

STEAME

FOR SAVING LIFE

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

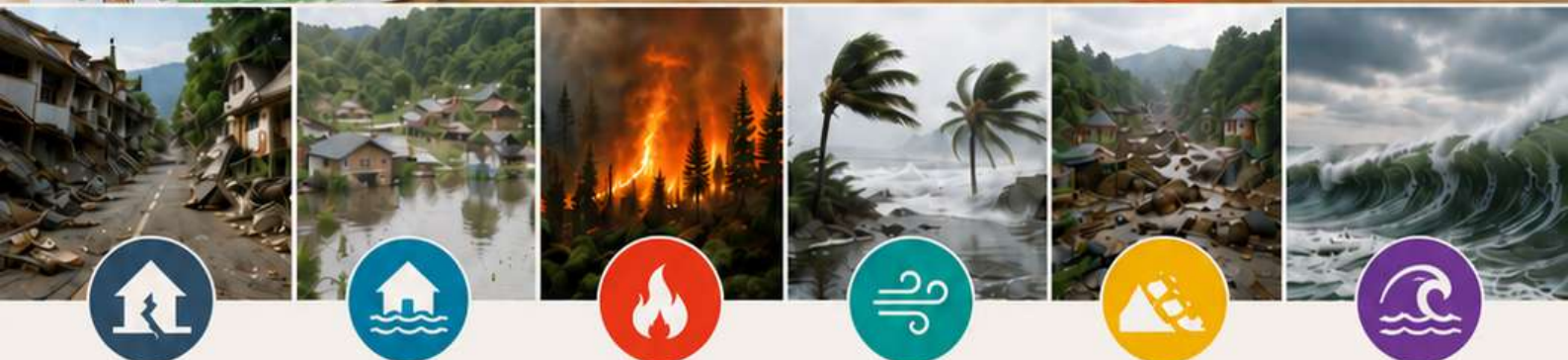
02/A1

**Development of STEAME-DRRE activities
for Elementary School (Grades 1st-6th)**

Project Acronym: STEAME-DRREC

Reference number: 2023-2-CY01-KA210-SCH-000169945

Implementation period: 31 August 2024 – 30 August 2026



www.steame-life.eu

✉ steamedrrec@gmail.com

📌 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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1. BRIEF DESCRIPTION

This report presents 40 sample STEAME-DRREC activities developed as part of Output O2/A1 of the STEAME for Saving Life project. The activities are designed as reference models for teachers, showing how Disaster Risk Reduction Education (DRRE) can be integrated into the daily curriculum of elementary school students (Grades 1–6, ages 6–12) through a STEAME interdisciplinary approach. Twenty activities are provided for Grades 1–3 and twenty for Grades 4–6. Each sample encompasses the theme/topic to be discussed, the objectives of the lesson, the methodology, a step-by-step activity description, the expected learning outcomes, and the recommended materials and digital tools.

2. INTRODUCTION

The integration of Disaster Risk Reduction Education (DRR) into formal curricula has become a global priority, driven by the growing impact of climate change and natural hazards on human lives and sustainable development. Education plays a pivotal role in fostering disaster resilience by equipping learners with the awareness, knowledge, and skills needed to respond effectively to crises. Within this landscape, the STEAME framework offers a dynamic, interdisciplinary approach that aligns well with DRR goals.

This report presents the sample activities developed under Output O2/A1. The activities are designed for integration into the daily curriculum of elementary school students in Greece and Cyprus, and build directly on the methodological framework established in O1/A2 (Methodological Guidelines for incorporating STEAME-DRREC activities in curriculum-content instruction): project-based learning, context-based learning, storytelling for risk awareness, inquiry-based learning, design thinking, simulation and role-playing, and game-based learning.

Activities are organised into two age groups: Grades 1–3 (ages 6–9) and Grades 4–6 (ages 9–12), with 20 activities in each group. Each activity covers one thematic focus (earthquake, flood, wildfire, or general natural hazard awareness and preparedness) and follows a consistent structure that includes the theme/topic, a brief description and the STEAME domains addressed, as well the learning objectives and outcomes, the methodology, and recommended materials and digital tools. These samples are intended to serve as reference models for teachers, demonstrating how DRR concepts can be embedded naturally into existing curriculum subjects — Language Arts, Mathematics, Science, Geography, ICT, Physical Education, and Arts — rather than being taught as a separate topic.

Supplementary material developed within this output also includes: (i) digital interactive multimedia educational content, (ii) eQuiz self-assessment tools, and (iii) augmented reality (AR) material. Activities making use of these supplementary resources are indicated in the relevant sections. The thematic supplementary worksheets are provided in Annex I; the pre-assessment questionnaire, the eQuiz master content, and the student self-assessment and reflection sheets in Annex II; the catalogue of digital and multimedia resources in Annex III; and the augmented reality material in Annex IV.

3. Theoretical Framework for the Development of the Activities

Over the past decade, Disaster Risk Reduction Education has moved from a novel school practice to the centre of international policy. Priority 1 of the Sendai Framework for Disaster Risk Reduction 2015–2030 includes the promotion of the incorporation of disaster risk knowledge in formal and non-formal education at all levels (UNDRR, 2015), and the Comprehensive School Safety Framework 2022–2030 establishes risk reduction and resilience education as one of its three pillars (GADRRRES, 2022). Recent global analyses of curricular integration nevertheless show that, where DRR does appear in national curricula, it is most often confined to a small number of geography or civics units, delivered didactically and assessed through recall, rather than developing the action competence and participation that the Sendai Framework envisages (Masocha, Takaidza, Manyani & Mutseekwa, 2025; Tyas, Wilujeng, Rosana, Kuswanto & Purwasih, 2025). This picture is also confirmed for the European and national contexts examined under O1/A1 of this project. Reviews of children’s disaster education programmes point in a complementary direction: school-based interventions do improve hazard knowledge, risk perception and preparedness, but their effect depends on sustained implementation, adequate teacher preparation and connection to the family and community around the school, rather than on isolated awareness events (Seddighi et al., 2022; Amri et al., 2022). Longitudinal quasi-experimental evidence confirms that structured, repeated disaster education leads children and their households to adopt concrete preparedness measures (Yildiz, Dickinson, Priego-Hernández, Teeuw & Shaw, 2024). The curriculum-infusion strategy adopted in O1/A2, and operationalised in the activities that follow, is a direct response to this evidence.

