

Europäisches Anrechnungssystem für Teilqualifikationen in den Metallberufen

Nummer der Finanzhilfevereinbarung: 2010-4992/001-001



Arbeitspaket 3 DEV

Entwicklung von Lerneregebniseinheiten und Bepunktung

3.3 Ableitung von units of l.o.

Lerneregebniseinheit Nr. 2 in englisch: 1204_EN_LE2_maschinelle_Grundlagen_Metall

Unit of learning outcomes for basic qualification in metal industry

No. 2

Basics of metal processing using simple machine production techniques

April 2012



Dieses Projekt wurde mit Unterstützung der Europäischen Kommission finanziert. Die Verantwortung für den Inhalt des Produkts trägt allein der Verfasser; die Kommission haftet nicht für die weitere Verwendung der darin enthaltenen Angaben.



Dieses Projekt wird gefördert aus Mitteln des Hessischen Ministeriums für Wirtschaft, Verkehr und Landesentwicklung

Unit of Learning Outcomes 2

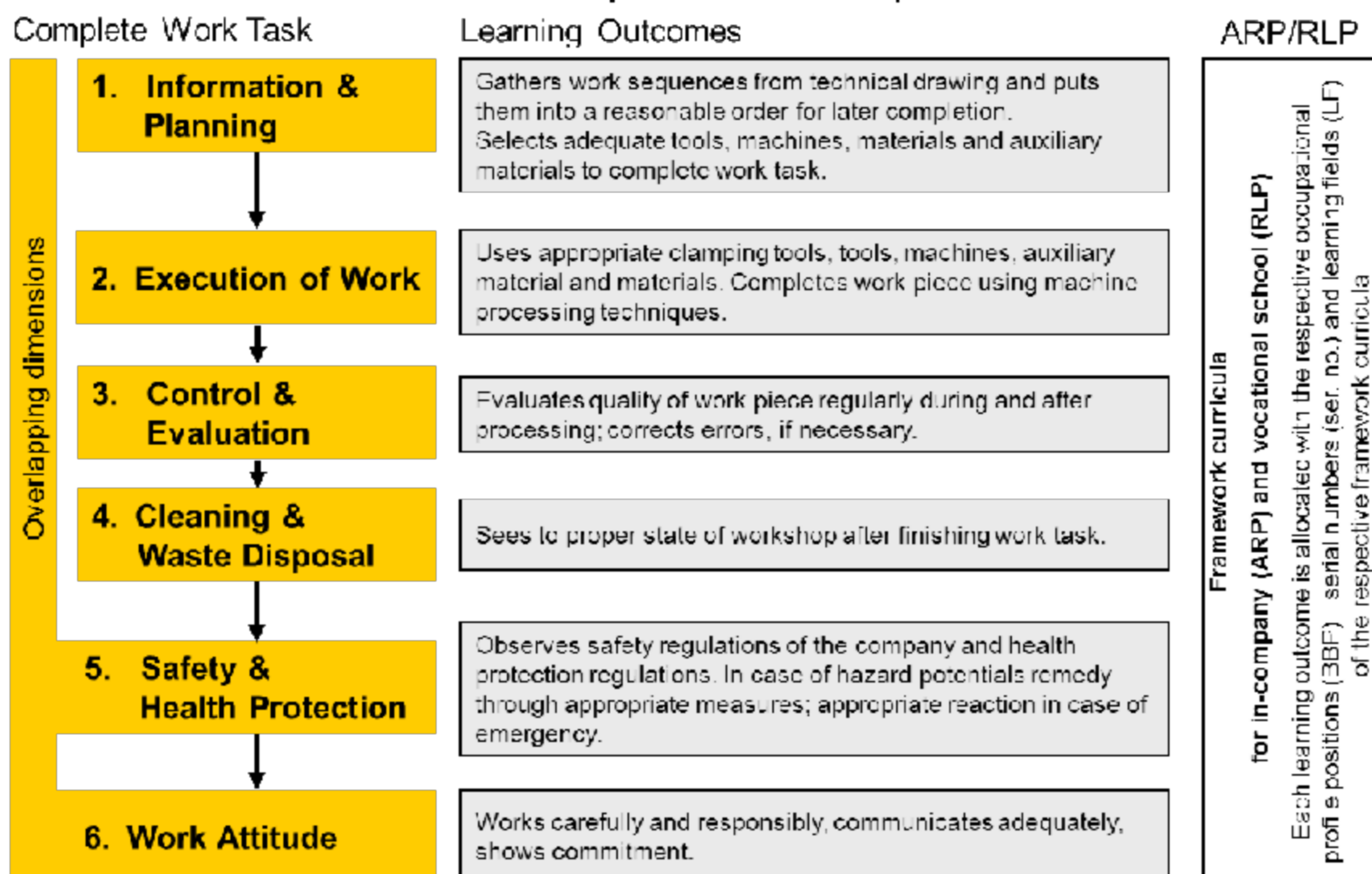
Prevocational Training in Metal Working with Test Criteria

