

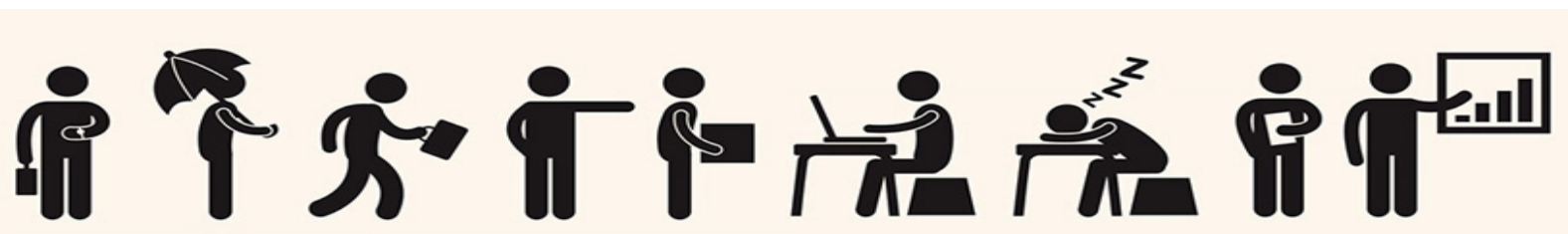
## External Evaluation 1

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## EXTERNAL EVALUATION OF THE FIRST FINAL VERSION OF METHODOLOGICAL MATERIALS

**TOPICS DRAFTED AND DEVELOPED BY:** The Stuttgart University (US), MiNe-MINT e.V. (MM)

### LIST OF EVALUATED TOPICS:

#### A Wood, Metals and Plastic

##### A1 Utility and Gift Products

- A 1.1 Fritz Ekkert: Is it Possible to Blow out LED Candle? (US)

##### A2 Man and Production in Practice

- A 2.1 Marco Spurk: Adhesives – Substances which Connect (US)

##### A3 Simple Machines and Mechanisms

- A 3.1 Marco Spurk: What Does Have an Arm in Common with (US)
- A 3.2 Bernhard Horlacher, Hans - Martin Trein: Hydraulics and Pneumatics (MM)

##### A4 Technical Materials and their Processing Procedures

- A 4.1 Norbert Jurich: Working with Wood, Working with Metals (US)
- A 4.2 Marcus Brändle: Plastics (US)

##### A5 Graphic Communication in Technology

- A 5.1 Bernhard Horlacher: From a Simple Sketch to a Technical Design (MM)

##### A6 Technical Creation

- A 6.1 Franz Kranzinger: Designing Electrical Circuits (MM)

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## A7 Machine Processing of Materials

- A 7.1 Bernhard Horlacher: Drilling, Milling, Lathing (MM)

## B Man, Technology and Electricity

### B1 Man and Technology

- B 1.1 Marcus Brändle: Renewable Energy Sources (US)

### B2 Electric Power and Electric Circuits

- B 2.1 Franz Kranzinger: Simple Motors (homopolar motors) (MM)
- B 2.2 Fritz Ekkert: Electric Circuitry in the Home (US)

### B3 Machines and Devices in Household

- B 3.1 Fritz Ekkert: Solar Ovens, Rocket Stoves (US)

### B4 Household Appliances

- B 4.1 Franz Kranzinger, Bernhard Horlacher: Refrigerator (MM)
- B 4.2 Marcus Brändle: Microwave, Electric Stove, Induction Stove (US)

### B5 Technical electronics

- B 5.1 Karl Heller, Bernhard Horlacher: Smartphone Applications (e.g. Sensors) (MM)

## C Man and Work

### C1 Career Choice and Labour Market

- C 1.2 Bernhard Horlacher: The Changing Job Market in Technical Fields (MM)

### C2 Work, Job, Employment

- C 2.1 Jessica Liß: Running a Business (MM)

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## General impression

The resources cover a great range of topics, which makes them rich in variety. The topics offer many interesting and motivating ideas for teachers and students.

However, it would be helpful if the different topics could be unified in the use of categories and definitions as well as in structure. This concerns all topics. On top of that, many topics are missing alternatives with less equipment, e.g. A 4.2 or B 5.1

We strongly recommend editing the topics A 3.2 as well as A 7.1 as they don't fit the structure that all the other topics have.