The pedagogical core of the activities is crucial. Learners are treated as building their understanding of hazards from experience and from structured interaction with peers and adults, rather than receiving it ready-made, and each activity is organised as a cycle of concrete experience, observation, conceptualisation and active experimentation (Kolb, 1984). Because the phenomena at stake are real and local, the samples anchor learning in the hazard profile of the children’s own community. Contemporary conceptualisations of disaster education stress precisely this situated character, treating it as learning that has to function in the routine and crisis contexts of everyday life rather than as a body of content to be reproduced in a test (Kitagawa, 2021). This point is decisive for DRRE, where the objective is not recall in a test but appropriate action during a rare and stressful event. Research on preparedness shows that hazard knowledge translates into protective behaviour only when it is accompanied by self-confidence and by positive outcome expectancy (Bandura, 1997) — a pattern reproduced in recent cross-country studies of children’s hazard knowledge, risk perception and preparedness (Yildiz, Dickinson, Priego-Hernández & Teeuw, 2023). Every sample activity therefore closes with something the child does or produces: a barrier that is built and tested, a plan that is drawn, a route that is walked, a message that is communicated.

The STEAME framework supplies the integrative vehicle. Extending the STEAM model with Entrepreneurship and Environment, it treats Science, Technology, Engineering, Arts, Mathematics and Entrepreneurship/Environment as complementary lenses on a single problem. Systematic reviews of STEAM in primary schools report gains in disciplinary knowledge, attitudes towards science, creativity, problem-solving and communication, while also cautioning that the approach is often loosely defined and that empirical guidance for designing and assessing primary STEAM content remains scarce (Aguilera & Ortiz-Revilla, 2021; Yim, Su & Wegerif, 2025) — one reason why the samples below state their methodology, steps and expected outcomes explicitly. Natural hazards lend themselves unusually well to this treatment: an earthquake is simultaneously a geological process, an engineering problem, a set of measurements and probabilities, a question of community organisation, and a story to be told and illustrated. Rather than adding DRR as a new subject, the STEAME lens allows the same event to be studied within Language Arts, Mathematics, Science, Geography, ICT, Physical Education and Arts — which is what makes curriculum infusion practically achievable within an already crowded timetable.

Seven methodological approaches, established in O1/A2, structure the samples, each grounded in its own research tradition: project-based learning, in which a driving question sustains extended inquiry towards a shared artefact, and which produces gains in achievement, attitudes and thinking skills provided the design is sustained rather than token (Zhang & Ma, 2023; Ferrero, Vadillo & León, 2021); inquiry-based learning, following the orientation–conceptualisation–investigation–conclusion–discussion cycle, whose effects on

higher-order and critical thinking are well documented for primary learners when the inquiry is appropriately guided (Antonio & Prudente, 2024; Arifin, Sukarmin, Saputro & Kamari, 2025); design thinking, whose iterative design–build–test–improve logic mirrors the engineering of protective measures (Li & Zhan, 2022; Rusmann & Ejsing-Duun, 2022); storytelling, which gives young children a narrative structure for organising unfamiliar and potentially frightening events and which has been used successfully to make hazard and resilience education accessible rather than technical (Keswick et al., 2025; Haber & Kumar, 2025); context-based learning, anchoring content in the hazard profile of the school’s own community; simulation and role play; and game-based learning, whose motivational and cognitive affordances are strongest precisely at primary level (Wang, Chen, Hwang, Guan & Wang, 2022).

Four design principles govern how these approaches were applied. The first is developmental appropriateness: activities for Grades 1–3 remain concrete, sensory and playful, while those for Grades 4–6 introduce measurement, data, mapping and probabilistic reasoning. The second is agency rather than alarm — fear-based messaging is counterproductive with children, and each activity therefore closes on what can be done rather than on what may be lost, in line with evidence that disaster education works through concrete preparedness action rather than through heightened threat perception (Seddighi et al., 2022; Yildiz et al., 2024). The third is transfer beyond the classroom: children are effective communicators of risk within their own households, and quantitative evidence of intergenerational spillover from school disaster education to parental preparedness supports this (Harada, Shoji & Takafuji, 2023), so a number of activities deliberately produce artefacts that travel home. The fourth is formative assessment, built in through observation, discussion, worksheets and the self-assessment instruments provided in Annex II, which is most effective when students take an active role in it and when teachers act on what it reveals (Lee, Chung, Zhang, Abedi & Warschauer, 2020). Digital, augmented and virtual reality resources are used where they offer something the physical classroom cannot — scale, invisible processes, safe exposure to dangerous scenarios — rather than for their own sake, since their benefit depends on the pedagogical design around them rather than on the technology itself (Chang et al., 2022; Villena-Taranilla, Tirado-Olivares, Cózar-Gutiérrez & González-Calero, 2022).

These commitments explain the uniform structure of the pages that follow. Each activity states its lesson objectives; names the methodology and approach, so that the pedagogical rationale is visible rather than implicit; sets out a step-by-step description that a teacher can follow without further preparation; declares the expected learning outcomes; and lists the materials and digital tools required. The intention throughout is that the forty samples serve as models to be adapted to the hazards, curricula and resources of each individual school, and not as a script to be reproduced.

4. STEAME-DRRE activities for Elementary School Students

4.1 Activities for Grades 1-3 (Ages 6-9)

These activities are designed for younger elementary students (Grades 1–3). They emphasise concrete hands-on experiences, storytelling, sensory exploration, simple experiments, and cooperative play. Scientific vocabulary is introduced gradually and connected to familiar contexts. Activities are typically 30–50 minutes in duration and integrate DRR objectives with core curriculum subjects.