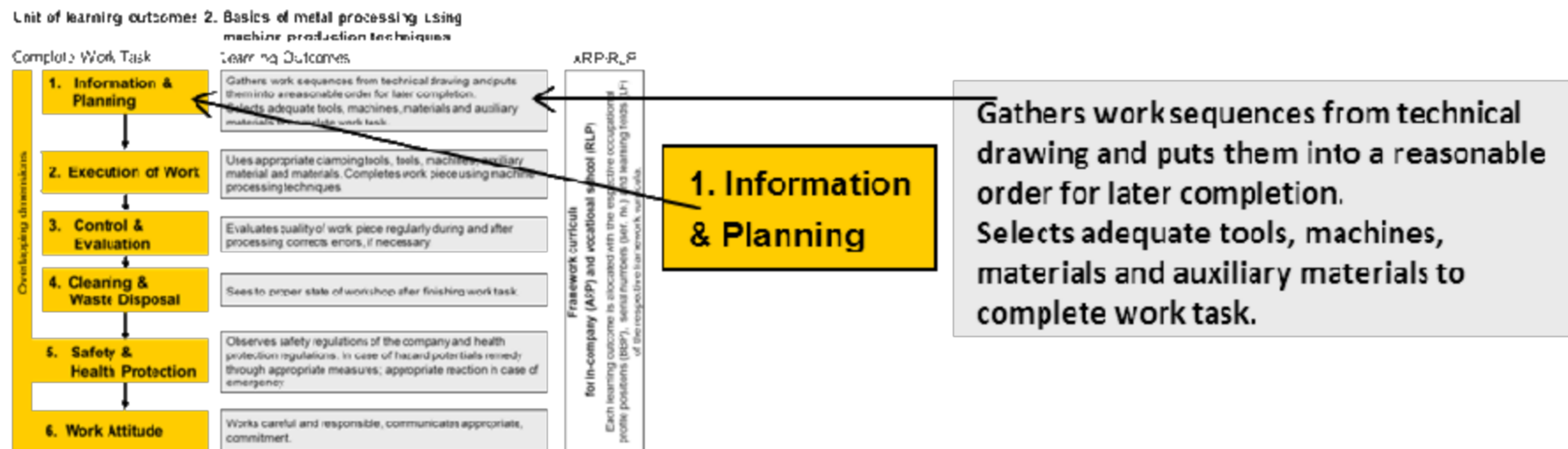
Title	Basics of metal processing using machine production techniques
Brief description of the unit of learning outcomes	The trainees are able to plan and execute an entire work task. Based on a technical drawing they determine the task and plan the work process with the help of a work schedule. They prepare the task consisting of theoretical and practical basics of processing techniques and materials science as well as of machine production procedures, and then complete the task. They control the result, and clean up. They observe the basic aspects of work-, health- and environmental protection.
Example for entire work task (see Annex)	Example: Manufacture of items for an extractor
Respective qualified jobs and ECVET points to be scored (in relation to entire training). (Calculation based on 60 points per year.)	<p>Industrial metal-working occupations (3,5 years) (plant mechanic, industrial mechanic, construction mechanic, tool mechanic, milling machine operator)</p> <p style="text-align: right;">10,12 ECVET points</p> <p>Metal worker (3,5 years) 16,7 ECVET points</p> <p>Machinery and plant operator (2 years) 14,5 ECVET points</p>
Dual Vocational Training System	<p>The dual vocational training system combines part-time vocational school with practical work experience. The training in companies and in vocational schools is based on framework curricula so that uniform national qualification standards are guaranteed.</p> <p>The dual vocational training system sees itself as a holistic system in which the vocational education has to place the skills, knowledge and competences (vocational action ability), which are essential for the exercise of a qualified vocational operation in a changing working environment (See: Vocational Training Act Section 1, Paras. 3).</p>
Framework curriculum (in company)	Legal basis for the training in companies according to respective job
Framework curriculum (vocational school)	Legal basis for the education in vocational schools according to respective job
Prevocational training	<p>Training preparation is an integral part of the vocational training (see: Vocational Training Act).</p> <p>Training modules used in schemes to prepare individuals for vocational education and training contain parts of the vocational training offered for recognized occupations.</p> <p>The "unit of learning outcome" at hand is one of four units which are illustrating the first year of apprenticeship of the occupations above.</p>