## Chapter Overview

The overview at the beginning of each topic has excellent categories, which should offer good and quick orientation for readers.

The competencies and „Fächerübergreifende Beziehungen“ are very diverse. Currently, some topics don't match German competence frameworks as well they could. If the basis for the resources is a different curriculum, you should check the framework of the particular curriculum.

## Theoretical introduction

The introduction is very informative and provides background information as well as context for the different topics.

## Methodological input for teachers

The solutions and tables containing the course of the lesson are fantastic and very helpful. However, it often remains unclear at which point of the lesson the work sheets and additional resources provided should be used (e.g. A 5.1 or B 5.1). Often, this part starts with more background information, which is helpful in general but should be placed in the theoretical introduction ( e.g. A 1.1, A 2.1, B 1.1 or B 2.2). Also, the didactic goals are missing in many of the topics (e.g. A 2.1, A 3.1, A 4.1, A 4.2, A 6.1, B 1.1, B 2.1, B 2.2, B 3.1, B 5.1, B 6.1, C1.2 or C 2.1).

## Additional resources

Naturally, all the resources provided are in German. This might not be very helpful for non-German speaking readers. We would recommend checking whether the resources themselves offer possibilities to switch to other languages.

## Appendix: Texts for students

Some of the texts are well written for the target group but most of them are too academic, use too many technical terms the students won't know at this age and are simply too long (e.g. B 1.1 or B 6.1)

## Appendix: Work sheets for students

The additional instructions for teachers are great for inexperienced staff. The work sheets themselves should contain clear instructions or questions. Some topics (e.g. A 7.1) are lacking instructions altogether.

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## External Evaluation

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## **EXTERNAL EVALUATION OF THE FIRST FINAL VERSION OF METHODOICAL MATERIALS**

**TOPICS DRAFTED AND DEVELOPED BY:** The University of West Bohemia in Plzeň

### **LIST OF EVALUATED TOPICS:**

#### **A Wood, Metals and Plastic**

##### A1 Utility and Gift Products

- A 1.2 Petr Simbartl, Eva Korálová: Plastic Bottle Jewelry

##### A2 Man and Production in Practice

- A 2.2 Jitka Štrofová, Milan Kraitr: Simulation of Papermaking

##### A5 Graphic Communication in Technology

- A 5.2 Jan Fadrhonc, Jan Král: 3D Modeling and 3D Space Orientation

##### A6 Technical Creation

- A 6.2 Petr Simbartl, Lukáš Štich: We build Log Cabins

##### A7 Machine Processing of Materials

- A 7.2 Daniel Aichinger, Jan Krotký: Computer-Controlled Machines, the Way from Idea to Product

##### A8 Creative Activities

- A 8.1 Jarmila Honzíková: Creative Work with Wire and Beads
- A 8.2 Jan Fadrhonc, Jan Král: Let's Make Own Board Game

#### **B Man, Technology and Electricity**

##### B1 Man and Technology

- B 1.2 Lukáš Honzík: Navigation and Orientation in Nature and in the City

##### B3 Machines and Devices in Household



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- B 3.2 Petr Simbartl, Eva Korálová: Electronic Home Security Systems

#### B5 Technical electronics

- B 5.2 Daniel Aichinger: Building Reliable Microphones for Music Recording and Acoustical Experiments with a Smartphone or a Laptop (ZUP)

#### B6 Housing fittings

- 6.2 Daniel Aichinger, Jan Krotký: Environment Friendly Heating and Air Conditioning Systems for a Family House, Regulation

### C Man and Work

#### C1 Career Choice and Labour Market

- C 1.1 Jan Krotký: Study or Work ? What to Do After Elementary School?
- C 1.3 Daniel Aichinger, Tomáš Kanta, Kateřina Tomisová: Unfold Your Technical Talent! - Extracurricular Youth Education in the EU

#### C2 Work, Job, Employment

- C 2.2 Daniel Aichinger, Tomáš Kanta, Kateřina Tomisová: Workshop on Writing a CV and Applying for a Job (ZUP)

### D Family and Household

#### D1 Planning and Running a Household

- D 1.1 Petr Simbartl: Debt Trap
- D 1.2 Jan Krotký, Lukáš Honzík: Transport Costs and Household Budget
- D 1.3 Daniel Aichinger, Tomáš Kanta, Kateřina Tomisová: Energy Costs under Control or how to Easily Measure the Electric Energy Consumption in Your Household with your PC

