bottom of the page.

3) Together, answer the seven practice questions in table 4. The solutions are provided at the bottom of the page.

4) Together, discuss: Is there a minimum percentage to be reached for marker and fabric utilization in your factory? If so, what is it?

Marker utilization: How much of the marker is used for garments (%)
Marker utilization = (Marker area used for garments/Total marker area) x100

Fabric utilization: How much of the fabric is used for garments (%)
Fabric utilization = (Marker area used for garments / Total fabric area) x100

Table 3. Calculating marker efficiency

1. How to calculate marker area used for garments?

2. How to calculate total marker area?

3. How to calculate total fabric area?

Although Marker planning is generally done in the cutting room, it is better if the person in charge of Marker planning reports to the **merchandising** department. This helps control and keep track of consumption, and thereby saves material.

Solutions: 1. Calculate the area for each pattern piece, and sum all the areas of all pattern pieces for the marker; 2. Total marker area = Marker length x Marker width; 3. Total fabric area = Fabric length x Fabric width

Table 4. Marker efficiency

1. For cutting order 4739, the marker length is 9 meters, and marker width is 2 meters. What is the total marker area? _____ square meters.

2. For cutting order 4739, the fabric length is 10 meters, and fabric width is 2 meters. What is the total fabric area? _____square meters.

3. For cutting order 4739, marker area used for garments is 14 sq. meters. Total marker area was calculated in 1. Marker utilization is:
    a. 78%
    b. 87%
    c. 88%

4. If the marker utilization is 78%, it means that:
    a. 22% of the marker was used for garments
    b. 78% of the marker was used for garments
    c. 78% of the fabric was used for garments

5. For cutting order 4739, marker area used for garments is 14 sq. meters. Total fabric area was calculated in 2. Fabric utilization is:
    a. 78%
    b. 74%
    c. 70%

6. If the fabric utilization is 70%, it means that:
    a. 30% of the fabric was used for garments
    b. 70% of the marker was used for garments
    c. 70% of the fabric was used for garments

7. Is it possible to reach 100% marker or fabric utilization?
    a. Yes
    b. No
    c. Sometimes

Solutions: 1. 18sqm; 2. 20sqm; 3.a), 4. b), 5. c), 6. c), 7. b)

Activity

2c

30 minutes

Improving marker efficiency

In order to maximize fabric use and minimize fabric waste, **marker efficiency** should be as high as possible. There are several things you can do to improve marker efficiency. In this activity, you will practice making markers more efficient.

Instructions:

1) Have a participant read aloud the eight tips for maximizing marker efficiency in table 5, and put a ✓ in the column on the right if you do these things in your factory.