Outline of Unit of Learning Outcomes 2

The following figure shows the sequences of a complete work task including information and planning, execution of the task, control and evaluation as well as cleaning up the workplace and waste disposal. One dimension that concerns all work sequences is the observation of safety instructions and health protection regulations. Another overlapping dimension is the work attitude as prerequisite for a successful execution of a work assignment. To each working sequences learning outcomes are allocated as well as occupational profile positions/ serial numbers and learning fields of the respective framework curricula.

Unit of learning outcomes 2: Basics of metal processing using machine production techniques





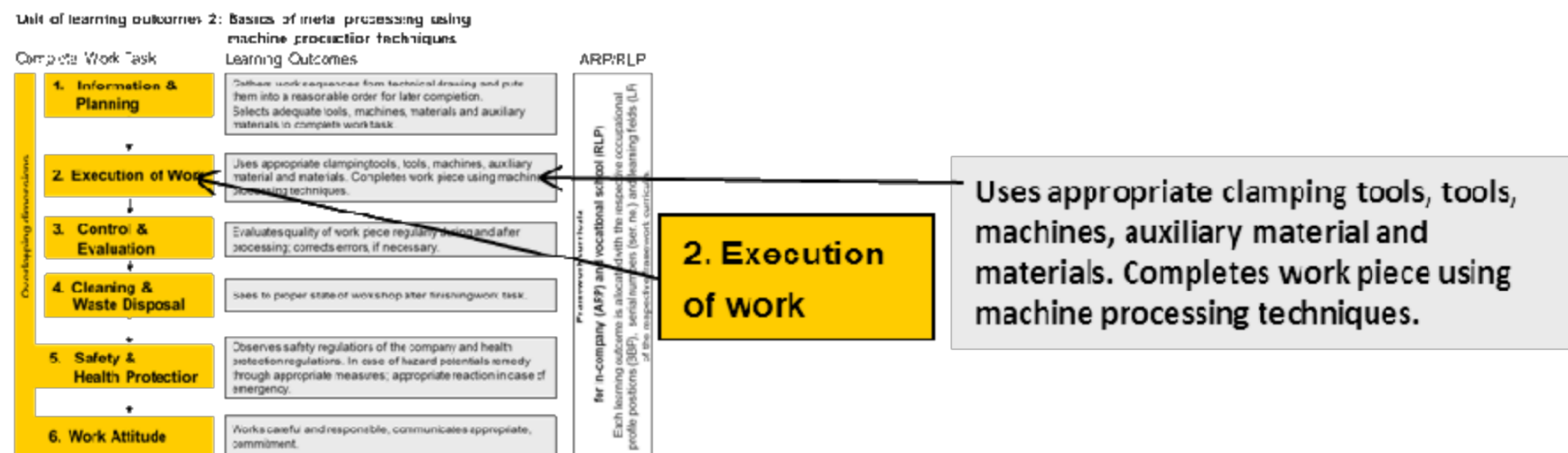
Learning outcome: Gathers work sequences from the technical drawing and puts them into a reasonable order for later completion. Selects adequate tools, machines, materials and auxiliary materials to complete work task.

