Erasmus+ program Cooperation partnerships in school education
"Diversifying the STEM Ecosystem"
No 2024-1-LV01-KA220-SCH-000250755

Ozolnieki Secondary School STEM Ecosystem Development Strategy

2025. – 2030.

Funded by the European Union

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Content:

Abbreviations and Explanations

Abbreviation	Explanation
CE	Centralized Exams
EU	European Union
ED	Education Department
IT	Information Technology
ICT	Information and Communication Technologies
CE lessons	Career Education lessons
CW	Career Week – an annual series of events highlighting the importance of timely and conscious choices in further education and career planning for building a successful personal life
cl.	Class
LBTU	Latvia University of Life Sciences and Technologies
LU	University of Latvia
acad. yr.	Academic year
MG	Methodological Groups – associations of subject teachers, support staff, and class teachers, aimed at enhancing professional competencies and methodological work, promoting cooperation, experience exchange, and the introduction of innovations within the educational field to support students' personal development and improve the quality of the educational process in the institution
Ozolnieki Sec. School	Ozolnieki Secondary School
RTU	Riga Technical University
STEAM	A learning method based on Science, Technology, Engineering, Arts, and Mathematics, integrating these disciplines to promote and guide students' inquiry and critical thinking
STEM	An abbreviation for Science, Technology, Engineering, and Mathematics, used in education policy to denote academic, research, and technological development fields based on natural sciences, technology, engineering, and mathematics

Introduction

In the educational ecosystem of Jelgava Municipality, Ozolnieki Secondary School is the largest educational institution in the municipality. It has the potential to become the Jelgava Municipality STEAM resource center in the future, thanks to its strong teaching staff—particularly in engineering, programming, and 3D—as well as its existing active experience and vision.
(Source: Jelgava Municipality Educational Ecosystem Development Strategy 2024–2029)

To enhance its role as a STEAM resource center and ensure continuity in the STEM field, in October 2024, Ozolnieki Secondary School launched the implementation of the European Union "Erasmus+" program KA2 Strategic Partnerships project "Diversifying the STEM Ecosystem." The project will be implemented until December 31, 2026, with EU funding of EUR 250,000.

Project objectives:

- To enhance school capacity through teacher professional development, diversification and digitalization of STEM offerings, ensuring further development of these offerings.
- To identify innovative practices and approaches to engage teenagers, especially girls, in learning STEM subjects.

By creating an international network within the EU and collaborating with institutions from various educational sectors, to implement best practices in the STEM ecosystem.

Project partners are from Finland, Lithuania, Poland, Greece, and the Latvia University of Life Sciences and Technologies.

Main blocks of project activities:

1. Development and implementation of a STEM ecosystem development strategy;
2. Professional development of teachers;
3. Development and piloting of extracurricular educational offerings for teenagers.

The STEM ecosystem development strategy is designed for a 5-academic-year period and consists of two parts:

PART I: Evaluation of the current situation

PART II: Strategic and action plan

To develop the strategy, a working group was established based on Ozolnieki Secondary School's Order No. OZOV/1—9/24/37, dated October 10, 2024. The group includes the project coordinator and Mathematics Methodology Group coordinator Jekaterina Zaharova, the project manager and STEM strategy coordinator Lelde Santare, deputy directors Ainārs Kākers and Daumants Lagzdiņš, and the career consultant teacher Līga. Veidemane. Additional contributions for certain sections of the strategy were made by the school management team, heads of methodological groups, and other teachers. According to the Order No. IP/3—2/25/11 from the Jelgava Municipality Education Department dated January 24, 2025, Jānis Erno, the department's senior specialist in educational technologies, also participated in the STEM ecosystem development working group.

PART I: "Evaluation of the current situation" is based on a comprehensive study of Ozolnieki Secondary School's STEM ecosystem, analyzing educational, extracurricular, and career education offerings, resources, outcomes, and demand. This includes the results and analysis of surveys conducted among STEM teachers, students from grades 6–9, and their parents. In December 2024 and January 2025, surveys were conducted with 53 teachers, 199 students (grades 6–9), and 187 parents.

PART II: “Strategic and action plan” consists of conclusions—SWOT analysis, an action plan, a career education program for the 2025/26 academic year, and a roadmap for implementing the strategy. The action plan includes the necessary steps to achieve the school’s defined vision and strategic goals, aligning with the Jelgava Municipality Educational Ecosystem Development Strategy 2024–2029.

To develop the action plan, the “World Café” method was used on March 13, 2025. Four working groups collaborated—comprising school management, heads of methodological groups, STEM teachers, Student Council and Parent Council representatives—alongside representatives from the Jelgava Municipality Education Department and the Latvia University of Life Sciences and Technologies.

The roadmap was developed on June 5, 2025, with participation from the entire school management team.

In September 2025, the STEM ecosystem development strategy was presented to the School Council and the Jelgava Municipality Education Department.

During the implementation of the STEM Ecosystem Development Strategy, an annual report will be prepared, including actions outlined in the action plan (with regularly collected data), structured according to the defined activities and expected outcomes. If necessary, the action plan will be updated. The first evaluation and update will be prepared in December 2026, at the conclusion of the Erasmus+ project “Diversifying the STEM Ecosystem,” based on a methodology developed by the Finnish partners. The annual evaluation and updated action plan will be presented to the School Council.

1.General Information

1.1. School Summary

<table>
<tr><td>Vision and Mission-STEM profile</td><td>Vision – Ozolnieki Secondary School is a modern, growth-oriented educational institution where every learner can obtain quality education and develop their personality.

Mission – To provide each learner with quality education in a supportive, safe, and healthy environment, developing individual abilities and leadership skills.

Ozolnieki Secondary School is an educational and creativity center that combines quality formal education with a diverse range of extracurricular activities and meaningful leisure opportunities. Ozolnieki Secondary School is the Jelgava Municipality STEAM Resource Center. (Source: Jelgava Municipality Educational Ecosystem Development Strategy 2024–2029)</td></tr>
<tr><td>Implemented Education Programs and STEM Upper Secondary Courses</td><td><table><tr><td>Basic Education Program</td></tr><tr><td>Special Basic Education Program for Students with Learning Disabilities</td></tr><tr><td>Special Basic Education Program for Students with Intellectual Disabilities</td></tr><tr><td>General Secondary Education Program</td></tr><tr><td>Advanced STEM Courses: Design and Technology II, Chemistry II, Biology II, Programming II</td></tr></table></td></tr>
<tr><td>Student Numbers</td><td><table><tr><th>Acad. yr.</th><th>Total</th><th>Grades 1–3</th><th>Grades 4–6</th><th>Grade s7–9</th><th>Grades 10–12</th></tr><tr><td>2022/2023</td><td>761</td><td>292</td><td>230</td><td>156</td><td>71</td></tr><tr><td>2023/2024</td><td>825</td><td>304</td><td>239</td><td>165</td><td>115</td></tr><tr><td>2024/2025</td><td>901</td><td>298</td><td>286</td><td>181</td><td>136</td></tr></table></td></tr>
<tr><td>Teaching Staff</td><td>In the 2024/2025 academic year, the school has 96 pedagogical staff and 23 technical staff, including:

• 70 teachers
• 18 support staff
• 8 administrative staff
• 2 librarians
• 1 museum pedagogue
• 2 nurses

STEM teachers

<table><tr><th>Total</th><th>Grades 1–6</th><th>Grades 7–12</th></tr><tr><td>43</td><td>24</td><td>19</td></tr></table>
Methodological Groups (MG) for STEM Subjects:

1. Mathematics MG – 10 educators in total (7 mathematics teachers, 3 teaching assistants)

2. Natural Sciences MG – 9 educators in total (1 physics, 1 geography, 3 chemistry, 2 biology, 2 science teachers for</td></tr>
</table>

	grades 4–6; one teacher teaches both biology and chemistry in grades 7–9; 1 methodologist – subject area consultant) 3. **Technology MG** – 11 educators in total (4 – Design and Technology, 7 – Computer Science; 2 of them also teach programming) 4. **Primary School MG (Grades 1–3)** – 13 educators in STEM subjects (science, mathematics, design and technology) **Support available for teachers in the field of ICT:** • ICT Mentor • Lifelong Learning Mentor in ICT **Sigita Krauze**, mathematics teacher at Ozolnieki Secondary School, also serves as the **Mathematics Methodology Area Coordinator for Jelgava Municipality**.
Cooperation Partners and Service Providers in the STEM Field	**Cooperation Agreements for the Effective Implementation of Advanced and Specialized Courses:** • Collaboration with the **Latvian State Institute of Wood Chemistry** for the implementation of the practical part of the advanced Chemistry II course in the general secondary education program. • Collaboration with the **Faculty of Agriculture and Food Technology of the Latvia University of Life Sciences and Technologies** for the implementation of the practical part of the advanced Biology II course in the general secondary education program. • Collaboration with the **Junior Achievement Latvia** business education organization for the implementation of the specialized upper secondary course "Fundamentals of Entrepreneurship." **RTU Children and Youth University** – STEM extracurricular clubs for students in grades 2–9. **Organizations and Associations Cooperating with the School:** • International Innovation School – Minecraft extracurricular club for students in grades 1–4. • UNESCO Associated Schools Network – supporting sustainable education to address global challenges. • Eco-Schools Program – environmental education, sustainable resource use, and ecology. • Health-Promoting Schools Network – participation in school health promotion activities and career education in the fields of health and medicine. • Collaboration with Latvian State Forests – career education, "Forest Days," and other activities.

	• Cooperation with companies from various sectors (medicine, veterinary medicine, agriculture, ICT, food industry, etc.) through student field trips and participation in Job Shadow Days.
	
	Additional Partnerships:
	
	• Collaboration with Jelgava State Gymnasium – as a regional Methodological Center and partner in the Erasmus+ project "Green STEAM."
	• Cooperation with other general education schools in Latvia:
	  ○ Druva Secondary School – administrative collaboration and work with gifted students;
	  ○ Dobele State Gymnasium – collaboration in foreign languages and technology;
	  ○ Mārupe State Gymnasium, Ādaži Secondary School, and Ikšķile Secondary School – collaboration in the primary education sector.

Nearest Educational Institutions Offering STEM Course Options at the Upper Secondary Level	**Ozolnieki Secondary School is the largest educational institution in Jelgava Municipality offering secondary education, including in the STEM field.** In Jelgava Municipality, advanced STEM subject studies are offered at: • **Kalnciems Secondary School** (Design and Technology II) • **Eleja Secondary School** (Design and Technology II, Biology II, Programming II) **Educational institutions in the city of Jelgava offering STEM course options:** **Jelgava State Gymnasium** (Natural Sciences – Mathematics; Natural Sciences – Chemistry and Biology; Engineering) **Jelgava Spīdola Gymnasium** (Mathematics, Natural Sciences, and Technology stream) **Jelgava Technology Secondary School** (IT, Engineering) **Jelgava 4th Secondary School** (Advanced Biology II, Mathematics II)
Nearest STEM Extracurricular Education Opportunities for Primary School Level	In **Jelgava** – Creative Center "JUNDA", Jelgava Technology Secondary School. In **Olaine** – RTU Olaine College, Olaine 1st Secondary School.

