



Concept for the use of Unimat Machines

In technical crafting class from elementary schools
to secondary schools from the ages of 6 to 12 in the
countries of Austria, Germany, and Switzerland

The Cool Tool
est. 1982
GmbH

Education

1 Introduction and Summary

The following comments are concerning the content of the curricula (curriculum) in the field of technical crafting in Austria, Germany, and Switzerland. In particular, these fields are covering:

- **Building and Living**
- **Technical**
- **Product Design**

All curricula have the common interest of playfully leading children into a built and technical environment, and all areas call for the experimental use of material. The students should start by trying something easy so that they can compare and understand the relations, then develop proposals for solutions, and work with drawings that lead to constructive and environmentally conscious actions. The student's age and abilities should match the courses' contents. They would learn to apply creative methods and principles, get more focused, and have the functional and aesthetic quality of their workpieces increased. During the designing phase, they work without templates and express their individual perspectives in their work and develop their own creative skills. The age appropriate encounters with simple technical operations give students an insight into various areas of the technical world and help them consciously go through technology-induced changes.

Right at this stage of development, the devices manufactured by TheCoolTool, especially the Unimat set equipped with hand drill, sander, wood lathe and jigsaw in the modular system offer a significant contribution to the technical crafting class to primary schools and first and second graders of secondary schools.

Subject inter-operated teachings should take place in all classes. As a part of the curricular treatment of the subject-specific content, learning in contexts by sensible combination of technical insights will be possible. The natural exploration of the real world for the child should therefore be taken into account during the lesson. This is what we show in the sample classes.

What makes the Unimat System so special is that the technical understanding is universal for young adults. The modular system makes insights into the structure of technical devices possible. Students can make their first insights into the complex world of manufacturing processes in a fun way, as well as learn the technical language step by step.

2 General Subject Goals

All curricula of the technical crafting classes must take the following personal subject goals into account

- **Play and Discover**
- **Gain technical understanding by observing, comparing, analyzing, and exploring.**
- **Describe and „experience“ terms**
- **Planning of Solutions**
- **Test out solutions**
- **Independent task solving**
- **Measuring and labeling**
- **Learn how to work with materials and machines**
- **Accident prevention**
- **Sketches/Drafts**
- **Insight into the context, form and function**
- **Insight into the work world**
- **Critical behavior towards the environment**

Source: Johann Eckel, Herbert Halamiczek, *Werkerziehung Grundstufe – Pädagogik aus dem Bundesverlag: Wien, 1981*

Play and Discover

Our students have already collected technical knowledge at kindergarten while playing. It is therefore advisable to plan the lessons in a way that they can use their knowledge to their advantage and playfully approach the workshop topic.

With the Unimat Set it is much easier to discover the technical world. For example, before working with the wood lathe for the first time, you could teach the students about the different types of wood that exist. You could find the materials at hand to their different processing options, as well as the smell of the different types of wood.

Acquire technical knowledge by watching, comparing, analyzing, and exploring

The encounter with the technical reality should be gone over at the beginning of a subject.

Students should recognize how an object operates by observing, comparing, analyzing and exploring it at the beginning of solving a problem.

Students should be provided with the opportunity to experiment with the subjects. Ex: Testing out the roles, floating or sinking, flying...

The machines set up with the Unimat allow first insights into the mechanical production of simple objects for children. The set encourages the invention and modification of small objects with a claim to technical accuracy.

Describe and „experience“ Terms

When experiencing the subject, students should use their own words. Later on, these words will be converted by the teacher into proper terms.

Working with the modular system of the Unimat Sets enables learning about the different parts of a machine and promotes understanding the technical terms in a unique way.

The Planning of Solutions

Based on the series of tests that were carried out, students will very quickly understand what works and in what area there are problems to solve. Simple problem solving ways should be initiated.

Test out Solutions

Students should learn strategies by trial and error in a fun way. The Unimat lets you explore the usage of electricity machine production, stabilization, woodworking, etc. very well.

Independently Solve Tasks

The aim of a good technical crafting class should be to give the students the possibility for creative growth. On physical levels as well as by using different ways to find your solutions. Thinking technically should be encouraged in children.

Learning control, revenue assurance, and assessment of performance should also be applied in this area.

The tasks and instructions in the Unimat project proposals meet these needs through proposals for quality control. (Ex. Checklists)

Measuring and Labeling

An important prerequisite for the success of a good product is the accuracy of the measurement and marking. Students in the first grade should be allowed to use measuring devices.

Templates in the project booklets of Unimat offer students the opportunity to learn accurate work.

Learn How to Work with Materials and Machines

Students must be taught the proper use of tools and simple machines. In the first grade, students are taught the terms, usage, and functions of simple machines like a drill, a jigsaw, a wood-lathe, and other similar machines, which they can then creatively transfer their knowledge into skill. The Unimat Set accomplishes precise work in easier ways, so that even a very untalented student would succeed in his project.

Unimat accomplishes precise work in easier ways and is therefore suitable for unskilled students as well. An insight into the technical modes of action and relations, like that of the process of various materials, provides a valuable contribution to the implementation of the common general objectives of the curriculum in the „handling of materials and machine learning“

Accident Prevention

Teachers must pay particular attention to the handling of tools and machines by the students. Discipline and order in the working area is a prerequisite for a positive experience in dealing with technical aids for the students.

Because of the simple and child friendly applications of the Unimat Sets, students can use the machines without supervision.

Drafts/ Sketches

Through the use of graphs and diagrams, students will be tested again on their knowledge and their expertise on concepts. They would gain fundamental insights into the technical drawing.