EQF-Dimensions

Knowledge	<p>Knows and is able to name the major drawing practice standards, drawing instruments.</p> <p>Names materials and auxiliary material as well as their properties and fields of application from the title block of the technical drawing.</p> <p>Assigns materials and auxiliary materials according to their properties to fields of application.</p> <p>Names the major groups of manufacturing method: primary shaping, metal forming, cutting, joining, coating and changing of substance property.</p> <p>Names tools, machines, materials and products, the relation between cutting edge geometry, materials and tools, as well as procedures of machine processing.</p>
Skills	<p>Gathers all relevant information for processing from technical drawings and sketches.</p> <p>Care: handles drawings with care.</p> <p>Communication: in case of uncertainty: asks appropriate (clarification questions) and adequate (choice of language) questions; listens attentively.¹</p> <p>Sees to serviceability of machines including tools and provides the necessary auxiliary materials.</p>
Competences	<p>Plans the work sequences according to information gathered from the technical drawing and puts them into a reasonable order.</p> <p>Care: pays attention during the planning process to the work sequences being complete.</p> <p>Evaluates and selects appropriate tools, machines, materials and auxiliary materials subject to procedures and materials.</p> <p>Communication: in case of uncertainty: asks appropriate (for clarification) and adequate (choice of language) questions; listens attentively. Makes arrangements with colleagues to co-ordinate use of materials and machines.</p> <p>Care: resource-oriented working</p>

¹ The execution of a complete work task implies work attitudes that are generally called "social and personal competences". The companies consider them as prerequisite for an apprenticeship. The "unit of learning outcomes" lists them under "work attitude" (sequence no. 6). Furthermore, they are mentioned in the respective sequences of the work task in order to show at what point they are especially relevant. The draft of the German National Qualification Framework (G-NQF/GQF) mentions, apart from knowledge and skills, also social competence and self-competence.

Framework curricula	Industrial metal-working occupations: BBP5a,b,c,d,e,g,i, 6a,b,c,l, 7a,b, 12a,b; LF 1,2; Metal worker: Ser. no. 5a,b,c,d,e,f,i,j, 6a,b,c, 11a,c; LF1,2; Machinery and plant operator: Ser. no. 5a,b, 6a,b,c,d,f,g, 7a,b, 9a,c; LF 1,2 of industrial metal working occupations.
Test criteria	Prepares a work schedule with the help of a drawing. Names 3 different kinds of metal and one specific property for each of them. Ascribes 5 auxiliary materials and three kinds of energy. Names tools, machines and work equipment technically correct. Selects all necessary tools and machines based on technical drawing. Selects all necessary auxiliary materials based on technical drawing. Sees to serviceability of machine. Names four of the six major groups of manufacturing methods with one example for each. Describes the processing procedure of grading (definition, process, example) Names edges and faces at cutting wedge and explains relation to material (solid vs. soft). Describes system of the material group of metal. Names two auxiliary materials of machine processing. Names 4 substance properties of metals.



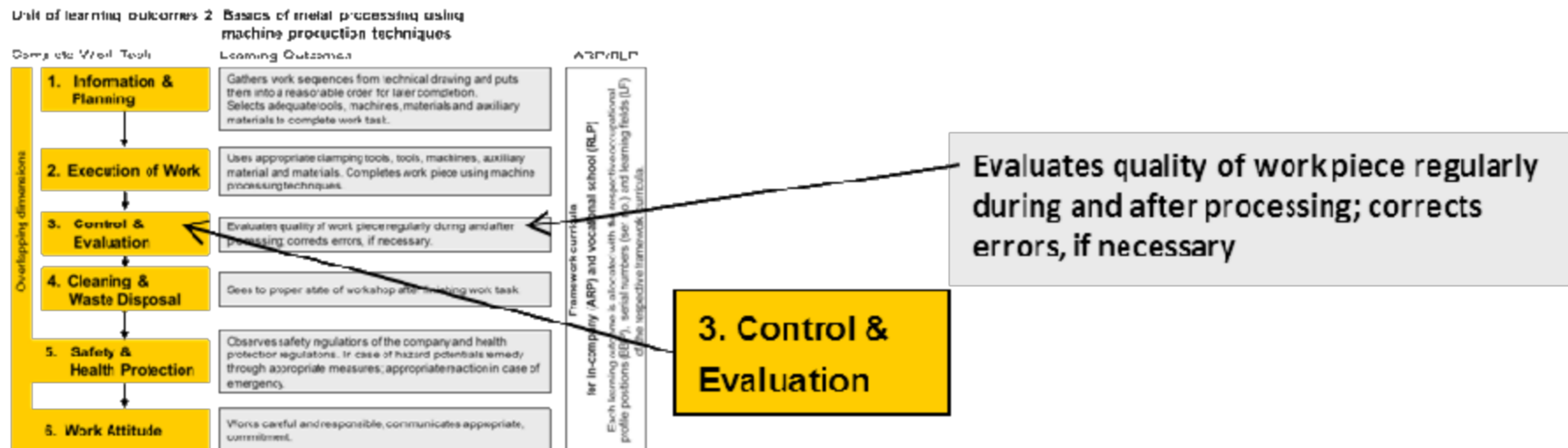
Learning outcome: Uses appropriate clamping tools, tools, machines, auxiliary material and materials. Completes work piece using machine processing techniques.