1.2. Planning Documents and Their Relevance to STEM/STEAM

Source: Jelgava Municipality Educational Ecosystem Development Strategy 2024–2029

Planning Document	Relevance to STEM/STEAM

European Education Area 2025	At the EU level, the educational space is intended to develop digital skills as basic skills, transversal skills (critical thinking, entrepreneurship, creativity, civic participation), and promote interdisciplinary approaches, learner and teacher mobility, and cross-border cooperation. Educational institutions should become catalysts supporting the transition to sustainability, including integrating environmental sustainability into science and humanities.
Latvia's National Development Plan 2021–2027	The direction 'Quality of education and effective management of the education system' aims to improve general education by implementing new content and approach, emphasizing entrepreneurship, digital and STEM/STEAM skills, sustainable development education, learning environment improvements, individualized learning, talent development, high-quality extracurricular activities, effective career education, and strengthened cooperation with parents and other partners.
Education Development Guidelines 2021–2027	The education goal 'A modern, high-quality educational offer focused on the development of skills valued by the labor market' foresees improvements in content, process, and environment, emphasizing inclusive approaches, interdisciplinarity, STEAM, and transversal skills (digital literacy, civic engagement), socio-emotional learning, and deep learning.
Digital Transformation Guidelines 2021–2027	The action line 'Development of society's digital skills in the education process' aims for the comprehensive development and use of digital skills throughout the education system, including career and interest education in technical creativity (e.g., maker spaces, fab labs, robotics clubs, rocket modeling, participation in competitions).
Youth Policy Guidelines 2021–2027	The action line 'Promoting the acquisition of skills and competences necessary for the labor market and independent life' includes developing a youth work practice support system, strengthening cooperation with society and employers, and building cross-institutional coordination mechanisms to support youth entrepreneurship initiatives.
National Industrial Policy Guidelines 2021–2027	The action line 'Strengthening human capital' includes increasing labor market competitiveness by continuing education reforms, establishing lifelong learning, improving child, youth, and adult education systems, and accelerating reskilling opportunities. STEM and transversal skills acquisition should be promoted, especially in exact sciences (physics, chemistry, biology, mathematics) and environmental sciences, both in-school and through extracurricular activities. Support should be provided for youth outreach and motivation projects, such as TehnoBuss.
Zemgale Planning Region Development Program 2021–2027	The direction 'Development of a modern, innovative educational environment' aims to create modern, accessible, innovative environments in schools, ensuring quality learning processes and investing in climate neutrality. The goal is to develop innovative, technological, and creative educational offerings and access, establish schools as innovation network centers, and provide resources and materials for implementing the new curriculum (e.g., equipment and STEM teaching materials), including improved extracurricular offerings in technical creativity, STEM/STEAM, robotics, programming, etc.

Jelgava City and Jelgava Municipality Development Program 2023–2029	The direction 'Lifelong learning and labor market competitiveness' aims to enhance cooperation with employers in all educational levels, develop students' talents, creativity, research and career management skills, entrepreneurship, and sustainable thinking. Actions have measurable goals and indicators.
Methodological Work Priorities in Jelgava Municipality 2024/2025 Academic Year	Implementing STEAM approaches and methods in curriculum: teacher collaboration across subjects, creating interdisciplinary activities for students, planning and conducting practical, student-centered lessons.
Interest Education Priorities in Jelgava Municipality 2024/2025 Academic Year	One of the priorities is to expand STEAM offerings (science, technology, engineering, and mathematics, including technical creativity and environmental education) in extracurricular education within Jelgava Municipality's schools.

2. General Overview of the STEM Ecosystem

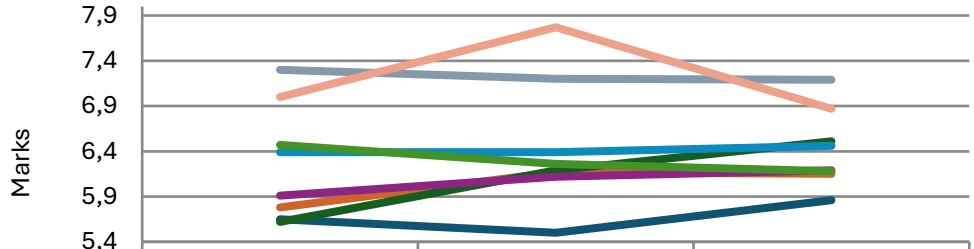
2.1. Teaching Process and Results in STEM

In grades 7–9, Math is taught in level-based groups. Beginning in the 2024/2025 academic year, four such groups were formed in grade 9, based on students' knowledge and skills at the end of grade 8. An additional group was created to help students with special needs or those who previously received unsatisfactory grades in mathematics to successfully master the material and prepare for state exams.

Ozolnieki Secondary School also provides optional weekly mathematics classes for grades 1–3, 9, and 10–12. These classes aim to develop mathematical and logical thinking, improve knowledge and skills, and build the ability to solve higher-difficulty tasks.

Students have the opportunity to attend consultations in all STEM subjects according to a fixed schedule.

Average Annual Rating Marks in Grades 7–9



	2023./2024.m.g.	2022./2023.m.g.	2021./2022.m.g.
Matemātika	5,65	5,5	5,86
Fizika	5,78	6,17	6,15
Ķīmija	5,62	6,19	6,51
Bioloģija	6,39	6,39	6,46
Ģeogrāfija	5,91	6,12	6,19
Datorika	6,47	6,26	6,18
Dizains un tehnoloģijas	7,3	7,2	7,19
Inženierzinātnes	7	7,77	6,87

An analysis of academic performance in STEM subjects for grades 7–9 shows a decline over the last three academic years: 6.43 in 2021/2022, 6.45 in 2022/2023, and 6.27 in 2023/2024.

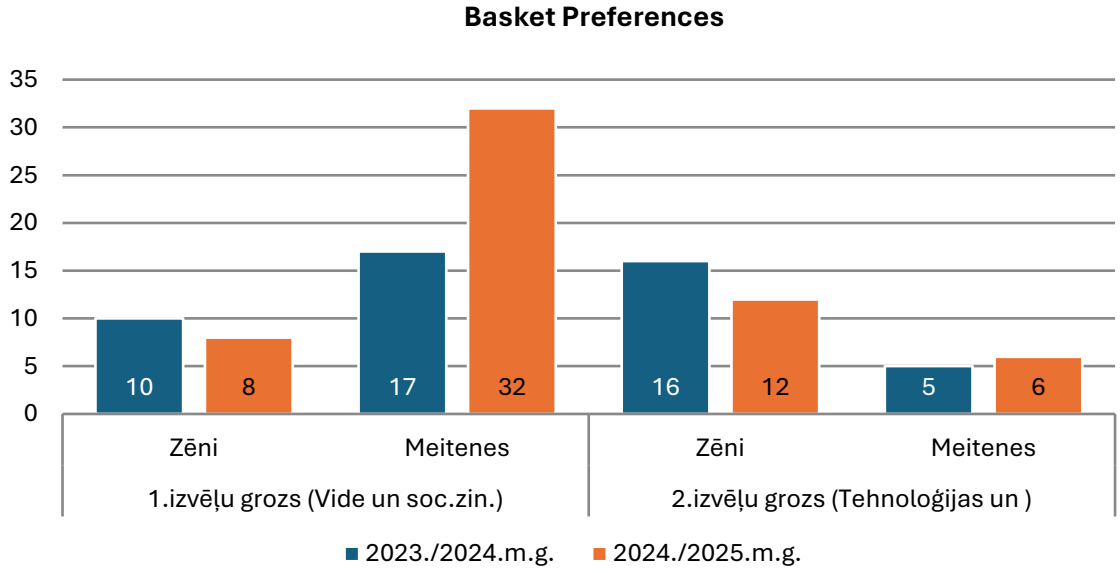
The results highlight the need to strengthen foundational knowledge and skills in primary school (grades 1–6) to prepare students for STEM subjects in later years. Weak reading comprehension, poor numeracy (e.g., multiplication table, operations), lack of independent study habits, and concentration issues contribute to underperformance.

Special attention in grades 1–3 should focus on early diagnostics of students' knowledge and abilities. Where needed, support from speech therapists, special educators, and teaching assistants should be provided. Teachers must also develop skills to analyse student performance, diagnose challenges, and strategically set goals—not only focusing on results, but also on personal development, fostering values and positive habits.

Despite prior trends, mid-year assessments in grades 7–9 show most students improved by one or two points compared to the previous academic year's final results.

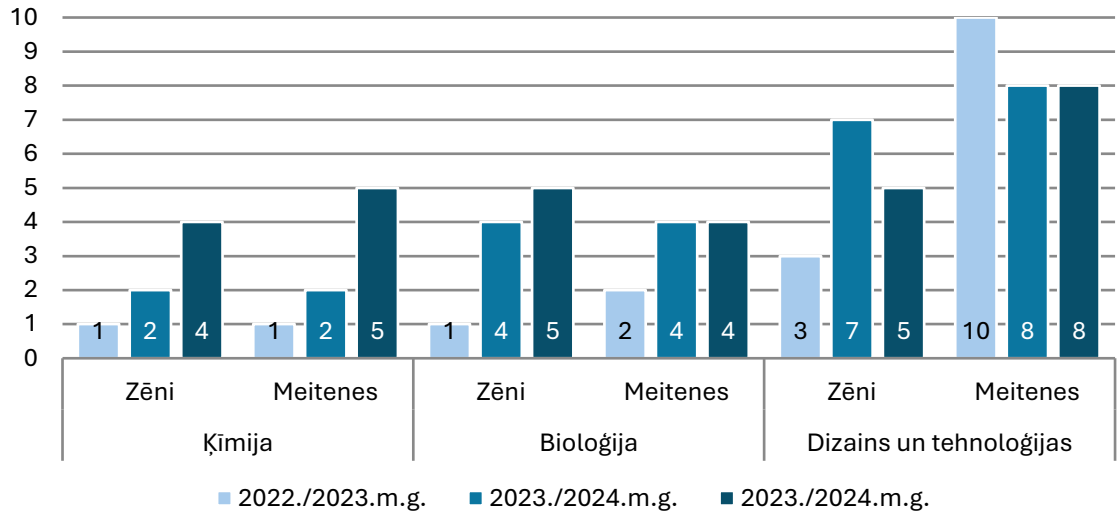
In grades 10–12, students choose from one of two academic pathways ('baskets') based on their interests and career goals:
- **Environment and Social Sciences**: Social Sciences II, Culture and Arts II, Design and Technology II, Biology II, Chemistry II.
- **Technology and Natural Sciences**: Programming II, Design and Technology II, Chemistry II, Biology II, Social Sciences II.

In the 2024/2025 academic year, 136 students are enrolled in the upper secondary level: 59 in grade 10, 48 in grade 11.



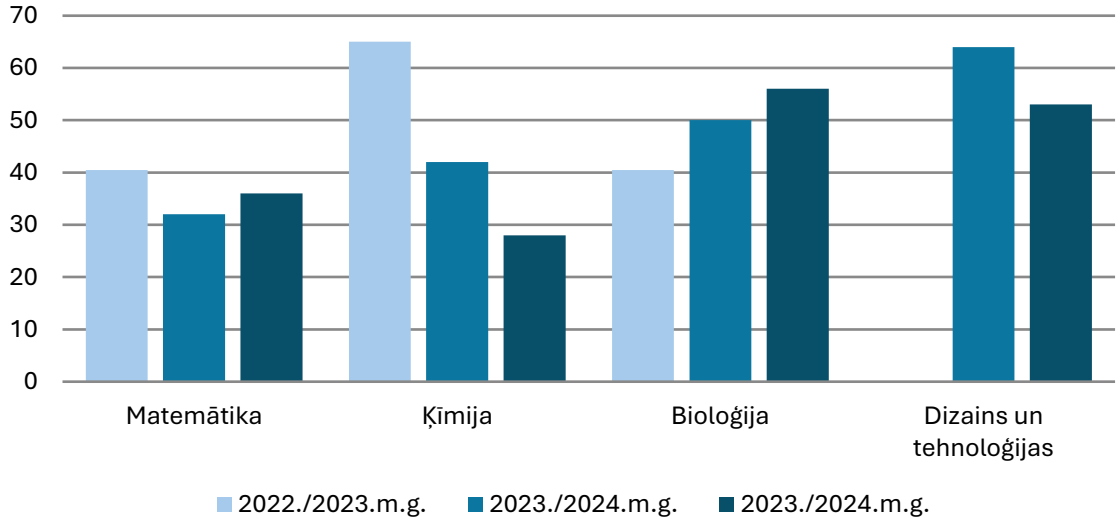
The Environment and Social Sciences basket is more popular, likely because girls constitute the majority of upper secondary students. However, career education and extracurricular activities can encourage more students to choose the Technology and Natural Sciences path.