Insight into the Relations, Form and Function

Students should become aware of the first insights into the functionality of a work-piece as well as the aesthetics on product design.

Insight into the Working World

The technical crafting class connected with the life sciences class gives students the opportunity to look into the working world and the usage of machines. The reality aspect of the direct experience of the kids should be taken into consideration when planning.

The Unimat makes it possible to regard the working world in a playful manner. In many cases, children become aware of their own interests in the art of technics while working with it. The fascination of the quick success that comes from well designed products affects a person's future. A positive entry in dealing with technical equipment has often influenced young adult's career choices. Many girls take caution when dealing with technical aids. Because of the simplicity and proficiency of the Unimat machines, such fears are reduced and maybe never even generated.

Critical Behavior towards the Environment

Students should be motivated to express their opinions on a critical analysis of the built environment.

3 The Curriculum

The following comments relate to the content of the curriculum of technical crafting in the countries of Austria, Germany, and Switzerland. In particular, these themes are being dealt with:

- Building and living
- Technical
- Product design

Building and Living

In this section the focus lies on the area of „toys for house and living“. Students should use their prior experience and their knowledge of their surroundings when creating a house model. The following aspects are important for a class:

- Elementally open up the environment under statics and structural calculations
- Recognizing the static correlations: stability, equilibrium, center of gravity
- Compare reality with the model
- Play around with the designs of the living options
- Critical examination of the possible use of furnishings

Technics

- Learn the use of various machines and gain insight in their functions
- Achieve first insights in the area of swimming and sinking
- Recognizing kinetic relationships of rolling, driving, turning and pushing
- Apply aerodynamic principles to flying
- Gain basic insights in the relationship between man and machine
- Learn to solve tasks independently

Product Design

- Learn tools and test them out
- Try out different materials and find out what their functions are
- Achieve economic aspects in business, media, and advertisement

3.1 The Curriculum Relating to Austria

The following is concerning the curricula of the technology class of Austrian primary/elementary schools.

Kids in the ages of six to ten attend primary/elementary schools, and from ages ten to 14 they attend the first years of secondary schools, in which case the curriculum is the same for both. Elementary schools can still be divided into:

- Elementary level 1:1 and 2. grade (GS 1) and
- Elementary level 2:2 and 3. Grade (GS 2)

therefore have kids from the ages of six to eight in first grade and kids from ages of eight to ten in second grade.

3.1.1 Elementary level 1 (GS 1)

Building and Living

In this section a child should experiment, construct and play with building blocks and other materials to gain building experience. By designing and experiencing playrooms and workrooms, insights into the relations of volume, form, and usage in that area can be gained.

Technical

In the field of engineering, students should be introduced to their important technical environment. Through the connecting of building materials such as an axle shaft wheel, crank, lever, etc., the basic functions and effects should be understood.

Product Design

In the area of product design, simple everyday objects of the child should be tested out and prepared by yourself. That way an insight into the context of use, size, color effect, shape, material, and way of display would be gained.

3.1.2 Elementary level 2 (GS 2)

Building and Living

Coping with simple work tasks such as timber, tent, and bridge serves to find and test out ways to connect and stabilize components. By planning, preparing, and arranging simple room models, one should gain insights into use, configuration and meaningful juxtaposition of rooms and outdoor spaces.

Technic

In addition to the planning, manufacturing, and testing, you can gain an analyzed observation and a proper judgment. This should create an understanding between man and machine and the relationship between hand-work, machine work and industrial production.

Machines such as windmills, water wheels, winches, cranes, and vehicles can easily be understood by students. They should therefore assemble these machines together themselves in order to understand their functions better.

Product Design

In the area of product design, everyday items are made from various materials and in various manufacturing ways. To evaluate and compare with industrial consumer products is the knowledge about purpose, form, and function relationships and the nature of the manufacturing process is required. Reasons for the purchase of a product (advertising, etc) as well as different expectations of manufacturers and buyers should be considered. Source:

<http://www.werken.at/lehrplan/vslehrplan.rtf>

Didactic Principles (Notes)

Different structures of the class and subjects require

- **Specific teaching methods for class topics and contents**
- **Spiral curricular build up from 1 and 2 grade basis for the class**
- **Co-education**
- **Motivation through the production of everyday products in the environment of children**
- **Process-oriented classes usually involves exploration phases such as planning, sketching, working with construction kits, and the production of rough draft models**
- **Technical crafting or robotic decorating is to be eliminated**
- **Demanded autonomy excludes the use of ready-made kits and recipe-like instructions**
- **The use of simple machines (drill press, jigsaw, sander) is allowed**
- **Promotion to appreciative attitudes towards your own and foreign labor**
- **Practice of taking criticism and strengthening of self-esteem**
- **Pay general attention to the directions given in the actions you can take to avoid accidents**
- **Apply a maximum voltage of 24 volts when working with electricity**

<http://schulkultur.files.wordpress.com/2008/09/leitfaden-tech.pdf>

Unimat fulfills the requirements of these areas in the curriculum. It satisfies both the use of machines as well as the use of electricity and the appreciation of the resulting work.

3.1.3 Secondary Level (5th and 6th grade)

Core – Built Environment

By analyzing the contents of „The Place“, „the Building“ „The Living“, students should be responsible in shaping their living area or develop fantasies and conceptual models for the future.

They should know and learn to apply basic principles to the designing and use of buildings. The interactions between people and architecture will be noticed, and the resulting problems can be analyzed and possible solutions can be found.

In addition to the experience of built architecture, you can gain insight by making models.

The Place

Address the situation of a building, its exteriors, its immediate surrounding and its larger environment through exploration of real-life situations and plan appropriate representations.