EQF-Dimensions

Knowledge	Names regular clamping tools and respective fields of application. Names relevant parameters for machine processing (e.g. cutting and feed rate).
Skills	Aligns work pieces and tools and clamps them according to material. Sense of responsibility: works carefully during aligning and clamping process. Care: handles material and clamping tools carefully. Uses tools and machines (simple and complex) securely, properly and according to procedure, subject to respective work sequences and requirements (drawing). Machine processing of work piece according to assignment and time schedule. Commitment: works steadily.
Competences	Evaluates clamping tools according to work assignment, material, tools, machines and safety regulations; and selects them respectively. Checks proper condition of tools, machines, auxiliary material and materials regularly and, if necessary, makes corrections. Checks measures of work piece regularly during work process. Resource-saving use of tools, machines, auxiliary material and materials. Care: handles tools, machines, auxiliary material and material carefully. Care: works carefully, precisely and resource-oriented Sense of responsibility: evaluates what precautions must be taken while working with tools and machines. Sense of responsibility: shows responsibility for entrusted materials, tools and machines.

Framework curricula	Industrial metal-working occupations: BBP5f, 6c,d, 7a,b, 8a,b,c,d,e, 11a,b; LF 1,2; Metal worker: Ser. no.5g, 10g, 11a,b,c,d,e,f; LF 1,2; Machinery and plant operator: Ser. no. 5b, 6e, 9b,c, 12a; LF 1,2 of industrial metal working occupations.
----------------------------	---

Test criteria	Selects appropriate tools, machines, auxiliary material and clamping tools. Knows three requirements for clamping devices of machine tools. Completes work sample using at least one cutting procedure (milling or turning from major group 'cutting') by machine. Completes work sample according to the usual and fixed tolerance values and fits (e.g. milling and turning ± 0.1 mm). Observes the sequences of processing. Checks regularly the proper state of tools, machines, auxiliary material and materials and corrects autonomously; if necessary.
----------------------	---



Learning outcome: Evaluates quality of work piece regularly during and after processing; corrects errors, if necessary.