Activity 1 | Grades 1–3 (Ages 6–9)

Title: "The Big Rain and the Flood" – Simulation Experiment

Theme/Topic: Floods / Water Cycle

STEAME Domains: Science · Math · Engineering · Arts

Learning Objectives

- Understand how floods occur due to intense rainfall and soil saturation
- Observe the relationship between water, soil, and surface runoff
- Identify basic prevention measures against flooding
- Develop vocabulary related to weather and natural hazards

Methodology and Approach

Hands-on simulation experiment (STEM approach) in small cooperative groups. Students engage in guided inquiry: they predict, observe, record, and discuss results. The teacher facilitates through questioning and scaffolded discussion.

Procedure

- Fill a large transparent container with soil or sand and model a small "village" using toy figures (houses, cars, trees)
- Create a small "river" channel in the middle of the soil by pressing gently
- Use a watering can or plastic bottle with holes to simulate rainfall — start slowly then increase intensity
- Observe how the river fills up, overflows, and floods the village
- Discuss: What could protect the village? (dams, raised houses, trees for water absorption)
- Extension: build mini dams with pebbles and test whether they reduce flooding
- Students draw "Before and After the Flood" pictures and share observations

Learning Outcomes

- Explain how flooding happens in simple terms
- Identify factors that increase or decrease flood risk
- Apply engineering thinking by designing and testing a small flood barrier
- Record observations in a simple worksheet

Materials, Resources and Tools

Large transparent container, soil/sand, small toys, watering can, water, pebbles, observation worksheets (optional), Supplementary worksheets: Worksheet 7 (Annex I) – The Flood Experiment; Worksheet 5 – The Water Cycle

Activity 2 | Grades 1–3 (Ages 6–9)

Title: "The Sponge and the Rain" – Soil Absorption Experiment

Theme/Topic: Floods / Soil Science

STEAME Domains: Science · Math

Learning Objectives

- Understand the concept of soil absorption and saturation
- Connect soil saturation with flood formation
- Develop observation and data recording skills

Methodology and Approach

Guided inquiry experiment. Students use a sponge as a model for soil, observing water absorption until overflow. The teacher leads Socratic questioning to help students transfer findings to real floods.

Procedure

- Each group receives a large sponge, a glass of water, and a tray
- Students touch and describe the dry sponge (texture, weight)
- Slowly pour water onto the sponge — students observe absorption
- Continue adding water until the sponge is saturated and begins dripping
- Discussion: "The sponge is like the ground. When too much rain falls, the ground cannot hold more water — that is when floods happen!"
- Students draw their experiments and write a caption explaining what they learned

Learning Outcomes

- Describe how soil absorbs water and what happens when it reaches capacity
- Explain in their own words why heavy rain can cause floods
- Connect the experiment to real-world flood events

Materials, Resources and Tools

Large sponge, glasses of water, tray, student worksheet for drawing and writing
Supplementary worksheet: Worksheet 7 (Annex I) – The Flood Experiment

Activity 3 | Grades 1–3 (Ages 6–9)

Title: "Which Material Absorbs Water Best?" – Materials Investigation

Theme/Topic: Floods / Materials Science

STEAME Domains: Science · Engineering · Math

Learning Objectives

- Distinguish between absorbent and waterproof materials
- Design and conduct a fair comparison test
- Connect findings to flood prevention and building design

Methodology and Approach

Inquiry-based investigation (IBL). Students predict, test, and compare materials systematically. Results are recorded in a simple table and discussed as a class. Teacher connects findings to real-world applications (raincoats, flood barriers).

Procedure

- Present 4–5 materials: kitchen paper, cotton, plastic sheet, wood, fabric
- Students predict which material will absorb the most water
- Using a dropper, apply 5 drops of water to each material and observe
- Record results in a table: material name / absorbs quickly / absorbs slowly / repels water

- e. Class discussion: Which material would be good for a raincoat? Which for a flood barrier?
- f. Students present their findings and explain their reasoning

Learning Outcomes

- a. Classify materials as absorbent or waterproof based on observations
- b. Explain why material choice matters in flood protection and everyday life
- c. Record and interpret simple experimental results

Materials, Resources and Tools

Kitchen paper, cotton balls, plastic sheet, wood piece, fabric scraps; dropper, water, recording worksheets

Activity 4 | Grades 1–3 (Ages 6–9)

Title: "Building a Dam" – Engineering Design Challenge

Theme/Topic: Floods / Engineering

STEAME Domains: Science · Technology · Engineering · Math

Learning Objectives

- a. Understand how dams help control water flow and prevent flooding
- b. Apply basic engineering design process: design → build → test → improve
- c. Develop teamwork and problem-solving skills

Methodology and Approach

Project-based learning (PBL) and cooperative learning. Each group designs, builds, and tests their own mini dam. Multiple rounds of testing encourage iterative improvement. Teacher facilitates reflection after each round.

Procedure

- a. Introduce the challenge: "Your village is at risk of flooding. Design a dam to protect it!"
- b. Groups plan their dam on paper — choosing materials (pebbles, clay, cardboard strips)
- c. Fill a tray with soil, create a river channel, place toy village on one side
- d. Build the dam and test it by slowly pouring water upstream
- e. Evaluate: Did the dam hold? What needs improving?
- f. Rebuild improved version and retest
- g. Groups present their final design and explain what worked and why

Learning Outcomes

- a. Explain the purpose and function of a dam
- b. Describe the engineering design cycle (design–build–test–improve)
- c. Collaborate effectively in a group to solve an engineering problem

Materials, Resources and Tools

Shallow trays, soil/sand, water, pebbles, clay, cardboard; toy figures for the village; recording worksheets
Supplementary worksheet: Worksheet 7 (Annex I) – The Flood Experiment

Activity 5 | Grades 1–3 (Ages 6–9)

Title: "Rain Stories" – Illustrated Storytelling from Textbook

Theme/Topic: Floods / Language Arts

STEAME Domains: Arts · Science · Technology

Learning Objectives

- Introduce water-related vocabulary (rain, cloud, river, flood)
- Develop reading, listening, and comprehension skills
- Connect textbook content to natural hazard awareness
- Express ideas creatively through drawing and writing

Methodology and Approach

Storytelling (Story Telling / ST approach). The teacher reads an illustrated story about rain and flooding (e.g., a picture book or the textbook unit "The Cloud Brought Rain"). Students engage with the story through questions and creative response activities.

