

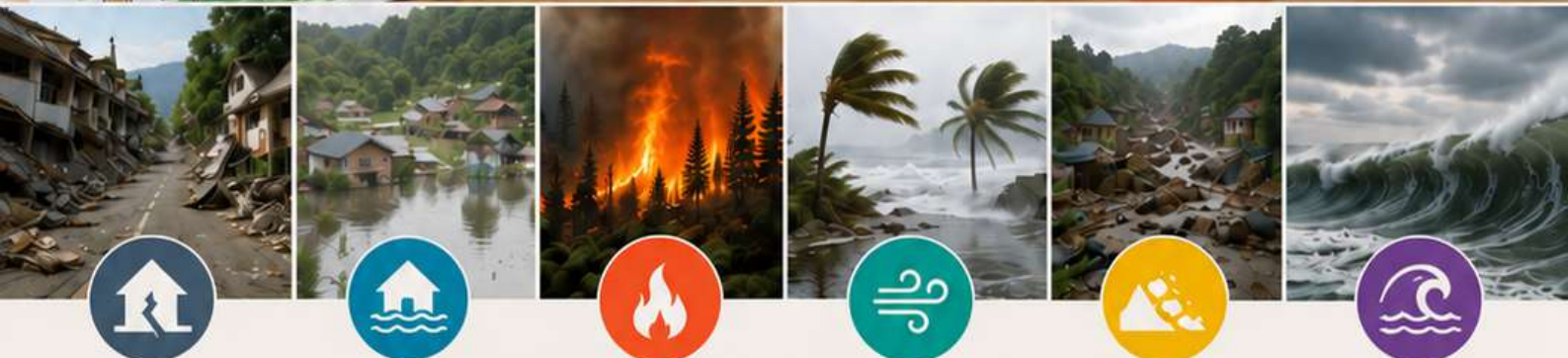
STEAME

FOR SAVING LIFE

Guidelines for developing and implementing
Disaster Risk Reduction Education in
Elementary School Curriculum

O4/A1
**Pilot testing and compilation of
guidelines and activities**

Project Acronym: STEAME-DRREC
Reference number: 2023-2-CY01-KA210-SCH-000169945
Implementation period: 31 August 2024 – 30 August 2026



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📄 Steame for Saving Life



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Deliverable leading partner: Competence Center for a Sustainable and Resilient Built Environment using Smart Technologies (SURE)

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BRIEF DESCRIPTION

This report presents the outcomes of Output O4/A1 “Pilot testing and compilation of guidelines and activities” of the STEAME for Saving Life (STEAME-DRREC) Erasmus+ project. It compiles, in their finalised form, the results of the project’s development work after their piloting in real classroom conditions in Greece and Cyprus. Specifically, the report presents: (a) the finalised set of STEAME-DRREC activities in digital form for elementary school students — 20 lesson/unit plans for Grades 1–3 and 20 for Grades 4–6; (b) the finalised methodological guidelines for incorporating STEAME-DRRE activities in elementary curriculum-content instruction; (c) the finalised and upgraded related tools and teaching/learning material (worksheets, eQuizzes and self-assessment applications, digital and multimedia resources, augmented and virtual reality material); and (d) the evaluation of the pilot-testing process — its design, the semi-structured interview guide used as its single instrument, and its results.

1. INTRODUCTION

The STEAME-DRREC project develops, tests and disseminates a complete framework for integrating Disaster Risk Reduction Education (DRRE) into the daily curriculum of elementary schools, through a STEAME (Science, Technology, Engineering, Arts, Mathematics, Entrepreneurship/Environment) interdisciplinary approach. The project’s development pathway progressed from the analysis of European and global practice (O1/A1), to the methodological framework (O1/A2), the development of sample activities and supplementary material (O2/A1), and the design and implementation of a teacher training course (O3/A1). Output O4/A1 constitutes the final stage of this pathway: the piloting of the developed activities and materials in real classrooms, and the compilation of all products — refined on the basis of the piloting experience — into their final form.

The pilot testing followed the two-phase model established in the teacher training programme (O3/A1). In the first phase, participating teachers from Greece and Cyprus were trained in the DRRE concepts, methodologies and tools of the project. In the second phase, the teachers designed — with the continuous scientific and pedagogical support of the project team — their own curriculum-based DRRE activities and implemented them in their classrooms. The lesson/unit plans that emerged from this authentic classroom implementation were documented in a common template, reviewed, and compiled into the finalised activity sets presented in this report. The feedback gathered throughout this process informed the finalisation of the methodological guidelines and the upgrading of the supporting tools and materials.

Objectives of the Work Package O4/A1

According to the project application, the results of this activity are the following:

- a. A finalised set of STEAME-DRREC activities in digital form for Elementary School Students (at least 20 for Grades 1–3 and at least 20 for Grades 4–6).
- b. Finalised Methodological guidelines for incorporating STEAME-DRRE activities in Elementary curriculum-content instruction.
- c. Finalised/upgraded related tools and teaching/learning material.
- d. Evaluation instruments and results of the pilot-testing process, evaluation report.

The present report is organised around these four results: Chapter 2 presents the finalised activity sets, Chapter 3 the finalised methodological guidelines, Chapter 4 the finalised and upgraded tools and materials, and Chapter 5 the pilot-testing and evaluation process, its instruments and the reporting of its results. The interview guide used in the evaluation is provided in Annex III.

2. FINALISED SET OF STEAME-DRREC ACTIVITIES

2.1 The finalisation process

The finalised activity sets are the product of a complete development–training–implementation–refinement cycle. Sample activities were first developed by the project team (O2/A1) and used in the teacher training programme (O3/A1) as reference models. During the second phase of the training, the participating teachers designed their own lesson/unit plans in the common project template — covering thematic area, target grades, teaching time, summary, DRR objectives, subject curriculum objectives, learning outcomes, resources and step-by-step activities — and implemented them in their classrooms in Greece and Cyprus. The plans were then reviewed, refined on the basis of the implementation experience and the evaluation feedback, translated into English, and compiled into two unified digital volumes:

- a. EMKK/DRR Unified Lesson Plans — Grades 1–3 (20 lesson/unit plans, English digital edition), and
- b. EMKK/DRR Unified Lesson Plans — Grades 4–6 (20 lesson/unit plans, English digital edition).

Both volumes are included in full in Annexes I and II of the present report and are also made available as separate digital files through the project website (www.steame-life.eu). Each activity is presented in the common template so that any teacher can adopt it directly, adapt it to their own class, or use it as a model for designing new activities. The two catalogues below provide an overview of the finalised sets.

2.2 Catalogue of activities — Grades 1–3 (ages 6–9)

No	Title	Thematic area	Grade	Duration
1	“Creating our own Magic Digital Book with the help of AI!”	Earthquake	1	2 x 45’
2	“The Superheroes’ Backpack: What will I take with me?”	Earthquake / Preparedness	1	2 x 45’
3	“Earthquake Dance: We become Music Stars!”	Earthquake	1	2 x 45’
4	“The Great Exit of the Earthquake Heroes!” — Preparedness drill	Earthquake	1	2 x 45’
5	“Detectives at Home: Dangerous or Safe?”	Fire	1	2 x 45’
6	“Lifeline: Learning to Call 199”	Fire	1	2 x 45’
7	“Operation Exit: Low under the Smoke”	Fire	1	2 x 45’
8	“Hermes and the Flood” — Story and neighbourhood map	Flood	1	2 x 45’
9	“Water Experiments: Where does the rain go?”	Flood	1	2 x 45’
10	“The Forest Before and After the Fire”	Fire	2	2 x 45’
11	“Robot Firefighter: Finding a safe route on the map”	Fire	2	2 x 45’
12	“In the Eye of the Fire” — VR 360° simulation	Fire	2	2 x 45’
13	“Our own Volcano” — Model and eruption experiment	Volcano	2	2 x 45’
14	“How do I stay safe?” — Flood poster (Before–During–After)	Flood	3	2 x 45’
15	“The Numbers that Save Lives” — Poster and digital puzzle	All hazards	3	2 x 45’
16	“Journey to the Centre of the Earth” — 3D & AR	Earthquake	3	2 x 45’

17	“From School to the Assembly Point” — Scratch	Earthquake	3	2 x 45’
18	“The Earthquake Alarm” — LEGO WeDo 2.0	Earthquake	3	2 x 45’
19	“Which Building Withstands?” — Stability experiment	Earthquake	3	2 x 45’
20	“Drop, Cover, Hold On!” — Escape plan and drill	Earthquake	3	2 x 45’

2.3 Catalogue of activities — Grades 4–6 (ages 9–12)

No	Title	Thematic area	Grade	Duration
1	Brainstorming (Idea Stations) — The secret of earthquakes	Earthquake	5	2 x 45’
2	Investigation using video	Earthquake	5	2 x 45’
3	Experimentation with the model “Tectonic plates in action”	Earthquake	5	1 x 45’
4	Representation – Simulation of Seismic Movement	Earthquake	5	2 x 45’
5	Browsing websites, experimenting and creative expression	Earthquake	5	2 x 45’
6	Activity with the website of the Geodynamic Institute	Earthquake	5	2 x 45’
7	Little engineers – How much can a building withstand?	Earthquake	5	2 x 45’
8	Construction and testing: “We build and improve”	Fire	5	2 x 45’
9	Mapping hazards in the school grounds	Earthquake	6	1 x 45’
10	Building an earthquake-resistant building	Earthquake	6	2 x 45’
11	Introduction, Awareness-Raising and Waste Sorting	Earthquake / Fire	4	2 x 45’
12	Systematic Analysis & Digital Interaction	Earthquake / Fire	4	3 x 45’
13	Experiential Action “A day in the forest” & Self-Assessment	Earthquake / Fire	4	2 x 45’
14	Digital Journey Through Time with Google Maps	Earthquake / Fire	4	2 x 45’
15	Rules for Protection and Preparedness against Earthquakes	Earthquake / Fire	4	3 x 45’
16	Learning about earthquakes	Earthquake	5–6	1 x 45’
17	Examining earthquakes in Greece	Earthquake	5–6	2 x 45’
18	Using the Merge application (AR)	Earthquake	5–6	2 x 45’
19	“The earthquake emergency kit”	Earthquake	5–6	2 x 45’
20	Review and evacuation drill	Earthquake	5–6	1 x 45’

2.4 Correspondence with the O2/A1 sample activities and the O1/A2 framework

The finalised sets presented above are the outcome of a traceable development line that runs from the methodological framework (O1/A2), through the sample activities developed by the project team (O2/A1), to the lesson/unit plans designed and implemented by the participating teachers and compiled in the present output. This section makes that line explicit, so that each finalised activity can be read against its origin and each approach of the methodological framework can be seen in operation in the classroom.

Three types of relation are distinguished in the tables below. **Direct correspondence (D)** indicates that the finalised plan implements the same core idea, hazard and pedagogical approach as a specific O2/A1 sample, with adjustments limited to teaching time, context and materials. **Adaptation (A)** indicates that the pedagogical structure of an O2/A1 sample was retained but transferred to a different hazard, grade band or local context. **Extension (E)** indicates that the plan has no direct counterpart in the sample set: it develops the sample bank further — by adding a new hazard, a new tool strand, or a new stage in a learning sequence — while remaining anchored in the design logic of one or more identified samples. The final column names the principal methodological approach of the O1/A2 framework that governs the activity; most plans combine two or more approaches, and the one named is the dominant one.

Table 1. Grades 1–3 — correspondence of the finalised activities with the O2/A1 sample set.

No	Finalised activity (O4/A1)	Rel.	Origin in the O2/A1 sample set	Principal O1/A2 approach
1	“Creating our own Magic Digital Book with the help of AI!”	E	Extends G1–3 No 11 “Earthquake Stories” and No 5 “Rain Stories”; adds AI-assisted digital book creation	Storytelling for Risk Awareness
2	“The Superheroes’ Backpack: What will I take with me?”	A	G1–3 No 16 “Emergency Kit Treasure Hunt”, transferred to earthquake preparedness	Game-Based Learning / Context-Based Learning
3	“Earthquake Dance: We become Music Stars!”	E	Extends G1–3 No 11 and No 17 “Escape from the Flood!”; adds a music and movement strand	Simulation and Role-Playing (Arts)
4	“The Great Exit of the Earthquake Heroes!” — Preparedness drill	D	G1–3 No 12 “Drop, Cover, Hold On!” – Earthquake Evacuation Drill	Simulation and Role-Playing
5	“Detectives at Home: Dangerous or Safe?”	A	G1–3 No 15 “Nature’s Dangers” – Sorting and Classifying Hazards, transferred to home fire safety	Inquiry-Based Learning / Context-Based Learning
6	“Lifeline: Learning to Call 199”	E	Extends G1–3 No 7 “Rescue Mission!” and No 14 “Forest Fire Safety Rules”; adds the emergency-call procedure	Simulation and Role-Playing
7	“Operation Exit: Low under the Smoke”	E	Extends the evacuation logic of G1–3 No 12 to fire and smoke; linked to No 14	Simulation and Role-Playing
8	“Hermes and the Flood” — Story and neighbourhood map	A	G1–3 No 5 “Rain Stories” and No 18 “A Drop Travels”; adds neighbourhood mapping	Storytelling / Context-Based Learning
9	“Water Experiments: Where does the rain go?”	D	G1–3 No 2 “The Sponge and the Rain” and No 3 “Which Material Absorbs Water Best?”	Inquiry-Based Learning
10	“The Forest Before and After the Fire”	A	G1–3 No 20 “Before and After the Flood”, transferred to wildfire; linked to No 14	Storytelling (Arts)
11	“Robot Firefighter: Finding a safe route on the map”	E	Extends G1–3 No 14 and the escape-route idea of No 12; adds programming and robotics	Design Thinking / Game-Based Learning

No	Finalised activity (O4/A1)	Rel.	Origin in the O2/A1 sample set	Principal O1/A2 approach
12	"In the Eye of the Fire" — VR 360° simulation	E	Extends G4–6 No 16 "VR Immersive Experience" down to Grades 1–3, with fire content	Simulation and Role-Playing
13	"Our own Volcano" — Model and eruption experiment	E	New hazard (volcanic activity), not covered in O2/A1; built on the model-experiment design of G1–3 No 1	Inquiry-Based Learning
14	"How do I stay safe?" — Flood poster (Before–During–After)	D	G1–3 No 10 "Flood Safety Poster" – Infographic Design; linked to No 20	Context-Based Learning (Arts)
15	"The Numbers that Save Lives" — Poster and digital puzzle	E	Extends G1–3 No 10 and No 16; adds emergency numbers and a digital puzzle	Game-Based Learning
16	"Journey to the Centre of the Earth" — 3D & AR	E	Extends G4–6 No 17 "Earth Structure 3D Explorer" (Merge Cube) down to Grades 1–3	Inquiry-Based Learning (AR)
17	"From School to the Assembly Point" — Scratch	E	Extends G1–3 No 12 with programming; linked to G4–6 No 9 (school mapping)	Design Thinking / Project-Based Learning
18	"The Earthquake Alarm" — LEGO WeDo 2.0	E	Extends the engineering-design logic of G1–3 No 4 "Building a Dam" and No 9; adds robotics	Design Thinking
19	"Which Building Withstands?" — Stability experiment	A	G1–3 No 9 "Build a Waterproof House" and No 4, transferred to seismic stability	Design Thinking
20	"Drop, Cover, Hold On!" — Escape plan and drill	D	G1–3 No 12 "Drop, Cover, Hold On!" – Earthquake Evacuation Drill	Simulation and Role-Playing

Table 2. Grades 4–6 — correspondence of the finalised activities with the O2/A1 sample set.

No	Finalised activity (O4/A1)	Rel.	Origin in the O2/A1 sample set	Principal O1/A2 approach
1	Brainstorming (Idea Stations) — The secret of earthquakes	E	Orientation stage preceding G4–6 No 1 and No 4; no direct counterpart in O2/A1	Inquiry-Based Learning (orientation phase)
2	Investigation using video	A	G4–6 No 3 "The Earthquake Came Suddenly" and No 16; video used where VR equipment is unavailable	Inquiry-Based Learning / Context-Based Learning
3	Experimentation with the model "Tectonic plates in action"	D	G4–6 No 4 "Tectonic Plates in Motion" – PhET Simulation (physical-model version)	Inquiry-Based Learning
4	Representation – Simulation of Seismic Movement	D	G4–6 No 5 "Seismograph & Seismic Waves"	Simulation and Role-Playing
5	Browsing websites, experimenting and creative expression	A	G4–6 No 1 "Live Seismic Map Explorer" combined with No 3 (creative writing)	Inquiry-Based Learning (Arts)
6	Activity with the website of the Geodynamic Institute	D	G4–6 No 1 "Live Seismic Map Explorer", localised to the national data source; linked to No 20	Context-Based Learning (authentic data)
7	Little engineers – How much can a building withstand?	E	Raises the engineering-design challenges of G1–3 No 4 and No 9 to upper primary	Design Thinking
8	Construction and testing: "We build and improve"	E	Same engineering strand as No 7; iterative design–build–test–improve cycle	Design Thinking

No	Finalised activity (O4/A1)	Rel.	Origin in the O2/A1 sample set	Principal O1/A2 approach
9	Mapping hazards in the school grounds	D	G4–6 No 9 “Our School’s Flood Risk Map” and No 7, widened to all hazards	Project-Based Learning / Context-Based Learning
10	Building an earthquake-resistant building	E	Culminating design challenge of the engineering strand (see No 7–8)	Design Thinking
11	Introduction, Awareness-Raising and Waste Sorting	E	New environment strand; draws on the O2/A1 waste-management worksheets (Annex I)	Context-Based Learning
12	Systematic Analysis & Digital Interaction	E	Continues the environment strand of No 11; linked to G4–6 No 13 “Stop Disasters!”	Game-Based Learning / Inquiry-Based Learning
13	Experiential Action “A day in the forest” & Self-Assessment	E	Extends G4–6 No 14 “Wildfire Risk Analysis”; uses the O2/A1 self-assessment sheets (Annex II)	Simulation and Role-Playing
14	Digital Journey Through Time with Google Maps	A	G4–6 No 15 “Map Storytelling” (Google My Maps instead of ArcGIS); linked to No 12 (history + DRR)	Storytelling / Context-Based Learning
15	Rules for Protection and Preparedness against Earthquakes	A	G4–6 No 10 “Flood Preparedness Plan”, transferred to earthquake; linked to No 18 “Riskland”	Context-Based Learning / Project-Based Learning
16	Learning about earthquakes	A	G4–6 No 6 “Earthquake Magnitude” and No 4, as a knowledge-building introduction	Inquiry-Based Learning
17	Examining earthquakes in Greece	D	G4–6 No 2 “Earthquake Data Analysis” – Spreadsheet Graphing, with No 1	Inquiry-Based Learning (authentic data)
18	Using the Merge application (AR)	D	G4–6 No 5 and No 17 “Earth Structure 3D Explorer” – AR with Merge Cube	Inquiry-Based Learning (AR)
19	“The earthquake emergency kit”	A	G1–3 No 16 “Emergency Kit Treasure Hunt”, raised to upper primary; linked to G4–6 No 10	Project-Based Learning / Context-Based Learning
20	Review and evacuation drill	E	Extends G1–3 No 12 to upper primary as the synthesis and drill closing the sequence	Simulation and Role-Playing

D = direct correspondence

A = adaptation

E = extension. “G1–3 No x” and “G4–6 No x” refer to the numbering of the sample activities in report O2/A1.

Read across the two tables, twenty-one of the forty finalised plans stand in a relation of direct correspondence (10) or adaptation (11) to the O2/A1 sample set, and nineteen are extensions of it. Thirty-three of the forty O2/A1 samples are taken up in the finalised set. Every one of the seven methodological approaches of the O1/A2 framework is represented in both grade bands, which confirms in practice the applicability of the framework across the whole of elementary education.

The extensions are not incidental additions: they cluster in four areas, each responding to a need that emerged during the teacher training and the classroom piloting. First, an additional hazard — volcanic activity — was introduced for Grades 1–3, at the request of teachers working on the geological causes of earthquakes. Second, a programming and robotics strand (Scratch, LEGO WeDo 2.0, robot route-finding) and the supervised use of AI tools for digital storytelling extend the Technology and Engineering components of STEAME, which the sample set addressed mainly through ready-made digital resources. Third, an engineering-design strand for Grades 4–6 raises to upper primary the design–build–test–improve challenges originally written for Grades 1–3, and culminates in the construction of an earthquake-resistant building. Fourth, an environment and waste-

management strand for Grade 4 develops the Environment component of STEAME and connects disaster risk to everyday environmental behaviour, building on the supplementary worksheets of O2/A1.

Seven O2/A1 samples were not selected by the piloting teachers and remain fully usable in the reference bank: for Grades 1–3, “Flood Safety Comics”, “Weather Observers”, “The Fire Triangle” and “Rescue Team Flood!”; for Grades 4–6, “Flood Variables”, the “Rain Gauge Project” and the “DRR Infographic Campaign”. Two consequences follow for the adoption of the package. The flood and water theme, strongly represented in the sample set, is comparatively less present in the finalised Grades 4–6 activities, which reflect the hazard priorities of the piloting regions; schools in flood-prone areas are therefore directed to the corresponding O2/A1 samples, which operate within the same methodological framework and the same template. Likewise, the citizen-science and campaign-type samples remain available to schools able to sustain longer-term projects beyond the two-period unit adopted as the standard format after piloting.

2.5 Digital form and availability

All 40 activities are provided in digital form (accessible documents in the common template) and are complemented by the digital interactive material developed in the project: eQuizzes and self-assessment applications, digital games and puzzles, 3D/AR models and VR experiences, and programming/robotics resources (Scratch projects, LEGO WeDo 2.0, Polytech R2/Mind+). The complete collection is published on the project website, from which teachers can download the activity volumes, the supplementary worksheets and the links to all digital resources.