EQF-Dimensions

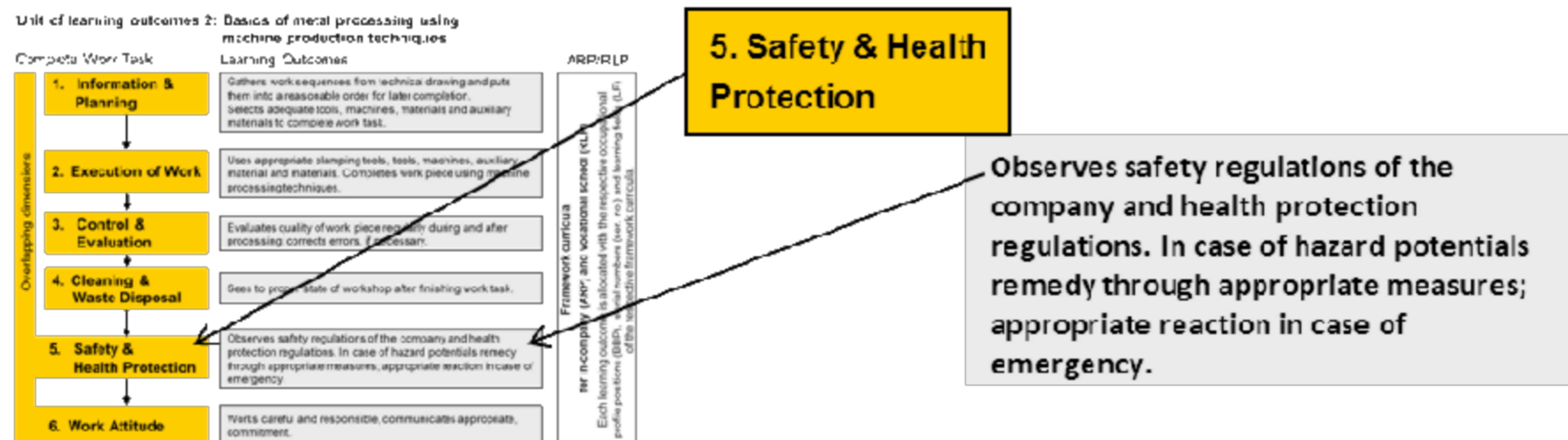
Knowledge	Names major test procedures / mediums to evaluate form errors and measures.
Skills	Considers major reasons for measurement errors. Uses appropriate test mediums to check required quality of the work piece.
Competences	Evaluates regularly the results of the work sequences by application of appropriate test mediums and corrects errors according to requirements. Care: handles test mediums with care.
Framework curricula	Industrial metal-working occupations: BBP 5f,h, 6e,f,g,j,k, 9b; LF 1,2; Metal worker: Ser. no. 5h, 6d, 7a,b, 8a,b,c,d,e,f,g,h; LF 1,2; Machinery and plant operator: Ser. no. 8a,b,c,d, 9d; LF: 1,2 of industrial metal working occupations.
Test criteria	Names all necessary test procedures / mediums (measuring instruments and gauges) relating to the work sample, as well as achievable accuracy. Names four reasons for measurement errors. Uses suitable test mediums properly. Checks regularly by application of appropriate test mediums during work process, and corrects of measurement errors. Evaluates the final result.



Learning outcome: Sees to proper state of workshop after finishing work task.

EQF-Dimensions

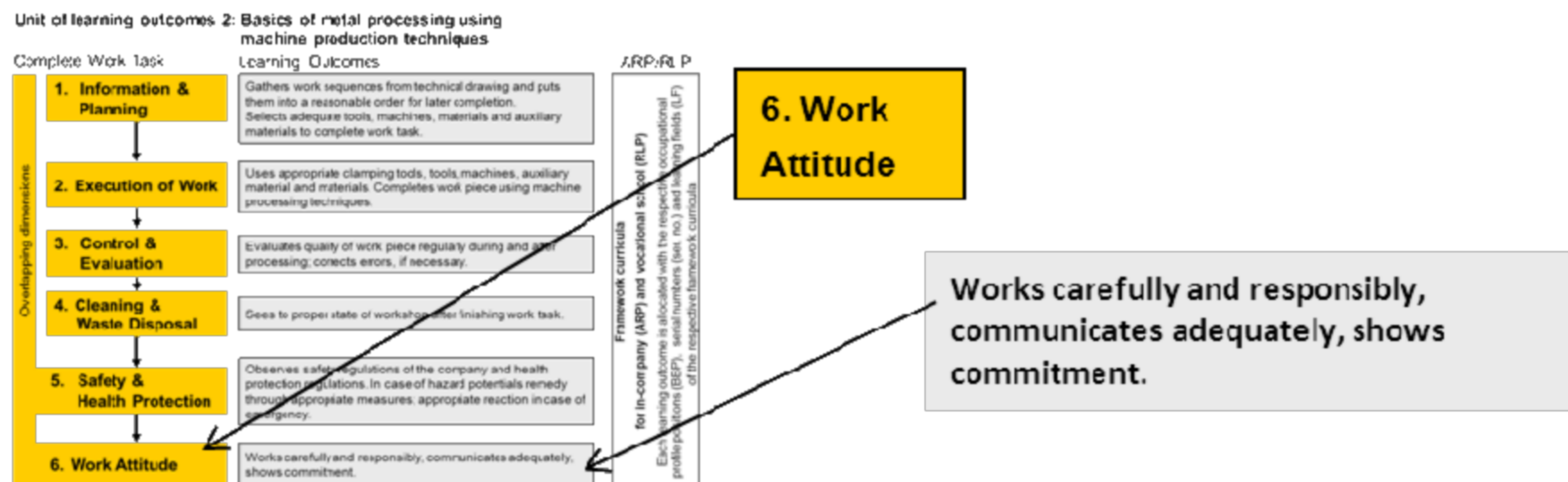
Knowledge	Names necessary steps for machines / equipment maintenance. Names the possibilities and regulations for safe and environmentally correct disposal on the premises, the storage system, workshop rules as well as basics of health-, work- and environment protection
Skills	Disposal of remains of (auxiliary) materials. Stows away tools, materials, products according to storage system of the workshop. Maintains machines and equipment. Carefully cleans up the workplace according to health-, work- and environment regulations as well as of workshop rules.
Competences	Checks and evaluates the orderliness of workplace and workshop, makes corrections independently or upon consultation
Framework curricula	Industrial metal-working occupations: BBP 4a,b,c,d; 9a,b,c; LF 1,2; Metal worker: Ser. no. 4a,b,c,d, 12a,b,c,d,e,f,g; LF 1; Machinery and plant operator: Ser. no. 4a,b,c,d, 12b, 13, 14; LF 1,2 of industrial metal working occupations.
Test criteria	Cleans up workplace by using appropriate instruments and auxiliary material. Cleans tools and machines; stows away tools properly.. Names necessary maintenance jobs for machines /equipment. Names internal facilities for disposal of waste and hazardous material. Finally evaluates cleaning up and corrects, if necessary.