STEM Final Exam Choices (By Gender)



An analysis of centralized STEM exam choices by gender shows that boys and girls equally choose chemistry and biology, while more girls than boys opt for Design and Technology. Programming as a centralized exam will be offered only from 2025/2026, so no data is available yet.

STEM Exam Results Over a 3-Year Period



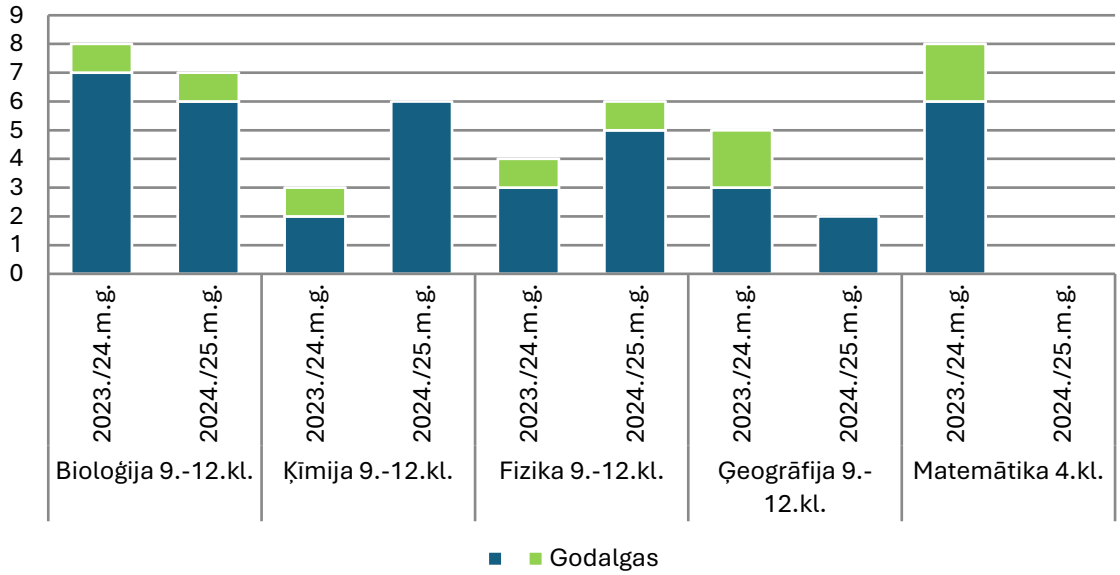
Centralized exam results indicate a decline in chemistry and design & technology performance, while biology scores have improved. In 2023/2024, the Chemistry II exam score was below the national average, due to late exam choice, low motivation, lack of preparation, and increased exam difficulty.

Mathematics CE results at the optimal level in Ozolnieki Secondary School were higher than the municipal and national averages: 36.3% for the school, 24.3% for the municipality, and 34.3% nationwide. Advanced level CE results in biology and design & technology exceeded both municipal and national averages.

Participation in STEM Competitions and Olympiads

2021/2022: 82 out of 675 students (12%) participated in Olympiads; 36 students (44% of participants) received awards.
2022/2023: 67 out of 762 students (9%) participated; 22 students (33%) received awards.
2023/2024: 116 out of 823 students (14%) participated; 45 students (39%) received awards. Of these, 39 students (32%) competed in STEM fields.

Olympiad results over a 2-year period



STEM Contest Participation in 2024/2025 – Semester 1

– Grineks Championship (three 8th-grade students, 3rd place nationally)
– Mathematics Contest 'Tik vai... Cik?' Round 1 (41 fourth-grade students)
– Open Mathematics Olympiad (18 students from grades 5–9, one commendation)
– Bebr(a)s Round 1 (17 students from grades 4–8)
– Mathematics Contest 'Tik vai... Cik?' Round 2 (37 fourth-grade students)

STEM Contest Participation in 2023/2024

– Mathematics Contest 'Tik vai... Cik?'
– Open Mathematics Olympiad
– Bebr(a)s Contest
– LVM Bioeconomy School
– Mathematics Contest 'Matemātiskais ķēriens' (uzdevumi.lv)
– International Mathematics Contest 'Pangea 2024'
– International Mathematics Contest 'Kangaroo'
– STEM Advent & Easter Contest (Riga Classical Gymnasium)

Supporting gifted students is a key priority. Optional math lessons are provided from grade 1 to stimulate logical thinking. From grades 4–12, subject teachers organize targeted and long-term preparation outside class time to help talented students engage in competitions and Olympiads.

Conclusions and Further Actions

– Continue offering level-based mathematics groups, including for students with learning difficulties and gifted students.
– Conduct targeted diagnostics of knowledge and skills in grade 1 and during transitions (grade 3→4, grade 6→7) to ensure basic competencies and identify special needs early.
– Increase efforts to engage girls in STEM, starting in primary school and highlighting career opportunities.
– Strengthen support for gifted students due to declining awards at the district level in STEM Olympiads. Organize additional consultations and activities to help prepare for competitions and scientific research work.

2.2. Teacher Competence

General Description of STEM Teachers

42 teachers teach STEM subjects, representing 61% of the total number of teachers. However, in primary school (grades 1–3), teachers teach multiple subjects, and STEM represents only a portion of their workload.

The school has developed a personalized system for improving teachers' professional competencies:

1. Evaluation of teachers' professional skills;
2. Grouping for relevant courses and seminars based on development needs;
3. A system where each teacher sets individual professional goals, presents them within their Methodological Group, and reflects at the end of the academic year;
4. Self-assessment by each teacher, with feedback from group leaders and administration;
5. Planned mentoring support in the first years of service;
6. Learning groups for professional growth;
7. Individual consultations with deputy heads and support teams.

Average Age and Workload Distribution

Educational Institution	Teacher average age and age group distribution									Average Age
	≤ 29 yrs	30–34 yrs	35–39 yrs	40–44 yrs	45–49 yrs	50–54 yrs	55–59 yrs	60–64 yrs	≥ 65 yrs	
Ozolnieki Sec. School (All)	9%	15%	13%	6%	15%	17%	11%	3%	10%	45.9
Ozolnieki Sec. School (STEM)	12%	8%	28%	5%	12%	21%	7%	2%	5%	42.2

Educational Institution	Teacher workload rates and employment share					
	0–0.249	0.25–0.499	0.5–0.749	0.75–0.999	1–1.334	>1.345
Ozolnieki Sec. School (All)	0%	6%	9%	21%	63%	1%

Ozolnieki Sec. School (STEM)	0%	2%	9%	21%	67%	1%

Analysis of the Age Group Distribution and Workload of Teachers Leads to the Following Conclusions:

1. New teachers have joined the STEM field within the institution, indicating a generational shift.
2. To support these new teachers, three beginning chemistry teachers have been paired with an experienced subject professional—a teacher-mentor. Methodological group leaders also supervise and assist new teachers in their daily work. Teacher-mentors receive additional remuneration for their mentoring responsibilities.
3. It is necessary to balance the workload of STEM teachers. Given the limited availability of teaching materials, the number of paid hours for lesson preparation should be increased to enhance lesson quality.
4. The school must attract additional STEM teachers to ensure balanced workloads in this subject area. More paid hours should be allocated for individual and group work with students—both those struggling with the subject and gifted students preparing for various competitions and Olympiads.

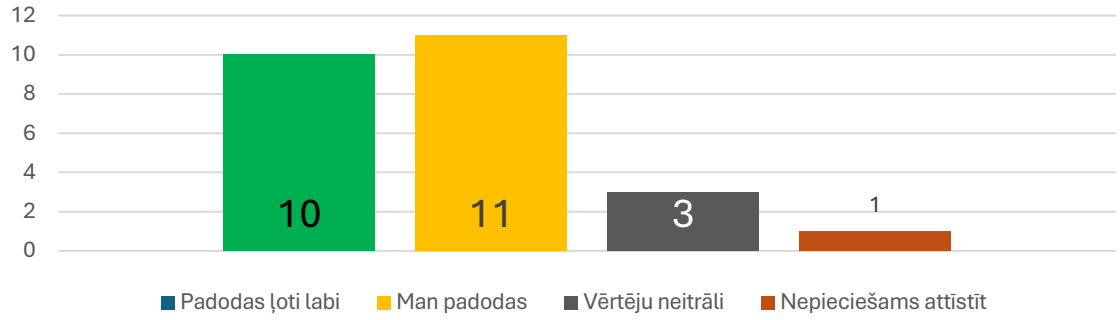
Challenges in Attracting STEM Teachers:

1. Latvian universities graduate an insufficient number of STEM teachers each year.
2. The compensation system for STEM specialists in education is significantly lower than in state or private sector jobs.
3. The content of advanced upper-secondary STEM courses is complex and requires either prior work experience or recently completed university studies. The number of teaching hours for these advanced courses is limited, making it difficult for schools to offer full teaching loads.
4. Students in grades 7–12 face difficulties with STEM subjects, which points to the need to strengthen foundational skills in grades 1–6—especially in reading literacy.
5. The availability of professional development courses for STEM teachers is insufficient. Most are provided by the Interdisciplinary Centre for Educational Innovation at the University of Latvia (LU SIIC), such as:\
   – Competence development program “Learning for Proficiency in Grades 4–6” (36 hours) for math and science teachers;
   – “Lesson Study for Personalized Learning” (54 hours) for teams of science and math teachers;
   – Additionally, the National Centre for Education (VISC) offers “Content and Methodology Modules in Mathematics for Grades 1–3.”
6. There is a lack of high-quality and innovative professional development courses specifically for STEM teachers.

Competencies of STEM Subject Teachers

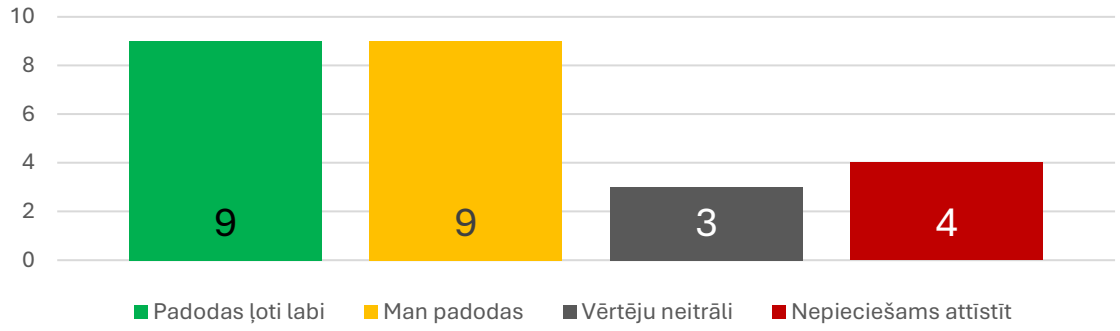
In November 2024, 25 STEM subject teachers at Ozolnieki Secondary School participated in a self-assessment survey to evaluate their digital skills (see diagrams below). 84% of the STEM teachers rated their ability to select and use appropriate IT tools in lessons as good or very good. In contrast, 16% rated their skills as neutral or insufficient.

Selection and Use of Appropriate IT Tools and Online Services in Lessons



72% of STEM subject teachers rated their skills in finding, evaluating information, creating new content, and related areas as good or very good. Meanwhile, 28% of teachers assessed their skills as neutral or insufficient.

Digital literacy: the ability to find, evaluate, and use information, create new content, as well as competence in computational thinking.



