Technical Competence, Digital Literacy and Production Skills at the Klax School

Internal School Curriculum – Educational Work in the Digital Age

Klax **Schule**

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Content

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1. Goals

The Klax School's educational aims are to develop mature and responsible fellow citizens. With this goal in mind, we work in different ways on further developing teaching practices with a view to developing these future skills.

Together we discuss what knowledge children and young people need to lead a responsible life in a digitized world as well as how we can impart these skills. Our colleagues have also dealt with these future-oriented skills, which have been presented worldwide, and developed measures and methods to promote them in the classroom:

- Collaboration,
- Construction of Knowledge,
- Use of IT in Learn Processes,
- Competent Communicaton,
- Creativity,
- Critical Thinking,
- Media and Information Literacy.

The most important finding that our colleagues will consider is that the nature of learning has changed. In traditional learning settings, children learn to listen and give the expected answer - they learn for tests and exams. In the context of future competences, however, it is not enough to remember and reproduce learning content. Knowledge must be discovered, critically scrutinized and effectively classified and applied. Anyone who wants to acquire knowledge today must be able to assess and organize the worldwide knowledge offer.

The children of today are learning for multi-perspective professions, some of which we do not even know today. They need to be able to learn again and again, to „unlearn" what they have learned and to integrate new insights.

For this to succeed, we are constantly changing our school. Our school should become a place of collaborative research and inquiry.

The goal is not to filter out the best listeners and performers, but to learn together and to understand learning processes, to find out the personal ability to learn and to deal with them effectively.

In changing forms of teaching, projects and open learning phases, students learn to understand themselves as part of a social community. They learn to benefit from the community and to pay into the community. This strengthens the ability to communicate competently, to act responsibly in the community and to construct and reflect on knowledge.

At Klax Schule we understand learning as active, collaborative research. Creativity and passion in learning processes come to the fore. The learning becomes playful. Social interaction becomes the central driver in the didactic approach. At the same time, social and personal competences become decisive success factors and receive a central position in the assessment of learning outcomes.

2. The School Concept at a Glance

The methods and measures anchored in the School Concept contribute to the above-mentioned objective. Knowing that learning in the digitized world cannot be about relaying and repeating knowledge, the Klax School has devoted itself to newer learning methods. Based on the ideas of 'Design Thinking', 'Inquiry based Learning' and Self-Organized Learning, we have developed a special concept at the Klax School.

The school concept is supported by the following features:

A Strong Social Community: A lot time is planned for Arrival Time, Morning and Afternoon Circles as well as sharing meals for educating and nurturing of the class and school community.

A Focus on Art and Digital: At the Klax School we offer more hours of Art Lessons, we also learn using digital media and Maker and Coding are taught from Grade 1. We also have regular Art Trips and in our Club Time we offer art related and technical/digital courses.

Project Learning: We are currently practicing this form of teaching and learning in three Project Weeks in the school year. Our teachers take part in the school's EU Project's courses based on 'Design Thinking', 'Inquiry Based Learning' and 'Future Classrooms.' These internationally established teaching methods form the basis for the approach to self-organized learning at the Klax School. In this way, we are working step by step to empower teachers to give students more responsibility for their own learning.