The Building

Getting to know the distinctions of categories by:

- **Usage and Space: Residential, industrial, and office construction, special construction (church, school, hospital...)**
- **Design and Shape**
- **Structures: solid construction, frame construction**
- **Building material**

Living

Experience and verbalize different impressions of the room like individual and cooperate development of fantasies and models.

Tool

Create simple tools out of easily workable materials

Commodity

Manufacture simple, functional products for daily life and play. Develop and manufacture vessels and containers from easily moldable materials.

Technical

Through the analyzation of the contents in the sections „mechanics“, „Flow and Electrical Engineering“, students should get an idea of the solution and make decisions, which eventually leads them to find the solution.

Mechanic

Gain insights from simpler mechanical operations on machines by examining, building and testing; making simple vessels, eventually with steering and braking device

Fluid Mechanics

The wind or water wheels of the flight or ship models, respectively, should give insight into the basic principles of machines that use air and water currents.

Electrical Engineering

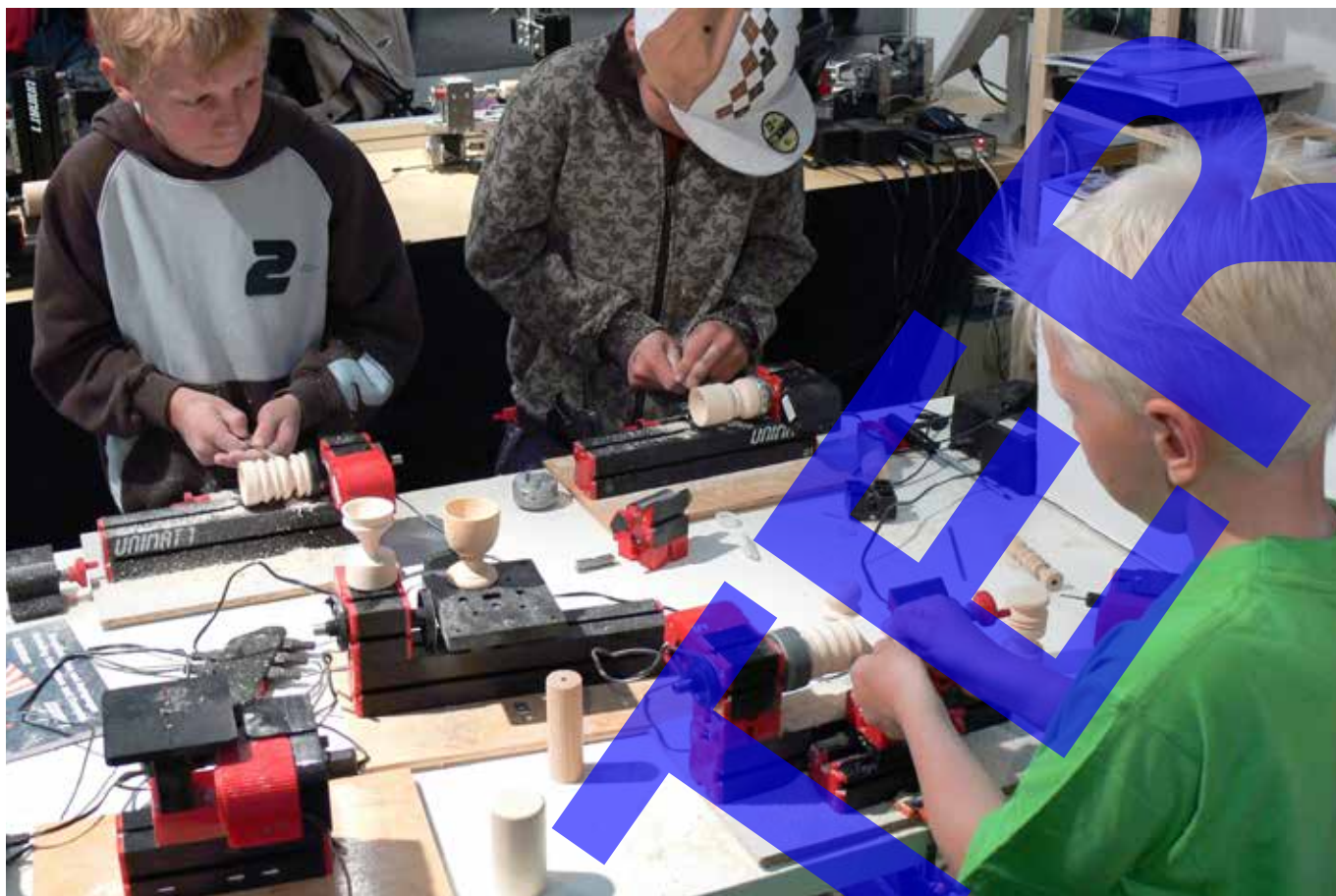
Gain insights from simple electrical circuits or equipment and develop circuit diagrams; application of different types of power sources and consumers- especially in the combining of tasks from other curriculum areas.

<http://www.bmukk.gv.at/medienpool/884/hs20.pdf>

Unimat offers students a childproof and easy way to use contents from the curriculum.