Procedure

- Teacher reads aloud an illustrated story featuring rain, clouds, rivers, and flooding
- Students listen and observe the illustrations, predicting what happens next
- Comprehension questions: "What did the cloud bring?", "What happened to the village?", "How did the people stay safe?"
- Vocabulary cards: students match word cards (rain, flood, cloud, boat, safe) to pictures
- Students create their own 4-panel illustrated story about what they would do during a flood
- Share stories with the class and display on classroom wall

Learning Outcomes

- Use new vocabulary related to weather and natural hazards correctly
- Retell the main events of the story in sequence
- Draw and describe flood safety actions
- Develop empathy for people affected by floods

Materials, Resources and Tools

Illustrated storybook or textbook (e.g., "The Cloud Brought Rain" unit — 1st Grade), word cards, drawing paper, coloured pencils

Activity 6 | Grades 1–3 (Ages 6–9)

Title: "Flood Safety Comics" – Creating a Digital or Paper Comic Strip

Theme/Topic: Floods / Language Arts · ICT

STEAME Domains: Arts · Technology · Science

Learning Objectives

- Learn and apply key flood safety rules
- Practice narrative writing and sequencing
- Use digital tools for creative expression

Methodology and Approach

Storytelling through comics (Story Telling approach). Students create a short comic strip showing what to do during a flood. Can be done on paper or using digital tools (e.g., Book Creator, Canva). Emphasises safe behaviour and emotional resilience.

Procedure

- Teacher presents a sample comic strip: characters caught in a flood, deciding what to do
- Class discussion: What should you do when there is a flood? (turn off electricity, go to high ground, stay indoors, stay calm)
- Students plan their own 4-panel comic: Panel 1 — rain starts; Panel 2 — flood warning; Panel 3 — what the character does; Panel 4 — safe outcome
- Draw or use digital tool (Book Creator / Canva) to create comic
- Write speech bubbles and captions
- Share with the class and explain character choices

Learning Outcomes

- Identify at least 3 correct actions to take during a flood
- Create a sequential narrative showing cause → response → outcome
- Use speech bubbles to express characters' thoughts and decisions

Materials, Resources and Tools

Comic strip template (paper) or Book Creator / Canva (digital); pencils, coloured markers; list of flood safety rules for reference

Supplementary worksheet: Worksheet 8 (Annex I) – Flood Safety: Before, During, After

Activity 7 | Grades 1–3 (Ages 6–9)

Title: "Rescue Mission!" – Flood Role-Play Game

Theme/Topic: Floods / Social Skills

STEAME Domains: Arts · Science · Social Studies

Learning Objectives

- Simulate emergency response in a cooperative, playful setting
- Understand the role of rescue teams and community helpers
- Practice decision-making and problem-solving under time pressure

Methodology and Approach

Cooperative role play (game-based learning). Students take on rescue team roles and navigate a simulated flooded map. The teacher sets the scenario and guides reflection after each round. Emphasises collaboration, empathy, and community resilience.

Procedure

- Set up a "flood map" on the floor using cushions, ropes, and cardboard (safe islands, flooded zones, road closures)
- Scatter toy figures or laminated picture cards (people, animals, emergency supplies) around the map
- Assign roles: rescue team leader, boat pilot, medical helper, communications officer
- Teacher announces: "The river has flooded! We have 5 minutes to reach and rescue everyone!"
- Groups cooperate to navigate the map, reach survivors, and return to the safe zone
- Debrief: "What was difficult? How did you decide who to save first? What would real rescuers do?"

Learning Outcomes

- Describe the role of emergency services in disaster response
- Practice cooperative decision-making under simulated pressure
- Develop empathy for people and communities affected by floods

Materials, Resources and Tools

Cushions, rope, cardboard pieces; toy figures or laminated picture cards; optional: "Rescue Team Flood" digital game (y8.com) for ICT extension

Activity 8 | Grades 1–3 (Ages 6–9)

Title: "Weather Observers" – Daily Weather Recording

Theme/Topic: Weather / Climate · Floods

STEAME Domains: Science · Math · Technology

Learning Objectives

- Record daily weather observations systematically
- Understand the connection between heavy rainfall and flooding risk
- Create and interpret simple graphs from collected data

Methodology and Approach

Inquiry-based scientific observation sustained over time. Students keep a weather journal, compare measurements, and make connections between rainfall intensity and flood risk. Cross-curricular link to mathematics (graphs and data).

Procedure

- Each morning, students observe the weather and record: temperature (hot/warm/cold), sky (sunny/cloudy/rainy), wind strength (still/breezy/strong)
- Optional: build a simple rain gauge from a plastic bottle and measure rainfall after rain events
- After two weeks, create a simple bar chart of rainy vs. non-rainy days
- Teacher introduces colour-coded weather warnings (green/yellow/orange/red) and discusses what each means for flood risk
- Students write a short "weather report" at the end of the week and share with the class
- Discussion: "On which days might flooding be most likely? Why?"

Learning Outcomes

- Record observations consistently using a structured format
- Construct a simple bar chart from weather data
- Explain the link between heavy or prolonged rain and flood risk
- Interpret colour-coded weather warnings

Materials, Resources and Tools

Weather journal template, thermometer (classroom), optional rain gauge (DIY plastic bottle); graph paper or digital chart tool

Supplementary worksheet: Worksheet 5 (Annex I) – The Water Cycle

Activity 9 | Grades 1–3 (Ages 6–9)

Title: "Build a Waterproof House" – Engineering Design Challenge

Theme/Topic: Floods / Structural Engineering

STEAME Domains: Science · Engineering · Math · Arts

Learning Objectives

- Understand why building materials and construction methods matter for flood resilience
- Apply creative design and engineering thinking
- Test and improve physical construction

Methodology and Approach

Design Challenge (Engineering Design Process). Students are given limited materials and must build a house that stays dry when "rained on". Groups test, observe, and iterate. Encourages creativity, critical thinking, and teamwork.