Portfolio: A student-led learning biography that serves as a form of self-reflection.
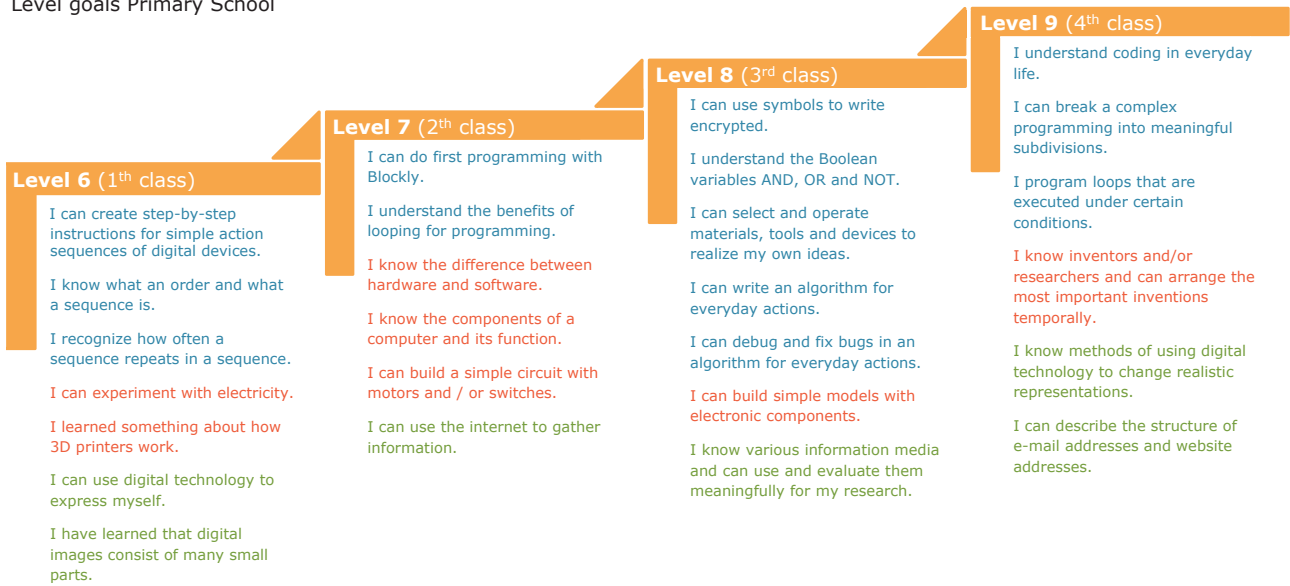
Logbook: The Logbook is the personal learning booklet that is kept by every child and adolescent at the Klax School. Teachers document learning success, parents give feedback and students document their self-reflection.

Subject Distribution Plan, Step Sheets, Step Plans, and Evidence of Learning: Using the Levels Sheets, the teacher prepares their Subject Plan for the school year, specifying when topics will be covered. Through the Level Sheets, issued in each subject at the beginning of the year, our students know what skills and competences they will acquire in the upcoming semester. Project Learning: Currently we practice this form of teaching in three project weeks in the school year. Our teachers participate in 'Design Thinking', 'Inquiry based Learning' and 'Future Classroom' training courses through the school's EU projects. These internationally established teaching methods form the basis for the approach to self-organized learning at the Klax School. In this way we are working step by step to empower teachers to give students more responsibility for their own learning.

Afternoon Clubs: Our afternoon clubs serve to continue teaching in optional courses. Here, students have the opportunity to practice the things that they enjoy doing or are passionate about in the afternoon, and to deepen their skills and knowledge. Clubs which intensify classroom learning also take place in the afternoons.