Use of Unimat machines (overview) according to curriculum reference:

Topics	Jigsaw	Wood-turning machine	Drilling machine	Sanding machine
1st + 2nd grade				
BUILDING AND LIVING				
Furnishings	X	X	X	X
Bridge for special cars	X	X		
TECHNIC				
Marble Run	X	X	X	X
Simple wheeled vehicles	X	X	X	X
Levels and Barriers games	X	X	X	X
Swing	X	X	X	X
Wind vane	X	X	X	X
Windmill	X	X	X	X
Ship	X	X	X	X
PRODUCT DESIGN				
Modelling wood	X	X		
Flower rod	X	X		
Tangram	X	X		
Bat for a ball game	X	X	X	
Farm animals	X	X		
3rd – 6th grade				
BUILDING AND LIVING				
Furnishings	X	X	X	X
Marble run	X	X	X	X
Bridge	X	X	X	
TECHNIC				
Crane and crane truck	X	X	X	
Windmill	X	X	X	
WHEELED VEHICLES				
Oldtimer	X	X	X	X
Automobiles ford	X	X	X	X
AIRPLANES				
Spitfire	X	X	X	
Jet	X	X	X	
Helicopter	X	X	X	
Boats	X	X	X	X
Water wheel	X	X	X	
Spinning top	X	X	X	X
Train	X	X	X	X
Rickshaw	X	X	X	
PRODUCT DESIGN				
Furnishings	X	X	X	X
Seat	X	X	X	X
Commode	X	X	X	X
Country Cupboard	X	X	X	X
Mobiles	X	X	X	X
Pencil holder, Kangaroo	X	X	X	
Memo board	X	X	X	X
Figures and crib figures	X	X	X	X
Puzzles	X	X		
Dinosaur	X	X		
Moose	X	X		
Mouflon	X	X		
Rhino	X	X		
Pen	X	X	X	
Wooden ball	X	X		
Man	X	X	X	
Key rack	X	X	X	



Lessonplan Unimat Education

10 lessons, each 90 min, to learn and practice anything with the Unimat woodworking sets

BM = relevant page in user-manual Unimat 1 Basic/Elementary

DM = relevant page in user-manual Unimat Design and Technology

E = relevant page in didactical material Elementary

D = relevant page in didactical material Design and Technology

VS1602-VS1604 = relevant page in the project books



Education

Lesson 1

The Unimat concept


	15 min	<ul style="list-style-type: none">• Activate students• What is a machine• Which machines do you know• Which machines have you seen in production• On which machines have you worked already	
Introduction		<ul style="list-style-type: none">• What is the difference between Unimat and other machines• Why Unimat is safe for students	
Check manual and partlist	30 min	<ul style="list-style-type: none">• Unboxing and exploring Unimat• How to use the manual• How to use the video• Identifying the Unimat parts• Play around with the parts• Learn about partlists• Learn about vocabulary – technical terms	BM 3-5 DM 3-5
Assembling and working	30 min	<ul style="list-style-type: none">• Assembling the first modules• How to use the connection piece• Learn about motor-headstock, tailstock, slide, etc• Adaptor / socket/plug – learn about voltage / electricity• Learn about how to use the tools included in the Unimat kit (screwdriver, allen key, etc)	BM 6-8 DM 6-8
Reflection and feedback	10 min	<ul style="list-style-type: none">• What have you learned about machining, assembling	
Cleanup and storage	5 min	<ul style="list-style-type: none">• Cleanup and store into the box	
	90 min		

INTRO UNIMAT SYSTEM

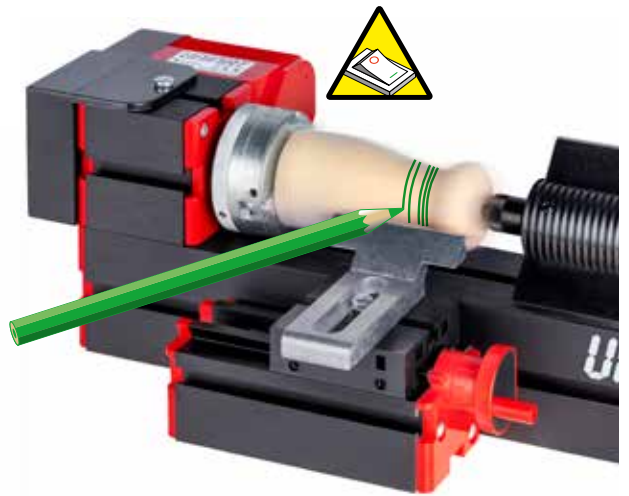
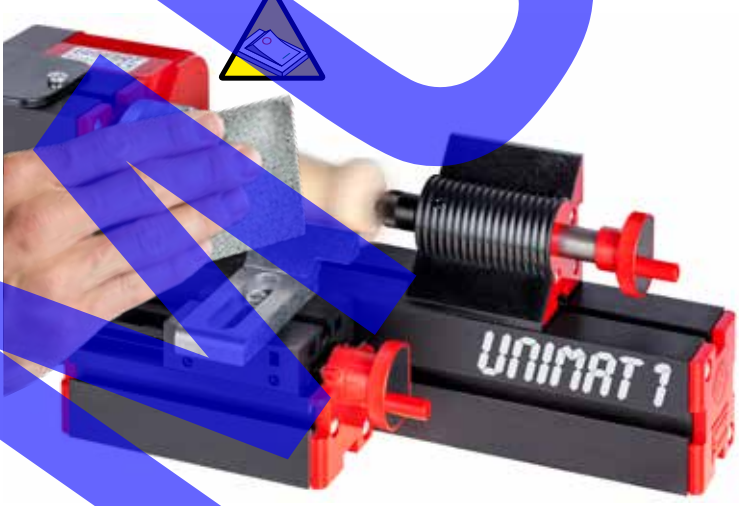