Procedure

- Challenge brief: "Design and build a small house that keeps dry when it rains!"
- Available materials: cardboard, straws, aluminium foil, plasticine, toothpicks
- Groups sketch their design and choose materials, justifying choices
- Build the house and place it on a flat surface
- "Rain" on the house using a spray bottle — observe which parts get wet
- Redesign and rebuild: students improve weak spots using different materials
- Final test and reflection: "What material worked best as a roof? Why?"

Learning Outcomes

- Identify which materials are waterproof vs. absorbent
- Explain how roof slope, material choice, and structure affect water resistance
- Iterate and improve a design based on test results

Materials, Resources and Tools

Cardboard, straws, aluminium foil, plasticine, toothpicks, tape; spray bottle with water; design sketch worksheet

Activity 10 | Grades 1–3 (Ages 6–9)

Title: "Flood Safety Poster" – Infographic Design

Theme/Topic: Floods / Public Safety

STEAME Domains: Arts · Technology · Science

Learning Objectives

- Summarise key flood safety rules in visual format
- Organise and present information clearly and creatively
- Develop media literacy and communication skills

Methodology and Approach

Creative production activity (Arts integration). Groups brainstorm flood safety rules, categorise them (Do / Don't Do), then design an A3 poster or infographic. Encourages classification, visual communication, and peer teaching.

Procedure

- Class brainstorm: "What should we DO and NOT DO in a flood?" — write all ideas on sticky notes
- Group and classify ideas on the board: Safety actions / Dangerous actions / Preparing before a flood
- Groups select the most important rules and design an A3 poster with drawings and text
- Headings: "Stay Safe in a Flood — DOs and DON'Ts"
- Optional: use Canva (digital) to create an infographic
- Display posters in school corridors and present to another class

Learning Outcomes

- Correctly list at least 5 flood safety rules
- Categorise actions as safe / unsafe during a flood
- Design a clear, audience-appropriate visual communication piece

Materials, Resources and Tools

A3 paper, coloured pencils and markers, sticky notes; optional: Canva (digital); reference list of flood safety rules

Supplementary worksheet: Worksheet 8 (Annex I) – Flood Safety: Before, During, After

Activity 11 | Grades 1–3 (Ages 6–9)

Title: "Earthquake Stories" – What Would We Do?

Theme/Topic: Earthquakes / Personal Safety

STEAME Domains: Arts · Social Studies · Science

Learning Objectives

- Become familiar with basic earthquake response rules (Drop, Cover, Hold On)
- Develop narrative writing skills connected to real-life scenarios
- Build emotional resilience through story-based exploration

Methodology and Approach

Storytelling approach. Students listen to a short fictional story set during an earthquake, then create their own continuation or parallel story. Teacher guides discussion on feelings, safety choices, and community support.

Procedure

- Teacher reads a short illustrated story where a family experiences a small earthquake
- Discussion: "How did the characters feel? What did they do? Did they follow the right steps?"
- Introduce "Drop, Cover, Hold On" as the universal earthquake safety response
- Students create their own short story (or draw a 4-panel comic): "An Earthquake Came!"
- Story must show: the shaking starts / character uses Drop-Cover-Hold On / character goes to the meeting point / family is reunited
- Share stories in small groups — discuss what they would really do in their home or school

Learning Outcomes

- Recall and demonstrate "Drop, Cover, Hold On" procedure
- Identify a safe meeting point and explain why it matters
- Write or draw a narrative sequence showing correct earthquake response

Materials, Resources and Tools

Illustrated story book or teacher-written story; comic template or drawing paper; coloured pencils
Supplementary worksheet: Worksheet 4 (Annex I) – Earthquake Hazards

Activity 12 | Grades 1–3 (Ages 6–9)

Title: "Drop, Cover, Hold On!" – Earthquake Evacuation Drill

Theme/Topic: Earthquakes / Emergency Response

STEAME Domains: Social Studies · Science · Physical Education

Learning Objectives

- Practice the correct physical response to an earthquake warning
- Learn and follow the school evacuation route
- Build confidence and reduce panic in simulated emergency situations

Methodology and Approach

Simulation-based experiential learning. The class practices the drill procedure in stages: first in the classroom, then the full school route. Reflection and discussion follow to consolidate understanding.

Procedure

- Classroom preparation: teacher explains the drill steps (signal → Drop under desk → Cover head and neck → Hold On until shaking stops → wait for second signal → walk calmly to exit)

- b. Practice run in classroom: sound the signal, students perform Drop-Cover-Hold On
- c. Full school drill: walk (not run) to the designated assembly point, staying in line
- d. At the assembly point: roll call, questions, and reflection ("Why walk? Why not run? What do we do if we are in the corridor?")
- e. Classroom follow-up: students draw and label the evacuation route
- f. Optional: each student makes a small family emergency card to take home

Learning Outcomes

- a. Demonstrate "Drop, Cover, Hold On" correctly without prompting
- b. Walk calmly to the evacuation assembly point
- c. Explain the reasons behind each step of the drill procedure

Materials, Resources and Tools

School emergency plan and evacuation map; signal (bell/alarm); student route-drawing worksheet; optional: family emergency card template

Supplementary worksheet: Worksheet 4 (Annex I) – Earthquake Hazards

Activity 13 | Grades 1–3 (Ages 6–9)

Title: "The Fire Triangle" – Fire Discovery Experiment

Theme/Topic: Wildfires / Fire Science

STEAME Domains: Science · Math · Arts

Learning Objectives

- a. Understand the three elements needed for fire: fuel, oxygen, heat
- b. Identify how removing one element extinguishes fire
- c. Connect the fire triangle to wildfire prevention strategies

Methodology and Approach

Guided experiment and concept mapping. Students discover the fire triangle through simple demonstrations and a hands-on activity. Teacher uses questioning to guide inductive reasoning from observation to principle.