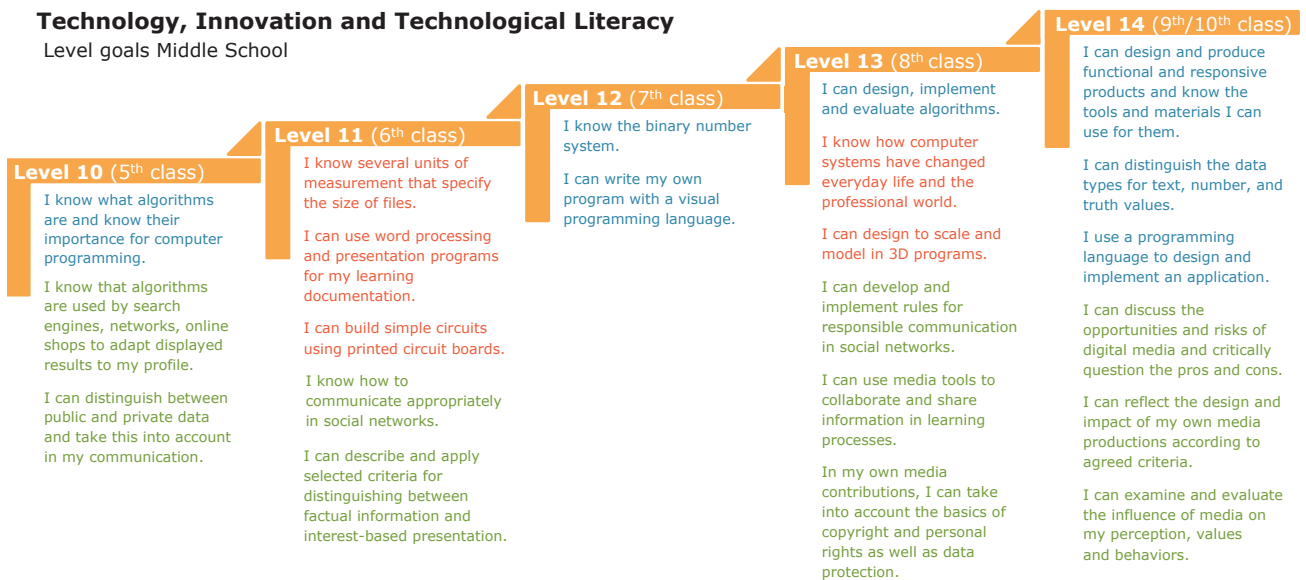## Technology, Innovation and Technological Literacy
Level goals Primary School

Level 6 (1th class)

I can create step-by-step instructions for simple action sequences of digital devices.

I know what an order and what a sequence is.

I recognize how often a sequence repeats in a sequence.

I can experiment with electricity.

I learned something about how 3D printers work.

I can use digital technology to express myself.

I have learned that digital images consist of many small parts.

Level 7 (2th class)

I can do first programming with Blockly.

I understand the benefits of looping for programming.

I know the difference between hardware and software.

I know the components of a computer and its function.

I can build a simple circuit with motors and / or switches.

I can use the internet to gather information.

Level 8 (3rd class)

I can use symbols to write encrypted.

I understand the Boolean variables AND, OR and NOT.

I can select and operate materials, tools and devices to realize my own ideas.

I can write an algorithm for everyday actions.

I can debug and fix bugs in an algorithm for everyday actions.

I can build simple models with electronic components.

I know various information media and can use and evaluate them meaningfully for my research.

Level 9 (4th class)

I understand coding in everyday life.

I can break a complex programming into meaningful subdivisions.

I program loops that are executed under certain conditions.

I know inventors and/or researchers and can arrange the most important inventions temporally.

I know methods of using digital technology to change realistic representations.

I can describe the structure of e-mail addresses and website addresses.

Production Skills & Coding (Innovation)
Technical Competence (Technology)
Information Competence

KLAX

Technology, Innovation and Technological Literacy
Level goals Middle School

Level 10 (5th class)

I know what algorithms are and know their importance for computer programming.

I know that algorithms are used by search engines, networks, online shops to adapt displayed results to my profile.

I can distinguish between public and private data and take this into account in my communication.

Level 11 (6th class)

I know several units of measurement that specify the size of files.

I can use word processing and presentation programs for my learning documentation.

I can build simple circuits using printed circuit boards.

I know how to communicate appropriately in social networks.

I can describe and apply selected criteria for distinguishing between factual information and interest-based presentation.

Level 12 (7th class)

I know the binary number system.

I can write my own program with a visual programming language.

Level 13 (8th class)

I can design, implement and evaluate algorithms.

I know how computer systems have changed everyday life and the professional world.

I can design to scale and model in 3D programs.

I can develop and implement rules for responsible communication in social networks.