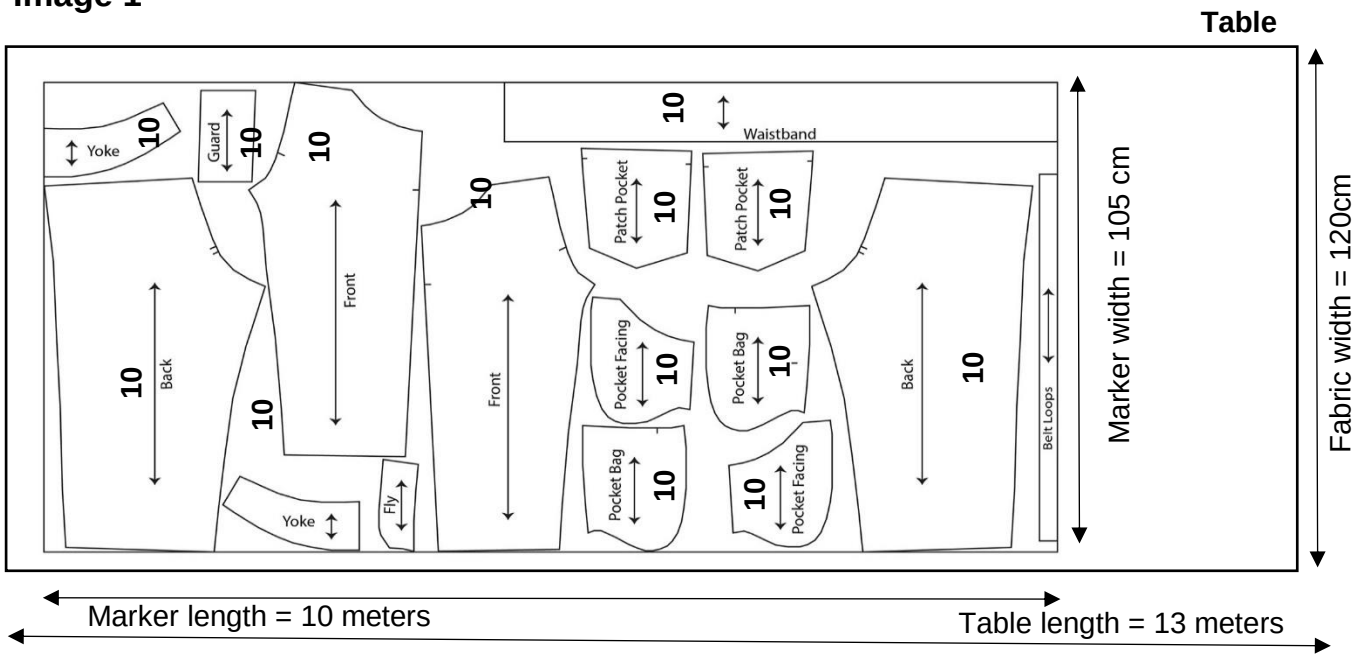
2) Together, discuss: Which of these tips would you like to apply in your factory if you do not already use them?

3) Together, look at the picture of a lay plan for a style of denim pants size 10 (Image 1), and discuss how it could be improved based on the 8 tips. List improvements in the space provided in table 6.

Table 5. Tips to maximize marker efficiency

Tips	✓
1. Use longer markers: the longer the more efficient (the least waste).	
2. Use wider markers: the wider the more efficient (the least waste).	
3. Obtain actual fabric width from the storerooms and re-calculate marker width based on this to maximize fabric use (marker width = actual fabric width – selvage).	
4. When there is leftover fabric, use it for short or mini markers.	
5. Use multi-size markers: the more the number of different pattern piece sizes, the most efficient (better utilization).	
6. Start the marker by laying large pattern pieces, then fit the smaller pieces in the gap of larger pieces to maximize utilization.	
7. Use the “either way” marker mode by orienting pattern pieces down or up depending on wherever they fit best to maximize utilization.	
8. Mix smaller and larger patterns as much as possible to occupy as much fabric as you can.	

Image 1



Lay plan for one style of denim pants size 10
Note : Selvage on both ends in width = 2cm

Table 6. Improving efficiency

List your ideas for improvement below.

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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 calculate and maximize marker efficiency in order to improve marker planning.

Calculating efficiency

Improving efficiency

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

Activities

Activity
3a

5 minutes

Best practices checklist

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

Instructions:

1) Together, look at the list of best practices in table 7, and put a ✓ in the column on the right if you use these practices in your factory.

Table 7. Ensuring marker efficiency

Best practices	✓
1. Marker and fabric utilization are calculated and recorded for each cut order.	
2. Fabric utilization is calculated and recorded for each cut order.	
3. Marker planners are trained in improving (maximizing) marker efficiency based on calculations.	

Activity

3b

15 minutes

Your action plan

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

Instructions:

1) Together, fill in the action plan (table 8) 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 8. Ensuring marker efficiency – Action Plan				
Problem identified				
Solutions identified	**Action(s) to be taken**	**Person responsible**	**By when?**	**How will improvements be measured?**

Ensuring marker efficiency

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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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