3. FINALISED METHODOLOGICAL GUIDELINES

The methodological guidelines for incorporating STEAME-DRRE activities in elementary curriculum-content instruction were developed in O1/A2 and are finalised in the present output, incorporating the experience of the teacher training and the classroom piloting. The full text of the guidelines is provided in the accompanying report “O1/A2 — Methodological guidelines for incorporating STEAME-DRRE activities in Elementary curriculum-content instruction (final version)”. This chapter summarises their structure and the refinements introduced after piloting.

3.1 The methodological framework

The guidelines establish a framework of seven core methodological approaches for DRRE in the elementary school, each documented with its rationale, implementation steps and worked examples: Project-Based Learning (PBL); Context-Based Learning (CBL); Storytelling for Risk Awareness; Inquiry-Based Learning (IBL); Design Thinking; Simulation and Role-Playing; and Game-Based Learning (GBL). These approaches are complemented by supporting strategies and techniques for integrating STEAME-DRR (cooperative learning structures, use of authentic data, formative assessment techniques) and by holistic, cross-curricular approaches that embed DRR across Language Arts, Mathematics, Science/Environmental Studies, Geography, ICT, Arts and Physical Education, rather than treating it as a separate subject.

The guidelines also provide practical, grade-band-specific guidance: for early primary education (Grades 1–3), emphasis is placed on concrete hands-on experiences, storytelling, sensory exploration, simple experiments and cooperative play, with scientific vocabulary introduced gradually; for upper primary education (Grades 4–6), on higher-order thinking, real data analysis, digital tools, extended inquiry and civic engagement.

3.2 Refinements introduced after the pilot testing

The classroom implementation phase confirmed the overall validity of the methodological framework and led to targeted refinements, which are incorporated in the final version of the guidelines:

- a. Time realism: activities are structured in units of 1–2 teaching periods (45’ or 2 x 45’), with clearly marked optional extensions, reflecting teachers’ feedback on the time actually available within curriculum-content instruction.
- b. Curriculum anchoring: every activity template now includes an explicit “Subject Curriculum Objectives” table (subject – unit – objectives), which teachers identified as the single most useful element for legitimising DRRE within regular instruction.
- c. Emotional safety: strengthened guidance on age-appropriate treatment of frightening content (selection of visual material, normalisation of feelings, hope- and agency-oriented closure of every activity), particularly for Grades 1–3.
- d. Technology with a fallback: for every digital, AR/VR or robotics component, the guidelines now require a tested offline alternative, responding to the variability of school infrastructure observed during piloting.
- e. Family and community link: activities systematically include a “home mission” component (family emergency backpack, home safety check, family escape plan), which piloting showed to be a powerful multiplier of impact.

4. FINALISED AND UPGRADED TOOLS AND TEACHING/LEARNING MATERIAL

The tools and the teaching/learning material developed in O2/A1 and used in the teacher training (O3/A1) were reviewed and upgraded on the basis of the piloting feedback. The finalised package comprises the following categories:

4.1 Thematic supplementary material (worksheets)

A set of printable thematic worksheets accompanies the activities, covering the units Natural Disasters, Earthquakes, Wildfires, Floods, Waste Management and the Water Cycle: observation sheets for experiments, classification and sorting sheets (safe/dangerous; before/during/after), mazes and escape-plan sheets, data-recording tables and drawing/retelling templates. The worksheets are provided in editable and printable digital form, in Greek and English, so that they can be adapted to each class.

4.2 eQuizzes and self-assessment applications

The assessment content developed in the project — a diagnostic pre-assessment questionnaire, four thematic quizzes and six student self-assessment and reflection sheets — is provided both in printable form and as digital interactive eQuizzes implemented on free platforms (Google Forms, LearningApps, Wordwall). Following piloting, the eQuizzes were upgraded with clearer age-appropriate wording, immediate feedback per question, and separate versions for the two grade bands. All links are published on the project website.

4.3 Digital and multimedia educational material

The finalised catalogue of digital resources used across the 40 activities includes: live seismicity maps (seismo-live.gr, USGS, EMSC) and citizen-science platforms (“Did You Feel It?”); interactive simulations (PhET Plate Tectonics; Mozaik 3D); serious games (Stop Disasters!/UNDRR, Rescue Team – Flood); official thematic maps (EEA discomap, mapsportal.yopen.gr); weather data portals (meteo.gr); creation tools (Book Creator, Canva, StoryboardThat, ArcGIS Story Maps, Google My Maps, jigsawplanet); programming and robotics environments (Scratch, LEGO WeDo 2.0, Polytech R2 with Mind+); and AI tools for image and music generation used under teacher supervision. Each resource is documented with its type, the related activities and its classroom use.

4.4 Augmented and virtual reality material

The AR/VR package comprises: the Merge Cube with the Merge EDU applications (virtual seismograph and seismic waves; Earth structure in 3D; volcanic activity simulations), including the free printable paper cube; Sketchfab 3D/AR models (Palace of Knossos, Earth layers, faults, volcanoes); and curated 360° VR experiences of earthquakes and forest fires. Following piloting, the package was upgraded with a practical classroom protocol for safe AR/VR use at young ages (short exposure, station rotation, voluntary participation, flat-screen alternative, offline fallback), which is included in the methodological guidelines.

4.5 Teacher training material

The complete training package of O3/A1 — the three training modules (DRRE for natural hazards in the school curriculum; natural hazard scenarios and educational simulations; using real data and linking DRRE to the curriculum), the presentation materials, the worked examples and the activity design template — is available as reference material supporting the adoption of the activities by new teachers and schools beyond the project partnership.

5. PILOT TESTING AND EVALUATION

5.1 Purpose and evaluation questions

The pilot testing examined how the STEAME-DRREC sample activities developed under O2/A1 performed when they were taken up by teachers and implemented with real classes within regular curriculum-content instruction. Its purpose was twofold: to obtain structured professional feedback on each of the forty sample activities, and to document the adaptations and extensions that teachers made to them, so that both could inform the finalised sets presented in Chapter 2 and the refinements of the methodological guidelines presented in Chapter 3.

The evaluation addressed five questions:

- EQ1.** How much teaching time does each activity actually require when implemented within curriculum-content instruction, and how does this compare with the time foreseen in its design?
- EQ2.** What level of difficulty does each activity present — for pupils, in terms of cognitive and procedural demand, and for teachers, in terms of preparation, materials, technology and classroom management?
- EQ3.** What adaptations and extensions did teachers make to the sample activities, and for what reasons?
- EQ4.** How could the experiment-based activities of the lower grade band be extended to the upper grade band, and what does this imply for the finalised sets?
- EQ5.** Which of the sample activities were carried into the finalised sets, in what form, and for what reasons were the remainder not selected?

5.2 Evaluation design and participants

A qualitative design was adopted, based on semi-structured interviews with the teachers who implemented the activities. Interviews were the single evaluation instrument used in this output, for two reasons. First, the object of the evaluation was not the measurement of pupil outcomes but the professional judgement of experienced teachers on the workability of each activity: how long it actually takes, where it becomes difficult, what has to be changed and what must not be changed. Evidence of this kind is activity-specific, comparative and explanatory, and it is generated far more reliably in conversation than through rating scales. Second, the evaluation of the training programme conducted under O3/A1 had already established, through pre- and post-training questionnaires administered to the full body of participants, teachers' perceptions of the programme, of curriculum integration and of the materials presented; what remained to be captured, and what O4/A1 required, was the detailed activity-level experience of classroom implementation.

The interviewees were teachers of the participating primary schools who had completed the training programme (O3/A1) and had subsequently implemented one or more of the O2/A1 sample activities in their own classes. They formed an experienced group: the great majority had more than eleven years of service and a substantial proportion more than twenty years, and all grade levels of primary education were represented. Their professional profile, documented in detail in O3/A1, is directly relevant to the interpretation of the findings reported below. Before the training they expressed strong support for the integration of DRRE into the curriculum ($M = 4.52/5$) and had considerable practical familiarity with school emergency drills, while identifying limited curriculum time as by far the strongest barrier to implementation ($M = 4.04/5$), followed by insufficient educational materials ($M = 3.86$) and limited specific training ($M = 3.79$). Their self-assessed capability was highest for earthquake protection ($M = 3.76/5$) and lowest for the explicit connection of hazard-related activities with curriculum content ($M = 3.19$) and for flood protection ($M = 3.20$). They were also already using pedagogical approaches compatible with the project's framework — realistic contexts (72.4%), interdisciplinary activities (71.7%), inquiry-based learning (70.9%) and digital tools (83.5%).

The interviews were conducted individually after the implementation period, following the common guide set out in Section 5.3, and lasted between forty and sixty minutes. They were audio-recorded with the participants' consent, transcribed and analysed thematically. Participation was voluntary and the data were anonymised; no pupil data were collected.

The analysis treats the interview material as a single corpus. No distinction is drawn between the participating countries in the reporting of the findings. The evaluation questions concern the activities themselves — their duration, their demands and their adaptability — rather than national education systems, and the patterns identified in the interviews were common across the sample. Reporting the findings by country would suggest a comparative design that was neither intended nor supported by the data, and would obscure the activity-level conclusions that the finalisation of the sets required.

5.3 The interview guide

The guide was organised in six parts and is reproduced in full in Annex III. Parts A to D were applied to each activity that the teacher had implemented: the sequence was repeated for every activity, so that the resulting evidence is activity-specific rather than an overall impression of the programme. Part E was addressed to three experiment-based activities of the lower grade band and was asked of all interviewees, whether or not they had implemented those activities themselves. Part F closed the interview at the level of the teacher’s overall experience.

Part	Focus	What it establishes
A. The activity as implemented	Identification and description	Which sample activity, which grade, which subject; how the lesson unfolded; what was changed before implementation
B. Time (per activity)	Teaching time and preparation	Actual time required against planned time; the phase that overran; what would be cut in a single period; preparation time outside the classroom
C. Difficulty (per activity)	Demand on pupils and on the teacher	Three-level rating for pupils and for the teacher; the hardest step; within-class differentiation; failures of materials or tools
D. Adaptations and extensions (per activity)	What was changed and why	The adaptations made and their reasons; extensions beyond the sample; what the sample would need for a colleague to use it unchanged
E. Extension of the experiment-based activities	Transfer to the upper grade band	How “Water Experiments”, “Our own Volcano” and “Which Building Withstands?” could be developed for Grades 4–6 without repeating the lower-grade version
F. Overall	Synthesis at teacher level	Which activities worked best and least well; which would not be attempted and why; what support sustained implementation requires

5.4 Data analysis

The transcripts were analysed thematically and by activity. Two coding passes were carried out. The first was activity-based: for each of the forty sample activities, all references across the interviews were assembled and summarised on three dimensions — the teaching time reported, the difficulty reported for pupils, and the principal demand placed on the teacher. Time was coded in teaching periods; difficulty was coded on the three-level scale used in the guide. The second pass was thematic and cut across activities, identifying recurring patterns in the adaptations made, the reasons given for them, the obstacles encountered and the conditions that teachers regarded as necessary for sustained implementation. The two passes were then brought together: the activity-level summaries provided the evidence for the revisions made to individual activities, while the cross-cutting themes provided the evidence for the refinements of the methodological guidelines reported in Section 3.2.

5.5 Findings

5.5.1 Teaching time required

The most consistent finding of the evaluation concerned time, and it confirmed in practice the barrier that teachers had identified before the training. Almost all activities required more teaching time than the teachers had initially allowed for them. The excess was not caused by the substantive part of the activity — the experiment, the construction, the investigation — but by what surrounds it: distributing and setting up materials, forming and settling groups, and moving between the practical phase and the discussion that gives it meaning. Where digital tools, augmented reality or robotics were involved, the logging-in, distribution and rotation of equipment added further time that had not been anticipated in the plan.

Asked what they would shorten if the activity had to fit a single period, teachers were consistent: they would reduce the introduction and the recording or presentation phase, and they would protect the closing discussion. Their reasoning was that the discussion is where protective knowledge is formulated and where the activity ceases to be a pleasant experiment and becomes disaster risk education. Several teachers noted that an activity interrupted between the practical phase and the discussion loses a considerable part of its effect, since pupils return to it with the memory of the experiment but without its conclusion.

The consequence for the finalised sets was the adoption of the two-period unit (2 × 45') as the standard format, with one-period versions retained only where the activity genuinely closes within a single session, and with optional extensions marked explicitly rather than embedded in the main sequence. Preparation time outside the classroom was reported as significant but acceptable and was reduced considerably when materials were prepared jointly by more than one teacher.

5.5.2 Difficulty

Difficulty was reported along two distinct axes that did not coincide. For pupils, difficulty followed the cognitive demand of the content: activities based on narrative, drawing, sorting, role play and drills were consistently reported as of low demand and were implemented smoothly even in the first grades, while activities requiring quantitative reasoning — magnitude scales, the interpretation of thematic maps, the handling of data in spreadsheets — were reported as the most demanding of the whole set. For teachers, difficulty followed logistics rather than content: the activities that were hardest to run were those depending on equipment, connectivity or space, not those dealing with the most complex ideas. This is the axis on which the participating teachers had been most reserved after the training, when the applicability of the tools received the lowest ratings of the post-training questionnaire (78.0% for the tools and 78.9% for the activities, against 100% for the examples and teaching techniques presented).

Two further observations recurred. First, the experiment-based activities occupied an intermediate position: undemanding conceptually for pupils, but requiring real preparation and supervision from the teacher, particularly where water, heat or open space was involved. Second, within-class differentiation was raised repeatedly: in mixed-ability classes the same activity was too easy for some pupils and too difficult for others, and teachers handled this by assigning roles within the group rather than by differentiating the task, a solution they judged effective but improvised.

The tables below summarise, for each of the forty sample activities, the teaching time reported, the difficulty reported for pupils, and the principal demand placed on the teacher.

Table 3. Grades 1–3 — teaching time and difficulty reported for the O2/A1 sample activities.

No	O2/A1 sample activity	Teaching time reported	Difficulty for pupils	Principal demand on the teacher
1	“The Big Rain and the Flood” – Simulation Experiment	2 × 45'	Moderate	Materials, water management and protection of the classroom surface
2	“The Sponge and the Rain” – Soil Absorption Experiment	1 × 45'	Low	Minimal; simple everyday materials
3	“Which Material Absorbs Water Best?” – Materials Investigation	1 × 45'	Low–moderate	Preparing a material set for each group

No	O2/A1 sample activity	Teaching time reported	Difficulty for pupils	Principal demand on the teacher
4	"Building a Dam" – Engineering Design Challenge	2 × 45'	Moderate	Materials and the two testing rounds; group management
5	"Rain Stories" – Illustrated Storytelling	1 × 45'	Low	Locating a suitable illustrated text
6	"Flood Safety Comics" – Comic Strip	2 × 45'	Low–moderate	Set-up of the digital tool where the digital version is chosen
7	"Rescue Mission!" – Flood Role-Play Game	2 × 45'	Moderate	Floor space and layout; managing movement and turn-taking
8	"Weather Observers" – Daily Weather Recording	10' daily + 1 × 45'	Low	Sustaining the daily routine over the recording period
9	"Build a Waterproof House" – Engineering Design Challenge	2 × 45'	Moderate	Materials and testing arrangements
10	"Flood Safety Poster" – Infographic Design	1–2 × 45'	Low	Art materials or access to a design tool
11	"Earthquake Stories" – What Would We Do?	1 × 45'	Low	Age-appropriate handling of frightening content
12	"Drop, Cover, Hold On!" – Evacuation Drill	1 × 45'	Low	Coordination with the school's drill schedule
13	"The Fire Triangle" – Fire Discovery Experiment	1 × 45'	Moderate	Safety supervision; conducted as a teacher demonstration
14	"Forest Fire Safety Rules" – Drawing and Writing	1 × 45'	Low	Minimal
15	"Nature's Dangers" – Sorting and Classifying Hazards	1 × 45'	Low	Preparing the card sets
16	"Emergency Kit Treasure Hunt" – Maths and Preparedness	2 × 45'	Low–moderate	Assembling the kit items; space for the search
17	"Escape from the Flood!" – Physical Education Game	1 × 45'	Low	Gymnasium or open space and equipment
18	"A Drop Travels" – Water Cycle Storytelling	1 × 45'	Low	Minimal
19	"Rescue Team Flood!" – ICT and Digital Game	1 × 45'	Low	Device availability and a stable connection
20	"Before and After the Flood" – Drawing and Retelling	1 × 45'	Low	Minimal

Table 4. Grades 4–6 — teaching time and difficulty reported for the O2/A1 sample activities.

No	O2/A1 sample activity	Teaching time reported	Difficulty for pupils	Principal demand on the teacher
1	"Live Seismic Map Explorer" – Reading Real Earthquake Data	1–2 × 45'	Moderate	Devices and connection; guidance in navigating the site
2	"Earthquake Data Analysis" – Spreadsheet Graphing	2 × 45'	High	Computer room; pupils' uneven spreadsheet skills
3	"The Earthquake Came Suddenly" – Creative Writing after VR	2 × 45'	Moderate	VR equipment and rotation; emotional debriefing after viewing
4	"Tectonic Plates in Motion" – PhET Simulation	1 × 45'	Moderate	Devices; explaining the model before pupils use it

No	O2/A1 sample activity	Teaching time reported	Difficulty for pupils	Principal demand on the teacher
5	"Seismograph & Seismic Waves" – AR with Merge Cube	2 × 45'	Moderate	Cubes and application access; station rotation
6	"Earthquake Magnitude" – Maths and the Richter Scale	2 × 45'	High	The logarithmic scale requires careful scaffolding
7	"Flood Risk Mapping" – Digital Thematic Maps	2 × 45'	High	Map portals; teaching the reading conventions first
8	"Flood Variables" – Scientific Inquiry Experiment	2 × 45'	Moderate	Materials; supporting pupils in controlling variables
9	"Our School's Flood Risk Map" – Community Mapping Project	3 × 45'	Moderate	Outdoor session, permissions and supervision
10	"Flood Preparedness Plan" – Class Emergency Action Plan	2 × 45'	Moderate	Alignment with the school's own emergency plan
11	"Rain Gauge Project" – Data Collection and Analysis	Recurring + 2 × 45'	Moderate	Sustaining the measurement period and the record
12	"The Minoan Civilization and Natural Disasters" – History + DRR	2 × 45'	Moderate	Assembling age-appropriate source material
13	"Stop Disasters!" – Strategic Planning Digital Game	2 × 45'	Moderate	Devices; the game runs longer than a single period allows
14	"Wildfire Risk Analysis" – Thematic Maps and Data	2 × 45'	High	Data portals; interpretation of the indicators
15	"Map Storytelling" – ArcGIS Story Maps	3 × 45'	High	Accounts and prior familiarity with the platform
16	"VR Immersive Experience" – Experiencing Disasters Safely	1 × 45'	Low–moderate	Headsets, rotation, voluntary participation, flat-screen alternative
17	"Earth Structure 3D Explorer" – AR with Merge Cube	1 × 45'	Low–moderate	Cubes and application access
18	"Riskland" – Board Game for Disaster Preparedness	2 × 45'	Low	Printing and preparing the boards and cards
19	"DRR Infographic Campaign" – Digital Media Production	3 × 45'	Moderate	Design tool; the longest project format of the set
20	"Citizen Science: Earthquake Monitoring Network"	2 × 45'	Moderate	Registration on the reporting platform

5.5.3 Adaptations and extensions made by teachers

Teachers did not implement the samples unchanged, and the interviews show that this was deliberate rather than incidental. Five patterns of adaptation recurred across the corpus.

- Transfer to another hazard.** The pedagogical structure of a sample was retained and applied to the hazard most relevant to the school's own setting — most often from flood to fire or earthquake. This was the single commonest adaptation and it accounts for a substantial part of the finalised sets.
- Localisation.** Generic scenarios were replaced by local ones: the neighbourhood, the school building, an event within local memory. Teachers reported that this change, which costs nothing, produced the clearest gain in pupil engagement.
- Simplification of the technological component.** Where equipment was unavailable or unreliable, teachers substituted a simpler medium — video for virtual reality, a printed map for a digital portal, a paper model for a simulation — while keeping the learning objective intact.
- Addition of a task taken home.** Teachers frequently added a component addressed to the family: a home safety check, an emergency backpack prepared with parents, a family escape plan. This was not present in the samples and emerged spontaneously in several classes.

- e. **Extension of the grade range.** Activities designed for one grade band were raised or lowered to the other, most often by changing the level of measurement and recording rather than the activity itself.

Teachers were also explicit about what the samples would need in order to be implemented by a colleague without such adaptations: an explicit statement of the curriculum objectives served, a tested alternative for every digital component, and a clear indication of which parts of the sequence are essential and which are optional. All three requirements were incorporated in the finalised template and in the guidelines, as reported in Section 3.2.

5.5.4 From the sample set to the finalised set: the outcome of each activity

The evaluation was carried out on the O2/A1 sample activities, but its purpose was the finalisation of the sets presented in Chapter 2. This section closes that loop: it records what became of each of the forty samples, and — for those that were not carried forward — why. Three outcomes are distinguished. **Carried forward** means the sample was implemented and survives in the finalised set as a direct correspondence or an adaptation, with the revisions described above. **Extended** means the sample was not reproduced as such, but its pedagogical structure or its design logic underpins one or more of the extensions in the finalised set. **Retained in the reference bank** means the sample was not selected by the teachers during the pilot; it remains part of the project's published material and fully usable, and the reason for its non-selection is recorded so that schools can judge whether that reason applies to them.

Table 5. Grades 1–3 — outcome of each O2/A1 sample activity in the finalised set.