Lesson 2

Learn about assembling and woodturning

Explore the woodlathe	7 min	<ul style="list-style-type: none">• Intro• Check and repeat content from lesson 1• What is a woodlathe/woodturning	E 7-9 D 6-8
Check manual and partlist	10 min	<ul style="list-style-type: none">• Check the manual for the woodlathe• How to assemble the lathe	BM 6-9 DM 6-11
Assembling the woodlathe	20 min	<ul style="list-style-type: none">• Take the Unimat parts out of the box• Assembling the woodlathe by using the prepared modules• Doublecheck with manual• Use 30 mm wooden dowels• Use driver and center finder according to manual to fix the workpiece	
Working with the woodlathe	25 min	<ul style="list-style-type: none">• Start working with the lathe – candle holder• How to use the gouge correctly• How to cut a nice surface/groove	E 22/23; D 21/22 E15-17; D 14-16
Improve the wooden surface	10 min	<ul style="list-style-type: none">• Use sanding paper to smoothen the surface• Use crayons or wax to color / protect the surface	
Reflection and feedback	10 min	<ul style="list-style-type: none">• How does a woodlathe work• What did you like most• Theory exercise – woodlathe	E 20/21; D 19/20 E 20/21; D 19/20
Cleanup and storage	8 min	<ul style="list-style-type: none">• Cleanup and store into the box <p>Best practices to reduce exposure to dust </p>	


90 min



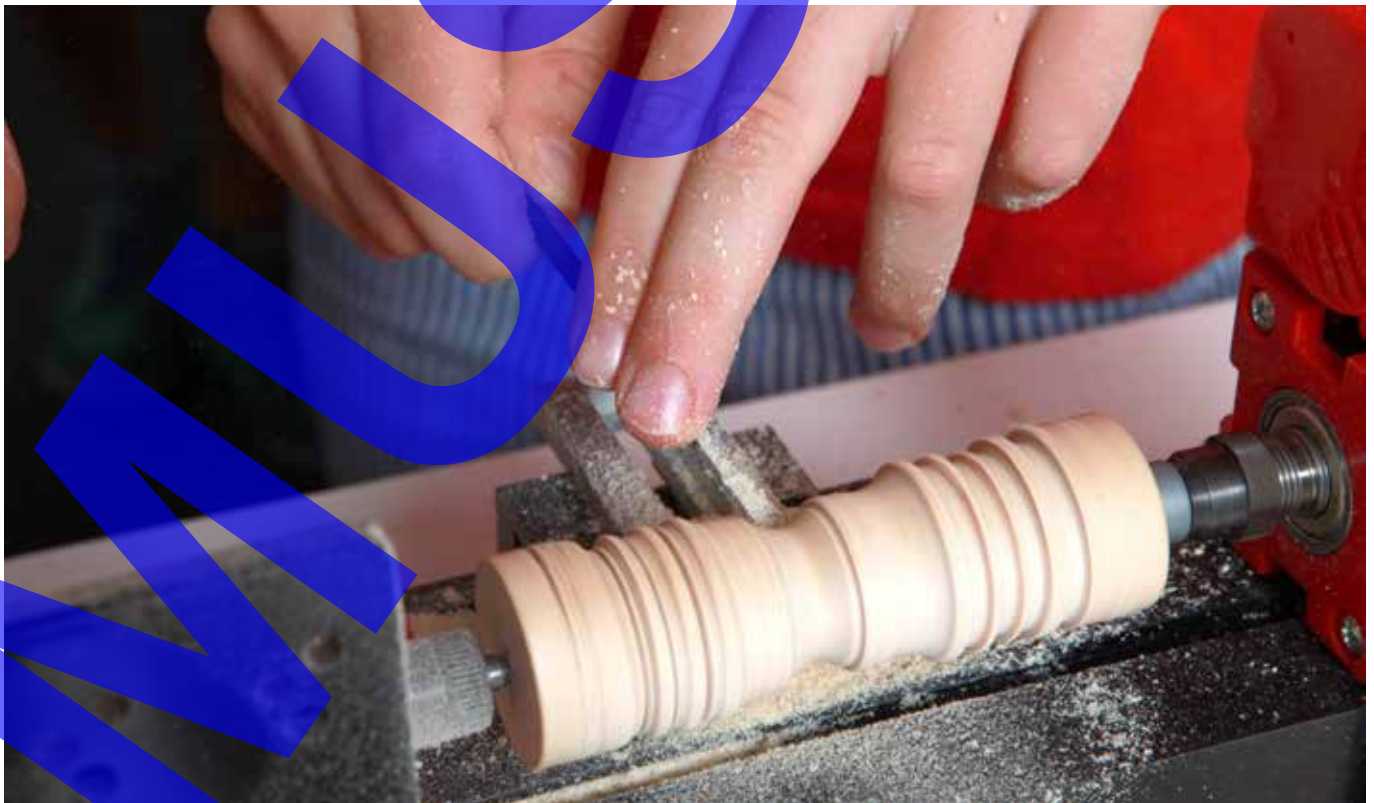
TECHNICS WOOD

Lesson 3

Learn more about woodturning, material


Explore	7 min	<ul style="list-style-type: none">• Short summary of lesson 1+2• What do you remember from this lessons	
Learn	15 min	<ul style="list-style-type: none">• Learn about the different type of wood• Which trees / wood do you know• What wood is used for which application	E 18; D 17
Working with the woodlathe	35 min	<ul style="list-style-type: none">• Take the woodlathe out of the box• Use 20 mm wooden dowels for keyring project• Use driver and center finder according to manual and fix the workpiece• Follow the instructions in the manual	E 24/25; D 23/24
Improve the wooden surface	15 min	<ul style="list-style-type: none">• Use sanding paper to smoothen the surface• Use colored pens to color the surface• Fix the keyring into the wood	
Reflection and feedback	10 min	<ul style="list-style-type: none">• How does a woodlathe work• What did you like most• Trouble shooting – what to do if....• What's about safety	E 12; D 11 E 11; D 10
Cleanup and storage	8 min	<ul style="list-style-type: none">• Cleanup and store into the box	
<hr/>			
	90 min		