Procedure

- a. Teacher demonstration (safety-supervised): light a small candle in a glass jar — students observe it goes out when covered
- b. Discussion: "Why did the flame go out? What was missing?"
- c. Introduce the "Fire Triangle" diagram: Fuel (dry materials) + Oxygen (air) + Heat (source of ignition)
- d. Students complete a fire triangle worksheet: label each side and give real-world examples
- e. Group activity: "Which wildfire conditions are most dangerous?" — match weather cards (hot, dry, windy) to fire risk level (low / medium / high)
- f. Drawing activity: students draw a wildfire scenario and label the three fire triangle elements present

Learning Outcomes

- a. Name the three elements of the fire triangle
- b. Explain why hot, dry, and windy conditions increase wildfire risk
- c. Identify one way to prevent wildfire for each triangle element (reducing fuel, blocking oxygen, avoiding ignition)

Materials, Resources and Tools

Candle and glass jar (teacher demonstration), fire triangle worksheet, weather cards, drawing paper; fire safety reference poster

Supplementary worksheet: Worksheet 1 (Annex I) – Fire Experiment Observation; Worksheet 2 – The Secrets of Fire

Activity 14 | Grades 1–3 (Ages 6–9)

Title: "Forest Fire Safety Rules" – Drawing and Writing Activity

Theme/Topic: Wildfires / Public Safety

STEAME Domains: Arts · Science · Language Arts

Learning Objectives

- Identify safe and unsafe behaviours that affect wildfire risk
- Communicate safety rules clearly through visual art and writing
- Develop awareness of human responsibility in wildfire prevention

Methodology and Approach

Creative arts integration combined with discussion and critical thinking. Students hear a short scenario about a wildfire and then work to create a safety guide. Encourages reflection on human-caused and natural causes of wildfires.

Procedure

- Teacher reads a short news-style story: "A wildfire broke out near a village on a hot summer day..."
- Class discussion: "What might have caused it? What could people have done to prevent it?"
- Introduce main prevention rules: do not light fires in dry areas; do not throw cigarettes; do not light BBQs near vegetation; call 112 if you see smoke; do not use machinery near dry grass on hot days
- Students choose 3 rules and illustrate each with a drawing and a sentence
- Display illustrations as a classroom "Fire Safety Guide"
- Roleplay extension: students explain their rule to a partner as if they were a safety officer

Learning Outcomes

- List at least 3 human behaviours that can cause or prevent wildfires
- Create a clear visual and written safety rule
- Explain why careless behaviour near vegetation in summer is dangerous

Materials, Resources and Tools

Illustrated news story, drawing paper, coloured pencils; list of wildfire prevention rules for reference
Supplementary worksheet: Worksheet 1 (Annex I) – Fire Experiment Observation; Worksheet 2 – The Secrets of Fire

Activity 15 | Grades 1–3 (Ages 6–9)

Title: "Nature's Dangers" – Sorting and Classifying Hazards

Theme/Topic: Natural Hazards / General

STEAME Domains: Science · Math · Social Studies

Learning Objectives

- Identify different types of natural hazards (geological, hydro-meteorological, biological)
- Classify hazards by type and potential impact
- Develop scientific categorisation skills

Methodology and Approach

Cooperative classification activity (Inquiry-Based Learning). Groups receive a set of picture/word cards depicting different natural events and must classify them into categories. Discussion and justification of choices develop scientific reasoning.

Procedure

- Groups receive 15–20 cards showing: earthquake, flood, fire, hurricane, tsunamis, drought, landslide, hailstorm, volcanic eruption, extreme heat, pandemic, etc.

- b. Task 1: Sort cards into natural hazards vs. not a hazard
- c. Task 2: Group natural hazards by type — geological / water-related / weather-related / other
- d. Task 3: Rank the 3 most common hazards in your region — justify choices
- e. Each group shares their classification with the class and explains any disagreements
- f. Class discussion: "Which of these can people do something to prepare for? Which are hardest to predict?"

Learning Outcomes

- a. Name at least 5 different types of natural hazards
- b. Classify natural hazards into geological, hydrological, and meteorological categories
- c. Identify which hazards are most relevant to their local area

Materials, Resources and Tools

Picture/word cards of natural hazards (laminated for reuse); classification mat; class discussion board
 Supplementary worksheet: Worksheet 6 (Annex I) – Natural Disasters & Safety Measures

Activity 16 | Grades 1–3 (Ages 6–9)

Title: "Emergency Kit Treasure Hunt" – Maths & Preparedness Game

Theme/Topic: Emergency Preparedness

STEAME Domains: Math · Science · Social Studies

Learning Objectives

- a. Identify essential items in an emergency kit
- b. Practice maths skills (directions, counting, measuring) in a real-life context
- c. Develop cooperation and communication under playful "pressure"

Methodology and Approach

Game-based learning. Students follow mathematical clues (directions, distances, number sequences) to find hidden emergency kit items around the classroom or school. Combines maths skills with DRR knowledge in an active, engaging format.