No	O2/A1 sample activity	Outcome	Destination in the finalised set, or reason for non-selection
1	"The Big Rain and the Flood"	Extended	Its simulation-experiment structure underpins G1–3 No 13 "Our own Volcano". Not implemented in its original form: teachers judged the soil-and-water set-up disproportionate to the lesson time and preferred the smaller-scale water experiments.
2	"The Sponge and the Rain"	Carried forward	G1–3 No 9 "Water Experiments: Where does the rain go?"
3	"Which Material Absorbs Water Best?"	Carried forward	G1–3 No 9, merged with No 2 into a single two-period investigation
4	"Building a Dam"	Extended	Design logic carried into G1–3 No 18 and No 19 and into the whole engineering strand of G4–6 (No 7, 8, 10)
5	"Rain Stories"	Carried forward	G1–3 No 8 "Hermes and the Flood"; storytelling structure also extended into No 1
6	"Flood Safety Comics"	Reference bank	Not selected: the same communication objective was met more quickly by No 10 (poster) and No 20 (before/after drawing), while the digital comic tool added set-up time without adding to the DRR objective.
7	"Rescue Mission!"	Extended	Emergency-response roles carried into G1–3 No 6 "Lifeline: Learning to Call 199"
8	"Weather Observers"	Reference bank	Not selected: requires a daily routine sustained over two weeks, which teachers could not protect within curriculum-content instruction. Retained for schools able to run it as a longer project.
9	"Build a Waterproof House"	Carried forward	G1–3 No 19 "Which Building Withstands?", transferred to seismic stability
10	"Flood Safety Poster"	Carried forward	G1–3 No 14 "How do I stay safe?"; extended into No 15
11	"Earthquake Stories"	Extended	G1–3 No 1 (AI digital book) and No 3 ("Earthquake Dance")

No	O2/A1 sample activity	Outcome	Destination in the finalised set, or reason for non-selection
12	"Drop, Cover, Hold On!"	Carried forward	G1–3 No 4 and No 20; also extended into No 7, No 17 and G4–6 No 20. The most widely reused sample of the whole set.
13	"The Fire Triangle"	Reference bank	Not selected: involves an open flame and was judged feasible only as a teacher demonstration. Teachers preferred the non-combustion route to the same concept offered by No 10 and by the home fire-safety survey (G1–3 No 5).
14	"Forest Fire Safety Rules"	Carried forward	Content distributed across G1–3 No 6, No 7, No 10 and No 11
15	"Nature's Dangers"	Carried forward	G1–3 No 5 "Detectives at Home: Dangerous or Safe?"
16	"Emergency Kit Treasure Hunt"	Carried forward	G1–3 No 2 "The Superheroes' Backpack"; extended into No 15 and G4–6 No 19
17	"Escape from the Flood!"	Extended	Movement and physical-education strand carried into G1–3 No 3
18	"A Drop Travels"	Carried forward	G1–3 No 8 "Hermes and the Flood"
19	"Rescue Team Flood!"	Reference bank	Not selected: depends on an external web game whose availability, language and stability teachers could not rely on. Its game-based objective is met by G1–3 No 15 (digital puzzle).
20	"Before and After the Flood"	Carried forward	G1–3 No 10 "The Forest Before and After the Fire"; also No 14

Table 6. Grades 4–6 — outcome of each O2/A1 sample activity in the finalised set.

No	O2/A1 sample activity	Outcome	Destination in the finalised set, or reason for non-selection
1	"Live Seismic Map Explorer"	Carried forward	G4–6 No 6 (national data source); also No 5 and No 17
2	"Earthquake Data Analysis"	Carried forward	G4–6 No 17 "Examining earthquakes in Greece"
3	"The Earthquake Came Suddenly"	Carried forward	G4–6 No 2 "Investigation using video", with video substituted for VR where equipment was unavailable; also No 5
4	"Tectonic Plates in Motion"	Carried forward	G4–6 No 3 (physical-model version) and No 16
5	"Seismograph & Seismic Waves"	Carried forward	G4–6 No 4 and No 18 (Merge Cube)
6	"Earthquake Magnitude"	Carried forward	G4–6 No 16 "Learning about earthquakes", with the logarithmic scale scaffolded more gradually
7	"Flood Risk Mapping"	Carried forward	G4–6 No 9 "Mapping hazards in the school grounds", widened to all hazards
8	"Flood Variables"	Reference bank	Not selected: the highest preparation demand of the flood set, combined with a hazard that is not dominant in the areas of the participating schools. Its inquiry structure survives in the extension proposals for "Water Experiments" (Section 5.5.5).

No	O2/A1 sample activity	Outcome	Destination in the finalised set, or reason for non-selection
9	"Our School's Flood Risk Map"	Carried forward	G4–6 No 9, as the community-mapping core of the activity
10	"Flood Preparedness Plan"	Carried forward	G4–6 No 15 "Rules for Protection and Preparedness", transferred to earthquake; also No 19
11	"Rain Gauge Project"	Reference bank	Not selected: requires a measurement period longer than the implementation window, the same constraint as "Weather Observers". Retained for schools running a year-long environmental project.
12	"The Minoan Civilization and Natural Disasters"	Extended	History-and-DRR link carried into G4–6 No 14 "Digital Journey Through Time"
13	"Stop Disasters!"	Extended	Digital strategic-planning component carried into G4–6 No 12
14	"Wildfire Risk Analysis"	Extended	G4–6 No 13 "A day in the forest", with the map analysis reduced and the experiential component strengthened
15	"Map Storytelling" (ArcGIS)	Carried forward	G4–6 No 14, with Google My Maps substituted for ArcGIS — a technology simplification made by the teachers themselves
16	"VR Immersive Experience"	Extended	Adapted downwards into G1–3 No 12 "In the Eye of the Fire"; also underpins G4–6 No 2
17	"Earth Structure 3D Explorer"	Carried forward	G4–6 No 18; also extended downwards into G1–3 No 16
18	"Riskland"	Carried forward	Incorporated as the game component of G4–6 No 15
19	"DRR Infographic Campaign"	Reference bank	Not selected: the three-period project format exceeded the time teachers could protect within curriculum-content instruction. The communication objective is covered by the shorter poster and puzzle formats of the Grades 1–3 set.
20	"Citizen Science: Earthquake Monitoring Network"	Carried forward	Incorporated as the reporting component of G4–6 No 6

Twenty-one of the forty samples were carried forward directly or by adaptation, twelve were extended into new activities, and seven were retained in the reference bank. The reasons for non-selection fall into three groups, and none of them concerns the pedagogical quality of the activity. **Three activities were not selected because of their time format:** "Weather Observers", the "Rain Gauge Project" and the "DRR Infographic Campaign" all require a sustained routine or a multi-session project that teachers could not protect within curriculum-content instruction — the very barrier they had identified as strongest before the training. **Two were not selected for reasons of safety or preparation:** "The Fire Triangle", which involves an open flame, and "Flood Variables", the most materials-intensive of the flood investigations. **Two were displaced by a faster route to the same objective:** "Flood Safety Comics" and "Rescue Team Flood!", whose communication and game-based objectives were met by other samples in less time and with fewer dependencies.

These seven activities remain published and fully usable, and the recorded reasons make them directly actionable for other schools: a school with a longer project slot, a laboratory-equipped classroom or a stable digital infrastructure faces none of the constraints that led to their non-selection here. This is also where the flood theme is concentrated, which is the reason it is comparatively less present in the finalised Grades 4–6 set; schools in flood-prone areas are directed to these samples, which operate within the same methodological framework and the same template.

5.5.5 Extension of the experiment-based activities to the upper grade band

The responses to Part E converged on a single principle: the experiments should not be repeated in the upper grades but re-entered at the level of measurement, control of variables and interpretation of data. Pupils who have already seen the phenomenon should now quantify it.

“Water Experiments: Where does the rain go?” For Grades 4–6, teachers proposed converting the demonstration into a controlled investigation: identical quantities of water poured over different substrates (bare soil, grass, gravel, paved surface) with the volume of runoff collected and measured, the infiltration time recorded, and results tabulated and graphed. Extensions suggested included relating the findings to the proportion of sealed surfaces in the school's own neighbourhood and to local rainfall records, which links the experiment to Mathematics, Geography and Environmental Studies simultaneously.

“Our own Volcano”. Teachers were clear that the model eruption is a demonstration and, repeated in the upper grades, would add nothing. Their proposal was to shift the object of study from the eruption to the conditions that produce it: varying the composition of the mixture and observing the effect on the vigour and duration of the eruption; distinguishing between explosive and effusive behaviour; and connecting the model with real data on volcanic activity in the wider region. Several teachers noted that the activity is also the natural place to introduce the distinction between a hazard and a risk, which the lower grades do not address.

“Which Building Withstands?”. For the upper grades, teachers proposed a genuine engineering cycle in place of the single test: construction of structures of measurable height and mass, testing on a simple shaking table with graduated intensity, systematic recording of the point of failure, and a second round of construction informed by the first. The connection with the structure of real buildings, with the reasons for the collapse of particular buildings in known earthquakes, and with the work of civil engineers was proposed as the closure of the activity.

Across all three, teachers raised the same caution: the extension must be visibly different from the lower-grade version, otherwise pupils recognise the material and disengage. The distinguishing element they identified was in every case the same — the pupils' own numerical data, produced, recorded and interpreted by themselves. These proposals were incorporated in the finalised Grades 4–6 set, where they underpin the engineering-design strand and the data-based investigations.

5.5.6 Challenges and enabling conditions

The challenges reported were practical rather than pedagogical: instructional time, additional preparation, coordination between teachers and with external services, adaptation of materials, management of group work, and access to equipment and technical support. Teachers considered that the engagement of their pupils justified the additional effort, but they distinguished clearly between the demands of coordination, which complicate implementation, and professional collaboration, which they regarded as one of the principal benefits of the whole process.

Collaboration between teachers was, indeed, the most consistently reported enabling condition. Joint planning, shared preparation of materials and the exchange of adaptations reduced the individual burden and produced better activities than any teacher had designed alone; teachers described this as a form of professional learning in its own right, extending beyond the formal training. Cooperation with civil protection and fire services and with local authorities was reported as the second enabling condition, contributing authenticity that no classroom material can supply. For sustained implementation, teachers recommended age-differentiated materials, explicit curriculum links, sufficient time for collaborative planning, adequate infrastructure with low-technology alternatives, stable partnerships with local services, and continued opportunities to exchange effective practice.

5.5.7 Conclusions of the evaluation and finalisation decisions

EQ1 (time). The activities are workable within curriculum-content instruction, but not within the time initially assumed for them. The two-period unit was adopted as the standard format of the finalised sets, with optional extensions marked separately and the closing discussion protected as the non-negotiable phase.

EQ2 (difficulty). For pupils, difficulty is governed by quantitative demand, not by the hazard content; for teachers, it is governed by logistics, not by subject matter. The finalised sets therefore introduce quantitative work gradually across the grade bands and require a tested low-technology alternative for every digital, AR/VR or robotics component.

EQ3 (adaptations). Adaptation is the normal mode of use of the samples, not a deviation from it. The finalised template accordingly makes the curriculum objectives explicit, separates the essential from the optional steps, and treats transfer to another hazard and localisation as intended uses rather than as departures from the model.

EQ5 (outcome of the samples). Twenty-one samples were carried forward, twelve were extended into new activities and seven were retained in the reference bank for reasons of time format, preparation or redundancy, none of which concerns their pedagogical quality. The traceability of each sample to its destination in the finalised sets is recorded in Section 5.5.4 and, from the opposite direction, in Section 2.4.

EQ4 (extension of the experiments). The experiment-based activities of the lower grade band extend to the upper band through measurement, control of variables and interpretation of pupils' own data, provided the extension is visibly distinct from the earlier version. This principle shaped the engineering-design and data-based strands of the finalised Grades 4–6 set.

The table below summarises the revisions made to each category of product as a result of the pilot testing.

Product	Main revisions following the pilot testing
Activities (Grades 1–3)	Restructuring into units of 1–2 teaching periods; explicit curriculum-objectives table; low-technology alternative for every digital component; addition of a task addressed to the family; strengthened guidance on the age-appropriate treatment of frightening content.
Activities (Grades 4–6)	Same structural changes; gradual introduction of quantitative work; development of the engineering-design and data-based strands proposed by teachers for the extension of the lower-grade experiments; roles within groups to allow differentiation without changing the task.
Methodological guidelines	Time realism; curriculum anchoring; emotional safety; technology with a tested fallback; family and community link — as set out in Section 3.2.
Tools and materials	Simplified and age-differentiated wording of the worksheets and quizzes; separate versions for the two grade bands; classroom protocol for the safe use of AR/VR; complete documentation of each digital resource with its related activities.

6. CONCLUSIONS

Output O4/A1 completes the development cycle of the STEAME-DRREC project by delivering, in finalised digital form, the full package required for the systematic integration of Disaster Risk Reduction Education in the elementary school: 40 piloted lesson/unit plans covering Grades 1–6 and the hazards most relevant to Greece and Cyprus (earthquake, fire, flood, and related phenomena); methodological guidelines refined through authentic classroom implementation; a complete, upgraded set of supporting tools and teaching/learning materials, from printable worksheets to eQuizzes, digital resources, robotics and AR/VR; and a documented pilot-testing and evaluation process with a reusable interview instrument.

The distinctive strength of the compiled package is that it was not produced in the abstract: every activity was designed or refined by practising teachers, implemented with real students within regular curriculum-content instruction, and revised in the light of that experience. The package is therefore ready for direct adoption by schools, and constitutes a sound basis for the project's dissemination and sustainability actions, including the training of new teachers, the engagement of school networks in both countries, and the transfer of the model to other European contexts.

All components of the deliverable are available in digital form on the project website, www.steame-life.eu.

ANNEX I — FINALISED SET OF ACTIVITIES, GRADES 1–3 (20 LESSON/UNIT PLANS)

This annex contains, in full, the finalised set of 20 STEAME-DRREC lesson/unit plans for Grades 1–3 (ages 6–9), in the common project template (English digital edition). Each plan specifies the thematic area, target grade, teaching time, summary, DRR (EMKK) objectives, subject curriculum objectives, learning outcomes for DRR, resources/materials, and the step-by-step description of the activity.

The 20 lesson/unit plans follow on the next pages.



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STEAME-DRREC

"STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum"

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

☒

Fire

☐

Flood

☐

Other (specify):

Teacher's name: KL (adapted)

Students' Grades

1

☒

2

☐

3

☐

4

☐

5

☐

6

☐

Teaching time	2 teaching hours (2 x 45 minutes)
Title / Topic	"Creating our own Magic Digital Book with the help of AI!"
Summary	Grade 1 students become the "directors" and "publishers" of their own interactive digital book on earthquake protection. Having learned the basic self-protection rules, each group chooses a protection scene, describes it in words to an Artificial Intelligence tool (prompting) and selects the most representative of the images the AI produces. The images are composed in the Book Creator platform together with short texts and captions written by the children themselves. The activity naturally combines language development (precise description, captions), technology (AI, digital publishing) and art (aesthetic selection of images), following the STEAME approach. At the same time it consolidates the protection rules in a creative way: in order to "order" the right picture from the AI, children must first deeply understand the rule they want to illustrate. The final e-book is shared with the school community and families, turning the students into "ambassadors" of preparedness.
DRR (EMKK) Objectives	Students are expected: - To consolidate the basic protection measures before, during and after an earthquake by transforming them into images and texts. - To describe a scene accurately and completely in words, so that the AI tool produces the desired result (first contact with prompting). - To critically evaluate and select among the images produced by the AI, justifying their choice. - To combine image and text into digital book pages, organising information in a logical order. - To collaborate in groups, sharing roles (description, image selection, caption writing). - To develop a positive, creative relationship with technology as a tool for learning and expression.

Subject Curriculum Objectives	Subject	Unit	Objectives
	Language	Oral and written expression	a. Accurate oral description of a scene (who, where, doing what). b. Writing simple captions and short texts for the pages of the book.
	ICT	Digital creation and expression	a. Familiarisation with an AI image-generation tool and with the Book Creator platform. b. Understanding that the computer follows our instructions — the better the description, the better the result.
	Arts	Aesthetic education – Digital art	- Observation, comparison and aesthetic evaluation of images; AI image creation as a new form of digital art.
	Environmental Studies	Natural phenomena – Protection	- Consolidation of earthquake protection rules through their visualisation.
Learning Outcomes for DRR	By the end of the activities, students will be able to: a. State correctly at least three earthquake protection rules and represent them with an image and caption. b. Compose a simple, clear description (prompt) that leads to a suitable image. c. Select the most appropriate image among alternatives, with justification. d. Produce a complete digital book page (image + text) in collaboration with their group. e. Present the e-book in class and explain the page they created.		
Resources / Materials	a. Tablets or computers with access to an AI image-generation tool (operated/supervised by the teacher). b. Book Creator platform (bookcreator.com) for composing the e-book. c. Interactive whiteboard for shared viewing and image selection. d. Cards with the protection rules (EPPO/OASP material) as an "idea bank" for the scenes. e. Page-planning sheet: "Our scene – Our words – Our caption".		
Activities	Stage 1 — Warm-up and planning (15') The class recalls the protection rules with the help of the EPPO cards. The teacher presents the mission: "We will make our own book to teach other children what to do in an earthquake — and a magic helper, Artificial Intelligence, will help us!" Each group (3–4 children) picks one rule and completes the planning sheet: which scene will their page show (e.g. "children protecting themselves under the desk"). Stage 2 — Designing the image with AI (30')		

	Each group formulates the description of its scene orally; the teacher types it into the AI tool in front of the children, on the interactive whiteboard. The group observes the generated images and discusses: "Does it show what we wanted? What is missing? How can we ask for it better?" If needed, the description is improved and generation is repeated — the children experience first-hand that precise language brings better results. Each group selects its final image with justification. Stage 3 — Composition in Book Creator (30') The images are imported into Book Creator. Each group writes (with support where needed) the caption and a short text for its page — e.g. "When the earth shakes: Drop, Cover, Hold On!" Background colours and page order are chosen, and a cover is added with a title voted by the class. Stage 4 — Presentation and dissemination (15') The completed e-book is projected on the interactive whiteboard; each group presents its page and explains its rule. The book is shared with families and the other classes of the school. Reflection: "What did we learn about earthquakes? What did we learn about Artificial Intelligence?"
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STEAME-DRREC

"STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum"

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: KL (adapted)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)	
Title / Topic	"The Superheroes' Backpack: What will I take with me?"	
Summary	An experiential decision-making activity in which students learn to organise the family Emergency Backpack. The teacher brings real objects to class — essential ones and "traps" — and the children, working in groups, must choose only what is really needed and fits in the backpack. Through sorting into categories (Survival, Communication, Health), Mathematics meets Civil Protection, while the discussion about the "why" of each choice cultivates argumentation. The activity does not stop at knowledge: each child undertakes to prepare the family emergency backpack at home with their parents, using the illustrated checklist of the class. School learning is thus transferred to real life and the children become carriers of preparedness for the whole family — a fundamental principle of Disaster Risk Reduction Education.	
DRR (EMKK) Objectives	Students are expected: - To understand the purpose of the emergency backpack and when we need it. - To distinguish essential from non-essential items, developing decision-making skills under constraint (limited space). - To sort objects into categories using criteria (Survival – Communication – Health). - To justify their choices with simple arguments ("we need it because..."). - To learn where the backpack is kept at home (near the exit) and who takes it during evacuation. - To transfer the knowledge to their family by participating in preparing the family backpack.	
Subject Curriculum Objectives	Subject	Unit
	Mathematics	Sorting – Grouping – Problem solving a. Grouping objects by criteria, counting, comparing sets.

			b. Solving a problem with constraints: "only 8 items fit — which do we choose?"
	Language	Oral expression – Argumentation	- Justifying choices, negotiating within the group, presenting to the class.
	Environmental Studies	Civil Protection – Preparedness	- Understanding the importance of preparing before a disaster.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Name at least six essential items of the emergency backpack (water, dry food, torch, whistle, radio, first-aid kit). - Sort the objects correctly into the three categories (Survival, Communication, Health). - Justify why an object is or is not essential. - Know where the backpack should be kept at home. - Participate in preparing the family backpack using the checklist.		
Resources / Materials	- A real backpack and real objects: small water bottles, cereal bars, torch with batteries, whistle, portable radio, first-aid kit, tissues, keys. "Traps": toys, tablet, a large book, a ball — objects that do not belong in the backpack. - Three hoops or boxes labelled: Survival – Communication – Health. - Illustrated backpack checklist for home (one per child). - EPPO / Civil Protection material on the contents of the emergency backpack.		
Activities	Stage 1 — Warm-up: "We must leave — what do we take?" (10') The teacher sets the scenario: "After a big earthquake we may need to stay outside the house for a few hours. What would we want to have with us?" The children make free suggestions which are written on the board — without correction yet. Stage 2 — The selection game (25') All the objects (essential and "traps") are spread in the centre of the classroom. Each group takes turns choosing one object for the backpack, justifying: "We take it because...". The class agrees or disagrees with arguments. The constraint rule ("only what fits and what we can carry") forces the children to prioritise: the favourite toy stays out, the water goes in first. Stage 3 — Sorting into categories (25') The selected objects are sorted into the three hoops: Survival (water, food), Communication (whistle, radio), Health (first-aid kit, hygiene items). The "difficult" cases are discussed (where does the torch belong?) and the items of each category are counted. Finally, one group ceremonially fills the class backpack and the class discusses where it will be kept (near the door). Stage 4 — The home mission (10' + family homework) Each child takes the illustrated checklist with the mission to prepare the family backpack with their parents and tick ✓ everything they found. The following week the children report to the class how the "mission" went and what difficulties they encountered.		