WOODLATHE-KEYRING



Lesson 4

Learn more about woodturning, tools and design


Repeat	7 min	<ul style="list-style-type: none">• Short summary of lesson 1-3• What do you remember from this lessons	
Learn	15 min	<ul style="list-style-type: none">• Learn about the different tools for woodturning• What tools do you know in general• Which tool is used for which application	E 14; D 13
Working with the woodlathe	30 min	<ul style="list-style-type: none">• Take the woodlathe out of the box• Follow the instructions in the manual for penmaking• Start working	E 26; D 25
Improve the wooden surface	20 min	<ul style="list-style-type: none">• Use sanding paper to smoothen the surface• Use crayons or wax to stain / color the surface• Assemble the pen by use of pen-press	
Reflection and feedback	10 min	<ul style="list-style-type: none">• Let's talk about design• Thoughts on design and function of a pen• Quality management and process organisation	E 27-29; D 26-29 E 30; D 29
Cleanup and storage	8 min	<ul style="list-style-type: none">• Cleanup and store into the box.	

90 min



Lesson 5

Assembling variations of woodlathe


Repeat	7 min	<ul style="list-style-type: none">• Short summary of lesson 1-4• What do you remember from this lessons	
Learn	20 min	<ul style="list-style-type: none">• Learn about the different types of woodturning• What kind of woodlathe do you know• What parts can be done by which setup	BM 9; DM 10 E 9/10; D 8/9
Working with the minature woodlathe	30 min	<ul style="list-style-type: none">• Take the woodlathe out of the box• Disassemble the penmaking mandrel• Use 6 mm collet and 6mm beech wood for making miniature parts for dollhouses, minature furniture, ships• What other kind of miniatures can you produce?	BM 9; DM 10 VS 1604 – page 17,18,50; VS 1603 – page 9,15
Faceplate turning	15 min	<ul style="list-style-type: none">• Explain the fixation via faceplate and chuck	M 9; D 10 E 10; D 9
Reflection and feedback	10 min	<ul style="list-style-type: none">• What kind of products can you make with this setup	
Cleanup and storage	8 min	<ul style="list-style-type: none">• Cleanup and store into the box	

90 min



Lesson 6

Jig-saw


Repeat	7 min	<ul style="list-style-type: none">• Short summary of lesson 2-5 – all about woodturning• What do you remember from this lessons	
Explore the jig-saw	15 min	<ul style="list-style-type: none">• Intro• What is a saw and a jig-saw	E 32; D 31
Check manual and partlist	15 min	<ul style="list-style-type: none">• Check the manual for the Unimat jig-saw• How to assemble the Unimat jig-saw	BM 10/11; D 11-13 E 35; D 34
Assembling the Unimat jig-saw	20 min	<ul style="list-style-type: none">• Take the Unimat woodlathe out of the box• Dis-assembling the Unimat woodlathe to the modules• Assemble the Unimat jig-saw components• Assemble the complete Unimat jig-saw on the machinebed• Learn how to change the Unimat jig-saw blade	BM 10/11; D 11-13
Working with the Unimat jig-saw	15 min	<ul style="list-style-type: none">• Start working with the Unimat jig-saw by using the testing board to learn cutting angles and curves• How to transfer a design onto the wooden sheets	BM 15; DM 18 E 38; D 37
Reflection and feedback	10 min	<ul style="list-style-type: none">• How does a jig-saw work• What did you like most	
Cleanup and storage	8 min	<ul style="list-style-type: none">• Cleanup and store into the box	