#### D2 Household Chores and Maintenance

- D 2.1 Václav Richter, Milan Kraitr: Colouring, Bleaching and Cleaning of Textiles (ZUP)

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### D3 Food Preparation and Nutrition

- D 3.1 Milan Kraiter, Václav Hrdlička: Food Production Principles and Food Processing in a Household
- D 3.2 Petr Simbartl, Eva Korálová, Lukáš Štich: Packaging Is Not Just for Decoration
- D 3.3 Daniel Aichinger, Tomáš Kanta, Kateřina Tomisová: Hi-Tech Cooking - Applied Physics for Faster, Cheaper and Tastier Meal Preparation

### D4 Handwork

- D 4.1 Jarmila Honzíková: Working with Textiles - Knitting Without Needles
- D 4.2 Jarmila Honzíková: Hand and Machine Sewing
- D 4.3 Jan Fadrhonc, Jan Král: Woodworking – Puzzles and Games Creation

### D5 Family Preparation

- D 5.1 Petr Simbartl, Eva Korálová: How to Buy Real Estate

### D6 Growing and Raising

- D 6.1 Daniel Aichinger, Petr Simbartl, Lukáš Štich: Urban Gardening and Home Growing of Vegetable in Flowerpots, Small Herb Garden
- D 6.2 Jiří Prchlík: Household in Nature

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## Synoptical Table

In most cases the synoptical table helps to gain a compact overview about a topic. However, adapting Slovak circumstances and Slovak legislature to some topics (D 3.2, C 2.2, D 6.1) is necessary. The exact topic of D 1.2 is unidentifiable from the table. It is not clear what the topic is about.

## Theoretical Introduction

The theoretical introduction is very interesting, informative and awakens interest in the content of the theme. Especially its conciseness and having no useless information was positively evaluated. The texts were evaluated as understandable and simple. The exception was the theoretical introduction to the topic D 1.3, which contained too many badly-arranged formulas.

However, it does not usually interest the readers so much as to make them deal with a topic further (C 1.3, D 1.2, D 3.2). It could be helpful if the text referred more to the methodical part (D 3.2), if it were more modified for boys (D 4.2), or if the text carried information which is connected to the practical life (A 1.2). Contrariwise the theoretical introductions to texts D 2.1, A 8.1, C 2.2 were so interesting that the readers would look for further information about the topic themselves.

It is recommended to remove the subjective critical opinion in the text D 4.3.

## Methodical Part for Teachers

Some parts of the methodical part for teachers were aptly proposed and should help teachers with teaching methodology. It should help especially those teachers who are not certified and the ones who finished a technically oriented faculty (Ing.).

The didactic aims/objectives of a topic were clear and explicitly formulated in most of the topics. Data concerning the needed materials were useful and correct. The time frame was aptly laid out. Tools and forms of work organization were helpful and useable. Illustrations of activities in the worksheets were positively evaluated.

It is recommended to work up those parts in topics D 3.2 and D 6.1 more precisely which deal with the teaching process.

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The aims/objectives were not formulated in the methodical part of topics D 1.3 and D 3.3. Although these are given in the introductory table.

The methodical part for teachers in topic A 1.2. was not sufficiently handled. The aims were not aptly formulated or rather were not formulated at all. The suggested teaching process was not rightly written and it lacked meaning. The time allocation did not fit too.

Contrariwise the methodical procedures for teachers were excellently described in all points of topics D 4.2, D 1.2 and A 8.1.

### **Accompanying Material**

The suggested sources and internet links were useable and helpful in gaining supplementary information to a given topic.

However, it would be useful for some topics (A 1.2, D 2.1, D 4.3, A 8.1) to have links to specific videos showing various procedures and instructions.

It is advisable to include such bibliography to the topic C 2.2 which would help Slovak teachers get oriented in Slovak legislature in this regard.

It is recommended to include newer bibliography regarding topic D 3.1.

It is recommended to include to the topic D 6.1 such bibliography which would help Slovak teachers translate terminology into the Slovak language.

No further sources are given in the materials to the topics D 3.3 and D 4.1.

### **Learning Text for Students**

The topics are adequate to the students' age. They are understandable. The texts are highly motivating. The conciseness of the texts was positively evaluated.

Worksheets for Students

The texts are adequate to the students' age and understandable.

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