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

☒

Fire

☐

Flood

☐

Other (specify):

Teacher's name: KL (adapted)

Students' Grades

1

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"Earthquake Dance: We become Music Stars!"		
Summary	Students transform the earthquake self-protection rules into a song and choreography. Starting from the key words "Drop, Cover, Hold On", the children become lyricists: they create simple rhythmic verses describing what we do when "the earth dances". The lyrics are fed into an AI music-generation tool (e.g. Suno) and the class chooses the musical style — cheerful and rhythmic, so that the melody "sticks" and recalls the protection movements. Rhythmic memorisation is a powerful tool for young ages: what is sung is remembered. In parallel, the choreography with movements matching the protection instructions consolidates the protocol physically, while the joyful atmosphere of the "performance" defuses the anxiety that may accompany the topic of earthquakes. The song is reused in the school preparedness drills, functioning as an audio "anchor" of calmness.		
DRR (EMKK) Objectives	Students are expected: - To memorise the "Drop, Cover, Hold On" protocol through rhythm and melody. - To create simple rhyming verses with the key protection words. - To match body movements to the protection instructions (choreography). - To get to know an Artificial Intelligence music tool as a means of creation. - To emotionally defuse the topic of earthquakes through music, dance and the joy of collective creation.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Music	Rhythm – Song – Creation	- Sense of rhythm and metre, performing a song with movement, first contact with music creation using digital tools.
	Language	Poetic language – Rhyme	- Creating simple verses, playing with rhymes and repetition.

	Physical Education	Movement and rhythm	- Performing movements with precision and synchronisation to the rhythm of the music.
	Environmental Studies	Earthquake protection	- Consolidating the self-protection steps through rhythmic repetition.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Sing the class song and perform the corresponding protection movements in synchronisation. - Recite the three steps "Drop, Cover, Hold On" from memory. - Participate in creating rhyming verses. - Perform the self-protection position immediately and correctly when the song/signal is heard during a drill.		
Resources / Materials	- AI music-generation tool (e.g. Suno) — operated by the teacher. - Speakers / interactive whiteboard for playback. - Poster board for writing the lyrics in large letters. - Sample verse: "I drop, I cover, I hold on tight / calm inside with all my might! / I count to ten, slow and low / and everything will be OK, I know!"		
Activities	Stage 1 — The lyric-writing team (25') The class recalls the three protection steps. With guidance, the children propose rhyming words and compose a verse and a chorus. The lyrics are written on a large poster and read rhythmically with clapping. Stage 2 — The AI sets our lyrics to music (20') The teacher enters the lyrics into the AI tool in front of the children. The class listens to 2–3 versions in different styles (pop, kids dance) and votes for its favourite. Discussion: "How did this happen? We wrote the words — the machine made the music!" Stage 3 — Rehearsal and choreography (30') The children learn the song and create movements matching the instructions: at "drop" they go down on their knees, at "cover" they put their hands over their heads, at "hold on" they grab their "desk", at "count to ten" everyone counts aloud on their fingers. Stage 4 — The big performance (15') The class sings and dances all together — learning becomes a celebration! The song is recorded/saved and it is agreed that it will accompany the school preparedness drills, so that the protection steps are recalled automatically with the melody.		



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

☒

Fire

☐

Flood

☐

Other (specify):

Teacher's name: KL (adapted)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"The Great Exit of the Earthquake Heroes!" — Experiential preparedness drill		
Summary	The culmination of the earthquake unit: a complete experiential simulation drill in which students apply in practice everything they have learned. At the sound of the signal, the children perform the "Drop, Cover, Hold On" protocol under their desks; when the "shaking" stops, they evacuate the classroom calmly and in order, following the pre-agreed route to the assembly point in the schoolyard. The drill is designed to be joyful and empowering, not frightening: the walk to the yard becomes a "musical march" with the protection song, and at the assembly point the children raise their poster high, showing the whole school that they are ready and informed. The reflection that follows ("what we did well, what we will improve") introduces children to the logic of continuous improvement of preparedness — just as real Civil Protection teams do.		
DRR (EMKK) Objectives	Students are expected: - To apply the "Drop, Cover, Hold On" protocol accurately and calmly at the sound of the signal. - To know and follow the evacuation route of their classroom to the assembly point. - To understand the rules of safe exit: we do not run, we do not push, we do not go back, we help anyone in difficulty. - To manage their anxiety through preparation, repetition and the song. - To reflect on the execution of the drill and propose improvements.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	Civil Protection – Our school	- Getting to know the school emergency plan and the assembly point area.
	Physical Education	Motor skills – Orientation	- Body control (quick cover), moving in line safely, orientation in the school space.

	<table><tr><td>Language</td><td>Oral expression – Reflection</td><td>- Describing the experience, formulating observations and improvement suggestions.</td></tr></table>	Language	Oral expression – Reflection	- Describing the experience, formulating observations and improvement suggestions.
Language	Oral expression – Reflection	- Describing the experience, formulating observations and improvement suggestions.		
Learning Outcomes for DRR	By the end of the activities, students will be able to: a. Perform the self-protection position within a few seconds of the signal. b. Evacuate the classroom calmly, in line, without running or pushing. c. Reach the correct assembly point following the correct route. d. State at least one safe-exit rule and one suggestion for improving the drill. e. Show a spirit of mutual help during the evacuation.			
Resources / Materials	a. School emergency plan and evacuation plan; route signage. b. Audio signal (bell/alarm) in agreement with the school management. c. The class "Earthquake Song" and the Big Poster from previous activities. d. The class emergency backpack. e. Drill observation sheet (for the reflection).			
Activities	Stage 1 — Preparation and slow-motion rehearsal (20') The class studies the evacuation plan: where the exit is, what the route is, where the assembly point is. A slow rehearsal of the movements follows: cover under the desk, count to ten, stand up, line up. The 4 golden rules are recalled: I don't run – I don't push – I don't go back – I help. Stage 2 — The drill (25') The signal sounds: "Earthquake!" The children immediately apply "Drop, Cover, Hold On" and count to ten. At the "end of the shaking", the teacher takes the backpack, the children line up holding on to each other and exit calmly, singing their song softly for courage — the "Musical March" of safety. Stage 3 — At the assembly point (15') In the yard, a head count takes place ("Are we all here?") — the children understand why we count. They raise their Big Poster high, showing the school that they are ready and informed. The moment is photographed for the class diary. Stage 4 — Reflection (30') Back in the classroom, a circle discussion: "What did we do well? What was difficult? How did we feel?" Two or three points for improvement are recorded on the observation sheet for the next drill. Closing message: "We are not afraid of the earthquake — we know it and we are ready!"			



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: KL (adapted)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)	
Title / Topic	"Detectives at Home: Dangerous or Safe?"	
Summary	Students take on the role of "safety detectives" and learn to spot fire hazards inside the home. Evaluating pictures of everyday scenes — lit candles next to curtains, overloaded power strips, matches in a drawer within children's reach, but also the smoke detector "guarding" the ceiling — the children classify the situations as "safe" (green) and "dangerous" (red), justifying each decision. The activity cultivates critical thinking and detailed observation: danger often "hides" in familiar, everyday images, and the aim is for children to develop the "eye" that spots it early. Special emphasis is given to the smoke detector as the "guardian angel" of the home. The activity concludes with a real "investigation" by the children in their own home together with their parents — transferring prevention from the classroom to the family.	
DRR (EMKK) Objectives	Students are expected: - To distinguish dangerous from safe situations related to fire inside the home. - To recognise the most common sources of danger: matches/lighters, candles, power strips, flammable items near heat sources. - To understand the function and importance of the smoke detector. - To justify their judgements with simple arguments ("it is dangerous because..."). - To adopt preventive behaviours ("matches are not toys — I tell an adult"). - To carry out the "safety check" in their own home with the help of their parents.	
Subject Curriculum Objectives	Subject	Unit
	Environmental Studies	My home – Safety in everyday life
	Language	Oral expression – Justification
		Objectives
		- Recognising hazards in the home environment and adopting rules of safe behaviour.
		- Describing pictures in detail and justifying the "safe/dangerous" judgements.

	<table><tr><td>Mathematics</td><td>Sorting – Tables</td><td>- Sorting cards into two sets and counting/comparing their elements.</td></tr><tr><td>Arts</td><td>Colour and symbol</td><td>- Using the green/red colour code and drawing danger symbols.</td></tr></table>	Mathematics	Sorting – Tables	- Sorting cards into two sets and counting/comparing their elements.	Arts	Colour and symbol	- Using the green/red colour code and drawing danger symbols.
Mathematics	Sorting – Tables	- Sorting cards into two sets and counting/comparing their elements.					
Arts	Colour and symbol	- Using the green/red colour code and drawing danger symbols.					
Learning Outcomes for DRR	By the end of the activities, students will be able to: a. Correctly classify at least eight picture-situations as "safe" or "dangerous". b. Justify the classification with a simple argument for each picture. c. Explain what the smoke detector does and why it saves lives. d. State what they must do if they find matches or a lighter (don't touch — tell an adult). e. Carry out the "detective check" at home with their parents.						
Resources / Materials	a. Worksheet "Dangerous or Safe?" (Station 2 of the material "Becoming the Hero of my Home"). b. Pictures/cards with scenarios of correct and incorrect use of electrical appliances and flammable materials. c. Green and red stickers or markers. d. Picture/real smoke detector for demonstrating its sound. e. "Detective Investigation at my home" sheet for the family homework.						
Activities	Stage 1 — We become detectives (10') The teacher presents the mission: "Safety detectives see what others walk past!" A first picture is shown and the children are invited to "investigate": what do we see? Is there anything that could start a fire? Stage 2 — Investigation and argumentation (30') The pictures are presented one by one (a socket with many cables, a candle next to a curtain, matches in an open drawer, an unattended frying pan, a smoke detector, switched-off appliances). For each picture, the children take a position and justify: "It is dangerous because matches are not toys", "It is safe because the detector warns us." The sound of the smoke detector is played and its role as "guardian angel" is explained. Stage 3 — Sorting with the colour code (25') On the worksheet, students circle the safe pictures in green and the dangerous ones in red. The class cards are posted in two columns on the board and counted. Discussion: "What can WE do about each red picture?" — the children propose the correction (blow out the candle, call an adult, etc.). Stage 4 — Investigation at home (10' + family homework) Each child takes the "Detective Investigation" sheet: together with their parents they check the house (Is there a smoke detector? Are the matches up high? Is the power strip not overloaded?) and note the findings. At the next meeting, the "detectives" report what they discovered and what their family corrected.						



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: KL (adapted)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"Lifeline: Learning to Call 199"		
Summary	Students practise memorising the Fire Service emergency number (199) and handling an emergency phone call correctly. Through role play with the teacher as "operator", the children learn to give the critical information calmly and clearly: who is calling, what is happening, where exactly. A child's ability to make such a call correctly can literally save lives. Particular weight is given to distinguishing a real emergency from a prank call: the class discusses why false calls are dangerous (they keep the firefighters busy while someone else needs them) and responsibility towards the emergency services is cultivated. The activity concludes with the creation of a personal card with the number 199 and the child's details, to be placed next to the family telephone.		
DRR (EMKK) Objectives	Students are expected: - To memorise the emergency number 199 (and get to know the European number 112). - To recognise when it is necessary to call the Fire Service and when not. - To state their personal details (full name, address) clearly and calmly in a simulated call. - To transmit the three critical pieces of information of a call: who – what – where. - To understand the responsibility that accompanies emergency numbers (no prank calls). - To cultivate calmness and self-confidence in handling an emergency.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Language	Oral communication in real situations	- Clear, organised oral communication: introducing oneself, describing an event, answering questions.

	Mathematics	Numbers – Recognition and writing	- Recognising, writing and memorising the number 199; games with its digits.
	Environmental Studies	People who help us	- The role of the Fire Service and the emergency services in the community.
	Arts	Card making	- Designing and decorating the "199" card for home.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Recall the number 199 immediately and connect it with the Fire Service. - Say their full name and address clearly in role play. - Transmit the "who – what – where" information correctly in a simulated call. - Explain why we never make prank calls. - Make and place at home the card with the emergency numbers.		
Resources / Materials	- Worksheet "We call for help!" (Station 4 of the material). - Two old/toy telephones for the role play. - Scenario cards (fire in a saucepan, smoke from a balcony, burning dry grass – and "traps": a cat in a tree, a lost toy). - Poster board, markers, stickers for the "199" card.		
Activities	Stage 1 — Getting to know the number (20') The number 199 is presented with a story: "Three digits that run faster than the fire engine!" The children find and colour the number on the worksheet, trace it with their finger in the air, "dial" it on the toy telephone. The 112 is also mentioned as the European number for every emergency. Stage 2 — What do we say when we call? (25') The "triptych" of the call is taught: WHO I am (full name) – WHAT is happening (I see smoke/fire) – WHERE (address). Each child practises saying their name and address clearly. Emphasis: we speak slowly, we do not hang up until the operator tells us to. Stage 3 — Role play (30') With the scenario cards, each child takes a turn in the role of the "citizen" reporting a fire, while the teacher plays the Fire Service operator, asking the real questions. With the "traps" (cat in a tree, lost toy) the class discusses: is this a job for 199? When do we call and when not? Why can a prank call cost a life elsewhere? Stage 4 — The lifeline card (15') Each child makes and decorates their card with 199 (and 112), their full name and address. The card goes home to be placed near the family telephone — turning classroom knowledge into a tool for the whole household.		



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

☐

Fire

☒

Flood

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Other (specify):

Teacher's name: KL (adapted)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)	
Title / Topic	"Operation Exit: Low under the Smoke"	
Summary	An experiential activity of motor practice in escaping correctly from a smoke-filled space. Students learn the "golden rule": smoke rises — clean air is near the floor, so we get down low and crawl towards the exit. Using tables and sheets, a safe "smoke tunnel" is created in the classroom environment, through which the children practise moving low, calmly and oriented towards the exit. The motor experience is complemented by spatial-thinking exercises: on the maze worksheet, children plot the escape route from a house avoiding the rooms with fire, and then draw their own simple "escape plan" from their bedroom to the front door, with two alternative exits and a family meeting point. The "Stop, Drop and Roll" technique for clothes catching fire is also taught.	
DRR (EMKK) Objectives	Students are expected: - To understand that smoke rises and that clean air is found low. - To physically apply the low-escape technique (crawling with the head low). - To perform the "Stop, Drop and Roll" technique for clothes on fire. - To plan an escape route avoiding obstacles (fire, smoke) on a representation of a space. - To learn the concept of the family "meeting point" outside the house. - To keep calm by performing practised, automatic movements.	
Subject Curriculum Objectives	Subject	Unit
	Physical Education	Motor skills – Crawling
	Mathematics	Spatial awareness – Routes
		Objectives
		- Performing controlled crawling, safe rolling, moving at restricted height.
		- Reading a simple floor plan, solving a maze, the concepts "left/right/straight".

	Environmental Studies	Safety at home	- Behaviour rules in a fire: we do not hide, we do not take things, we get out and stay out.
	Arts	Drawing	- Drawing a simple floor plan of the room and the escape line.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Explain why we move low when there is smoke. - Cross the "smoke tunnel" crawling correctly, head low, towards the exit. - Perform correctly the three steps "Stop, Drop and Roll". - Solve the escape maze avoiding the rooms with fire. - Draw a simple escape plan with two exits and a meeting point.		
Resources / Materials	- Tables, chairs and large sheets for building the "smoke tunnel". - Fire and smoke pictures/symbols for marking the "obstacles". - Worksheet "Escape from the smoke" (maze — Station 3 of the material). - Fabric/gym mat for the "Stop, Drop and Roll" exercise. - Paper and pencils for the home escape plan.		
Activities	Stage 1 — Why low? Theory into practice (15') The teacher explains with a simple example that hot smoke rises (like steam from soup), which is why clean air stays near the floor. The rules are discussed: we do not hide under beds or in wardrobes, we do not go back for toys, we get out and stay out. Stage 2 — The smoke tunnel (30') The "tunnel" is set up with tables and sheets and the "obstacles" are marked with the fire pictures. The children, one by one and then in small groups, cross the tunnel crawling with their heads low, following the lit "exit". Repetitions with variations: the exit position changes, a "blocked corridor" is added so they must choose the alternative route. Stage 3 — Stop, Drop and Roll (20') Teaching the technique for clothes on fire: STOP (don't run — running feeds the flame), DROP to the ground, ROLL covering the face. Practice on the mat in playful form, repeated until the movement becomes automatic. Stage 4 — The maze and the escape plan (25') On the worksheet, children find the route leading out of the house avoiding the rooms with fire and draw the line to the "Meeting Point". They then draw their own simple escape plan (bedroom → front door, with a second alternative exit) to complete at home with their parents, also agreeing the family meeting point.		



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MCS (adapted for Grade 1)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"Hermes and the Flood" — A story and the neighbourhood map		
Summary	Using the story "Hermes and the Flood" as a vehicle, students get to know the phenomenon of flooding through the safe distance of narration and connect it with their own place: the river, the streets and the low points of their neighbourhood. The story provides the emotional framework — what the hero feels as the water rises, who helps him, how he is saved — and opens the discussion about the causes and consequences of floods in words a six-year-old can understand. In the second part, narrative becomes geography: on a simple map/aerial photo of the neighbourhood, children locate the school, the river and their street, and mark in red the points that may flood and in green the safe, high points. Thus, from the very first grade, the "spatial awareness of risk" is built: knowing where we are at risk and where we are safe in our own place — the foundation of every local protection plan.		
DRR (EMKK) Objectives	Students are expected: - To understand through the story what a flood is, what causes it and what its consequences are. - To express and process emotions (fear, anxiety, relief) through the heroes of the story. - To recognise elements of the natural environment of their neighbourhood (river, stream, low/high points). - To locate on a simple map the risk points and the safe points of their area. - To state simple protection rules: we stay away from the water, we listen to the adults, we go to high ground.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Language	Listening – Comprehension – Retelling	- Understanding a narrative, retelling in time order, enriching vocabulary (flood, riverbank, the water rises/falls).

	Environmental Studies	My neighbourhood – The natural environment	- Recognising elements of the natural and built environment and first contact with the concept of the map.
	Arts	Drawing – Mapping	- Depicting scenes of the story and marking the map with a colour code.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Retell the story of Hermes in the correct time order. - Explain in simple words why the hero's place flooded. - Locate on the neighbourhood map the school, the river and at least one "red" and one "green" point. - State three flood protection rules. - Express their feelings about the story in words or drawing.		
Resources / Materials	- The story "Hermes and the Flood" (printed or digital). - A simple map or aerial photo of the school neighbourhood (printed large). - Red and green stickers/markers for the marking. - Photos of floods in the area (selected, mild, without traumatic images). - Drawing paper and colours.		
Activities	Stage 1 — The narration (25') Narration of the story with its pictures. Prediction pauses: "What do you think will happen now? What will Hermes do?" After the reading, a comprehension and feelings discussion: Why did it flood? How did the hero feel? Who helped him? What did he learn? Stage 2 — From the story to our neighbourhood (20') Two or three mild photos of a real flood in the area are shown. The children make the connection: "Does what happened to Hermes happen here too?" The river/stream of the area and the points that "collect water" when it rains hard are identified orally. Stage 3 — The map of risk and safety (30') On the large neighbourhood map, the children first find the school and their home (with help). Then, with guiding questions ("Where is the river? Is this road low or high?"), they stick red stickers on the points that may flood and green ones on the high, safe points. "Our Neighbourhood Map" is displayed in the classroom. Stage 4 — Expression and closure (15') Each child draws the scene of the story that impressed them most, or the "rescued" Hermes at the high, safe point. Closing with the three class rules: "Away from the water — I listen to the adults — I go up high".		



STEAME-DRREC

"STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum"

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MCS (adapted for Grade 1)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"Water Experiments: Where does the rain go?"		
Summary	Students experimentally investigate the fundamental question behind every flood: where does the rainwater go? At three simple experiment stations, the children pour "rain" on soil, sand and a sponge, observe where the water is absorbed and where it pools, and test what happens when the rain is light and what happens when it is sudden and heavy. Finally, they safely "flood" a small model village and discover for themselves what protects it: channels, barriers, high ground. The activity follows the steps of the scientific method adapted to Grade 1 — predict, try, observe, tell what I saw — and builds the first scientific explanation of the phenomenon: a flood happens when the water is more, or faster, than the ground can "drink". On this fundamental idea, the concepts of runoff, saturation and flood protection will be built in later grades.		
DRR (EMKK) Objectives	Students are expected: - To observe that different materials/grounds absorb water differently. - To find that saturated ("full") ground does not absorb any more water. - To connect the amount and speed of the rain with the creation of a flood. - To discover simple "protection works" (channel, barrier, high ground) by testing them on the model. - To practise the steps: predict – try – observe – conclude.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	Water – Weather	- Observing the behaviour of water in nature and connecting rain–ground–flood.
	Mathematics	Comparisons – First measurements	- Comparisons "more/less", "fast/slow", measuring with cups.

