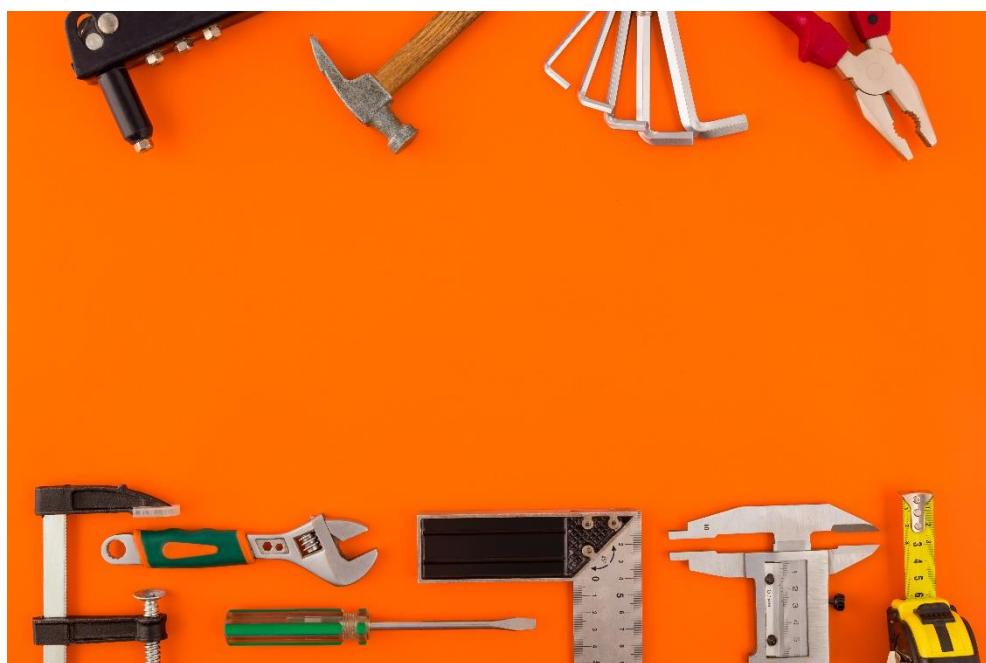




## Introduction to workshop hand tools and benchwork.



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# **Summary of the module**

This lesson plan covers understanding of tools and their usage. We will also address basic safety in the school workshop.

## ***Module facts***

**Duration:** 2x90 minutes **Number of students:** Total 22

**Number of instructors:** 6

**Number of groups:** 2 (2 groups in each session)

**Students' age:** 10+

**Students' prerequisites:** Woodwork and technology in primary school

**Instructors' prerequisites:** Completed courses in Production Knowledge 1, Production Equipment 1, Product Development 1, Human in Industry, Industrial Technical Processes, Basic Welding.

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# **Introduction**

## ***Background***

The societal and business demand for individuals with technical expertise is increasing, while the interest in pursuing technical education is either decreasing or, at the very least, not growing sufficiently. Therefore, these lessons aim to encourage more young people to choose both vocational and preparatory technical education in upper secondary school.

## ***Purpose***

The purpose of these lessons is to expose younger students in primary school to captivating technology that they haven't worked with before. The younger students are guided by older students enrolled in technical programs at the upper secondary level. The older students serve as role models and can more easily transfer their youthful enthusiasm for technology and craftsmanship to the younger students.

## ***Method***

Empirical knowledge is gained by working together with older students, receiving guidance/instructions, and manufacturing a product based on a drawing, using measuring and drawing tools. In addition to this, students from primary school get the opportunity to visit the program's workshop, meet students and teachers, and gain insights into the facilities.

# **Introduction to benchwork**

## ***Preparations in Upper Secondary School***

Prepare a number of tool kits to be used by students guided by upper secondary students. Tools should be available in 5 sets. The condition of the tools is examined, and a simple drawing of a workpiece is created. Materials are cut and holes are drilled to ensure that younger students do not operate power tools yet.

Tools: hacksaw, double-cut file, single-cut mill file, compass, steel ruler, marking pen, countersink 45°, cordless drill, tap, turning tool, thread grease, letter stamps, and hammer.

## ***Preparations in Primary School***

No prerequisites are required for the introduction to benchwork.

## ***Implementation***

The lesson begins with a safety briefing (including a review of fire safety and evacuation routes) and the distribution of safety goggles and earplugs.

Show drawing: Introduction to the Industrial Technology program and the participating students. Subsequently, a tour of the welding workshop (examining manual machines, different welding methods, sheet metal shears, and both guided and manual folding machines).

The whole group performs a demonstration of material cutting and a case study in filing and sawing with a hacksaw.

Then, the group is divided, and instructions are given at 2 tables with multiple vices. High school students demonstrate, based on the drawing of the flat iron, where students should mark before sawing and filing. High school students go through how all the tools are used and their names. After sawing, students file the radius and end, countersink, and thread. High school students and teachers assist. Students can stamp their name on the workpiece to take home.

## ***Evaluation***

After the students have completed the lessons in upper secondary school, an evaluation is conducted to assess their experience of the lesson and how their teachers perceived the course's effectiveness for the students. The purpose is to gather tips on how to improve future courses. Even the

mentors should be able to evaluate their participation. The evaluation is preferably done using the Google Forms tool.

## Appendix