I can use media tools to collaborate and share information in learning processes.

In my own media contributions, I can take into account the basics of copyright and personal rights as well as data protection.

Level 14 (9th/10th class)

I can design and produce functional and responsive products and know the tools and materials I can use for them.

I can distinguish the data types for text, number, and truth values.

I use a programming language to design and implement an application.

I can discuss the opportunities and risks of digital media and critically question the pros and cons.

I can reflect the design and impact of my own media productions according to agreed criteria.

I can examine and evaluate the influence of media on my perception, values and behaviors.

Production Skills & Coding (Innovation)
Technical Competence (Technology)
Information Competence

KLAX

Overview of competencies sought in grades 1–4 and 5–10, respectively.

Subject Distribution Plan
Class Level: 1

Teaching Material/Theme/Content Relevant material based on the Berlin curriculum, other important and / or interesting content, tried and tested projects and topics	Planned for Period:
1st Semester	
Natural and Artificial Light Sources Sources Level 6–9 Goal 14	August/ September
Which devices need energy? – Devices with and without current Level 6–9 Goal 14	Oktober
Electrically charged (experiments), simple circuit, which materials conduct electricity? Level 6–9 Goal 14	November
Operation Printer Level 6–9 Goal 15, Goal 17, Goal 22	December
Photo projects / edit photos, stories to photos Goal 6–9 Goal 22 and 21	January
2nd Semester	
From flip book to film, first film projects with Puppet Pals Level 6–9 Goal 21	February
Introduction to Creativity, Drawing App Sketches School Level 6–9 Goal 21	March
Introduction to Coding - Detecting Patterns, What are Codes / Commands? (Ozobot), Analog Programming for Commands and Sequences Level 6–9 Goal 1–3	April–June

Subject Distribution Plan
Class Level: 7

Teaching Material/Theme/Content Relevant material based on the Berlin curriculum, other important and / or interesting content, tried and tested projects and topics	Planned for Period:
1st Semester	
Getting to know variables and constants with the programming language Swift Level 10 Goal 1, Level 12 Goal 2	August– November
Data Types with Swift Programming Level 14 Goal 6	December
Application Micro: bit (Code Editor) Level 12 Goal 3, Level 13 Goal 4	January
2nd Semester	
Micro: bit own programs create Level 12 Goal 3, Level 13 Goal 4	February
Build circuits with circuit boards Level 11 Goal 10	March
Simple 3D models design with Tinkercad Level 13 Goal 12	April
Public and private data – Dealing with private data Level 11 Goal 15	May–June

3. Technology Available in the School

Equipment in Classrooms: The school is equipped with a high-performance WLAN, which is freely accessible for students (see our „Bring Your Own Device" concept, see Appendix).

In each classroom a wall was covered with whiteboard material and a ceiling mounted projector. The magnetic wall can be written on with special pens and serves as a projection surface for the projector. Pupils and teachers can use the projector to project their work results on the wall. Simultaneously projecting and writing on the wall creates interactivity between the virtual and real world that is superior to purely digital interactivity.

Printers: There are only a few printers in the school because printing is to be limited for sustainability reasons among other things.

Teacher Equipment: Each teacher has a laptop and an iPad. Apps are provided through a library maintained by our IT department.

Pupil Equipment: Our students are asked to bring their own equipment. This measure is development, as not all parents were able to purchase a device. For students without their own laptop or their own iPad, 60 tablets and 24 laptops are available to be borrowed at school. The students' smartphones are currently not included in this concept.

Recommended Platforms and Digital School Administration: The school works with the SchulWeb and the planning tool Untis. A digital calendar function communicates important dates and events across nine screens distributed throughout the school.

At the moment, we do not have our own learning platform. Currently we recommend students to use platforms like „Sofatutor" and „Khan Academy". We plan to make a decision about our own learning platform in the school year 20/21.