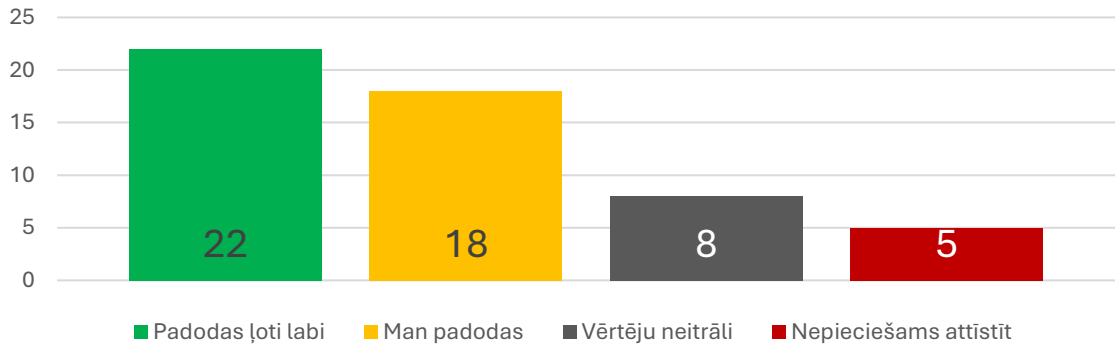
Digital Skills of All Teachers

In November 2024, 53 teachers at Ozolnieki Secondary School participated in a self-assessment survey to evaluate their digital skills (see diagrams below).

76% of STEM subject teachers rated their ability to select and use appropriate IT tools in lessons as good or very good. In contrast, 24% of teachers assessed their skills as neutral or insufficient.

Compared to the results of STEM subject teachers, the ratings of all teachers were slightly lower.

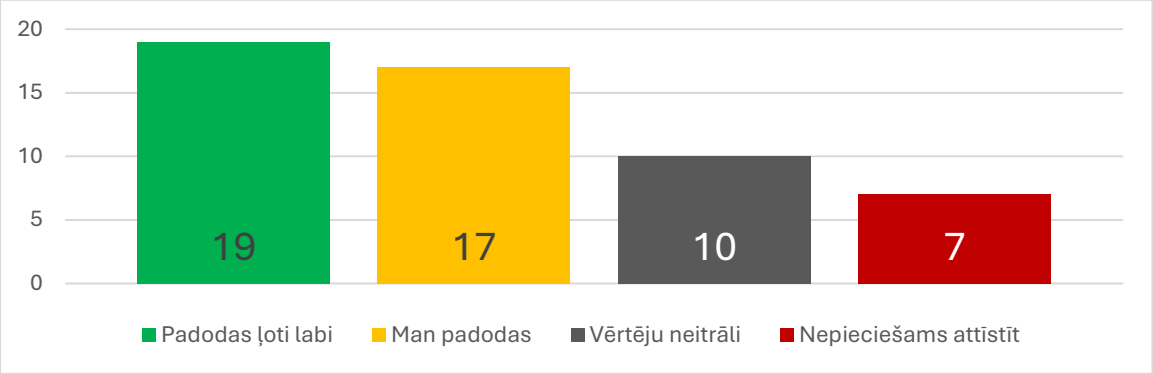
Selection and Use of Appropriate IT Tools and Online Services in Lessons



68% of STEM subject teachers rated their skills in finding, evaluating information, creating new content, and related tasks as good or very good. Meanwhile, 32% of teachers rated their skills as neutral or insufficient.

Compared to the results of STEM subject teachers, the ratings of all teachers were slightly lower—on average by 4 to 6 percentage points.

Digital literacy: the ability to find, evaluate, and use information, create new content, as well as competence in computational thinking.

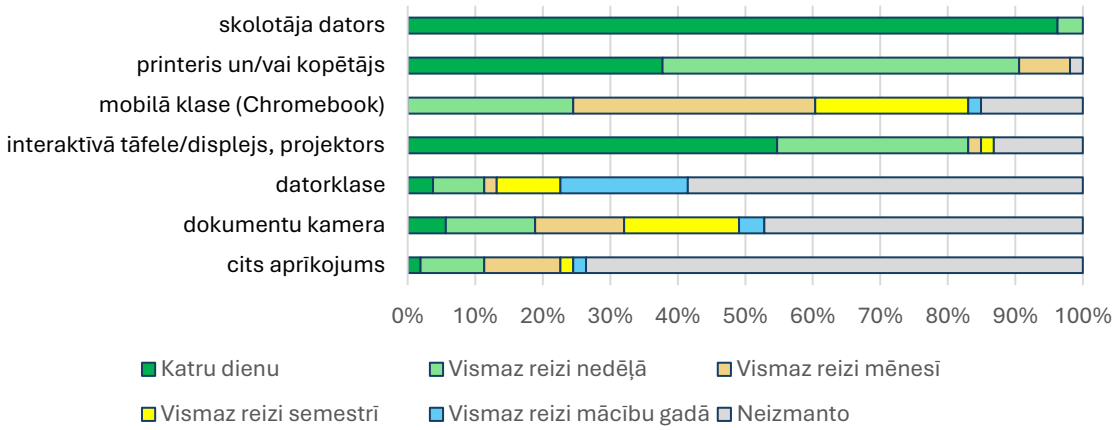


Use of ICT in the Teaching Process

Teachers most frequently use their personal computers. Printers/copiers and projectors or displays are also used fairly often. Mobile classrooms are regularly used in the teaching process, and teachers would like to use them more frequently. However, this is not always possible due to a limited number of mobile classrooms and a lack of available space—these mobile units are stored inside classrooms, making it difficult to retrieve and return them without disrupting lessons.

Computer labs are used relatively rarely, as they are usually occupied by scheduled classes.

Frequency of IT Equipment Usage



Conclusions and Next Steps

- Improve teachers' professional competencies to enhance the quality of STEM subject program implementation and promote the integration of interdisciplinary STEAM approaches.
- Develop the digital competencies of teaching staff and ensure the application of acquired technologies in the learning process. At Ozolnieki Secondary School,

teacher preparedness in using IT is relatively good; however, nearly one-quarter of teachers (16% of STEM teachers) wish to improve their IT skills.

- Strengthen staff competence in working with students who have special educational needs (learning and behavioral difficulties).
- Promote teachers' understanding of the importance of collaboration in jointly planning the learning process, conducting peer lesson observations, and engaging in collegial consultations to improve work quality.
- Enhance teachers' professional competencies in differentiating, individualizing, and personalizing the educational process.

2.3. Evaluation of Equipment and Facilities

ICT equipment is used in both STEM and non-STEM subjects, as well as in extracurricular activities, particularly robotics and technology clubs. The school's ICT infrastructure is generally considered adequate; however, some devices are outdated and insufficient in quantity for the large number of students. A significant shortage is felt in science subjects, especially for advanced courses, which is why Chemistry II and Biology II practical sessions are conducted in cooperation with partner institutions.

Equipment by Subject/Club

Subject/Club	Existing Equipment	Required Improvements
Robotics Grade 1	Lego WeDo2 – 7 units	At least 5–10 more sets + classroom space
Robotics Grade 2	Lego Spike – 6 units	At least 5–10 more sets + classroom space
Robotics Grades 3–4	Lego Mindstorm Ev3 – 9 units	Outdated/missing parts or batteries + classroom space
Robotics Club	10 Chromebooks	Not enough for all workstations
Computer Science	25 computers – Room 219	Replace outdated hardware + Windows 10 support ending
Computer Science	24 computers – Room 217	Renovate lab + replace outdated hardware
STEM Subjects	Projectors in Rooms 014, 016, 109, 206, 117, 314, 316	Replace with glass whiteboards with built-in interactive screens
Mathematics, Biology, Physics, Chemistry	Glass whiteboards with interactive screens in Rooms 213, 215, 312, 111, 113, 115	Additional needed: Math – 109, 314, 206; Geography – 316; Science – 117; IT – 217, 219; Tech – 014, 016
Computer Science / Tech Design	FDM 3D Printer – Rooms 217, 219	More small FDM 3D printers (1 per 2 students); at least one SLA 3D printer with accessories
Design and Technology	Sublimation printer	Laser cutter, 3D scanner
All STEM Subjects	Shared printers, copiers	Replace outdated equipment
All STEM Subjects	5 mobile labs (25 Chromebooks each, charging cabinets)	More mobile labs needed
Technology Club	3D printer, sublimation printer, CNC	Laser cutter

According to Jelgava Municipality's executive order No. JNP/3–2/24/125 dated May 13, 2024, a working group developed the infrastructure development strategy and cost justification for a planned building extension at Ozolnieki Secondary School. The project, included in the municipal investment plan and the education ecosystem development strategy, envisions a multifunctional hall, dining area, reading room, general classrooms, and interest education rooms equipped with 4 computer labs and 4 technical creativity rooms (technology, robotics,

design & technology). Additionally, science labs (chemistry, physics, biology) and mathematics classrooms require renovation.

A late-2024 teacher survey showed that 38% of respondents were satisfied with the school's equipment. Others identified areas needing improvement to ensure quality teaching:
- Internet speed and signal quality
- Laser cutter, 3D printers, vacuum former
- Outdated projectors
- Printers, copiers
- Modern interactive boards, particularly for mathematics
- Outdated computers
- Tablets for grades 1–6
- Quality sound systems

Conclusions and Next Steps

Some of the existing IT equipment at the school is relatively worn out or outdated, and in some positions, IT equipment is lacking in terms of volume (Mobile classroom, number of computers) or is not available at all (tablets, laser cutter, etc.).

In the Jelgava Local Municipality education ecosystem, the provision of ICT devices in general education schools in Jelgava Local municipality (as of 01.04.2024) indicates that in Ozolnieki there are 0.2 ICT devices per 1 student. The average in the region is 0.5. The school must increase this figure to at least the average in the region.

Great difficulties in using IT in the learning process are caused by the computer network infrastructure - it is no longer able to provide the speed and quality of the Internet connection that meets the needs of adults - the number and frequency of users have increased.

The lack of specific classrooms (computers, technologies, robotics) and the aging and wear and tear of the equipment in science classrooms also cause difficulties.

2.4. Interest Education Offerings

In the 2023/2024 academic year, 40% of surveyed students participated in extracurricular clubs at the school. An additional 32% were enrolled in professional arts programs at Ozolnieki Music or Art School, while 37% participated in extracurricular activities elsewhere—such as Jelgava city, local cultural centers, or sports like horseback riding in Brankas or Mušķi.

Students expressed the greatest interest in the following new clubs:
- Biking (25%)
- 3D Design/Modeling (21%)
- Photography (18%)
All three were launched in the 2024/2025 academic year.

There is also student interest in technical creativity, robotics, programming, and chess clubs (11% each). The highest participation in STEM clubs is among students in grades 1–3, particularly in robotics. Currently, robotics is offered only up to grade 4, which limits continuity into later grades. The robotics club at the primary level has the highest participation of boys. In grades 4–9, the gender distribution is nearly balanced. The interdisciplinary nature of STEAM clubs likely promotes this balance.

Distribution of Extracurricular Education Programs by Field for the 2024/25 Academic Year

Field	Grades 1–3:			Grades 4–6:			Grades 7–9:		
	No. of Clubs	Participants	Boys/ Girls % (Number)	No. of Clubs	Participants	Boys/ Girls % (Number)	No. of Clubs	Participants	Boys/ Girls % (Number)
Technology	0	—	—	0	—	—	0	—	—
Creative Industries	1	30	33/67 % (10/20)	—	—	—	—	—	—
Environmental Education	2	15	13/87 % (2/13)	2	4	0/100 % (0/4)	2	5	40/60% (2/3)
Technical Creativity	3	108	72/28 % (78/30)	3	35	60/40 % (21/14)	3	19	63/37% (12/7)
Other Fields (Culture, Sports, Youth Work, Languages)	8	125	25/75 % (31/97)	10	127	51/49 % (65/62)	8	65	31/69% (20/45)

Extracurricular Education Programs – Grades 10–12

Field	No. of Clubs	Participants	Boys/Girls % (Number)
Technology	1	12	50/50% (6/6)
Creative Industries	—	—	—
Environmental Education	—	—	—
Technical Creativity	—	—	—
Other Fields (Culture, Sports, Youth Work, Foreign Languages)	5	24	29/71% (7/17)

The STEM field includes technology, creative industries, environmental education, and technical creativity. The largest offering of STEM clubs is available to primary school students (grades 1–3), where the highest number of participants is also found. A particularly large number of students attend the robotics club; however, there is a lack of continuity as the robotics club is only available for students in grades 1–4.