	<table><tr><td>Language</td><td>Oral expression – Description</td><td>- Formulating predictions and describing observations with the new vocabulary (absorbs, overflows, pools).</td></tr></table>	Language	Oral expression – Description	- Formulating predictions and describing observations with the new vocabulary (absorbs, overflows, pools).
Language	Oral expression – Description	- Formulating predictions and describing observations with the new vocabulary (absorbs, overflows, pools).		
Learning Outcomes for DRR	By the end of the activities, students will be able to: a. Describe what happened to the water at each of the three stations (soil, sand, sponge). b. Explain in their own words why the soaked sponge "cannot drink any more". c. State the class conclusion: "A flood happens when the water is more than the ground can hold." d. Show on the model at least one way of protecting the village.			
Resources / Materials	a. Three basins/trays with soil, sand and a large sponge (experiment stations). b. Watering cans or bottles with holes ("rain clouds"), measuring cups. c. Small model "village": container with soil, little houses/blocks, figures. d. Pebbles and sticks for the "protection works". e. Illustrated observation sheet (I draw what I saw at each station). f. Aprons/towels — and a good mood for a little water everywhere!			
Activities	Stage 1 — The question and the predictions (15’) Warm-up: "It rained yesterday. Where did all that water go?" The children offer ideas. The three stations are presented and the children predict: "Which will drink the most water — the soil, the sand or the sponge?" The predictions are noted with symbols on the board. Stage 2 — Experimenting at the stations (30’) The groups rotate through the three stations: they pour the same "cup of rain" on soil, sand and sponge and observe: where did the water disappear quickly? where did a puddle stay? Then they try the critical step: they pour a second and a third cup on the already soaked sponge — and watch the water overflow. Every observation is drawn on the sheet. Stage 3 — We flood the village (safely!) (25’) On the village model, we first pour "gentle rain" (nothing happens) and then a "downpour" — the water runs down, gathers at the low points and reaches the little houses. The children propose and test solutions: they open a channel for the water to escape, build a small dam with pebbles, move the houses to the hill. Each solution is tested with new "rain". Stage 4 — What did we learn? (20’) A synthesis discussion with the observation sheets: the ground "drinks" the water, but when the water is a lot and fast, the ground "gets full" and the water spreads — that is the flood. The class conclusion is formulated and displayed together with the drawings. Connection with life: "That is why we never play near the stream when it rains hard."			



STEAME-DRREC

"STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum"

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name:

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"The Forest Before and After the Fire"		
Summary	Students investigate the effects of forest fires on the environment, animals and people, through carefully selected visual material and artistic creation. After watching short educational videos, the children discuss the causes of fires (natural and human-induced) and the factors that help fire spread, and record the key information in a simple three-column table: causes – consequences – ways of protection. The heart of the activity is the diptych artwork "Before and After": each child draws, on two halves of the same sheet, the living green forest with its animals — and the same landscape after the fire. The visual comparison makes the seriousness of the loss tangible in a way words cannot, while the discussion that follows deliberately turns towards hope: the forest can be reborn, and we can help it — above all by making sure it is not wounded again.		
DRR (EMKK) Objectives	Students are expected: - To describe the main consequences of a forest fire for the trees, the animals, the soil and people. - To state the main causes of fires, distinguishing natural from human-induced ones. - To recognise the factors that favour the spread of fire (drought, heat, wind). - To express emotions and empathy for the animals and people affected. - To cultivate an attitude of hope and responsibility: the forest regenerates and we protect it.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	Animals – The forest – Man and nature	- Understanding the forest as an ecosystem and the effects of fire upon it.
	Arts	Drawing – Comparing images	- Depicting a landscape in two states, using colour to convey emotion.

	<table><tr><td>Language</td><td>Oral expression – Organising information</td><td>- Participating in discussion, recording information in a table, describing their artwork.</td></tr></table>	Language	Oral expression – Organising information	- Participating in discussion, recording information in a table, describing their artwork.
Language	Oral expression – Organising information	- Participating in discussion, recording information in a table, describing their artwork.		
Learning Outcomes for DRR	By the end of the activities, students will be able to: a. Complete correctly the table "causes – consequences – protection". b. Create the "Before and After" diptych clearly rendering the two states of the forest. c. Express in words or image their feelings about the destruction and the hope of regeneration. d. State at least three rules for protecting the forest.			
Resources / Materials	a. Selected educational videos on forest fires (age-appropriate, without harsh images). b. Drawing sheets divided in two ("Before" / "After"), coloured pencils, markers. c. Three-column table template: Causes – Consequences – Ways of protection. d. Photos of a burnt forest regenerating (shoots through the ash) for the closure.			
Activities	Stage 1 — I observe and learn from the videos (25’) Viewing of the videos focusing on three questions given in advance: What starts a fire? What helps it grow? What does it leave behind? A discussion follows and the "causes – consequences – protection" table is completed as a class. Stage 2 — The "Before and After" diptych (35’) Each child draws on the left half the living forest (colours, animals, birds, the sounds you can "hear" from the picture) and on the right the same landscape after the fire. The teacher prompts thought with questions: "Where did the animals go? What colour is the soil now? What does it smell like?" Stage 3 — Presentation and discussion of feelings (20’) The diptychs are displayed side by side and the children describe their works. Discussion of feelings: sadness, anger, worry — all have a place and are named. Emphasis on empathy for the animals that lose their home. Stage 4 — Hope and responsibility (10’) The regeneration photos are shown: small shoots through the ash. The forest is reborn — slowly, and only if we let it. The class states its commitment: three rules so the forest is not wounded again, written under the artworks.			



STEAME-DRREC

"STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum"

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name:

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"Robot Firefighter: Finding a safe route on the map"		
Summary	An educational robotics activity that links programming with understanding the behaviour of a forest fire. On a 5x4 grid a "forest" is set up: a tree in every square, with the fire engine at the start and a little house in danger as the target. The activity unfolds as an experiential narrative: with each round of the story (lightning strikes, wind blows, litter is present), some trees "catch fire" and the students must re-plan a safe route for the fire engine. The groups first plan the route with paper arrows (forward – right – left), "read" it aloud as an algorithm, and then test it with the Polytech R2 robot: the commands are turned into a programme in the Mind+ environment and the robot executes the route square by square. By comparing scenarios, the children understand that wind favours the spread of fire and that water and roads act as protective zones — while also learning that an algorithm is a series of precise commands executed in order.		
DRR (EMKK) Objectives	Students are expected: - To plan and describe routes on a grid with simple commands (forward, turn right, turn left). - To understand the concept of the algorithm as a sequence of commands and to check/correct it. - To recognise the factors that influence the spread of fire (wind, dense vegetation, litter). - To understand the role of fire-protection zones (water, roads, cleared zones). - To collaborate in groups, sharing roles (planner, command "reader", operator, checker).		
Subject Curriculum Objectives	Subject	Unit	Objectives
	ICT	Algorithms – Programming – Robotics	Designing and executing simple command sequences, checking and correcting (debugging) the solution.

			b. Getting to know a programmable robot and a visual programming environment.
	Mathematics	Problem solving with games – Spatial concepts	- Counting steps/squares on a grid, orientation (forward/right/left), comparing route lengths.
	Environmental Studies	The forest – Natural hazards	- Understanding the factors of fire spread and the role of protection zones.
	Language	Precise oral expression	- Formulating clear, unambiguous commands – "the robot does what we say, not what we mean".
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Plan with arrows a correct route that avoids the "burning" squares. - Find and correct an error in a command sequence. - Explain why the safe route changed when "the wind blew" (the fire spread that way). - Name at least two elements that act as protection zones. - Collaborate effectively, rotating through the team roles.		
Resources / Materials	5×4 grid on transparent plastic or paper. - Cards/pictures: trees, fire, water, road, fire engine, little house. - Printed command arrows (forward, right, left). - Polytech R2 robot with Bluetooth, tablet with the R2 app (remote control) and computer with the Mind+ visual programming environment. - Scenario-story of the fire's development (lightning → wind → protection zones).		
Activities	Stage 1 — Setting up the forest and learning the commands (20') The trees are placed on the grid, the fire engine at the start and the little house at the target. The children learn the three arrow-commands and practise "dry": one child becomes the "robot" and executes on the floor exactly the commands the group gives — laughing at the mistakes and understanding how precise instructions must be. Stage 2 — Scenario 1: The lightning (20') The story begins: "Last night lightning struck!" Two or three trees are replaced with fire. The groups plan with the arrows the safe route of the fire engine to the little house, read it aloud and test it first with remote control of the R2. Stage 3 — Scenario 2: The wind is blowing! (25') The story continues: the wind pushes the fire and new squares "ignite" in its direction, while protection zones are added (a stream, a road) that the fire cannot cross. The groups re-plan, compare their routes (which is the shortest safe one?) and test again with the robot. Discussion: why did the fire go that way? what stopped it? Stage 4 — From arrows to programme (25') In the final test, one child "reads" the commands of the winning route and the teacher converts them into a programme in Mind+, with short pauses for faithful square-by-square movement. The robot executes — and the "forest" applauds! Reflection: what does the programme have in common with our arrows? (It is the same algorithm, written in the robot's language.)		



STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name:

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"In the Eye of the Fire": Forest fire simulation with Virtual Reality (VR 360°)		
Summary	Students approach the conditions of a forest fire safely and realistically through an experiential Virtual Reality experience. With VR headsets (or, alternatively, a 360° projection on tablets/interactive whiteboard) they watch the simulation "In the Eye of the Fire", which "places" them inside a burning forest: they see the smoke thickening, the fire moving with the wind, the rescue means intervening. The value of the experience lies not in the technology but in the processing that follows: in a discussion circle, the children describe what they observed (how the fire moved, how quickly visibility changed), name their feelings (fear, anxiety, need for help) and reach conclusions about the seriousness of the danger and the importance of early evacuation and prevention. The activity applies a full protocol for safe VR use at young ages: short exposure, voluntary participation, a flat-screen alternative for any child who prefers it.		
DRR (EMKK) Objectives	Students are expected: - To observe safely the characteristics of a forest fire: intensity, speed, smoke, direction of spread. - To understand why early evacuation is the only correct choice for citizens. - To express and process the feelings the experience provokes. - To develop empathy for the people, animals and firefighters who face real fires. - To become familiar with VR technology as a learning tool.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	Natural hazards – The forest	- Observing the behaviour of a fire and connecting it with the protection measures.
	ICT	Digital media – Virtual reality	- Safe use of VR/360° technology and understanding simulation as a representation of reality.

	<table> <tr> <td>Language</td><td> Oral expression – Expressing feelings - Describing an experience accurately, naming and managing feelings, drawing conclusions. </td></tr> </table>	Language	Oral expression – Expressing feelings - Describing an experience accurately, naming and managing feelings, drawing conclusions.
Language	Oral expression – Expressing feelings - Describing an experience accurately, naming and managing feelings, drawing conclusions.		
Learning Outcomes for DRR	By the end of the activities, students will be able to: b. Describe at least three elements they observed in the simulation (smoke, speed, direction, sounds). c. Name their feelings and connect them with the seriousness of the real danger. d. Explain why we move away immediately and do not stay "to watch" the fire. e. Formulate at least one conclusion about the importance of prevention.		
Resources / Materials	a. VR headsets (or tablets/interactive whiteboard for 360° projection). b. 360° video "In the Eye of the Fire" (YouTube VR). c. Feeling cards/emoji for the discussion circle. d. Reflection sheet: "I saw... / I felt... / I understood... / I will be careful..."		
Activities	Stage 1 — Preparation and rules (15') The teacher explains what the children will see and stresses that it is a simulation — "as if we are there, but completely safe". The equipment rules are set: seated, short exposure (2–3 minutes), I raise my hand if I want to stop, and any child who prefers watches on the flat screen — no pressure. Stage 2 — The VR experience (30', in group shifts) The groups take turns with the headsets, while the rest watch the 360° projection on the board, rotating the viewpoint. The teacher guides the observation in a calm voice: "Look where the smoke is going... What do you hear?... How far can you see?" Stage 3 — Discussion circle (30') In a circle, with the help of the feeling cards, each child shares: what they observed, what they felt, what impressed or frightened them. The teacher normalises the feelings ("it is natural to fear fire — fear protects us when we listen to it correctly") and turns the discussion to the conclusions: fire moves fast, smoke hides the way — that is why we leave early and follow the instructions. Stage 4 — Reflection and commitment (15') Completion of the sheet "I saw – I felt – I understood – I will be careful". The sheets are read voluntarily and displayed. Closing with the positive statement: "Fire is strong — but prevention is stronger."		



STEAME-DRREC

"STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum"

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify): *Volcano*

Teacher's name: ET (adapted)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"Our own Volcano" — Model construction and eruption experiment		
Summary	The most beloved STEM activity of the volcano unit: students build a plaster volcano model in groups and then watch its "eruption" with the classic, safe experiment of baking soda with vinegar and red food colouring. Before construction, the children recall the parts of the volcano (magma, crater, lava, ash) and make sure their model renders them correctly — the construction thus becomes a check and application of knowledge, not mere craftwork. During the experiment, students observe the "lava" overflowing from the crater and running down the slopes, identify which areas around the volcano are most "at risk" and connect the observation with the concepts of danger zones and evacuation. The activity concludes with each group presenting its model and a short self-assessment, closing the unit in a creative, hands-on and unforgettable way.		
DRR (EMKK) Objectives	Students are expected: - To recognise and render on the model the basic parts of the volcano (crater, slopes, "magma chamber"). - To describe in simple words what happens in a volcanic eruption. - To observe the flow of the "lava" and identify the danger zones around the volcano. - To understand at a first level the chemical reaction of the experiment (soda and vinegar "fizz" and push the liquid up). - To collaborate in the construction and present their work.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	Natural phenomena – Planet Earth	- Understanding the volcanic phenomenon and the concept of danger zones.
	Arts	Constructions – Modelling	- Building a three-dimensional model with plaster, rendering the shape and colours of the volcano.

	Mathematics	Measurements – Ratios	- Measuring the materials for the experiment mixture (spoonfuls of soda, amount of vinegar).
	Language	Presentation – Description	- Presenting the model and describing the experiment with the correct terminology.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Build a volcano model with a clearly visible crater and slopes. - Name the parts of the volcano on their model. - Describe what they observed during the "eruption" (where the lava went, which areas were "at risk"). - Explain in simple words why people do not build on the slopes of active volcanoes.		
Resources / Materials	- Plaster (or clay/papier-mâché), a small plastic bottle for the "conduit", cardboard base. - Paints (brown, grey, red) and brushes. - Baking soda, vinegar, red food colouring, washing-up liquid (for richer "foam"), spoons and measuring cups. - Little houses/trees for the "danger zone" around the volcano. - Experiment observation sheet and self-assessment sheet.		
Activities	Stage 1 — We remember and plan (15') A short revision of the parts of the volcano with pictures/cards. Each group sketches its model: where the crater will be, how steep the slopes, where the little houses of the "danger zone" will be placed. Stage 2 — Building the model (35') Around the plastic bottle (the volcano's "conduit") the groups mould the mountain with plaster, shape the crater and the slopes, and, when it dries, paint it. The little houses and trees are placed at the base. (If needed, construction and painting are split across two sessions.) Stage 3 — The eruption! (25') With measured quantities (2 spoonfuls of soda, a little washing-up liquid and colouring inside the "conduit", and the vinegar at the end), each group "triggers" its volcano. The children observe and record: where did the "lava" come out? which way did it flow? which little houses were "at risk"? Repeated with more "lava" for comparison. Stage 4 — Presentation and self-assessment (15') Each group presents its volcano: its parts, what the experiment showed, what they would advise the "inhabitants" of the area. A short self-assessment sheet is completed ("What I learned – What I liked – What I would like to learn next") and the models are exhibited in the class corner.		



STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

☐

Flood

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Other (specify):

Teacher's name: TA (adapted)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"How do I stay safe?" — The flood poster (Before – During – After)		
Summary	Students organise their knowledge of flood protection along the fundamental axis of Civil Protection: what we do BEFORE (prevention and preparation), what we do DURING (protection) and what we do AFTER (safe return). The starting point is the educational video of the Environmental Education Centre of Kastoria, "Floods: How do I stay safe?", which presents the official guidance in a child-friendly way. After the viewing and the processing of the instructions, the groups each take one time phase and create their section for the class's big shared poster: they choose the most important instructions of their phase, rephrase them in their own simple words, illustrate them and organise them visually. The completed poster is displayed at the school entrance, so that the children's work informs the whole school community — turning students into active citizens who disseminate the knowledge of prevention.		
DRR (EMKK) Objectives	Students are expected: - To learn the flood protection measures organised in the three phases: before, during, after. - To distinguish which phase each instruction belongs to and justify why. - To transform the official instructions into simple, understandable messages for children. - To collaborate in creating a shared, organised visual product. - To take on the role of active citizen, disseminating knowledge to the school community.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	Our place – Natural phenomena	- Understanding the flood phenomenon and the protection measures in each of its phases.

	Language	Written expression – Instructional texts	- Writing short, clear instructions in imperative/advisory form, suitable for a poster.
	Arts	Visual communication – Poster	- Organising image and text, using colour and symbols to convey a message.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Correctly classify at least nine protection instructions into the three phases (three per phase). - Formulate instructions in their own words, short and understandable. - Compose as a group a poster section with a functional combination of image and text. - Present and explain their section to the class.		
Resources / Materials	- Video "Floods: How do I stay safe?" (KEPEA-KPE Kastoria): https://www.youtube.com/watch?v=iXV4HDBqlhw - Cards with the official instructions (from civilprotection.gr) for the classification game. - Large poster board (divided into three zones: Before – During – After), markers, colours, scissors, glue. - Computer/interactive whiteboard.		
Activities	Stage 1 — Viewing and processing (25') The video is shown with two pauses for discussion. Then, with the instruction cards on the board, the class plays the classification game: each instruction ("We prepare a backpack", "We move away from streams", "We do not drink tap water before it is checked") is placed in the correct phase — Before, During or After — with justification. Stage 2 — The groups take action (30') Three groups, one per phase. Each group selects the 3–4 most important instructions of its phase, rewrites them simply and "child-friendly" (e.g. "Learn the way to the high point!") and designs the sketches to accompany them. Stage 3 — Assembling the poster (25') The three sections are joined on the large board with the three colour zones. A title voted by the class is added, along with the "signatures" of the creators. Each group presents its zone to the class. Stage 4 — Dissemination (10') The poster is displayed at the school entrance. Discussion: "Who will see it? What do we want everyone who reads it to remember?" Optional extension: photographing the poster and sending it to families through the class platform.		



STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify): *All emergencies*

Teacher's name: TA (adapted)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"The Numbers that Save Lives" — Poster and digital puzzle		
Summary	Students learn and consolidate the emergency numbers — 112 (European single number), 199 (Fire Service), 166 (Ambulance), 100 (Police) — and learn when to call each one and what information to give. The knowledge is organised in a group poster, where each number is presented with its colour, its symbol and its "profession", and with simple rules for making a correct call. The innovation of the activity lies in its digital extension: the poster is photographed and turned into a digital puzzle on the jigsawplanet.com platform. The children, solving the puzzle in pairs, reassemble the numbers and the instructions again and again — a playful, repeated exposure to the content that reinforces memorisation. The puzzle is shared with the families, so that the game (and the knowledge) continues at home.		
DRR (EMKK) Objectives	Students are expected: - To learn the basic emergency numbers and the service corresponding to each. - To choose the correct number according to the type of emergency (fire, injury, danger). - To know the information we give in a call (who – what – where) and the responsibility of correct use. - To create organised visual material (poster) and transform it into a digital game. - To become familiar with simple digital content-creation tools.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	The services of the community	- Getting to know the emergency services and the role of each in the community.
	Mathematics	Numbers – Number memory	- Recognising, writing and memorising three-digit numbers, games with their digits.

	ICT	Digital creation – Educational games	- Converting printed material into a digital game (photographing, uploading, creating the puzzle) and safe use of the platform.
	Arts	Poster – Symbols	- Designing with a colour code and a symbol for each service.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Correctly match each number (112, 199, 166, 100) with its service. - Choose the correct number in at least four scenarios. - Compose a group poster with the numbers, symbols and calling rules. - Solve the digital puzzle of the poster and share it with their family.		
Resources / Materials	- Service cards (Fire Service, Ambulance, Police, 112) with pictures of vehicles/symbols. - Large poster board, markers, colours for the poster. - Camera/tablet and computer with access to jigsawplanet.com. - Ready example of a digital puzzle: https://www.jigsawplanet.com/?rc=play&pid=232834a33b53 - Scenario cards for the number-choice game.		
Activities	Stage 1 — Who runs to help? (20') With the service cards, the children learn each number and its "profession". Scenario game: "I see smoke from a house — who do I call?", "Grandpa feels dizzy — who do I call?", "I don't know who to call — there is one number for everything!" (112). The call triptych is recalled: who – what – where, and the responsibility: never prank calls. Stage 2 — Making the poster (35') The groups each take one number: they write the digits large and clear, draw the symbol/vehicle of the service, choose a colour code and add one simple rule ("Speak clearly!", "Say where you are!"). The sections are assembled on the big poster with a title voted by the class. Stage 3 — From the poster to the digital puzzle (25') The poster is photographed and, with the teacher's help, uploaded to jigsawplanet.com where it becomes a puzzle (the children choose the number of pieces). The pairs solve the puzzle on the computer/tablet — and every time they assemble it, they "re-read" the numbers and the rules. Stage 4 — Dissemination (10') The poster is displayed in the school corridor and the puzzle link is shared with the families through the class platform, with the invitation: "Play it with the children — and stick the numbers on the fridge!"		