Makerspace: The school has its own makerspace. We know that spaces and their design have a direct impact on people's behavior and learning. The environment plays a crucial role in learning processes that promote creativity, initiative and social ingenuity. In the thinking of the international maker movement, an educational space is a workshop that supports joint activities. Our Makerspace, as a place of digital learning, is equipped with materials, tools and machines that allow students to realize their own projects: cables, motors, batteries, switches, conductive tape or yarn, conductive paint or plasticine. There are also microcontrollers and processors such as the „Microbit" or „Caliope".

Four 3D printers make it possible to develop and realize prototypes. Sewing machines, plotters and a heat press are just as present as a drill and a pendulum saw for woodworking. There is one or the other robot, a class set of „Lego WeDo", a „Kano" learning computer and „Makey Makey" set.

The Makerspace at the Klax School is based on the principle of the „Future Classroom Lab". These are areas to find ideas, design, realize and present. People work in small groups in the Makerspace.

4. Links to the Berlin Curriculum and School Year Plan

The implementation of educational goals for the digitized society is the objective of each lesson. Our teachers strive to shape teaching in terms of self-organized learning. In addition, in 2017 our school introduced teaching in Maker and Coding. The two new subjects serve to develop skills in the areas of technical competence, information literacy (media literacy) and production competence (innovation competence). Step sheets have been developed in all three areas to complement the Berlin curriculum.

The school year plan provides for three weeks of project work. In these project weeks, the focus will be on collaborative learning based on the „Design Thinking" method. The results of the school-wide project weeks are either presented at a large market or via a theatrical performance. In addition, the school participates regularly in the Code Week.

In the school year 18/19 the middle school took part in the nationwide project „#NichtEgal" from a working group about Media Literacy.

Since 2016, students and teachers from our school regularly attend the Maker Fair Festival. The annual school competition always includes a task from the Maker area.

The 17 sustainability goals of the UN are the current annual theme of the Klax School. Working on this focus would hardly be possible without the well-developed skills of our students in dealing with digital technology and information systems. Students document their project results with their own films, program sequences, create posters and build technology models.

The school's afternoon club program, offers a range of digital media services.

5. Teacher Training

In the Klax School so-called Micro Training has been implemented, in which employees train each other. Every Wednesday, a teammate offers colleagues a short 30 minute lesson on a specific topic on digitalisation and educational methods of the future.

The school continuously ensures that travel quotas are available to educational professionals and teachers from the EU's Erasmus program. This allows our teachers to travel and work in schools abroad. The experiences are passed on in Micro Training sessions. Currently, these training trips are about the implementation of digitization efforts and the changing of teaching in the light of the future skills currently being discussed.

Twice a year, two teachers each take part in the training courses of the Future Classroom Lab in Brussels.

During the winter and summer holidays, a training week will be initiated for the entire school team. These training weeks serve, alongside the Micro Training Sessions, to further improve the implementation of the concept in the areas of digitization and school of the future.

6. Parental Involvement

The parents of our students are fully aware of their children's activities. Digitalisation and Maker are always present at parents' evenings, in parent information letters and during our school events. Pupils hold parent information afternoons where parents can test their understanding of technology and put their media literacy to the test.

The visits to foreign and foreign experts are also important. For example, Linda Liukas gave a lesson and gave a talk at the MiniMaker Day 2018, which is organized annually by our school and the Institute for Klax Pedagogy. Of course, the parents of our students are cordially invited to this event.

7. International Perspectives

The school is partner school of the German Danish Efterskole in Denmark. A democracy project has been initiated for the school years 19/20 and 20/21 through the EU School Partnership program. In this context, students from the 10th grade meet regularly with Danish students to discuss topics in a digitized world. They create documentaries in the form of films, eBooks and digital collages.

The upper school are also working with EU funds on a podcast project on important topics of the future that are affecting young people today. Podcasts will be prepared and sent to five different democracy topics together with students from Sweden, the Netherlands and the United Kingdom.