Regarding gender distribution, the highest proportion of boys is observed in the robotics club at the primary school level. In grades 4–9, the proportion of boys in STEAM clubs only slightly exceeds the number of girls. This may be due to the interdisciplinary nature of these clubs, which employ a STEAM approach.

STEAM Clubs for the 2024/2025 Academic Year

Club	Instructor	Grade Range	Participants
Creative Experimental Art	Beate Gargurne	Grades 1–3	23
Robotics	Edgars Janovičs, Daumants Lagzdiņš	Grades 1–4	87
Technology Club	Jūlija Aleksejeva	Grades 10–11	12
Eco Council	Inta Vaškevica	Grades 6–9	6
RTU Youth University	External provider	Grades 2–9	54
Roblox Game Engineering	External provider	Grades 1–6	21

Two of the clubs, “Children and Youth University” and “Roblox Game Engineer,” are provided by external service providers within the school premises, supplying both instructors and equipment. The “Roblox Game Engineer” club is a paid service for parents.
During the summer holidays, camps are held on the school premises attended by Ozolnieki Secondary School students. These camps are organized by external providers who supply teachers and equipment. Participation in the camps requires a fee from parents.

STEM Summer Camps 2024

Camp Title and Duration	Organizer	Participants
Day Camp: 'Experience Technology with Roblox and Minecraft' – 5 days	International School of Innovations	~45 (2 groups)
Day Camp: 'Experience a Minecraft Summer' – 5 days	International School of Innovations	~40 (2 groups)
Summer Camp: 'Around the World in a Time Machine'	Dabe – Growth Center	~25

These summer camps are organized by external providers using the school’s premises and equipment. All camps are staffed independently and require participant fees.

Final Conclusions – Interest Education

In the 2023/2024 academic year, Ozolnieki Secondary School had the opportunity to attend 18 interest education groups; due to the increasing workload of teachers, as well as due to the change of teachers' jobs, 5 interest education groups ceased to operate in the 2024/2025 academic year. However, taking into account the interest shown by students, the activities of two groups were restored and 6 groups were created a new The demand for cultural education groups is greater, but it is also observed that interest in STEM groups is also growing.

The biggest challenge in the field of interest education is motivated, purposeful, growth-oriented teachers. Most teachers who are able to work in the field of interest education for a long time are enthusiasts of the industry and are able to captivate children, but some teachers are fully loaded with their main job and cannot work in the field of interest education (interest education groups in an educational institution are subordinate to basic education programs, which means that if teachers have a full-time job, then the teacher is not allowed to work in interest education).

Another challenge is the remuneration of interest education group teachers. It is uncompetitive in attracting purposeful, growth-oriented, high-quality and meaningful teachers who lead classes.

2.5. Career Education Activities in STEM/STEAM

Career education is carried out within the curriculum, educational excursions, hosting professionals as guest lecturers, and interdisciplinary lessons. Class teachers, especially in grades 10–12, accompany students to visit higher education institutions of interest. The school traditionally implements Science Days, IT Skills Days, and widely utilizes "Shadow Days." Two career education specialists work at the school, providing support to students in cooperation with class teachers and subject teachers. This cooperation and support should be further developed in collaboration with nearby employers.

Career Guidance Activities by Grade Levels

2021/22 academic year				
Grades	**1st–3rd**	**4th–6th**	**7th–9th**	**10th–12th**
Visits by professionals			Meeting with Director of the Energy Resources Control Department	
Introduction to educational institutions				Grade 10 – educational excursion to Latvia University of Life Sciences and Technologies (LBTU), catering and hotel management
Other educational STEM activities	Career Education (KI) lessons: "Professions of the Future"	Science Day with Laboratorium	Interdisciplinary lessons in grade 7 – exploration of STEM professions	Career Education lessons: "Subjects and Professions"
2022/23 academic year				
Grades	**1st–3rd**	**4th–6th**	**7th–9th**	**10th–12th**
Visits by professionals		Professions in maritime fields – cooperation with a parent representative	Meetings with graduates – STEM professionals	Profession: LANDSCAPE ARCHITECT – cooperation with a parent representative

Introduction to educational institutions			RTU Olaine College of Technology	
Other educational STEM activities		"Shadow Day" – shadowing STEM-related professions	IT Skills Day within Career Week, IT exam	"Shadow Day" – shadowing STEM-related professions; IT Skills Day within Career Week, IT exam
2023/24 academic year				
Grades	**1st–3rd**	**4th–6th**	**7th–9th**	**10th–12th**
Visits by professionals		Profession: LANDSCAPE ARCHITECT – cooperation with a parent	Professions in maritime fields – cooperation with a parent	"AirBaltic" school visit – exploring key STEM subjects required for this profession
Introduction to educational institutions			Presentations: RTU Olaine College of Technology, Ogre Technical School (grade 9)	Educational excursion to LBTU – catering and hotel management; Visit from LU ambassador, Visit to LU Universe
Educational excursions	Zoo, Saldus food plant, Skrīveri sweets factory, VIZIUM, Industrial park, Baldone observatory, workshops with craftsmen	Industrial park, peat plant Latflora, waste sorting site, Ādaži chip factory, VIZIUM, Liepāja Science and Innovation Center, Forest expedition, Getliņi Eko, Salaspils Botanical Garden, Saldus food plant, RSU Anatomical Institute	Getliņi Eko, Saldus food plant, RSU Anatomical Institute, Practical workshops at LBTU, LU House of Nature and laboratories	
Other educational STEM activities	"Shadow Day" – shadowing STEM-related professions	"Shadow Day" – shadowing STEM-related professions; IT Skills Day within Career Week, IT exam	"Shadow Day" – shadowing STEM-related professions; IT Skills Day within Career Week, IT exam	

Out-of-Class Activities ("School Bag" STEAM Program) - "School Bag" is a cultural education program aiming to provide Latvian students with opportunities to explore national art and culture (music, theater, dance, circus, visual arts, cinema, architecture, design, material and intangible cultural heritage, literature, and book art), connecting these with educational and upbringing work.

Activity Name	**Venue and Service Provider**	**Target Group (Grade)**	**Brief Description – Connection with STEM Subjects**

Educational Creative Workshop “Man, Wood, Cultural Value”	SIA “Namdaru darbnīca”	3rd Grade	Design and Technology – Woodworking
Educational Workshop “Ice Cream in the Art Room”	“Ikšķiles saldējums”	Grades 1–4	Design and Technology – Food Chemistry, Food Technology
Museum Pedagogical Workshop	Riga Motorcycle Museum; Bauska Branch	3rd Grade	Design and Technology
Museum Pedagogical Workshop “Latvian Auto, Moto and Bike Construction”	Riga Motorcycle Museum	9th Grade	Engineering; Design and Technology

Conclusions and Further Actions

Positive – Youth are open to all lectures, company visits, and learning about professions. The school administration consistently supports career education activities.

Challenges:
- Lack of suitable spaces for larger events, currently limited to hosting a maximum of 3 classes simultaneously, impacting quality (air quality, technological equipment, projection quality, etc.), affecting students’ comfort.
- Funding for events – to invite memorable guest lecturers, funding is necessary to cover costs.
- Diversity of student interests requires organizing events by interest groups (e.g., separately for boys and girls) and by interest areas (e.g., a drone manufacturing company visit may interest some classes more than others).
- Cooperation with local businesses for excursions is often limited by safety considerations.

Next Steps:
- Conduct research and build a database for class teachers and subject teachers of local companies, projects, and programs useful for STEM development, including summaries of science centers.
- Engage audiences via e-school platform, social media, and experiences from other schools.
- Develop cooperation between subject and class teachers for organizing study excursions, requiring at least one STEM-focused excursion per class per academic year.

2.6. STEAM (Interdisciplinarity)

In the 2023/24 academic year, 21 topics were covered using an interdisciplinary or STEAM approach as part of the learning process, involving collaboration between two or more subject teachers.

Grade Group	**Number of Topics/Sessions**	**Interdisciplinary Subjects**
Grades 1–3	10 topics (35 lessons)	Design & Technology / Latvian Language; Design & Technology / Visual Arts; Natural Sciences / Visual Arts; Social Studies / Latvian Language / Visual Arts / Design & Technology; Math / Latvian Language; Natural Sciences / Latvian Language; Design & Technology / Math
Grades 4–6	5 topics (13 lessons)	Design & Technology / Visual Arts; Visual Arts / Latvian Language; Music / Visual Arts; Design & Technology / Math; Latvian Language / Literature / Visual Arts
Grades 7–9	3 topics (6 lessons)	Physics / Music; Geography / Visual Arts; Biology / Health & Physical Education
Grades 10–12	3 topics (5 lessons)	Physics / Math; Biology / Health & Physical Education; Math / Health & Physical Education

For the 2024/25 academic year, teachers have indicated topics in their subjects that will be taught using the STEAM approach—either outdoors or through research and practical work.

- Grades 1–3: average of 7.8 hours annually (101 teaching hours total)
- Grades 4–6: average of 6.5 hours annually (84 hours)
- Grades 7–9: average of 7.5 hours annually (60 hours)
- Grades 10–12: average of 8 hours annually (48 hours)

Since this is the first academic year where the school has placed special emphasis on implementing practical work and the STEAM approach—fostering interdisciplinary work and teacher collaboration—not all teachers have recorded these lessons, and not all have managed to implement what was planned.

Conclusions and Further Actions

- Most active interdisciplinary collaboration with STEM subjects occurs in primary grades.
- In grades 7–9 and 10–12, only three interdisciplinary collaborations with STEM subjects have taken place.
- There is a need to promote interdisciplinary collaboration, raise teacher awareness of such opportunities, and encourage sharing of best practices.
- STEM teachers should be encouraged to include more practical and research-based methods in lessons, aiming to apply them at least monthly.

2.7. Digital Transformation

At school, various processes are carried out in the digital environment, including administration, lesson planning and analysis, school management, inclusive education, and project management.

The processes, tools, and improvement plans are outlined below:

Area of Activity	Processes	Tools	Improvement Plans
Administrative Work	Staff, material resource, and time management	HoP, Google Calendar, Google Sheets	
	Procurement	EIS	
	Finance & statistics	VIIS	
	Document Management	Document management system Namejs	
	Online staff meetings	Google Meet, Zoom, Microsoft Teams	
Learning process management	Journal, academic achievements, absences, communication with teachers, parents, students, etc.	E-klase	regularly send the necessary improvements to the e-class developer
	Thematic plans, test plans, lesson observation schedule	Google Sheets	
	Communication, document creation and storage	Google accounts for each students and teacher	
School work planning, work organization	School daily work plan	Google Calendar	
	Class schedule and changes/substitutions	AscTimeTable program and publishing on the	place information panels in several places in the school (at least

		website, e-classroom and info board	one place in the school foyer)
	Mobile classroom computer reservations	Shared Google Spreadsheet	
	Reporting IT needs/problems	Shared Google Spreadsheet	
Evaluation, data collection and analysis	For conducting surveys, summarizing results	Edurio	
	For visualizing results	Google Docs, Forms (Surveys)	
Inclusive education, student support	Individual educational program acquisition plans for students with learning and/or behavioral difficulties (MK 556.)	Shared Google Spreadsheet	Use of screen reading programs, etc. Identification of IT support measures
Project implementation	Data collection from participants and project management team	Google Shared Forms and Spreadsheets	
	Student group diaries, international mobility outcomes	Padlet.com, Taskcards, Canva.com	Learning various tools and platforms, improving the digital skills of students and teachers
	Student virtual part for mobilities	eTwinning, Padlet.com	

Teachers use various online programs and tools in their lessons. In a survey conducted at the end of 2024, only 2 educators indicated that they do not use programs or tools. Mostly all educators use 3-5 different platforms and tools in the teaching process. The most popular platforms with teaching materials and assignments are Uzdevumi.lv (73%), Soma.lv (58%), Skolo.lv (18.5%), Maconis.lv (17%) and tavaklase.lv (11%). In turn, of the online tools and programs, the most used by educators are Canva.lv (34%), Google tools (17%), Padlet.com (11%) and Mentimeter (8%). (Results of the teacher survey in November 2024)

Conclusions and further actions

Improved teachers' ICT skills in daily work (with Google Calendar, Google shared documents, filling out the E-class journal and information sections (assessment, behavioral records, individual conversations, summaries-reports on students' academic achievements, absences, etc.))