STEAME-DRREC

"STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum"

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name:

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"Journey to the Centre of the Earth" — 3D and Augmented Reality (Mozaik & Merge)		
Summary	Students "travel" into the interior of the planet to discover where earthquakes are born. Through an interactive 3D environment (Mozaik Education) they explore the layers of the Earth — crust, mantle, outer and inner core — and observe the lithospheric plates: their position on the crust and the three ways they move (convergence, divergence, sliding). Then, with the Merge Object Viewer application, the plates "come alive" in augmented reality: the children rotate three-dimensional models in their hands and locate the regions of the world where most earthquakes occur. The activity gives children what no textbook image can: the sense of depth, scale and movement. Understanding that an earthquake is the natural result of the slow, perpetual movement of the plates — and not something mysterious or random — is the strongest antidote to fear: what we understand, we fear less and prepare for better.		
DRR (EMKK) Objectives	Students are expected: - To describe the layers of the Earth's interior (crust, mantle, core) and their basic characteristics. - To understand what the lithospheric plates are and to recognise the three types of their movement. - To connect the movement of the plates with the origin of earthquakes. - To locate on the map/3D model the seismically active regions of the planet. - To become familiar with 3D and AR applications as tools of scientific observation. - To reduce fear of earthquakes through scientific understanding of the phenomenon.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	Natural phenomena – The subsoil	- Understanding the structure of the Earth and the earthquake as a

			natural phenomenon with a natural explanation.
	ICT	Digital tools – 3D/AR applications	- Handling interactive 3D models and augmented reality applications for learning purposes.
	Language	Scientific vocabulary – Description	- Using the terms crust, mantle, core, lithospheric plate in oral descriptions.
	Arts	Illustration – Models	- Drawing a cross-section of the Earth with its layers, with correct proportions and colour codes.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Name and describe in order the layers of the Earth. - Demonstrate with their palms the three plate movements (approaching, separating, sliding). - Explain in simple words how the movement of the plates causes an earthquake. - Point out on the model/map at least two seismically active regions. - Draw a cross-section of the Earth with correctly labelled layers.		
Resources / Materials	- Interactive whiteboard and computer with access to the Mozaik 3D models (mozaweb.com). - Tablets with the Merge Object Viewer application (and optionally a Merge Cube). - Plasticine in colours or cards for representing the layers. - Worksheet: cross-section of the Earth to complete and table "The three movements of the plates".		
Activities	Stage 1 — The question (10') Warm-up: "When an earthquake happens, what shakes? The floor? The road? Or something much, much bigger?" The children's ideas are recorded and are then "tested" with the journey into the Earth's interior. Stage 2 — 3D exploration in Mozaik (30') On the interactive whiteboard, the class "dives" into the 3D model: crust (thin as an apple peel!), mantle, outer and inner core. Then the lithospheric plates are observed and their three movements visualised — the children imitate them with their palms: approaching, separating, sliding past each other. Where the plates "stumble"... an earthquake is born. Stage 3 — AR with Merge (30') In groups with the tablets, the children "hold the Earth in their hands" with the Merge Object Viewer application: they rotate the model, locate the plates and the regions of intense seismicity (Ring of Fire, Mediterranean). Each group records two regions it identified and one question that arose. Stage 4 — Recording and reflection (20') The children complete the cross-section of the Earth on the worksheet (names and colours of the layers) and the table of the three movements. Closing discussion: "Since the plates always move, earthquakes will always happen. What can WE do?" — the answer (preparedness, not fear) bridges to the next activities.		



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name:

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)	
Title / Topic	"From School to the Assembly Point" — Programming a safe route in Scratch	
Summary	Students, working in pairs in the Scratch visual programming environment, create a digital scenario of safe movement after an earthquake. The hero of the project — a pupil — must move from the school to the assembly point, following a safe path and avoiding the dangerous spots of the scene: the old damaged building, the fallen tree, the broken cables, the damaged road. The children are given a ready-made Scratch file with the scene, the character and the starting code, so that teaching time is invested in the essence: reading the space, identifying the hazards and planning the safe route with the "glide to x...y..." command. The children add dialogue so that the hero expresses his thoughts and decisions ("Not this way — I see cables! I'll go through the square"), turning programming into a narrative of decision-making. Thus the rules of safe movement after an earthquake are not simply memorised — they are programmed, step by step, by the children themselves.	
DRR (EMKK) Objectives	Students are expected: - To identify the dangerous spots one may encounter after an earthquake (damaged buildings, fallen trees/objects, cables, damaged roads). - To plan a safe route to the assembly point, justifying every choice. - To organise command sequences in Scratch (movement with coordinates, dialogues) to implement their scenario. - To become familiar with the coordinate system (x, y) as a tool for describing position. - To collaborate in pairs (driver-navigator) alternating roles. - To present and explain their project to the class.	
Subject Curriculum Objectives	Subject	Unit
	ICT	Programming – Digital creation (Scratch) - Organising command sequences, using the movement command with coordinates, adding dialogues

			and running/testing the programme.
	Mathematics	Coordinates – Orientation	- First practical contact with the Cartesian system (position x, y) and estimating distances on the stage.
	Environmental Studies	Civil Protection – After the earthquake	- Rules of safe movement and the concept of the assembly point.
	Language	Dialogue – Justification	- Writing short dialogues expressing thought and decision.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Identify and name all the dangerous spots of the scene. - Programme the hero to reach the assembly point without passing through a dangerous spot. - Use the "glide to x...y..." command correctly in a sequence. - Add at least two decision dialogues to their hero. - Present their project explaining why their route is safe.		
Resources / Materials	- Computers with Scratch (online or offline), one per pair. - Ready starting file with scene, character and starting code: https://scratch.mit.edu/projects/1316166453 - Interactive whiteboard for the shared demonstration. - Paper "scene" (printout of the stage) for planning the route with pencil before programming.		
Activities	Stage 1 — Reading the scene (15') The scene is projected on the board: "An earthquake has just happened. Our hero is at school and must go to the assembly point. What do you see on his way?" The children identify the four dangerous spots and explain why each is dangerous. The rules are recalled: away from damaged buildings, never under/near cables. Stage 2 — Planning on paper (15') Each pair traces its safe route in pencil on the paper scene, marking the "waypoints". Comparison: is there more than one safe route? Which is the shortest? Stage 3 — Programming in Scratch (40') The pairs open the ready file and implement their route: with the "glide to x...y..." command they lead the hero from waypoint to waypoint, testing and correcting the coordinates. They add decision dialogues at the critical points ("Here is the old building — I keep my distance!"). The driver-navigator roles swap halfway through. Stage 4 — Presentation to the class (20') Each pair projects its project: the hero crosses the scene, "thinks" aloud and reaches the assembly point. The class checks: did he pass anywhere dangerous? The smartest route and the most expressive dialogue are voted. Reflection: "What does our game have in common with reality? What would YOU do after an earthquake?"		



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name:

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"The Earthquake Alarm" — Building with LEGO WeDo 2.0		
Summary	Students work in groups and build, with the LEGO WeDo 2.0 educational robotics system, a simple model of an earthquake alarm system. The construction includes a motor, a tilt sensor and the Smart Hub: the motor rotates the section holding the sensor through successive "alert" positions, and when it reaches the "danger" position the alarm is triggered — a light comes on at the Hub, a siren sounds and a warning message appears on the screen. The children do not merely follow instructions: they experiment with the programme, write their own warning message and try different sounds and colours, choosing with justification the most suitable ones for an alarm situation (which colour "shouts" danger? which sound is heard from afar?). Through the process they understand how real early-warning systems work — a sensor that "feels", a processor that "decides", a signal that "notifies" — and that technology is humanity's ally in protection from natural disasters.		
DRR (EMKK) Objectives	Students are expected: - To build a working alarm model following assembly instructions. - To recognise the role of the basic components: motor, tilt sensor, Smart Hub. - To understand the logic "sensor → processing → notification" of early-warning systems. - To modify the programme (message, sound, colour) and justify their choices. - To appreciate the contribution of technology to prevention and protection from natural disasters. - To collaborate in a group with distinct roles and present their joint work.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	ICT	Educational robotics – Programming	- Using the basic functions of LEGO WeDo 2.0, recognising the role of motor/sensor/Hub, modifying a ready programme.

	Environmental Studies	Natural phenomena – Technology and protection	- The concept of early warning and the connection of technology and safety.
	Language	Composing a message – Presentation	- Writing a short, clear warning message and orally presenting the construction.
	Mathematics	Angles – Positions	- Observing the positions/angles of the tilt sensor corresponding to the alert levels.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Assemble and operate the alarm model. - Explain what the tilt sensor, the motor and the Smart Hub do. - Modify the programme so that the alarm shows their own message, sound and colour. - Describe with their model how an early-warning system works. - Present the construction to the class, with all group members participating.		
Resources / Materials	- LEGO WeDo 2.0 sets (one per group of 3–4 children) with motor, tilt sensor and Smart Hub. - Tablets or computers with the WeDo 2.0 programming environment. - Assembly instructions for the model. - Group sheet: "Our message – Our sound – Our colour – Why we chose them".		
Activities	Stage 1 — What is early warning? (10') Warm-up discussion: "How does Civil Protection learn that an earthquake has happened? How could a machine 'feel' it before us?" The logic is presented: sensor → decision → notification, with examples from life (smoke detector, 112). Stage 2 — Building the model (35') The groups assemble the model following the instructions: the motor rotates the arm with the tilt sensor through successive positions. Roles: chief engineer (assembly), supplier (parts), programmer (tablet), tester (trials). First operation test with the basic programme. Stage 3 — Programming our alarm (30') Each group personalises its system: writes its own warning message ("EARTHQUAKE! STAY CALM — DROP, COVER, HOLD ON"), tries sounds and colours on the Hub and selects the most suitable, justifying on the group sheet. Repeated tests and small corrections. Stage 4 — Presentation and connection with reality (15') Each group presents its alarm in operation and explains: what the sensor "feels", when the notification is triggered, why they chose that message/sound/colour. Closing: how our model resembles real warning systems — and why, even with the best technology, our own preparedness remains essential.		



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name:

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	"Which Building Withstands?" — Structure stability experiment		
Summary	Students experimentally investigate why some buildings withstand earthquakes better. They build a simple "shake table" — a moving surface that simulates ground shaking — and place on it objects and constructions of different shape, height and base: cubes, cylinders, tall and short blocks, brick towers with wide or narrow bases. Shaking the surface in a controlled way, they observe, record and compare: which shapes stay upright? which fall first? what role does height play, and what the base? From their observations, the children infer the basic rules of stability — low centre of gravity, wide base, symmetry — and connect them with the seismic protection of real buildings and with home safety rules (why we fasten bookcases to the wall, why we do not place heavy objects up high). The activity demonstrates in practice that an earthquake is not a "punishment of chance": with knowledge and proper design, people build buildings that withstand.		
DRR (EMKK) Objectives	Students are expected: - To experimentally investigate the stability of bodies of different shape, height and base on a moving surface. - To identify the factors that make a structure stable (wide base, low height, symmetry). - To connect the conclusions with the seismic behaviour of real buildings. - To apply the knowledge to home safety rules (fastening furniture, light objects up high). - To practise fair testing: same shaking, same time, one variable at a time.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Mathematics	Geometric shapes and solids – Measurements	- Recognising and comparing solids (cube, cylinder, rectangular prism), measuring height and base, recording results in a table.

	Environmental Studies	Natural phenomena – People adapt	- Understanding the earthquake–structure relationship and the concept of seismic protection.
	Language	Formulating conclusions	- Formulating observations and conclusions in cause–effect form.
	Arts	Constructions	- Building the moving surface and the tested "buildings".
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Carry out fair tests changing one variable at a time (height or base or shape). - Record in a table which constructions fell and which withstood. - Formulate at least two stability rules in their own words. - Explain why we fasten tall furniture to the wall and do not store heavy objects up high. - Improve an "unstable" construction so that it withstands the shaking.		
Resources / Materials	"Shake table": a flat board/cardboard on cylindrical pencils or rubber bands, or a tray pulled rhythmically. - Test objects: cubes, cylinders, blocks of different dimensions, LEGO-type/wooden bricks. - Stopwatch or metronome for a steady shaking rhythm. - Recording table: "Structure – Height – Base – Withstood? (YES/NO)". - Photos of buildings with seismic design for the discussion.		
Activities	Stage 1 — Building the shake table (15') The groups assemble the moving surface and agree on the "fair shaking rule": same force, same rhythm, same time (e.g. 10 seconds) for every test. A trial shake without objects. Stage 2 — First round: the shapes (25') The solids are tested one by one: cube, upright cylinder, lying cylinder, tall and short block. Prediction before each test ("will it withstand?"), shaking, recording in the table. First conclusions: the short and wide ones withstand, the tall and narrow ones fall. Stage 3 — Second round: building towers (30') Each group builds two brick towers of the same height: one with a narrow and one with a wide base — and tests them. Then the challenge: "Build the tallest tower that withstands 10 seconds of shaking." The groups experiment, improve and discover in practice the engineers' "secrets": wide foundations, weight low down, symmetry. Stage 4 — From the experiment to life (20') Discussion with photos: how are modern buildings built to withstand? Connection with home: why we fasten bookcases and shelves, why heavy objects go low. Each child writes one "safety rule for my room" to check with their parents.		



STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: TA (adapted)

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)											
Title / Topic	"Drop, Cover, Hold On!" — Escape plan and preparedness drill											
Summary	Students get to know the concept of the School Emergency Plan and create their own simple escape plan for their classroom, which they then apply in a full preparedness drill. The starting point is an educational video on drawing up a school emergency plan for earthquakes; the children study the floor plan of their storey, identify the escape route (also using the footprint stickers on the floor), the caution points and the assembly point in the yard. The drill applies the "turtle method": at the signal, the children crouch, take cover under their desks and hold on to the desk legs, like a turtle withdrawing into its shell. After the "end of the shaking", they evacuate the room in order, taking the emergency backpack, and gather in the yard for the head count. The cycle closes with structured reflection — what went well, what needs improvement — introducing the children to the logic of continuous preparedness applied by schools and Civil Protection.											
DRR (EMKK) Objectives	Students are expected: - To understand the purpose and content of a School Emergency Plan. - To read a simple floor plan and locate on it the escape route and the assembly point. - To apply the "turtle" method (Drop, Cover, Hold On) immediately and correctly. - To perform an organised evacuation: order, calm, backpack, head count. - To evaluate the drill and propose improvements. - To understand that preparedness is a process that is repeated and improved.											
Subject Curriculum Objectives	<table border="1"> <thead> <tr> <th>Subject</th><th>Unit</th><th>Objectives</th></tr> </thead> <tbody> <tr> <td>Environmental Studies</td><td>Civil Protection – Our school</td><td>- Getting to know the school emergency plan and everyone's role in it.</td></tr> <tr> <td>Mathematics</td><td>Space – Floor plans – Routes</td><td>- Reading a floor plan, drawing a route, estimating distances and time.</td></tr> </tbody> </table>	Subject	Unit	Objectives	Environmental Studies	Civil Protection – Our school	- Getting to know the school emergency plan and everyone's role in it.	Mathematics	Space – Floor plans – Routes	- Reading a floor plan, drawing a route, estimating distances and time.		
Subject	Unit	Objectives										
Environmental Studies	Civil Protection – Our school	- Getting to know the school emergency plan and everyone's role in it.										
Mathematics	Space – Floor plans – Routes	- Reading a floor plan, drawing a route, estimating distances and time.										

	Language	Instructional texts – Reflection	- Writing simple step-instructions of the plan and formulating evaluative observations.
	Physical Education	Body control – Organised movement	- Quick cover, moving in line, disciplined group movement.
Learning Outcomes for DRR	By the end of the activities, students will be able to: - Draw on the classroom floor plan the escape route to the assembly point. - Perform the "turtle" method within a few seconds of the signal. - Evacuate the room in an organised way, with the backpack, without running or pushing. - Participate in the head count and explain why it is necessary. - Formulate at least one substantiated suggestion for improving the drill.		
Resources / Materials	- Video "Drawing up a School Emergency Plan for Earthquakes": https://www.youtube.com/watch?v=RrwCOLZkl74 - Floor plan of the storey/classroom (simplified, one per pair). - Footprint stickers on the floor (existing route marking). - The class emergency backpack. - EPPO poster "Earthquake and protection in school units" (oasp.gr). - Drill evaluation sheet: "Went well... / To improve..."		
Activities	Stage 1 — What is an emergency plan? (20') Viewing of the video and discussion: why does every school have a plan? what does it include? who does what? The EPPO poster is used for the protection steps in the school unit. Stage 2 — Our classroom's plan (25') In pairs, the children study the floor plan, locate the classroom, the stairs and the exits and trace the escape route, also checking it in the real space with the floor "footprints". The class agrees the common plan: exit order, backpack keeper, assembly point, head count. Stage 3 — The drill (25') Signal: "Earthquake!" The children apply the turtle method — they crouch, take cover under the desks, hold on — and calmly count to ten. At the "end of the shaking": backpack, line, exit along the correct route, gathering in the yard, head count. The teacher discreetly times and notes observations. Stage 4 — Reflection and improvement (20') In the classroom, with the evaluation sheet: what went well (speed, calm, order) and what needs improvement? The suggestions are recorded and it is agreed to repeat the drill in a month — "because preparedness is not a lesson you learn once; it is a habit you keep forever."		

ANNEX II — FINALISED SET OF ACTIVITIES, GRADES 4–6 (20 LESSON/UNIT PLANS)

This annex contains, in full, the finalised set of 20 STEAME-DRREC lesson/unit plans for Grades 4–6 (ages 9–12), in the common project template (English digital edition), as developed and implemented by the participating teachers during the pilot-testing process.

The 20 lesson/unit plans follow on the next pages.



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STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MN

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)
Title / Topic	Activity 1: Brainstorming (Idea Stations) <i>The secret of earthquakes! Ready for action?</i>
Summary	Students activate prior knowledge and feelings about earthquakes through an idea-stations game. They then compare their ideas with those of Artificial Intelligence (AI), evaluate their validity and draw conclusions.
DRR (EMKK) Objectives	Students are expected: a. To recognize the earthquake as a natural phenomenon, as a hazard and as a natural disaster.

	b. To state and explain how an earthquake is generated. c. To identify environmental impacts associated with earthquakes and to analyze the consequences of an earthquake. d. To act as responsible future citizens and to cultivate a spirit of volunteering. e. To connect school knowledge with real-life situations. To cultivate calmness and self-control in dangerous situations.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Language	Oral speech – Communication – Argumentation	- To communicate effectively, to justify their views, to express thoughts and feelings. To participate in discussions while following basic rules of communication.
	ICT	Development of digital literacy skills	- To use digital tools (AI) as means of learning and to take a critical stance towards their results.
	Active Citizen	Climate change – Natural disasters	- To learn prevention strategies and to cultivate critical thinking.
Learning Outcomes for DRR	At the end of Activity 1, students will be able to: a. Recall and express prior knowledge about earthquakes (e.g. tremor). b. Connect earthquakes with feelings and social dimensions (anxiety, fear, help, professions). c. Participate actively in brainstorming, proposing words and ideas. d. Externalize their views, ideas and feelings and discuss them. e. Enrich and revise their initial ideas through discussion. f. Take a critical stance towards the views of AI and reflect on the essential knowledge.		
Resources / Materials	a. Worksheets, markers, colored pencils b. 4 small pieces of cardboard or A4 sheets (idea stations) c. Interactive whiteboard d. Access to Copilot or ChatGPT (AI)		
Activities	The teacher has set up 4 stations in the classroom: four small pieces of cardboard or A4 sheets, each posted at a different spot in the classroom. Each piece of cardboard constitutes a station: Station 1: What is an earthquake? Station 2: How do we feel? Station 3: What do we do for safety? Station 4: What can happen to the environment? The children are divided into three groups. Each group starts at a different station and has 5 minutes to record its ideas. At the teacher's signal, they move to the next station.		

	The teacher writes the word «Earthquake» on the interactive whiteboard and the game begins. Next stage: Each group announces the ideas it recorded to the whole class, followed by discussion. Final stage: The teacher, together with the students, composes the appropriate prompt and invites the AI (Copilot or ChatGPT) to participate as an equal member and then as the «Seismologists» team. Discussion, comparison and drawing of conclusions follow regarding the validity of the AI's results. Note – Alternative variation: the groups record their ideas with various markers on the large piece of cardboard or roll of paper that will be posted on the wall at each station.
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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MN

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	Activity 2: Investigation using video <i>The secret of earthquakes! Ready for action?</i>		
Summary	Students watch a video from the Noesis Science Center about earthquakes, complete a worksheet and are then asked to describe orally and in writing how an earthquake is generated, also making use of the E.P.P.O. (Earthquake Planning and Protection Organization) website.		
DRR (EMKK) Objectives	Students are expected: a. To recognize the earthquake as a natural phenomenon, as a hazard and as a natural disaster. b. To state and explain how an earthquake is generated. c. To identify environmental impacts associated with earthquakes and to analyze the consequences of an earthquake. d. To connect school knowledge with real-life situations. To cultivate calmness and self-control in dangerous situations.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Science (Physics)	Energy – Waves	- To state that energy can take various forms and to identify

			waves as a way of transmitting energy.
	Language	Written comprehension and production – Oral speech	- To communicate effectively, to justify their views and to produce written text. To distinguish important from secondary information.
	ICT	Development of digital literacy skills	- To use digital tools as means of learning, expression and collaboration.
Learning Outcomes for DRR	At the end of Activity 2, students will be able to: a. Identify specific points in the video that sparked their interest or surprised them. b. Justify their choice, connecting it with prior knowledge or experiences. c. Distinguish important from secondary information. d. Propose their own ideas (experiment, image, model) for better understanding of the phenomenon. e. Use their imagination to explain the phenomenon. f. Express interest in further investigation. g. Evaluate the content of the video and propose alternative ways of presenting the knowledge.		
Resources / Materials	a. Video Noesis Science Center: https://www.youtube.com/watch?v=brDu508d3mU b. Worksheet (questions of observation, imagination, creativity, investigation) c. E.P.P.O. (Earthquake Planning and Protection Organization) website: https://oasp.gr/peri-seismon d. Interactive whiteboard / projector		
Activities	- The teacher presents to the whole class the video from the Noesis Science Center about earthquakes: https://www.youtube.com/watch?v=brDu508d3mU The students watch carefully, collaborate and answer a worksheet with questions of observation, imagination, creativity, investigation and creative thinking. They are also asked to express themselves through drawing and to take a critical stance towards the video: whether it met their needs, whether they could add something or what else they would like to learn. - They are then asked to describe orally and in writing (collaboratively) how an earthquake is generated. In addition to the video, they also make use of the E.P.P.O. (Earthquake Planning and Protection Organization) website: https://oasp.gr/peri-seismon		

STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MN

Students' Grades

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 ☐

Teaching time	1 teaching hour (45 minutes)		
Title / Topic	Activity 3: Experimentation and investigation using the model «Tectonic plates in action» <i>The secret of earthquakes! Ready for action?</i>		
Summary	Students experiment with rubber bands and pieces of styrofoam to understand the storage and release of potential energy, the movements of lithospheric plates and the generation of earthquakes.		
DRR (EMKK) Objectives	Students are expected: a. To recognize the earthquake as a natural phenomenon, as a hazard and as a natural disaster. b. To state and explain how an earthquake is generated. c. To connect school knowledge with real-life situations. To cultivate calmness and self-control in dangerous situations.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Science (Physics)	Energy – Forces	- To identify potential and kinetic energy. To explain how potential energy is converted into kinetic energy. To establish experimentally the occurrence of friction.