90 min

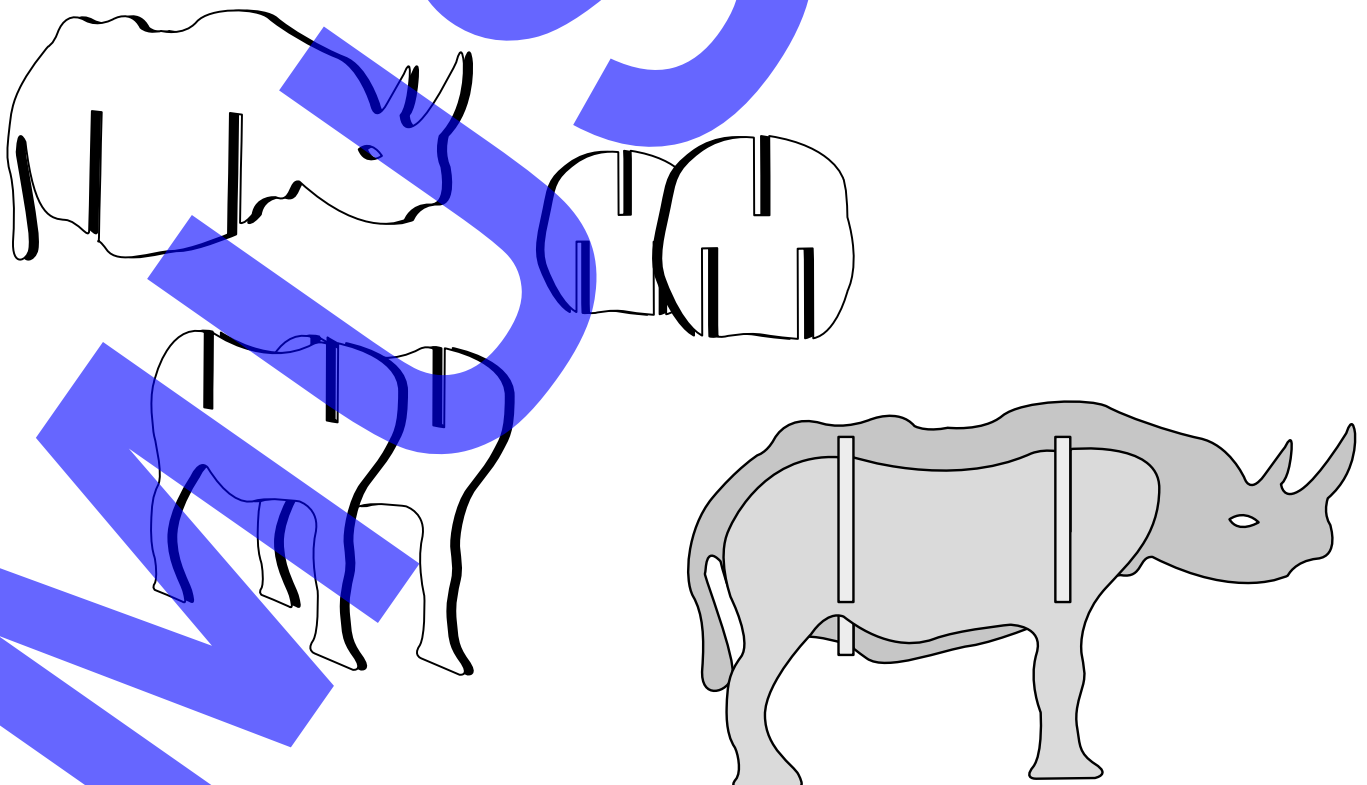


Lesson 7

Learn more about the jig-saw and sawing in general


Repeat	7 min	<ul style="list-style-type: none">• Short summary of lesson 6• What do you remember from this lessons	
Learn	20 min	<ul style="list-style-type: none">• Learn about the different types of sawing machines• Which machines do you know• Why is the Unimat jig-saw safe	E 32-34; D 31-33
Working with the Unimat jig-saw	30 min	<ul style="list-style-type: none">• Take the Unimat jig-saw out of the box• Cut out the first project with the Unimat jig-saw – Rhino	E 42/43; D 41/42
Improve the wooden surface	10 min	<ul style="list-style-type: none">• Use sanding paper to smoothen the edges – or use sanding machine• use colored pens to color the surface	
Reflection and feedback	18 min	<ul style="list-style-type: none">• How does a jig-saw work• What did you like most• Trouble-shooting – what to do if....• Theory exercise – jig-saw	E 38; D 37 E 40/41; D 39/40
Cleanup and storage	8 min	<ul style="list-style-type: none">• Cleanup and store into the box	

90 min



Lesson 8

Working with the Unimat jig-saw


Repeat	7 min	<ul style="list-style-type: none">• Short summary of lesson 7• What do you remember from this lessons	
Learn	10 min	<ul style="list-style-type: none">• Learn about the different types of saw blades• Learn about different kind of wood (plywood, solid wood, etc)	E 36; D 34
Working with the Unimat jig-saw	30 min	<ul style="list-style-type: none">• Take the Unimat jig-saw out of the box• Make a new project with the Unimat jig-saw	E 45-48, D 44-47 See VS1602 – VS1604
Improve the wooden surface	20 min	<ul style="list-style-type: none">• Use sanding paper to smoothen the edges – or use sanding machine• Use crayons to color the surface	
Reflection and feedback	15 min	<ul style="list-style-type: none">• What kind of saw blades do you know• What did you like most• Theory exercise – jig-saw	E 40/41; D 39/40
Cleanup and storage	8 min	<ul style="list-style-type: none">• Cleanup and store into the box	