Lesson observations show that ICT is used in almost all lessons, however, approximately 30% of teachers have been advised to evaluate the effectiveness of its use, paying attention to the meaningful use of ICT.

Teachers need to learn Artificial Intelligence tools, as well as acquire skills to detect content borrowed with technology or from Internet resources or from other authors (plagiarism).

It is necessary to develop procedures for the use of students' personal phones at school.

2.8. Internationalization and Projects

Ozolnieki Secondary School actively participates in and takes advantage of both national and European-level project opportunities, thus integrating into a unified network of European educational institutions.

The school is implementing 4 Erasmus+ program projects aimed at improving the teaching process in STEM fields within an international context.

From 2023 to 2027, two Erasmus KA1 mobility projects are being implemented: Erasmus Accreditation for Ozolnieki Secondary School No. 2022-1-LV01-KA120-SCH-000111204 and Erasmus Accreditation for the Jelgava District Education Department Consortium No. 2022-1-LV01-KA120-SCH-000106095.

Goals of the Erasmus accreditations in STEM:

Ozolnieki Secondary School Erasmus Accreditation	**Jelgava District Education Department Consortium Erasmus Accreditation**
Teachers purposefully use diverse digital tools in the teaching process and teach students to use them	To improve methods, techniques, and find innovative solutions for implementing a competence-based approach, promoting research, and motivating students in STEM
Students understand environmental problems, see improvement opportunities, and act responsibly (ECO Schools and UNESCO Schools activities)	Transfer of best practices in using outdoor environments in education and incorporating a green lifestyle into daily school activities
	Diversifying digital skills in education aligned with the competence approach and enhancing students' advanced technological knowledge

Professional development of teachers and student mobility in the field of STEM abroad within the framework of Erasmus accreditation:

Activity	**2023/24 acad. yr.**	**2024/25 acad. yr.**
STEM teachers' professional development in structured courses	4	6
Teachers' digital skills improvement via job shadowing or courses	4	6
Student group mobilities acquiring digital skills and technologies (number of students)	10	17

From October 1, 2022, to September 30, 2025, the school is involved in the EU Erasmus+ Cooperation Partnership project "Green Steam Ecosystems (G-Steam)." The goal of the project is to promote the use of the STEAM approach in the learning process, placing special emphasis on 'Green STEAM' (future-oriented STEAM education based on sustainability and clean technologies).

At Ozolnieki Secondary School, teachers of computer science, mathematics, biology, design and technology, visual arts, geography, and English are involved in the project. Seven lesson plans for grades 7–9 have been developed and tested. Teachers from other schools in the Jelgava district have also reviewed these plans. In the 2024/2025 school year, Ozolnieki teachers tested plans created by other schools for grades 1–3 and 4–6 and shared their own for testing.

As part of the G-Steam project, Ozolnieki teachers attended courses both in Latvia—organized by Jelgava State Gymnasium—and abroad, including at the STEAM Center in Kaunas, Lithuania, and at a STEAM conference in Turku, Finland.

Teachers and students actively participate in eTwinning projects, collaborating with colleagues from other EU countries. Currently, 5 teachers are registered on eTwinning.

Ozolnieki Secondary School has been implementing the 'Eco-Schools' program for 7 years, earning the 'Green Flag' annually. The Eco-School certificate was obtained in 2015. This is the largest environmental education program, aiming to involve learners in an engaging, action-oriented, and socially responsible environmental education process that promotes sustainable development. The program has been led by teacher I. Vaškevica since its inception.

Conclusions and Further Actions

Ozolnieki Secondary School is actively involved in the implementation of various national and international projects. Each project has a dedicated management team, and school teachers and students are involved in implementation. Participation is open through competitive selection processes, giving every eligible teacher and student an opportunity to apply.

To better engage students in project activities, better prepare for mobilities, and ensure higher quality post-mobility activities, the school has started linking extracurricular clubs with mobilities. Currently, a Technology Club is functioning in this way, which also allows for virtual and blended mobilities. Such club-based work should also be developed in an interdisciplinary format—e.g., social sciences and computer science at the high school level.

3. A collection of ideas, innovative practices and approaches to get students interested in learning STEM

In a survey conducted at the end of 2024, educators provided suggestions for extracurricular activities, events, and excursions that would help motivate students to study the subject in more depth.
Summary of the results of the educator questionnaire:

Activity/Event Title	Brief Description	Target Group
Content Customization Based on Student Interests	Daily communication, TikTok content.	Grades 1–12
Outdoor Lessons	Students carry out practical and research tasks.	Grades 1–12
Science Lab, Use of Virtual Reality Glasses	Students enjoy new and unique experiences; new experiences stimulate learning interest.	Grades 1–12
Digital Art Club	Students enjoy and are skilled in creating digital drawings and even animations. Video creation is fun and a useful skill, especially in social media and marketing.	Grades 1–12
Young Physicists' School, Excursion to Energy Efficiency Center in Jūrmala and Production Facilities	To engage students in learning physics by understanding its everyday applications and processes.	Grades 7–12
Workshops in Companies (Caramel Workshop, Mītavas Cone, Abra Food, Vienkoči Park)	Practical sessions introducing manufacturing processes and entrepreneurship.	Grades 1–3
Excursions to Forests, Marshes or Other Natural or Man-Made Ecosystems	Excursions with tasks to explore various ecosystems.	Grades 1–3
Student Markets	Students learn to be both sellers and buyers.	Grades 1–3

STEAM Subject Olympiad at School	Set of interdisciplinary tasks.	Grades 4–9
Work with Gifted Students	Quizzes, stations, project days in school. Talent development in extra classes (special lessons/electives/consultations) with motivated students.	Grades 4–9
English-Speaking Guest Lecturers at School, International School Partnerships, etc.	Sharing achievements, joint project work.	Grades 10–12

Partner Companies in STEM and STEAM Career Education

Company / Institution	Description
VIZIUM Science Centre (Ventspils)	Exhibitions, creative workshops, and science shows to educate children and youth about STEAM.
Space Exploration Centre (Cēsis)	Educational content aimed at fostering interest in natural sciences, engineering, technology, and mathematics through a space lens.
FUTURIMO RIGA	RTU's science center where visitors learn how the world works, natural science laws, and how engineering and technology improve life.
Roboskola (Sigulda)	STEAM education, innovation, science, and technology center.
Mazā brīnumzeme (Cēsis)	Technology workshops for grades 1–12.
Robopilots	Drone building and piloting.
Latvian National Museum of Natural History	Multidisciplinary museum offering educational content in natural sciences.
Jelgava Regional Tourism Centre	Municipal institution promoting tourism in Jelgava and its surroundings.
Zemgale Regional Competence Development Centre	Provides lifelong learning, educational, methodological and informational support for formal and informal educators.
Latvian State Forests (AS “Latvijas valsts meži”)	Forestry company offering educational and social activities for schools.
Plant Nursery “DIMZAS”	Private company engaged in plant cultivation, landscaping, and consultations.
Mītavas Čiekurs Ltd.	Private food company using pine as a primary raw material.
Edge Autonomy Riga Ltd.	Unmanned aerial vehicle manufacturer with a test site in Jelgava, open for educational visits.
LATRAPS	Agricultural service cooperative based in Jelgava Municipality.
Daile Agro Ltd.	Crop and livestock farming business based in Jelgava Municipality.
Līgo Farm (ZS “Līgo”)	Agricultural company based in Jelgava Municipality with practical cooperation.

4. Summary of the current situation

Strengths:

1. **Modern educational institution** : Ozolnieki Secondary School is the largest educational institution in the region with a modern approach to education, focused on growth and quality education for every student.
2. **High academic results** : 9th and 12th grade CE results exceed the county and national averages.

3. **STEAM Resource Center** : The school is positioned as the STEAM resource center of Jelgava region, offering advanced courses in engineering, programming, chemistry, and biology.
4. **Teacher collaboration** : Teachers collaborate in “Learning Groups” for classes and subjects in the development of unified curriculum plans, tests, interdisciplinary lessons, and analysis of learning outcomes.
5. **Teacher competence** : The school employs highly qualified teachers who regularly improve their professional skills and use innovative teaching methods.
6. **Digital transformation** : The school actively uses digital tools and platforms in the learning process, promoting the development of students' digital skills.
7. **Data analysis** : A system established by an educational institution for obtaining data on the quality of teaching and learning and for its improvement needs (analysis of lesson observations, analysis of documentation and E-class records, compilation and analysis of student achievements, development and implementation of individual educational support plans, work with the talented)
8. **Extensive interest education offer** : The school provides a diverse interest education offer, especially in the primary school stage, including robotics and technology clubs.
9. **International cooperation** : The school actively participates in international projects, such as Erasmus +, eTwinning programs, which promote the development of student competences and the professional development of teachers and international cooperation.
10. **Career Education** : The school offers a wide range of career education activities, involving students in study tours, guest lectures , and practical classes.
11. **Cooperation with universities and companies** : The school cooperates with LBTU, the University of Latvia, Riga Technical University and various companies, providing students with practical classes and excursions.
12. **Innovative teaching methods** : The school uses interdisciplinary and hands-on teaching methods, such as the STEAM approach, to promote students' critical thinking and research skills.
13. **STEM competitions and Olympiads** : The school actively involves students in STEM competitions and Olympiads, which promote students' interest and motivation to learn STEM subjects, as well as develop their knowledge and skills.

Weaknesses:

1. **Underachievement in STEM** : Average scores in STEM subjects in grades 7-9 have declined over the past three school years, indicating the need to improve the acquisition of basic knowledge and skills in primary school.
2. **Working with talented students** : It is necessary to develop a system for working with talented students.
3. **Lack of literacy and numeracy skills** : Many students have poorly developed literacy and numeracy skills, which negatively affects their ability to learn STEM subjects.
4. **Lack of teacher workload and resources** : Insufficient provision of teaching aids and equipment, as well as balancing the teacher workload, is a challenge. Some of the existing IT equipment is outdated, and there is a lack of specific classrooms for STEM subjects.

5. **Difficulties in attracting new teachers** : Latvian universities prepare an insufficient number of teachers in the STEM field, and the remuneration system in educational institutions is lower than in state and private companies.
6. **Insufficient interest education offer** : Although several STEM clubs are available, there is a lack of continuity and a variety of age groups. Some clubs depend on external service providers.
7. **Limitations of career education events** : Lack of space and funding constraints make it difficult to organize larger career education events.
8. **Digital skills and use of ICT** : Although the digital skills of educators have improved, there is still a need to improve the effectiveness of the use of ICT in the teaching process and to master artificial intelligence tools.
9. **Lack of interdisciplinary collaboration** : Insufficient interdisciplinary collaboration in STEM subjects, especially in grades 7–12. It is necessary to promote educators' understanding of the possibilities of interdisciplinary classes.
10. **Lack of motivation among students** : Many students lack motivation and independent learning skills, which affects their ability to learn STEM subjects and achieve good results.