Procedure

- a. Hide laminated picture cards of emergency kit items (torch, water bottle, first aid kit, whistle, food tins, warm blanket, radio, mobile phone charger, important documents)
- b. Each group receives a clue card with maths-based directions (e.g., "Walk 5 steps north, then 3 east", or "Find the item near the number that is 4×3 ")
- c. Groups follow clues to collect all their items
- d. Once all items are found: "Would you include all these items? What else would you add?"
- e. Discuss: "Why do we need a torch? What if the electricity goes off? How many days of food and water should an emergency kit have?"
- f. Each student takes home a mini emergency kit checklist for their family

Learning Outcomes

- a. List at least 6 essential items for an emergency kit
- b. Explain why each item is needed in a disaster situation
- c. Apply directional and numerical maths skills in a real-world context

Materials, Resources and Tools

Laminated emergency kit picture cards, clue cards with maths problems, student checklists; optional: compass or directional grid for navigation
 Supplementary worksheet: Worksheet 6 (Annex I) – Natural Disasters & Safety Measures

Activity 17 | Grades 1–3 (Ages 6–9)

Title: "Escape from the Flood!" – Physical Education Game

Theme/Topic: Floods / Physical Education

STEAME Domains: Science · Physical Education · Social Studies

Learning Objectives

- a. Practice quick, safe decision-making in a simulated emergency
- b. Distinguish between safe and unsafe actions/locations during a flood
- c. Develop physical coordination and spatial awareness

Methodology and Approach

Active game-based learning (PE context). Students play a dynamic game in the school yard that teaches flood safety decisions through movement. Fun and physical activity are used to embed safety knowledge in a memorable way.

Procedure

- a. Mark the school yard with zones: "safe islands" (raised areas), "flooded zones" (marked in blue), "danger items" (signs of wrong actions), "emergency supplies" (items to collect)
- b. Scatter laminated cards around the yard: some show correct actions, some incorrect
- c. Teacher calls "FLOOD!" — students must move to a safe island, avoiding flooded zones
- d. Students must also collect one "correct action" card on their way to safety
- e. Any student who steps in a flooded zone or picks up an incorrect action card explains the mistake and becomes a judge for the next round
- f. After 3 rounds: debrief in a circle — what were the most common mistakes? What are the real rules?

Learning Outcomes

- a. Identify at least 4 safe actions during a flood (reach high ground, avoid electricity, call for help, stay calm)
- b. Explain why specific actions are dangerous during flooding
- c. Develop fast, decisive physical responses in a simulated emergency

Materials, Resources and Tools

Chalk or cones to mark zones; laminated action cards (correct/incorrect flood behaviours); coloured bibs optional

Activity 18 | Grades 1–3 (Ages 6–9)

Title: "A Drop Travels" – Water Cycle Storytelling

Theme/Topic: Water Cycle / Floods

STEAME Domains: Science · Language Arts · Arts

Learning Objectives

- a. Understand the main stages of the water cycle (evaporation, condensation, precipitation)
- b. Connect the water cycle to flood formation
- c. Express scientific concepts through narrative and illustration

Methodology and Approach

Storytelling approach (ST). Teacher narrates a fantasy story about a water droplet's journey through the water cycle. Students then recreate the journey through drawing, drama, or writing. A kinaesthetic drama extension allows bodily enactment of the cycle.

Procedure

- a. Teacher narrates: "Once upon a time, a tiny water droplet called Stavi lived in the ocean. One hot summer day, the sun warmed the water and Stavi began to rise into the sky..."

- b. Students listen and visualise the journey: ocean → evaporation → cloud → precipitation → river → sea
- c. Each student draws the full water cycle as a circular diagram with arrows and labels
- d. Drama extension: students physically enact the cycle (group evaporates upward, condenses into a cloud huddle, falls as rain, flows as a river)
- e. Writing extension: students write a continuation of Stavi's story, adding a flood episode and how Stavi eventually returns to the sea
- f. Share and display: water cycle diagrams and stories posted in classroom

Learning Outcomes

- a. Label the four main stages of the water cycle (evaporation, condensation, precipitation, collection)
- b. Explain how the water cycle is connected to rainfall and flooding
- c. Narrate a creative story incorporating accurate scientific information

Materials, Resources and Tools

Illustrated story by teacher; drawing paper, pencils; optional music for the drama extension; "water cycle" diagram template for labelling

Supplementary worksheet: Worksheet 5 (Annex I) – The Water Cycle

Activity 19 | Grades 1–3 (Ages 6–9)

Title: "Rescue Team Flood!" – ICT & Digital Game

Theme/Topic: Floods / Digital Literacy

STEAME Domains: Technology · Social Studies · Science

Learning Objectives

- a. Develop basic digital literacy skills (mouse control, navigation)
- b. Apply flood safety knowledge in an interactive digital context
- c. Understand the role of rescue teams during flood disasters

Methodology and Approach

Game-based learning (digital). Students use the online game "Rescue Team Flood" (y8.com) on classroom computers or tablets. The game provides immediate feedback on correct/incorrect decisions. Teacher facilitates pre- and post-game discussion.

Procedure

- a. Teacher introduces the game scenario: "You are part of a flood rescue team. You must equip your team correctly and navigate floodwaters to save survivors and a puppy!"
- b. Students play the game in pairs (taking turns with mouse control)
- c. Pre-game: students predict what equipment a rescue team would need
- d. During play: teacher circulates and asks "Why did you choose that item?" and "What is the most important thing to do first?"
- e. Post-game discussion: "What did the game teach us? What would real rescue teams do differently?"
- f. Students draw or write: "The 3 things I learned about flood rescue"

Learning Outcomes

- a. Navigate a simple online game using basic mouse/touchscreen skills
- b. Identify correct safety equipment and actions for flood rescue
- c. Reflect on the difference between digital simulation and real emergency response

Materials, Resources and Tools

Computers or tablets (one per pair); internet access; "Rescue Team Flood" game at y8.com; reflection worksheet

Activity 20 | Grades 1–3 (Ages 6–9)

Title: "Before and After the Flood" – Drawing and Retelling

Theme/Topic: Floods / Language Arts · Social Studies

STEAME Domains: Arts · Language Arts · Social Studies

Learning Objectives

- a. Describe the impacts of flooding on communities and environments
- b. Develop vocabulary for before/during/after disaster scenarios
- c. Practice descriptive writing and visual representation skills

Methodology and Approach

Arts integration combined with discussion of real news images. Students first analyse news photographs or news stories about flood events, then produce a two-part artwork with written captions. Builds empathy and environmental awareness.