Learning outcome: Observes safety regulations of the company and health protection regulations. In case of hazard potentials remedy through appropriate measures; appropriate reaction in case of emergency.

EQF-Dimensions

Knowledge	Names safety regulations corresponding to work assignment: required personal protection equipment, safety signs.
Skills	Applies safety regulations corresponding to work assignment: uses required personal protection equipment, observes safety signs. Observes health protection regulations. Based on common hazardous situations identifies hazard potentials while working at machines and takes immediate remedial action. Adapts workplace subject to ergonomic requirements and work assignment. Keeps his / her workplace in order.
Competences	/
Framework curricula	Industrial metal-working occupations: BBP 3a,b,c,d,e, 6a; LF 1,2; Metal worker: Ser. no. 3a,b,c,d, 6c; 12e; LF 1,2; Machinery and plant operator: Ser. no. 3a,b,c,d, 5b, 7c; LF 1,2 of industrial metal working occupations.
Test criteria	Names four parts of personal protection equipment. Describes five hazards of turning and milling. Names three measures and/or steps to be taken in case of accidents. Names two measures and/or steps to be taken in case of accidents with electricity. Names four measures in case of fire. Names two safety installations of machines. Takes measures for health protection / safe handling of machines. Keeps workplace in order.



Learning outcome: Works carefully and responsibly, communicates adequately, shows commitment.

Features of work attitude and personality

Sense of responsibility	Works carefully while clamping. Considers required safety measures for use of tools and machines. Shows responsibility for entrusted materials, tools and machines.
Carefulness	Minds completeness of each work sequence during planning process. Handles drawings, tools, machines and materials carefully and selects them respectively. Works carefully, accurately and resource-oriented.
Appropriate, target-oriented communication	Asks appropriate and proper questions in case of uncertainties, listens attentively. Makes arrangement with colleagues to co-ordinate use of materials and machines.
Commitment	Works steadily on the work assignment.
Framework curricula	Industrial metal-working occupations: BBP 3a, 5e,h,i, 6l; Metal worker: Ser. no. 3a, 5b; Machinery and plant operator: Ser. no. 3a;
Test criteria	Selects required safety measures for working with tools and machines and applies them.. Selects appropriate tools, machines and materials and handles them carefully. Asks understandably in case of uncertainties. Makes arrangements with colleagues to co-ordinate use of materials and machines. Works continuously on the work piece. Produces a work piece accurate to measurement.

Annex:

Example for an entire work task: manufacture of items for an extractor

Specification and material, see: http://www.christiani.de/product_info.php/products_id/20676