Opportunities

1. **Expand the STEM interest education offering** : Create new groups and classes for different age groups, such as robotics, programming, 3D modeling, and digital art groups.
2. **In the future, the county STEAM resource center** will offer interest-based education classes, extracurricular activities, and professional development for teachers to all educational institutions in the county.
3. **Improve learning equipment and infrastructure** : Purchase modern learning tools and equipment, such as 3D printers, laser cutting machines, interactive whiteboards and tablets, to ensure a quality learning process.
4. **Promote interdisciplinary collaboration** : Organize interdisciplinary lessons and projects that combine different STEM subjects to promote students' critical thinking and creativity.
5. **To develop the professional competencies of educators in the field of STEAM** : digital literacy , development of practical and research skills, organization of project-based learning.
6. **Promote girls' interest in STEM** : Organize special events and activities that promote girls' interest in STEM subjects, such as career days, guest lectures , and hands-on activities.
7. **Improve digital skills and ICT use** : Promote the development of digital skills of students and teachers, as well as the acquisition of artificial intelligence tools, by organizing experience exchange and good practice transfer events.
8. **Provide support to talented students** : Organize STEM competitions within the school and prepare students for participation in Olympiads to promote students' interest and motivation to learn STEM subjects and develop their knowledge and skills.
9. **Improve collaboration in career education** : promote collaboration between career education specialists, class teachers and subject teachers by organizing targeted study tours

10. **Create Erasmus program project groups** : students would carry out practical, interdisciplinary work in an international environment, making them interested in learning STEM in depth
11. **Digital pollution** – a topic to study and consider in the context of a sustainable environment

Threat

1. **Insufficient funding** : A limited budget can make it difficult to purchase necessary equipment and resources, as well as to provide professional development for educators.
2. **Educator shortage** : Difficulty attracting and retaining qualified STEM educators, especially given lower salaries compared to the private sector.
3. **Internal communication problems** : Insufficient or ineffective communication between management and staff can create confusion about the goals and objectives of the strategy, which hinders its successful implementation.
4. **Insufficient data analysis and monitoring** : Without regular data analysis and quality monitoring, it is difficult to assess the progress of strategy implementation and make necessary adjustments.
5. **Outdated equipment** : Some of the existing IT and learning equipment is outdated, which can limit a modern and effective learning process.
6. **Low student motivation** : Students' lack of motivation and insufficient independent learning skills can negatively affect their achievements in STEM fields.
7. **Lack of literacy and numeracy skills** : Underdeveloped literacy and numeracy skills can hinder students' ability to learn STEM subjects.
8. **Insufficient interdisciplinary collaboration** : Insufficient collaboration between teachers of different subjects can limit the introduction of interdisciplinary approaches and innovations in the teaching process.
9. **Lack of space** : Insufficient and inadequate space can limit the organization of larger events, classes, including interdisciplinary, extracurricular , and practical classes.
10. **Impact of external factors** : Economic, social, and political changes can affect a school's ability to provide a stable and sustainable STEM ecosystem.
11. **Insufficient cooperation with social and cooperation partners** : The implementation of the strategy may be difficult if there is no effective cooperation with municipalities, businesses and other institutions that can provide support and resources.

5. Strategic and Action Section

5.1. Action Plan for the Development of the STEM Ecosystem in the School until 2030

Vision: Ozolnieki Secondary School is a modern educational institution focused on growth, providing every student with access to quality education and personal development.

Ozolnieki Secondary School — Jelgava Municipality STEAM Resource Centre (Source: Development Strategy of the Jelgava Municipality Education Ecosystem 2024–2029)

Strategic Objectives:

- **To create an educational environment that ensures high-quality and comprehensive STEM and STEAM learning at all educational levels**—both during lessons and in extracurricular activities, interest-based and career education, with a particular focus on the development of gifted children.
- **To foster adolescents', especially girls', interest and involvement in learning STEM subjects** by creating a motivating and inclusive learning culture.
- **To ensure full access to resources for STEM education development and to strengthen digital learning management** through the implementation of modern solutions and technologies.

Performance Indicators:

Performance Indicator	Baseline Value	Intermediate Value (2026)	Target Value (2030)
Proportion of students taking centralized exams in exact sciences and programming at the upper secondary level in physics, chemistry, biology, and programming	(2023/24) Chemistry: 18%, Biology: 40%	Chemistry ≥ 1.5%, Biology ≥ 1.5%	Chemistry ≥ 3%, Biology ≥ 3%
Proportion of students with high and low achievements in the 6th grade diagnostic test in mathematics	To be determined in 2025	Increases	Increases
Proportion of interest education programs in STEM and STEAM fields	(2024/25) 28%	32%	38%
Number of students in STEM and STEAM interest education programs (Environment, Technical Creativity, and Creative Industries)	(2023/24) 144 (2024/25) 228	Increases	Increases
Proportion of girls in 10th grade who have chosen the "Technology and Natural Sciences" elective basket	(2023/24) 23.8%	30%	40%
Developed and implemented professional development programs for teachers in STEM and STEAM	(2024/25) 2 programs	3 programs	5 programs
Proportion of 12th grade graduates who choose to continue studies in the STEAM field	To be determined in 2025	Increases	Increases

Action plan:

Consecutive number	Action	The result to be achieved by 2030 (planned performance indicators)	Reference to planning documents	Responsible/ involved	Implementation period
Action line: Ecosystem development management					
1.1.	Systematic monitoring of strategy	(1) Prepare an annual report on the implementation of the strategy, summarizing performance indicators, which is structured according to measures, actions and results of actions. If necessary, the action plan is updated. (2) Present the result to the Pedagogical Council and the School Council	1.1.1.1.2.; school development plan	School administration	1st time in October 2026, annually
1.2.	Development of the learning organization	(1) To establish a system of cooperation between school management teams and teacher-career counselors to strengthen the culture of lifelong learning for teachers, students and parents. (2) To ensure the activities of Methodological groups on areas and the activities of "Learning groups" to foster teacher leadership, mutual cooperation, mentoring of young teachers and the development of professional competencies.	1.1.2.1.4.; school development plan	School management team (school administration, MG leader); ESF+ project "School in the Community" team	By 2030
1.3.	Development of the STEAM Resource Center	(1) Develop an interest-based education offer for students of different ages in the STEM field in the region (2) Develop at least 5 professional development programs for teachers, ensure their acquisition by teachers of the region and the region (3) Organize school and region-level competitions, practical classes, events, popularizing STEM and promoting the involvement of all students (4) Ensure the position of the head of the STEAM Resource Center from 2028	1.2.3.2.	School management team; Erasmus+ project coordinators, municipality; JNIP, municipality	By 2030
1.4.	Digital governance	(1) Ensure that at least 80% of teachers have mastered digital tools for data collection and analysis (e.g. Google Forms, Excel, etc.) (2) Develop a unified approach to the use of digital platforms and tools for students' independent and practical work		Deputy Director for Education (IT)	January, 2026
Action line: Development of professional competencies of teachers					
2.1.	Exchange of experience and improvement of competence in the implementation of STEAM	Organize at least 2 experience exchange events per academic year in the introduction and implementation of the STEAM approach with specialists in the field and companies to improve the professional competence of educators.	P.2.4.; 3.2.	Deputy Director for Education	By 2030

2.2.	International and local experience exchange STEM projects	To encourage STEM educators to participate in international and local experience exchanges and learning mobilities every year, ensuring the implementation and dissemination of results at school, and organizing at least one event to disseminate the results of learning mobilities at school.	P.2.4.; 3.3.	Erasmus + project coordinators	Year 2027
2.3.	of learning consultants and mentors to support new educators	To organize regular mentor and consultant support for new teachers, which includes at least 3 individual or group meetings per year, and at least 80% of them positively evaluate the quality of support based on the results of anonymous surveys.	1.3.1.1.5.	Deputy Directors of Education/ Mentor Teachers	By 2030
2.4.	Improving digital skills	Ensure that educators have participated in digital skills development activities under the guidance of a technology mentor , with at least 70% of educators demonstrating improved skills in the use of digital resources, programs and artificial intelligence (AI)	1.3.2.2.3.	Deputy Director of Education (IT area)/IT Mentors	By 2030
2.5.	A high-quality and modern educational process based on improving the quality of teachers' professional activities	(1) Ensure that 75% of teachers plan and implement a high-quality and effective learning process, ensure a child-centered approach, individualization and differentiation in the learning process. (2) Organize quality assessment of professional competencies for teachers, ensuring that at least 50% of STEM teachers' work quality is assessed	School development plan	Deputy Directors in the field of education	Until 2027
Direction of action: Developing educational talents, creativity, research and other skills relevant to future needs					
3.1.	Interdisciplinary cooperation, especially in grades 7-9	(1) To ensure mutual cooperation between teachers in organizing the learning process and planning the sequence of learning content, each teacher organizes interdisciplinary classes twice per academic year. (2) Introduce a STEAM approach in school, promote opportunities to use the outdoor environment in the learning process, and develop a unified evaluation system for practical research work.	P.2.4.; 2.3.	Deputy Directors in the field of education	By 2030
3.2.	basic skills - reading and numeracy	(1) Organize activities to develop students' reading and numeracy skills, provide individualized support, achieving a 20% improvement in students' reading and numeracy skills. (2) Ensure that the number of learners whose individual needs have been assessed and the necessary support has been organised and/or a decision has been made on the application of the necessary support measures has increased by 20%.	School development plan	Deputy Director for Education; ESF+ project “School in the Community” team	Until 2027
3.3.	Developing self-directed learning skills	(1) Provide tasks in the learning process that promote the acquisition of self-directed learning skills, developing the ability to effectively plan, organize and reflect on one's own learning process in order to promote long-term learning and personal growth.		Deputy Directors in the field of education; MG	By 2030

				ESF+ project "School in the Community" team	
3.4.	Support for talented people and participation in competitions	(1) Develop a support system for working with the talented and gifted. (2) Ensure in-depth study of STEM subjects in elective classes. (3) Increase the number of students participating in various competitions, Olympiads, ZPD, etc. – at least 10% of the total number of students participate in STEM Olympiads, competitions, fairs, ZPD conferences.	1.2.3.1.1. ; 1.2.3.1.2. School development plan	Deputy Directors in the field of education; MG	Until 2027
Action line: Promoting students' interest in continuing their education and careers in STEM fields					
4.1.	Graduate monitoring	(1) Ensure that 100% of primary school graduates continue their education at an appropriate educational institution. (2) Promote that more than 85% of secondary school graduates continue their education in higher education institutions. (3) High-quality and targeted career events have been organized, ensuring that the number of career events implemented in the STEM field has increased by 20%.	1.2.2.1.4.; School development plan	Educator career counselor; Erasmus + project coordinators	Until 2027
4.2.	Employer involvement	(1) Increase the number of events organized with employers. (2) Promote cooperation between class teachers and subject teachers by organizing targeted class excursions	1.2.2.1.6.	Educator career counselor/classroom teachers	By 2030
4.3.	Cooperation between entrepreneurs/institutions and subject teachers	(1) Increase the number of organized collaborative events, activities, and projects at school. (2) Establish cooperation with universities in the field of STEAM, emphasizing career education.	1.2.2.2.3.; School development plan	Educator career counselor; MG	Until 2027
4.4.	Student cooperation projects to strengthen the European dimension in education	To increase the number of high-quality projects implemented by groups of students of different ages in the field of STEM and STEAM based on international cooperation experience	1.2.2.2.4.	Erasmus + project coordinators	Until 2027
4.5.	Integration of career education into STEAM	Implement coordinated and targeted cooperation in the fields of STEAM and career education, develop a plan for integrating career education into STEAM learning. Set specific cooperation goals, collect and analyze data on implemented measures and their effectiveness.	P.2.4.; 2.4.	Educator career counselor; Erasmus + project coordinators	Diversifying the STEM ecosystem in the 2025/26 academic year
4.6.	Promoting girls' interest in STEM, especially programming	Organize special activities and events that promote girls' interest in STEM fields and reduce stereotypes about STEM professions (including the programming profession)		Educator career counselor;	Diversifying the STEM ecosystem in