90 min



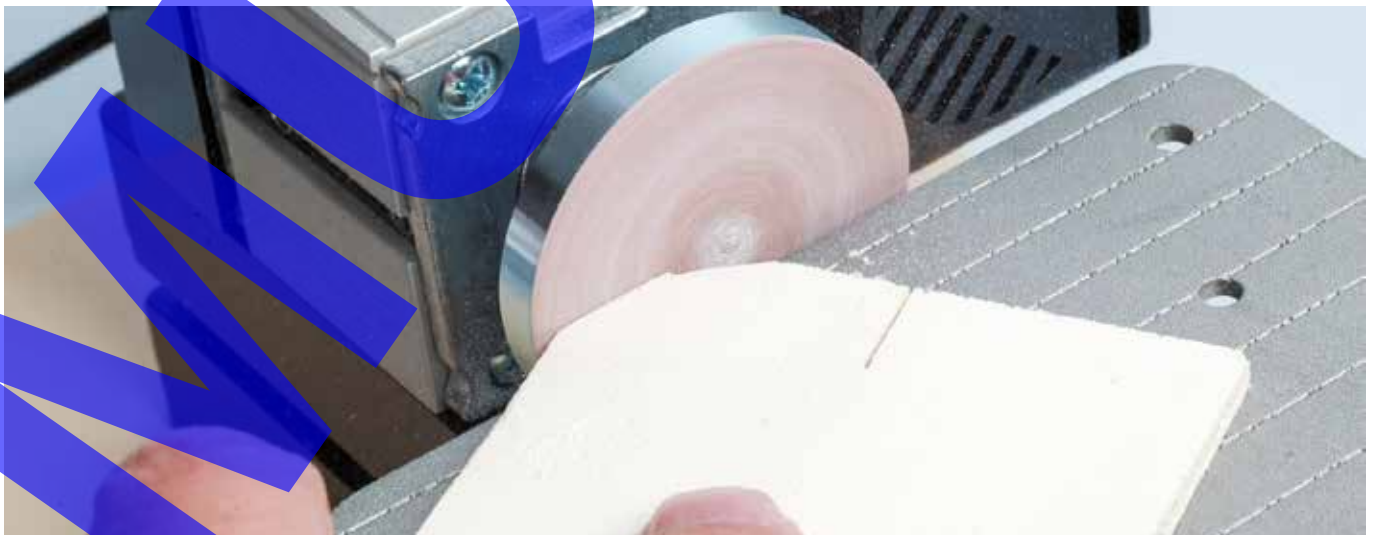
Lesson 9

Sanding machine

Repeat	10 min	<ul style="list-style-type: none">• Short summary of lesson 6-8 – all about sawing• What do you remember from this lessons	
Explore the Unimat sander	10 min	<ul style="list-style-type: none">• Intro• What is a sanding /a sanding machine• Learn about the different types of sanding machines• Learn about the different types of sanding paper and grain	E 50-52; D 49-51
Check manual and partlist	15 min	<ul style="list-style-type: none">• Check the manual for the Unimat sander• How to assemble the Unimat sander	BM 12/13; DM 14-16
Assembling the Unimat sander	20 min	<ul style="list-style-type: none">• Take the Unimat jig-saw out of the Box• Dis-assembling the Unimat jig-saw to the modules• Assemble the Unimat sander components• Assemble the sander modules on the machinebed• Learn how to change the sanding paper	BM 12/13; DM 14-16
Working with the Unimat sander	20 min	<ul style="list-style-type: none">• Start working with the Unimat sander to smoothen the finished woodturning and jig-saw projects• Take the motor-headstock unit from the machinebed and use the handsander	BM 12; DM 14
Reflection and feedback	10 min	<ul style="list-style-type: none">• How does a sander work• What is the difference between the hand-sander and the stationary sander	E 50; D 49
Cleanup and storage	8 min	<ul style="list-style-type: none">• Cleanup and store into the box	


90 min

SANDING MACHINE

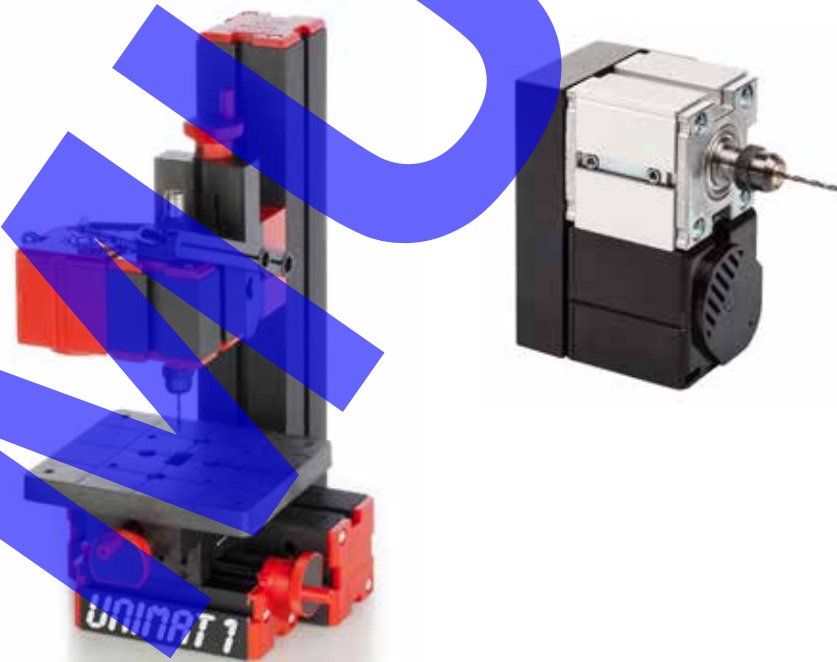


Lesson 10

Drilling machine / handdrill

Repeat	5 min	<ul style="list-style-type: none">• Short summary of lesson 9 – all about sanding• What do you remember from this lessons	
Explore the drilling machine	20 min	<ul style="list-style-type: none">• Intro• What is a drilling / a drilling machine• Learn about the different types of drilling machines• Learn about the different types of drilling bits	E 56; D 55 E 57-59; D 56-58 E 61; D 61
Check manual and partlist	15 min	<ul style="list-style-type: none">• Check the manual for the Unimat drilling machine• How to assemble the Unimat drilling machine	BM 12; DM 15
Assembling the Unimat drill	15 min	<ul style="list-style-type: none">• Take the Unimat hand-sander out of the box• Dis-assembling the sanding disc from the headstock• Fix the drill with the collets into to headstock	BM 12; DM 15
Working with the Unimat drill	15 min	<ul style="list-style-type: none">• Start working with the Unimat handdrill to drill holes into different materials• Feel the different characteristics by drilling into the various materials	
Reflection and feedback	15 min	<ul style="list-style-type: none">• How does a drilling machine work• What different kind of drills do you know	E 62/63; D 62/63
Cleanup and storage	8 min	<ul style="list-style-type: none">• Cleanup and store into the box	

90 min





Comments: use each lesson to talk about safety and a clean and proper workspace. Discuss how to work in teams of 2 to 4 students and more. Is there a difference in working, communication and feedback in smaller and larger groups.

Instead to using 8 woodlathes converted to 8 jig-saws, etc you can setup 4 woodlathes and 4 jig-saws as well. Beside the mentioned smaller projects you can work on larger projects like the ship in VS 1604 or the train in VS 1603 by splitting the task.

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