	Geography	The role of volcanoes and earthquakes in the changes of nature	- To grasp the role of earthquakes in shaping the earth's relief and to recognize the necessary coexistence with seismic activity.
Learning Outcomes for DRR	At the end of Activity 3, students will be able to: - Identify the movements of lithospheric plates. - Compare the movements (divergent, convergent, lateral movement). - Talk about pressure and friction forces. - Convert abstract concepts into simple, understandable representations. - Describe and present how an earthquake is generated.		
Resources / Materials	- Rubber bands - Pieces of styrofoam (expanded polystyrene, colored, used as thermal insulation material) - Worksheet with investigation questions		
Activities	- Students experiment with rubber bands to «feel» the storage and release of potential energy. They stretch the rubber band and observe, realizing that the same thing happens at the edges of lithospheric plates. Questions used: - What do you feel in your fingers when you stretch the rubber band? - What form of energy do you think is stored in the stretched rubber band? - Is there a limit to how much it can be stretched? What will happen if it is exceeded? - What conclusion do you reach? - What does the stretching represent, and what does the sudden snap-back represent, in terms of the behavior of lithospheric plates and the generation of an earthquake? - They then experiment collaboratively with pieces of styrofoam (colored) to grasp the movements of lithospheric plates, represent them, and talk about forces (friction, pressure). Movements: divergent, convergent, lateral movement. Questions used: - How can you represent the movements of lithospheric plates with the styrofoam pieces you have? - What will happen to the middle piece of styrofoam if you push the two outer pieces? - Which movement of the plates are you representing? - What do you feel in your hands when you push the styrofoam? - What kind of force dominates when you press two pieces of styrofoam against each other? - What kind of force do you feel when you push two pieces of styrofoam so that they slide?		

STEAME-DRREC

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MN

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	Activity 4: Representation – Simulation of Seismic Movement <i>The secret of earthquakes! Ready for action?</i>		
Summary	Students collaboratively create a PowerPoint presentation that represents the movements of the lithospheric plates and the genesis of an earthquake, evaluate their work and reflect on it.		
DRR (EMKK) Objectives	Students are expected: a. To recognize the earthquake as a natural phenomenon, as a hazard and as a natural disaster. b. To state and explain how an earthquake is generated. c. To participate actively in collaborative activities, to develop prevention and protection scenarios, as well as a common plan of danger points and escape points for a safe environment. d. To connect school knowledge with real-life situations. To cultivate calmness and self-control in dangerous situations.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	ICT	Development of digital literacy skills	- To use digital tools as means of learning, expression, collaboration and creation.

	Language	Comprehension and production of written language	- To communicate effectively, to argue and to organize their ideas in a logical order.
	Science (Physics)	Energy – Forces – Waves	- To explain how potential energy is converted into kinetic energy and to state that waves are a way of transmitting energy.
Learning Outcomes for DRR	At the end of Activity 4, students will be able to: a. Identify the movements of lithospheric plates. b. Compare the movements. c. Convert abstract concepts into simple, understandable representations. d. Describe and present how an earthquake is generated.		
Resources / Materials	a. Computers / tablets b. PowerPoint software or an equivalent presentation tool c. Images and audio files to insert into the slides		
Activities	Students are asked to collaboratively create a representation-simulation of the movements of the lithospheric plates and the earthquake in PowerPoint, with the aim of presenting it to their classmates. They reflect, discuss and decide: a. How many slides they will create b. Which shapes they will use c. Which colors, which animations for the shapes and why d. Which images are suitable e. What else is needed (e.g. inserting text, sound, recording a voice-over for narration) At the end, a discussion follows about the concerns and difficulties they encountered, the skills and knowledge they acquired, their feelings and the next steps.		

STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MN

Students' Grades

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 ☐

Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	Activity 5: Browsing websites, experimenting with a garden hose and creative expression <i>The secret of earthquakes! Ready for action?</i>		
Summary	Students explore the characteristics of an earthquake through websites (Greek-language and foreign-language), experiment with a garden hose to understand seismic waves and express themselves creatively.		
DRR (EMKK) Objectives	Students are expected: a. To recognize the earthquake as a natural phenomenon, as a hazard and as a natural disaster. b. To state and explain how an earthquake is generated. c. To identify environmental impacts associated with earthquakes and to analyze the consequences of an earthquake. d. To connect school knowledge with real-life situations. To cultivate calmness and self-control in dangerous situations.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Science (Physics)	Waves – Energy	- To state that waves are a way of transmitting energy. To experimentally verify the transfer of energy.

	ICT	Development of digital literacy skills	- To use digital tools as means of learning. To engage with foreign-language content.
	Language	Comprehension of written language	- To distinguish important from secondary information. To match foreign words with the Greek ones.
Learning Outcomes for DRR	At the end of Activity 5, students will be able to: a. Recognize and explain basic concepts: epicenter, focus, fault, fault line, seismic waves (transverse and longitudinal). b. Describe in simple terms the difference between earthquake intensity and magnitude. c. Explain what happens when the focal depth is small or large.		
Resources / Materials	a. Website ERT News: https://www.ertnews.gr/eidiseis/ellada/seismos-4-5-rixter-sta-ioannina-kathisyxastikos-o-eythymios-lekkas-den-anamenontai-isxyra-fainomena/ b. Foreign-language website: https://geo.libretexts.org/Bookshelves/Geology/GEOS%3A_A_Physical_Geology_Lab_Manual_for_California_Community_Colleges_(Branciforte_and_Haddad)/06%3A_Earthquakes/6.01%3A_Front_Matter c. Simulation website: https://open.oregonstate.education/earthquakes/chapter/earthquake-basics/ d. Garden hose e. Worksheet, drawing materials		
Activities	First, students discuss and read the following website, watching the embedded video: https://www.ertnews.gr/eidiseis/ellada/seismos-4-5-rixter-sta-ioannina-kathisyxastikos-o-eythymios-lekkas-den-anamenontai-isxyra-fainomena/ Questions: What information does the website give us? What is the epicenter? From which point did the earthquake start? How do you understand magnitude? What conclusions do you draw from the sentence about the 5 on the Richter scale? They browse the websites: a. The foreign-language site – they focus on the image-diagram that shows the characteristics (hypocenter, epicenter, fault) and on the images with the seismic waves. They match the foreign words with the Greek ones. b. Another foreign-language site, where they focus on the earthquake simulation. Then they experiment by representing the seismic waves (transverse and longitudinal) with the garden hose. Finally, they express themselves creatively by drawing the characteristics of the earthquake and the seismic waves.		

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“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MN

Students' Grades

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 ☐

Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	Activity 6: Activity with the website of the Geodynamic Institute <i>The secret of earthquakes! Ready for action?</i>		
Summary	Students explore the website of the Geodynamic Institute, analyze earthquake data on an electronic map, compare old and recent earthquakes and draw conclusions about seismic activity in the Greek region.		
DRR (EMKK) Objectives	Students are expected: a. To recognize the earthquake as a natural phenomenon, as a hazard and as a natural disaster. b. To state and explain how an earthquake is generated. c. To identify environmental impacts associated with earthquakes and to analyze the consequences of an earthquake. d. To evaluate protection and prevention measures. e. To connect school knowledge with real-life situations. To cultivate calmness and self-control in dangerous situations.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Mathematics	Measurement of quantities Operations with decimal numbers	- To apply addition and subtraction of decimal numbers.

			To use a variety of problem-solving strategies.
	ICT	Development of digital literacy skills	- To use digital tools as means of learning, expression, collaboration.
	Language	Comprehension and production of written language	- To communicate effectively, to justify, to produce written language.
	Geography	The role of earthquakes in the changes of nature	- To understand the role of earthquakes in shaping the earth's relief.
Learning Outcomes for DRR	At the end of Activity 6, students will be able to: a. Locate recent and old earthquakes on the electronic map. b. Compare earthquake data (magnitude), identify differences and reach conclusions.		
Resources / Materials	a. Worksheet «Activities with the website of the Geodynamic Institute» b. Computers / tablets with internet access		
Activities	The teacher gives the students the worksheet «Activities with the website of the Geodynamic Institute» and asks them to open the link. After observing carefully and browsing, they answer: a. What do you think the circles on the map show? b. Why are some circles larger or have a different color? c. Which colors appear most often? What might this indicate? They then work together to answer the remaining questions: they identify the time of occurrence, magnitude, focal depth, location, geographical coordinates. They make comparisons, find the sum and difference of decimal numbers and produce written language. In addition, the following is discussed: Looking at and comparing the data, what conclusions do we reach regarding the Greek region, the frequency of earthquakes and our daily life?		

STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MN

Students' Grades

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 ☐

Teaching time	2 teaching hours (2 x 45 minutes)
Title / Topic	Activity 7: Little engineers – How much can a building withstand? We build earthquake-resistant buildings <i>The secret of earthquakes! Ready for action?</i>
Summary	Students design, construct and test a simple building model with building blocks, checking how well it withstands shaking. They then prepare a questionnaire for a discussion with a civil engineer.
DRR (EMKK) Objectives	Students are expected: - To recognize the earthquake as a natural phenomenon, as a hazard and as a natural disaster. - To participate actively in collaborative activities, to develop prevention and protection scenarios, as well as a common plan of danger points and escape points for a safe environment. - To evaluate protection and prevention measures. - To connect school knowledge with real-life situations. To cultivate calmness and self-control in dangerous situations. - To recognize and describe basic principles of earthquake preparedness, documenting them in a clear and complete way.

Subject Curriculum Objectives	Subject	Unit	Objectives
	Science (Physics)	Forces – Energy	- To experimentally verify the appearance of forces and to explain how construction affects resistance to shaking.
	Mathematics	Problem solving	- To use a variety of strategies (creating shapes, mental representations) for solving complex problems.
	Active Citizen	Climate change – Natural disasters	- To learn prevention strategies. To cultivate responsibility and critical thinking.
Learning Outcomes for DRR	At the end of Activity 7, students will be able to: a. State basic characteristics of an earthquake-resistant building (e.g. wide base, reinforcements). b. Design and construct a simple building model. c. Observe and improve their construction after testing (redesign). d. Explain how proper construction can reduce damage. e. Connect the school activity with real life.		
Resources / Materials	a. Building blocks b. Cardboard (construction base) c. Stopwatch, observation sheet d. Computers for the shaking simulator (computer lab)		
Activities	- Students collaborate and experiment with building blocks. They design and build a simple building model, place it on cardboard and test how well it withstands by moving the cardboard. Each time they add one more block, observe and record. Questions before construction: - What will happen if the building is very low? If the base is very small? If we put more weight on top? Questions during construction: - How can you improve your construction? What would you change? Questions after construction: a. Describe your construction. What puzzled you the most? b. So how does proper construction reduce damage? What happens in real life? The next step takes place in the computer lab, where they experiment with a simulator that changes the shaking conditions, the intensity and the magnitude. - Students collaboratively prepare a questionnaire for a discussion with a civil engineer about the earthquake resistance of buildings.		

STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake ☐

Fire

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Flood

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Other (specify):

Teacher's name: PCh, KD, TS

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)	
Title / Topic	Activity 8: Construction and testing: «We build and improve» <i>Fire! The «smart» little house saves our pet</i>	
Summary	Students construct the smart little house and test it for stability, functionality and effective protection of the pet. They identify possible problems and proceed with improvements or modifications.	
DRR (EMKK) Objectives	Students are expected: - To recognize the dangers that a fire poses to people and animals and to describe ways of prevention and protection in case of fire. - To collaborate on the design and construction of a «smart» house for the kitten. - To apply basic principles of the problem-solving process (they construct, test, evaluate and improve their work). - To develop a responsible attitude towards animals and the environment. - To communicate the ideas and results of their work in various ways (e.g. orally, in writing, on a poster).	
	Subject	Unit Objectives

Subject Curriculum Objectives	Language	Moods (grammar)	- To use the grammatical moods, giving instructions in case of fire.
	Mathematics	Measurement of quantities	- To measure and calculate the quantities of the materials they will use.
	Art	Poster making	- To create a poster about fire.
	Design and Technology	Construction	- To draw construction drafts, cut wood and other materials using the appropriate tools, and use material-fastening techniques (e.g. triangulation technique).
	Science	Environmental awareness	- To develop a spirit of environmental awareness (e.g. tree planting, energy saving).
Learning Outcomes for DRR	At the end of Activity 8, students will be able to: a. Build the smart pet house and test it for stability, functionality and effective protection of the pet. b. Identify possible problems and proceed with improvements or modifications.		
Resources / Materials	- Construction materials: cardboard boxes and/or coriflux, craft sticks, aluminum foil, fabrics, plasticine, glue/tape, LED lights, simple sensors or buzzer, recycled materials.		
Activities	Students build the smart pet house and test it for stability, functionality and effective protection of the pet. They identify possible problems and proceed with improvements or modifications. Possible functions of the model include a light alert, an alarm sound, a heat sensor, a safe escape exit and protective insulation.		

STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MK

Students' Grades

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Teaching time	1 teaching hour (45 minutes)
Title / Topic	Activity 9: Mapping hazards in the school grounds <i>Understanding Earthquakes — Building Safely, Protecting Life</i>
Summary	Students carry out a brief investigation of the school grounds, identifying possible danger points in the event of an earthquake, and create a simple safety map of the classroom or the school, on which they mark safe spots, evacuation routes and points that need improvement.
DRR (EMKK) Objectives	Students are expected: - To explain how earthquakes are generated (basic understanding of the movement of tectonic plates). - To describe the effects of earthquakes on inhabited areas, with reference to Cyprus. - To recognize the appropriate protection measures before, during and after an earthquake. - To measure and compare structures (height, base, stability). - To design and build a structure resistant to an earthquake. - To test, evaluate and improve a design based on data. - To understand how engineers use mathematics and technology to protect human life.

	h. To reflect on safety and real-life application. i. To make informed decisions in emergency situations.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Science / Geography	Generation of earthquakes — tectonic plates	- To explain the basic movement of tectonic plates and the generation of earthquakes; to understand the relationship between earthquakes and the shaping of the earth's relief.
	Mathematics	Measuring and comparing quantities	- To measure and compare structures (height, base, stability, height-to-base-length ratio).
	Design and Technology / Engineering	Designing an earthquake-resistant structure	- To design, build, test and improve a structure resistant to an earthquake, based on specific constraints (budget, height).
	Active Citizen	Preparedness and protection measures	- To recognize appropriate protection measures before, during and after an earthquake and to make informed decisions in emergency situations.
Learning Outcomes for DRR	At the end of Activity 9, students will be able to: a. Describe the effects of earthquakes on inhabited areas, with reference to Cyprus. b. Recognize the appropriate protection measures before, during and after an earthquake.		
Resources / Materials	a. A floor plan/sketch of the school premises (or a blank A3 sheet to draw it). b. Paper, pencils and markers to create the safety map. c. An observation/hazard recording sheet.		
Activities	Students carry out a brief investigation of the school grounds, identifying possible danger points in the event of an earthquake, such as heavy objects, bookcases, glass panels, narrow corridors or obstacles at the emergency exits. They then create a simple safety map of the classroom or the school, on which they mark safe spots, evacuation routes and points that need improvement. Drawing on their information and observations, they propose ways of prevention, protection and correct response before, during and after an earthquake.		

STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: MK

Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)
Title / Topic	Activity 10: Building an earthquake-resistant building <i>Understanding Earthquakes — Building Safely, Protecting Life</i>
Summary	Students build an earthquake-resistant building with paper straws and paper tape, applying in practice basic principles of structural stability and strength, based on specific constraints (budget, height, height-to-base-length ratio), and test it under a controlled «seismic» shake.
DRR (EMKK) Objectives	Students are expected: - To explain how earthquakes are generated (basic understanding of the movement of tectonic plates). - To describe the effects of earthquakes on inhabited areas, with reference to Cyprus. - To recognize the appropriate protection measures before, during and after an earthquake. - To measure and compare structures (height, base, stability). - To design and build a structure resistant to an earthquake. - To test, evaluate and improve a design based on data. - To understand how engineers use mathematics and technology to protect human life.

	h. To reflect on safety and real-life application. i. To make informed decisions in emergency situations.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Science / Geography	Generation of earthquakes — tectonic plates	- To explain the basic movement of tectonic plates and the generation of earthquakes; to understand the relationship between earthquakes and the shaping of the earth's relief.
	Mathematics	Measuring and comparing quantities	- To measure and compare structures (height, base, stability, height-to-base-length ratio).
	Design and Technology / Engineering	Designing an earthquake-resistant structure	- To design, build, test and improve a structure resistant to an earthquake, based on specific constraints (budget, height).
	Active Citizen	Preparedness and protection measures	- To recognize appropriate protection measures before, during and after an earthquake and to make informed decisions in emergency situations.
Learning Outcomes for DRR	At the end of Activity 10, students will be able to: a. Design and build a structure resistant to an earthquake. b. Test, evaluate and improve their design based on data (height, resistance to shaking, cost of materials). c. Connect their models to real buildings in their city and to the principles of earthquake protection.		
Resources / Materials	- Paper straws and paper tape for constructing miniature buildings capable of withstanding an earthquake.		
Activities	Students build an earthquake-resistant building with paper straws and paper tape, applying in practice basic principles of structural stability and strength. Their structure is designed on the basis of specific constraints, such as the available budget, the height and the height-to-base-length ratio, and is tested under a controlled «seismic» shake in order to evaluate its strength and effectiveness. They then draw conclusions about the construction of the earthquake-resistant building, taking into account the height, the resistance to the «seismic» shake and the total cost of the materials, and compare the models they created with real buildings in their city.		

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: PA

Students' Grades

1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐

Teaching time	2 teaching hours (2 x 45 minutes)
Title / Topic	Activity 11: Introduction, Awareness-Raising and Waste Sorting <i>«Becoming a Protector of Myself and the Environment: Learning about, Preventing and Responding to Earthquakes and Fires»</i>
Summary	Students are sensitized to the issue of forest fires through the screening of the educational video «Natural Disasters – Fire: I Protect the Forest». They discuss the forest as a precious lung of life and the role of waste and human negligence in the outbreak of fires. They then practice the correct sorting of waste with the worksheet «Waste: There are solutions!» and consolidate the 3 «magic» verbs: Reduce, Reuse, Recycle.
DRR (EMKK) Objectives	Students are expected: a. To recognize the natural causes (lightning, prolonged drought, high temperatures) of forest fires. b. To identify the human-induced causes of fires, distinguishing them into conditions of human negligence and acts of deliberate arson. c. To clearly distinguish the difference between the concept of «rubbish» and «useful material». d. To adopt responsible environmental behavior by correctly sorting and reducing their waste.

Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	The natural environment and its protection / «Waste: There are solutions!»	Understanding the ecological consequences of disasters (loss of flora/fauna, soil erosion). Consolidation of the 3 «magic» verbs: Reduce, Reuse, Recycle.
Learning Outcomes for DRR	At the end of Activity 11, students will be able to: a. Recognize the forest as a precious lung of life. b. Distinguish the causes of forest fires (natural, negligence, arson). c. Distinguish the difference between «rubbish» and «useful material». d. Apply correct waste sorting into the appropriate bins (Blue, Green, Special battery bin). e. Explain and apply the 3 «magic» verbs: Reduce, Reuse, Recycle.		
Resources / Materials	a. Educational video: «Natural Disasters - Fire: I Protect the Forest» (Papakosta Aikaterini) b. Worksheet: «Waste: There are solutions!» c. Supporting recycling video on YouTube d. Interactive whiteboard / projector		
Activities	Screening of the educational video «Natural Disasters - Fire: I Protect the Forest» in the class plenary. A guided discussion follows: students recognize the forest as a precious lung of life and identify how waste and human negligence turn into sources of fire risk. They give examples from their everyday lives and distinguish the difference between «rubbish» and «useful material». They then complete the handout «Worksheet: Waste: There are solutions!», sorting the rubbish into the correct bins (Blue, Green, Special battery bin). The activity concludes with the analysis and consolidation of the 3 «magic» verbs: Reduce, Reuse, Recycle.		

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Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

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Fire

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Flood

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Other (specify):

Teacher's name: PA

Students' Grades

1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐

Teaching time	3 teaching hours (3 x 45 minutes)
Title / Topic	Activity 12: Systematic Analysis & Digital Interaction <i>«Becoming a Protector of Myself and the Environment: Learning about, Preventing and Responding to Earthquakes and Fires»</i>
Summary	Students, divided into groups, study the Educational Infographic on Forest Fires and the Spider Concept Map «Fires», analyzing the four central pillars (Causes, Consequences, Prevention, Response). They then work on tablets/computers and interact with the H5P Interactive Video on the e-me platform, answering the embedded questions to consolidate the concepts.
DRR (EMKK) Objectives	Students are expected: a. To recognize the natural causes (lightning, prolonged drought, high temperatures) of forest fires. b. To identify the human-induced causes of fires, distinguishing them into conditions of human negligence and acts of deliberate arson. c. To interact effectively with modern digital learning environments, such as H5P interactive videos and digital assessment forms (Google Forms). d. To collaborate harmoniously and effectively within groups to solve problems, without tensions.

Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	The natural environment and its protection / «Waste: There are solutions!»	Understanding the ecological consequences of disasters (loss of flora/fauna, soil erosion). Consolidation of the 3 «magic» verbs: Reduce, Reuse, Recycle.
	ICT (Informatics)	Digital mapping, multimedia and interactivity	Development of skills in using interactive geographic maps (Google Maps), digital quizzes (Google Forms) and interactive environments (H5P).
Learning Outcomes for DRR	At the end of Activity 12, students will be able to: a. Analyze the causes (natural and human-induced) and the consequences (ecological, economic, health) of forest fires. b. Describe basic prevention measures and ways of responding to fires. c. Collaborate harmoniously and effectively within groups. d. Interact with modern interactive digital environments (H5P / e-me).		
Resources / Materials	a. Informational / Educational Infographic on Forest Fires b. Spider Concept Map «Fires» c. H5P Interactive Video (e-me content) d. Tablets / computers with internet access		
Activities	Students are divided into groups. Each group studies the Informational/Educational Infographic on Forest Fires and the Spider Concept Map «Fires». The groups analyze the four central pillars of the topic: Causes (natural and human-induced), Consequences (ecological, economic, health), Prevention and Response. Each group presents its conclusions to the plenary and a discussion follows. Immediately afterwards, students work on tablets/computers and interact with the H5P Interactive Video on the e-me platform, answering the embedded questions to consolidate the concepts in an interactive and enjoyable way.		

STEAME-DRREC

“STEAME for Saving Life: Guidelines for developing and implementing Disaster Risk Reduction Education in Elementary School Curriculum”

Disaster Risk Reduction Education from Natural Disasters (DRR)

Lesson/Unit Plan

Thematic Area

Earthquake

☒

Fire

☒

Flood

☐

Other (specify):

Teacher's name: PA

Students' Grades

1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐

Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	Activity 13: Experiential Action «A day in the forest» & Self-Assessment <i>«Becoming a Protector of Myself and the Environment: Learning about, Preventing and Responding to Earthquakes and Fires»</i>		
Summary	Screening of the Powtoon digital animation «A day in the forest», in which the characters clean up the forest. This is followed by an experiential simulation action in the schoolyard, where the children organize a «volunteer clean-up team» and identify mock sources of danger. The activity concludes with Google Form Quiz 1, the Student Self-Assessment Sheet and the assignment of homework.		
DRR (EMKK) Objectives	Students are expected: a. To collaborate harmoniously and effectively within groups to solve problems, without tensions. b. To adopt responsible environmental behavior by correctly sorting and reducing their waste. c. To recognize the value of volunteering and collective effort, acting as active and responsible citizens for the protection of the community and the forest.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Environmental Studies	The natural environment and its protection / «Waste: There are solutions!»	Understanding the ecological consequences of disasters (loss of flora/fauna, soil erosion).

			Consolidation of the 3 «magic» verbs: Reduce, Reuse, Recycle.
	Skills Labs	Caring for the Environment / Civil Protection	Learning protection rules and evacuation plans, and becoming familiar with the emergency telephone numbers (199, 112).
Learning Outcomes for DRR	At the end of Activity 13, students will be able to: a. Recognize the value of volunteering and collective effort. b. Identify sources of danger in their environment and propose ways to eliminate them. c. Self-assess their knowledge and their attitude towards the environment. d. Make a personal commitment (promise) to protect the environment.		
Resources / Materials	a. Powtoon digital animation: «A day in the forest» (Clean-up and prevention action) b. Digital assessment quiz Google Form Quiz 1 c. Student Self-Assessment Sheet d. Homework Assignment Sheet «Waste: There are solutions!» e. Schoolyard (experiential action area)		
Activities	Screening of the Powtoon digital animation «A day in the forest». Students watch the characters clean up the forest and comment on the importance of their action for fire prevention. This is followed by an experiential simulation action in the schoolyard: the children organize a «volunteer clean-up team» and identify mock sources of danger, practicing collaboration, observation skills and volunteering. At the end, students answer the Google Form Quiz 1 and complete the Student Self-Assessment Sheet, making their own pledge for the environment. For homework, they are given the Assignment Sheet (identifying 5 products with excessive packaging).		

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	Activity 14: Digital Journey Through Time with Google Maps <i>«Becoming a Protector of Myself and the Environment: Learning about, Preventing and Responding to Earthquakes and Fires»</i>		
Summary	Students work in the computer lab and explore the interactive Google Map «The Major Earthquakes and Fires of Macedonia from 1800 to Today». They study the temporal and geographical frequency of the phenomena and answer the questions of Google Form Quiz 2, drawing data directly from the map.		
DRR (EMKK) Objectives	Students are expected: a. To understand the nature and characteristics of seismic risk. b. To navigate with ease through digital interactive maps (Google Maps) to locate historical natural disasters. c. To interact effectively with modern digital learning environments, such as H5P interactive videos and digital assessment forms (Google Forms). d. To collaborate harmoniously and effectively within groups to solve problems, without tensions.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Geography & History	Elements of the local history of Macedonia	Study and recording of the historical development of natural disasters in the region

			(earthquakes and fires from 1800 to today).
	ICT (Informatics)	Digital mapping, multimedia and interactivity	Development of skills in using interactive geographic maps (Google Maps), digital quizzes (Google Forms) and interactive environments (H5P).
Learning Outcomes for DRR	At the end of Activity 14, students will be able to: a. Locate historical natural disaster events in Macedonia geographically and chronologically through the interactive map. b. Examine and compare the temporal and geographical frequency of earthquakes and fires. c. Draw and process data directly from digital interactive maps. d. Answer digital assessment quizzes (Google Forms) using the data they collected.		
Resources / Materials	a. Interactive Google Map: «The Major Earthquakes and Fires of Macedonia from 1800 to Today» b. Digital assessment quiz Google Form Quiz 2 c. Computer lab (computers with internet access)		
Activities	Students go to the computer lab and open the interactive Google Map «The Major Earthquakes and Fires of Macedonia from 1800 to Today». They study the major earthquakes and fires of the region, identifying where and when each event occurred. At the same time, they examine the temporal and geographical frequency of the phenomena and discuss their conclusions: which areas are affected most often and why. They then answer the questions of Google Form Quiz 2, drawing data directly from the map and practicing inquiry-based learning with digital tools.		

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Students' Grades

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2

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4

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Teaching time	3 teaching hours (3 x 45 minutes)		
Title / Topic	Activity 15: Rules for Protection and Preparedness against Earthquakes <i>«Becoming a Protector of Myself and the Environment: Learning about, Preventing and Responding to Earthquakes and Fires»</i>		
Summary	Teaching of the official safety protocol for the event of an earthquake (Before, During, After). Students work through and complete the handout «Worksheet: Natural Disasters & Protection Measures», answering True/False questions on hazard maps, multiple-choice questions on the evacuation plan, and matching questions on natural phenomena.		
DRR (EMKK) Objectives	Students are expected: a. To understand the nature and characteristics of seismic risk. b. To apply the appropriate self-protection actions and skills before, during, and after the occurrence of an earthquake. c. To collaborate harmoniously and effectively in groups to solve problems, without tension.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Skills Labs	Caring for the Environment / Civil Protection	Learning protection rules and evacuation plans, and becoming familiar with the emergency telephone numbers (199, 112).

Learning Outcomes for DRR	At the end of Activity 15, students will be able to: - Recognize the importance of prevention measures (hazard maps, preparedness drills, shelters). - Calmly apply the self-protection steps before, during, and after a seismic event. - Know the school's evacuation plan and the safe assembly points. - Recognize the emergency numbers (199 and 112) and the correct way to call them.
Resources / Materials	- Worksheet: «Natural Disasters & Protection Measures» - Interactive whiteboard / projector
Activities	The teacher teaches the official safety protocol for the event of an earthquake, organized in three stages: Before, During, After. Students discuss and practice the self-protection steps and the importance of staying calm. Reference is made to hazard maps, the school's evacuation plan, and the safe assembly points. They then work through and complete the handout «Worksheet: Natural Disasters & Protection Measures», answering True/False questions on hazard maps, multiple-choice questions on the evacuation plan, and matching questions on natural phenomena.

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Students' Grades

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Teaching time	1 teaching hour (45 minutes)		
Title / Topic	Activity 16: Learning about earthquakes <i>«An earthquake... now what do we do?»</i>		
Summary	Students, together with the teacher, browse the website of the Education Centre for the Environment and Sustainability of Lithakia, Zakynthos, and get a first introduction to basic information about earthquakes: what an earthquake is, how it is generated, types of seismic faults, calculation of earthquake magnitude, measurement scale, and seismic instruments. A whole-class discussion follows with questions and explanations.		
DRR (EMKK) Objectives	Students are expected: a. Students should understand the causes, consequences, and mechanism of an earthquake. b. Promotion of prevention and preparedness.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Geography	The role of volcanoes and earthquakes in the changes of nature / Natural disasters in Greece	- To recognize the role of earthquakes in the changes of the natural environment. To know how they should react in the event of an earthquake or fire.

	ICT	Digital literacy	- To evaluate the reliability of sources. To use digital tools.
Learning Outcomes for DRR	At the end of Activity 16, students will be able to: a. b. c. d. Explain in simple terms what an earthquake is and how it is generated. Recognize basic concepts: types of seismic faults, earthquake magnitude, measurement scale, seismic instruments. Use reliable digital sources to obtain scientific information. Formulate questions and participate in whole-class discussion.		
Resources / Materials	- Website of the Education Centre for the Environment and Sustainability of Lithakia, Zakynthos https://kpe-zakynth-new.zak.sch.gr/?page_id=1132 - Interactive whiteboard / projector		
Activities	Students, together with the teacher, browse the website of the Education Centre for the Environment and Sustainability of Lithakia, Zakynthos. The information from the website's article is used to give students a first introduction to basic information about earthquakes: what an earthquake is, how an earthquake is generated, types of seismic faults, calculation of earthquake magnitude, earthquake measurement scale, seismic instruments, and more. While engaging with the website's article and prompted by its information, a whole-class discussion arises along with questions from the students, which are then explained. Link: https://kpe-zakynth-new.zak.sch.gr/?page_id=1132		

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	Activity 17: Examining earthquakes in Greece <i>«An earthquake... now what do we do?»</i>		
Summary	Students watch a video from National Geographic with footage of real earthquakes from security cameras and learn how faults and earthquakes are created. Through two websites they observe earthquakes in real time from around the world and from Greece. They study the great Samos earthquake (October 2020) and concepts such as epicenter and focal depth, arriving at the observation that earthquakes occur where the tectonic plates intersect.		
DRR (EMKK) Objectives	Students are expected: a. Students should understand the causes, consequences, and mechanism of an earthquake. b. Reducing the vulnerability of individuals.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Geography	Natural disasters and their consequences on human life	- To develop the disposition and willingness to stand by and help those affected by natural disasters. To point out the consequences these phenomena have for humans.

	Mathematics	Statistics (Data management)	- To collect and organize data (on earthquakes).
	ICT	Digital literacy	- To evaluate the reliability of sources. To use digital tools.
Learning Outcomes for DRR	At the end of Activity 17, students will be able to: a. Describe how faults and earthquakes are created. b. Observe and collect earthquake data in real time from digital sources. c. Understand the concepts: epicenter, focal depth, aftershock. d. Conclude that earthquakes occur where the tectonic plates intersect.		
Resources / Materials	- Video from National Geographic https://www.youtube.com/watch?v=nmkp7Cpc13g - Websites for monitoring earthquakes in real time: https://www.earthquakes.gr/loc_eq/earthquakes-world.asp http://www.geophysics.geol.uoa.gr/stations/maps/recent_eq_1d_el.htm - Interactive whiteboard / projector		
Activities	Students first watch a video from National Geographic, with security camera footage of real earthquakes. They also watch how faults and earthquakes are created. Questions arise, which are answered through the discussion that follows. Then, through two websites, they observe earthquakes in real time from around the world and in Greece. Time is devoted to the great Samos earthquake (October 2020), studying its details and the large number of aftershocks. Students work with concepts such as epicenter and focal depth and arrive at the observation that earthquakes occur where the tectonic plates intersect. Links: https://www.youtube.com/watch?v=nmkp7Cpc13g https://www.earthquakes.gr/loc_eq/earthquakes-world.asp http://www.geophysics.geol.uoa.gr/stations/maps/recent_eq_1d_el.htm		

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	Activity 18: Using the Merge application <i>«An earthquake... now what do we do?»</i>		
Summary	Students watch a video about the structure of the Earth's interior and, once their questions have been answered, they go on to view the Earth's interior with the Merge – Explorer application using the cube (the "Journey to the Core!" activity from the "Terraforming Earth" unit). They then watch a video about tectonic plates and study them with the "Plates, are a burning thing..." activity.		
DRR (EMKK) Objectives	Students are expected: a. Students should understand the causes, consequences, and mechanism of an earthquake. b. Creating a culture of safety.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Science (Physics)	Forces – Motion	- To establish that when forces are exerted on bodies, changes are caused.
	ICT	Digital literacy	- To evaluate the reliability of sources. To use digital tools.

Learning Outcomes for DRR	At the end of Activity 18, students will be able to: - Describe the structure of the Earth's interior. - Explore the Earth's interior and the tectonic plates through the augmented reality application Merge – Explorer. - Connect the movement of tectonic plates with the generation of earthquakes. - Use digital tools to understand natural phenomena.
Resources / Materials	- Video about the structure of the Earth's interior and the tectonic plates: https://www.youtube.com/watch?v=V7Lsv9fjTGo https://www.youtube.com/watch?v=9iy8HvhfmaQ - Merge – Explorer application using the cube (application used on a mobile phone) https://mergeedu.com/explorer - Interactive whiteboard / projector
Activities	Students first watch a video about the structure of the Earth's interior. Once the questions that arise have been answered through discussion, they go on to view the Earth's interior with the Merge – Explorer application. Specifically, using the cube, the first activity ("Journey to the Core!") from the "Terraforming Earth" unit is carried out. Students then watch a video about tectonic plates and, after a whole-class discussion, study the tectonic plates using the application. Specifically, again using the cube, they study the second activity ("Plates, are a burning thing...") from the "Terraforming Earth" unit. Links: https://www.youtube.com/watch?v=V7Lsv9fjTGo https://www.youtube.com/watch?v=9iy8HvhfmaQ https://mergeedu.com/explorer

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Students' Grades

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Teaching time	2 teaching hours (2 x 45 minutes)		
Title / Topic	Activity 19: «The earthquake emergency kit» <i>«An earthquake... now what do we do?»</i>		
Summary	The teacher and the students discuss the importance of prevention and the preparation of a bag with basic emergency supplies. Through the discussion, the most essential items are noted on the board, and the students make two posters about the earthquake emergency kit and its contents. The posters are put up around the school with the aim of informing and raising the awareness of all students, achieving the dissemination of knowledge throughout the school.		
DRR (EMKK) Objectives	Students are expected: a. Promotion of prevention and preparedness. b. Creating a culture of safety. c. Reducing the vulnerability of individuals.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Social and Civic Education	Life in the community and in the wider world	- To develop civic awareness and an attitude of solidarity in disasters.
	Visual Arts	Applied arts	- To create posters combining text and image in a way that

			reinforces the message they want to convey.
Learning Outcomes for DRR	At the end of Activity 19, students will be able to: a. Recognize the importance of prevention and preparedness before an earthquake. b. Select and justify the basic emergency supplies for the earthquake emergency kit. c. Create posters that combine text and image to convey their message. d. Inform and raise the awareness of the school community.		
Resources / Materials	a. Board, kraft paper roll, markers b. Materials for creating posters		
Activities	The teacher and the students discuss the importance of prevention and the preparation of a bag with basic emergency supplies. Through the discussion, the most essential items that the earthquake emergency kit should contain are noted on the board. The students make two posters about the earthquake emergency kit and its contents. The posters are put up around the school with the aim of informing all students and raising their awareness of the topic. In this way, the dissemination of knowledge to all the students of the school is achieved.		

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Other (specify):

Teacher's name: TK

Students' Grades

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 ☒

Teaching time	1 teaching hour (45 minutes)		
Title / Topic	Activity 20: Review and evacuation drill <i>«An earthquake... now what do we do?»</i>		
Summary	Students review the new knowledge in a playful way, through Wordwall and exercises about earthquakes, recalling key terms and facts while playing. Finally, one student, guided by the teacher, demonstrates the correct way to take cover under the desk during an earthquake and the quick, but panic-free, way to safely evacuate the classroom once the earthquake is over.		
DRR (EMKK) Objectives	Students are expected: a. Promotion of prevention and preparedness. b. Creating a culture of safety.		
Subject Curriculum Objectives	Subject	Unit	Objectives
	Geography	The role of volcanoes and earthquakes in the changes of nature / Natural disasters in Greece	To recognize the role of earthquakes in the changes of the natural environment. To know how they should react in the event of an earthquake or fire.

	ICT	Digital literacy	- To evaluate the reliability of sources. To use digital tools.
Learning Outcomes for DRR	At the end of Activity 20, students will be able to: a. Recall key terms and facts about earthquakes through playful activities. b. Apply the correct way to take cover under the desk during an earthquake. c. Practice the quick and safe evacuation of the classroom, without panic, after the end of the earthquake. d. Develop a positive attitude towards prevention and preparedness.		
Resources / Materials	a. Digital Wordwall exercises about earthquakes b. Interactive whiteboard / projector c. Classroom (evacuation drill area)		
Activities	Students review the new knowledge in a playful way. Through Wordwall and exercises about earthquakes, they recall key terms and facts while playing. Finally, one student, guided by the teacher, demonstrates the correct way to take cover under the desk during an earthquake and the quick, but panic-free, way to safely evacuate the classroom once the earthquake is over. Link: Wordwall address - Earthquakes		

ANNEX III — SEMI-STRUCTURED INTERVIEW GUIDE

The guide below was used in all interviews. Parts A to D were repeated for each activity that the teacher had implemented. Part E was asked of every interviewee.

Part A — The activity as implemented

- A1.** Which of the O2/A1 sample activities did you implement, with which grade, and within which subject or subjects of the curriculum?
- A2.** Describe briefly how the lesson unfolded, from the introduction to the closure.
- A3.** Did you implement the activity as designed, or did you change something before you began? What, and why?
- A4.** Which curriculum objectives of the subject did the activity serve, alongside the DRR objectives?

Part B — Time (asked for each activity)

- B1.** How much actual teaching time did the activity require, from introduction to closure? Please express it in teaching periods.
- B2.** How does this compare with the time you had planned for it before you began?
- B3.** Which phase took longer than you expected — preparing and distributing materials, organising the groups, the investigation or construction itself, the discussion, or the recording and presentation of results?
- B4.** Was the activity completed in one session or spread over more than one? If it was interrupted, what did the interruption cost you when you resumed?
- B5.** If you had to fit this activity into a single forty-five-minute period, what would you shorten or omit — and which part must not be omitted without losing the point of the activity?
- B6.** How much preparation time did the activity require of you outside the classroom, and what did that preparation mainly involve?

Part C — Difficulty (asked for each activity)

- C1.** On a three-level scale (low – moderate – high), how demanding was this activity for your pupils? What made it so?
- C2.** Which specific step, concept or instruction did pupils find hardest?
- C3.** Were there pupils for whom the activity was too easy, or too difficult? How did you handle this within the same class?
- C4.** On the same three-level scale, how demanding was the activity for you — in preparation, materials, use of technology and classroom management? Which of these weighed most?
- C5.** Did anything in the materials, the instructions or the digital tools fail, prove unclear, or turn out to be unavailable in your school?
- C6.** Would you implement this activity again as it stands, with changes, or not at all?

Part D — Adaptations and extensions (asked for each activity)

- D1.** What exactly did you change in the activity during implementation, and what led you to change it?
- D2.** Did you extend the activity beyond what the sample proposed — a further session, an additional hazard, a link with the local community, a task taken home? Describe the extension.
- D3.** Did your adaptation change the grade for which the activity is suitable, or the subject in which it fits best?
- D4.** What would have to be added to the sample so that a colleague could implement it in your school without having to make the adaptations you made?

Part E — Extending the experiment-based activities to the upper grade band

Three of the sample activities for Grades 1–3 are built around a hands-on experiment. Teachers were asked how each of them could be developed for Grades 4–6, so that the same experimental core could serve a second grade band rather than being met once and abandoned.

- E1.** “Water Experiments: Where does the rain go?” — soil absorption and infiltration. How could this experiment be extended for Grades 4–6? Which variables could pupils control and measure, what data could they record, and which curriculum objectives of the upper grades would this serve?
- E2.** “Our own Volcano” — model and eruption experiment. How could this model be developed into an investigation suitable for Grades 4–6 rather than a demonstration?
- E3.** “Which Building Withstands?” — stability experiment. How could this experiment be extended for Grades 4–6, in terms of measurement, iteration of the design and connection with real data?
- E4.** For each of the three: what additional materials or tools would be required; what should remain unchanged; and how would you avoid the activity feeling to pupils like a repetition of what they already did in the lower grades?

Part F — Overall

- F1.** Across all the activities you implemented, which worked best and which least well, and why?
- F2.** Which of the sample activities would you not attempt in your school as they stand, and what prevents you?
- F3.** What form of support would make sustained implementation possible in your school?