				Erasmus + project coordinators	the 2025/26 academic year
Direction of action: Modern and relevant interest education offer					
5.1.	Expanding the offer of interest-based education	(1) Create an interest-based education offer for different age groups, especially in the field of IT from the 4th grade and for the development of logical thinking, practical/technical work skills. (2) Organize student attraction activities for groups (competitions, contests, excursions, etc.) (3) Ensure that the number of students participating in STEAM interest groups has increased by 20%.	P.2.4.; 2.8.; School development plan	Deputy Director for Education (extracurricular work)	Until 2027
5.2.	Attracting educators/practitioners	Increase the level of involvement of qualified educators and industry practitioners in interest-based education, ensuring more diverse, higher-quality and more modern educational content for children and young people.		School administration	Until 2027
5.3.	Organizing STEAM camps	Organize at least 2 camps (day or 24-hour camps) in the field of STEAM for various target groups during the summer holidays , involving external services or school educators.	P.2.4.; 2.9.	Deputy Director of Education (extracurricular work)	Until 2029
Action line: Modern learning equipment and infrastructure					
6.1.	of an extension and multifunctional hall at Ozolnieki Secondary School	Build an extension - a STEAM center, which includes a multifunctional hall, dining hall, reading room, classrooms and interest education classrooms with equipment, including 4 computer labs, 4 technical creativity classrooms (technology, robotics, design and technology).	1.1.3.1.17.; school development plan	JNIP, municipality	Until 2029
6.2.	Infrastructure renovation to ensure a full-fledged learning process	Improve the computer network infrastructure according to the needs of the institution.	1.1.3.1.1.	JNIP, municipality	Until 2029
6.3.	ICT infrastructure renewal	(1) Provide each teacher with a computer. (2) Ensure access to computers for learners according to their level of education. (3) Organize annual renewal of computer equipment (computers, tablets, projectors, interactive whiteboards, speakers, etc.) and office equipment (printers, scanners, etc.) in the amount of 10-20% of the total amount of equipment.	1.1.3.2.2.	JNIP, municipality	Until 2029
6.4.	Improving material and technical support (especially in the STEAM resource center)	(1) Develop the infrastructure and material and technical support of mathematics and natural science classrooms, ensure that the material and technical base of 90% of STEAM subject classrooms is appropriate for the implementation of the curriculum in a competency-based approach. (2) Promote the use of modern and advanced technologies in the learning process and in the operation of the regional STEAM resource center.	1.1.3.2.1.; School development plan	JNIP, municipality	Until 2029

5.2. Career education program for the 2025/26 academic year

Developed by Līga Veidemane, Ozolnieki Secondary School teacher and career counselor.

This program is for students in grades 7-9 to get them interested in learning STEM in depth, especially programming, with an emphasis on engaging girls. The program provides innovative activities, methods, mostly career activities in school or outside of school.

Planned results of the program implementation:

(1) At least 10 activities have been implemented for students aged 12-16;
(2) At least 200 students from Ozolnieki are involved in the events;
(3) At least 50% of participants admit that participating in the events motivates them to study STEM fields in the future;
(4) Increased interest among girls in the IT and programming industries, reducing gender-related prejudices;
(5) The school has shared examples of good practice at the regional and international levels.

Class	**Event topic and desired outcome**	**Time, place, type, number of students**	**Innovation**	**Main activities**
7th, 8th, 9th grade	**Who am I in the digital age?** SR – the student is able to name their interests and strengths that can help them learn one of the IT professions; understand how technologies affect the student's everyday life; create a short self-knowledge description – a "digital self-portrait".	September (80 min) Ozolnieki Secondary School Practical lesson ≈ 214 students	Students create their own digital portraits and a portfolio of their digital skills, which they can then use to explore their interests in other fields or choose a career.	1. Discussion "Technology - Impact or Tool" 2. Students become aware of their interests, skills, and abilities. 3. Self-knowledge : what I like, what interests me, what I know. 4. "My 3 superpowers in the digital age", group or individual work. 5. Creating a digital portfolio (Google Sites or Google Docs, Canva or Padlet). (Provisionally managed by a coach or Talent Forge)
7th, 8th, 9th grade	**Where is my place in IT?** SR – the student is able to name at least five STEM or IT professions, explain the basic skills required in the chosen profession, and understand the student's strengths to start a career in one of these professions.	September (80 minutes) Ozolnieki Secondary School Practical lesson ≈ 214 students	Create your own professional "stands" digitally (Canva , Google Slides), presenting your chosen profession with visual materials and researched facts.	1. The concept of STEM and the diversity of fields; 2. Lecture by a representative of the IT/STEM profession (Accenture; Riga) technology girls *dziveigatavs.lv* ; *here, lv* ; Evolution Latvia ; Printful Latvia, Emedium etc.) 3. The importance of skills in the future job market (https://www.myskillsfuture.gov.sg/content/student/en/secondary.html ; Profesiju pasaule.lv) (Provisionally could be led by Zuragus , Arstarulsmirus , a powerful personal growth coach)
7th, 8th, 9th grade	**My Personal Growth IT Portfolio.** SR – the student is able to structure their interests, skills, and future career vision; set short-term and long-term	October (80 min) Ozolnieki Secondary School Practical lesson	Digital portfolio development , which aims to create a portfolio of	1. Goal setting – SMART approach; 2. Next steps in personal development. 3. Task "My Career Map" (goals + resources + steps) ;

	goals; improve their digital personal growth portfolio, and tentatively envision their career in the technology industry.	≈ 214 students	your IT skills and identify your skills for a successful career in the IT industry.	4. Creating a portfolio by combining materials from the previous lesson ; 5. Feedback in pairs/groups, circle of inspiration . Daume or Riga could lead technology girls)
8th grade	**Signal Hunters** . SR – students understand how mobile communications and mobile internet networks work, gain an idea of the importance of technology in modern society, and learn about career opportunities in the information and communication technology industry.	November (6h) Riga, Study tour, ≈56 students	Mobile communications is a very specific field and contains many engineering professions as well as Information Technology professions, a place where programming languages work technically.	1. Before the excursion, groups come up with questions that could be asked during the excursion . 2. Tour of a company that provides mobile networks. 3. Students must complete their career portfolio, record the professions they have named, and master them in certain categories.
7th grade	**Mobile app development.** SR – the student is able to name various professions related to mobile app development, understands the types and goals of app development, and uses algorithmic thinking.	December (4h min) Ozolnieki Secondary School practical lesson ≈ 85 students	An innovative way to engage young people in creativity and technical thinking. Classes would promote additional learning content in computing.	1. Using Visual Programming Language App Inventor builds programs from blocks. 2. Test applications on your device – a mobile phone or tablet with iOS or Android operating system. 3. Classes create various games, chat apps, and other programs that are useful for both learning and entertainment. 4. Learn programming concepts – loops, branches, variables. (You can contact me here: https://pps.lv/#!/nodarbibas)
7th grade	**Professional Researcher: Technology in Action** . SR — The student understands how science and technology knowledge is applied in the real world, learns about career opportunities in the digital industry, and develops an understanding of the importance of innovation in society.	December (8h) Ventspils Excursion ≈ 85 students	Stepping into the role of company employees, company employees comment, offer their suggestions to young people in implementing the ideas they have created. **Innovation pitch (presentation):** Teams briefly present their idea to the “ Aspired ” jury –	At the VIZIUM Science Center: 1. Exploring interactive exhibits Students gain practical experience with various technological, natural science, and engineering phenomena – forces, motion, energy, programming, etc. 2. Reflection: What did I learn? What would I like to explore more deeply? At ASPIRED: 1. Meeting with representatives of various professions Students hear personal stories about the path to a career in technology (e.g., designer, developer, project manager). 3. Mini task for groups of students: Generating ideas about what digital app could solve a problem in their everyday life.

			this allows you to experience a real startup feeling.	4. Before the excursion, students work **in small teams** using **digital tools** (such as Figma , Canva , Miro , or on paper) and create **a prototype of their idea** – an app sketch or a digital product concept, which is reviewed by Company employees. 5. Aspired employees provide **real feedback** as product designers or UX specialists: • – Would this idea work in real life? • – How to improve it? • – What do people with such ideas actually do in their teams?
9th grade	**Digital Challenge: RADI!** SR – working in a team, identify a current problem and develop an idea for a digital product to solve it, present your prototype, developing problem-solving collaboration, entrepreneurship , and digital skills.	January (4h) Ozolnieki Secondary School practical lesson ≈73 students	A master class that helps you learn and develop a final thesis in computing.	1. Roboschool lesson. Which includes a problem-solving masterclass with the goal of creating digital products. 2. Project work in groups.
7th grade	**BIOcode : When nature meets algorithms** . SR - students use knowledge from biology, mathematics, design and technology, as well as computer science, to model and present an interactive, programmable solution-based biological system or process. The student demonstrates problem-solving , creativity, and digital literacy skills in an interdisciplinary collaborative project.	February (4h) Ozolnieki Secondary School practical lesson ≈ 85 students	Interdisciplinary connection between several subjects . Students work in teams to develop **a digitally controlled or simulated model of biological processes** ,	Interdisciplinary connection between several subjects . Students work in teams to develop a digitally controlled or simulated model of biological processes , such as: The photosynthetic cycle, the circulatory system, or the balance of the eco - system , Using mathematical modeling (percentages, flows, measurements) . Creates **a visual prototype with design elements** (e.g., cut-out structures, 3D printable parts, drawings), • And program with **Micro:bit , LEGO Spike or a simple Scratch simulation** to show **how the system works when input data changes** (e.g. light, water quantity, pollution)
7th-9th grade girls	**Speaking among IT girls** . SR – to gain an understanding of creative professions and career opportunities in the IT field, fostering interest in IT careers and digital skills.	March (1.5h) Ozolnieki Secondary School practical lesson ≈ 150 students	Promoting digital equality – by addressing a specific group of society (girls), gender disproportion in STEM fields is reduced	**1. Inspirational stories from women in the IT industry;** 2–3 IT professionals with varying experience: • UX/UI designer • Game artist or animator • IT project manager or digital marketing specialist Each one talks about their path to their profession, their daily work, and what they find creative. **2. Practical exercise/workshop (30–40 min)** Choose one of the simple and creative practical tasks: • **UX Challenge:** Create a paper prototype for a mobile app (e.g., “an app for students that helps them plan their day”).

				• **Color and design game:** Create a visual identity for a fictional brand (colors, font, logo sketch). • **Storytelling through technology:** Group work where you have to figure out how to solve a real problem with the help of technology (e.g., "How to make the school environment friendlier?"). **3. Roundtable discussion/question and answer session** • Open conversation: "What surprised you?", "What interested you?", "What else would you like to learn or try in the future?" • Opportunity to ask questions to guests. (Lesson leader, IT industry representatives who work creatively in the IT industry)
9th grade	**Computer games as a profession?** SR - gained understanding of various professions related to computer game development (e.g. game designer, programmer, artist, animator , story writer, sound designer, tester , etc.), increased young people's interest in a creative and technological career in the game industry, identified skills needed in game development , and opportunities for their development in school or outside of it.	March (2h) Ozolnieki Secondary School practical lesson ≈ 73 students	The event promotes the understanding that games are not just entertainment, but also a serious, creative and interdisciplinary career opportunity . An innovative way to motivate young people to learn IT, design, storytelling , foreign languages, mathematics and teamwork.	**Mosaic of professions in game development (15–20 min)** Presentation or visual poster with different roles in game development: ○ **Game designer** ○ **Programmer** ○ **Graphic artist/ animator** ○ **Screenwriter/story writer** ○ **Sound designer** ○ **Tester** ○ **Project Manager/Publisher** For each role: a short description, what skills are required and an example from a real game. Guest speaker from the industry. **Creative workshop: Create your own game idea (30–40 min)** **Group work (3–4 people):** Task: come up with a game concept, name, and short description. ○ Game genre (e.g. adventure, logic, challenge) ○ Main character ○ What will you have to do in the game? ○ Target audience ○ Why would this game be interesting? **Presentations and feedback (15–20 min)** • Each group briefly presents their game (1–2 min). • The other participants vote for: ○ The most original idea ○ The game they would like to play • The manager provides positive feedback and encourages ideas to be developed further.

5.3. Roadmap for STEM Ecosystem implementation