Procedure

- a. Teacher displays news photographs: a neighbourhood before and after a flood event
- b. Guided observation: "What do you notice? What has changed? How might people feel?"
- c. Vocabulary building: damage, rescue, recovery, community, rebuild, resilience
- d. Each student folds an A3 sheet in half: left side = "Before the flood", right side = "After the flood"
- e. Students draw both scenes in detail, then add 3 written captions per panel
- f. Share artwork and captions in small groups
- g. Class discussion: "How do communities recover? How can people help each other after a flood?"

Learning Outcomes

- a. Use descriptive vocabulary to explain the before/during/after stages of a flood
- b. Express empathy for flood-affected communities through art and writing
- c. Identify ways communities can support recovery (volunteers, donations, rebuilding)

Materials, Resources and Tools

News photos of flood events (printed or projected); A3 drawing paper; coloured pencils; vocabulary word bank

Supplementary worksheet: Worksheet 8 (Annex I) – Flood Safety: Before, During, After

4.2 Activities for Grades 4-6 (Ages 9-12)

These activities are designed for older elementary students (Grades 4–6). They involve higher-order thinking, real data analysis, digital tools, extended inquiry projects, and civic engagement. Students work with authentic data sources, digital simulations, AR tools, and community-facing projects. Activities are typically 45–60 minutes in duration, some extending over multiple days or weeks.

Activity 1 | Grades 4–6 (Ages 9–12)

Title: "Live Seismic Map Explorer" – Reading Real Earthquake Data

Theme/Topic: Earthquakes / Geography · Data Literacy

STEAME Domains: Science · Technology · Math · Engineering

Learning Objectives

- Use live online seismic maps to locate and describe recent earthquakes
- Read and interpret thematic map data (epicentre, magnitude, depth)
- Analyse patterns of seismic activity in the Mediterranean region

Methodology and Approach

Inquiry-based learning using real-time digital data (Context-Based Learning). Students access live seismic maps and extract actual data, developing digital literacy and scientific reasoning simultaneously. Authentic data engagement promotes critical thinking.

Procedure

- Teacher introduces the activity: "Scientists use digital maps every day to monitor earthquakes in real time. Today, you are junior seismologists!"
- Students navigate to seismo-live.gr or USGS earthquake map (earthquake.usgs.gov)
- Right-click on earthquake dots to view: date, magnitude, epicentre, focal depth
- Task: record data from 5 recent earthquakes in a table (location, magnitude, depth)
- Plot epicentres on a printed outline map of the Mediterranean using colour-coded dots (green: $M < 3.5$, orange: $3.5 - 5$, red: $M \geq 5$)
- Construct a legend for the map
- Discussion: "Which region had the most earthquakes? Which were strongest? What pattern do you notice?"

Learning Outcomes

- Read and record earthquake data from live online maps
- Explain the terms: epicentre, focal depth, magnitude
- Identify seismic-risk zones on a map and justify reasoning with data
- Construct a thematic map with a proper legend

Materials, Resources and Tools

Computers/tablets; seismo-live.gr or USGS earthquake map; printed outline map; coloured pens; data recording table

Supplementary worksheet: Worksheet 3 (Annex I) – Recording Earthquakes

Activity 2 | Grades 4–6 (Ages 9–12)

Title: "Earthquake Data Analysis" – Spreadsheet Graphing

Theme/Topic: Earthquakes / Data Analysis

STEAME Domains: Science · Technology · Math

Learning Objectives

- Download and organise earthquake data in a spreadsheet
- Create and interpret bar charts and scatter plots
- Draw conclusions about seismic activity patterns from quantitative data

Methodology and Approach

Data-driven inquiry using spreadsheet tools (Excel or Google Sheets). Students move from raw downloaded data to meaningful visualisations, applying mathematical skills in a scientific context. Develops digital literacy, data handling, and analytical reasoning.

Procedure

- Students download a CSV file of recent earthquakes from the USGS search tool
- Open in Excel / Google Sheets — explore columns: date, magnitude, depth, location
- Sort data by magnitude (largest first) and identify top 5 most powerful events
- Create a bar chart: X-axis = earthquake location / Y-axis = magnitude
- Create a scatter plot: X-axis = focal depth / Y-axis = magnitude — look for any pattern
- Write a 3-sentence summary: "Our data shows...", "The most seismically active region was...", "We noticed that..."
- Groups present their graph and key findings to the class

Learning Outcomes

- Navigate a data table and sort/filter information
- Create and label a bar chart and scatter plot correctly
- Interpret graphs to draw conclusions about seismic patterns
- Communicate findings clearly in a short data report

Materials, Resources and Tools

Computers; Excel or Google Sheets; earthquake CSV data from USGS; graphing guide handout
Supplementary worksheet: Worksheet 3 (Annex I) – Recording Earthquakes

Activity 3 | Grades 4–6 (Ages 9–12)

Title: "The Earthquake Came Suddenly" – Creative Writing after VR

Theme/Topic: Earthquakes / Language Arts · ICT

STEAME Domains: Technology · Arts · Language Arts

Learning Objectives

- Experience an earthquake scenario empathetically through VR or video
- Translate an immersive experience into descriptive narrative writing
- Apply knowledge of correct earthquake response procedures in a story

Methodology and Approach

Storytelling preceded by an immersive digital experience. Students first watch a 360° earthquake VR video or simulation, then process the experience through reflective discussion and creative writing. Combines emotional engagement with knowledge application.

Procedure

- Students watch a VR earthquake experience (YouTube 360° flood/earthquake videos, or VR headsets if available)
- Immediate reactions: "How did you feel? What did you see? What sounds were there?"
- Write a first-person narrative: "The Earthquake Came Suddenly" — from the perspective of a child at school during an earthquake
- Story must include: description of the shaking; correct response (Drop, Cover, Hold On); emotional experience; evacuation to the meeting point; reunion with family
- Peer review: partner checks if all safety steps are shown correctly in the story
- Share 2–3 stories with the class and discuss how stories communicate feelings and knowledge

Learning Outcomes

- Write a structured narrative with correct DRR content (safety procedures)
- Use sensory and emotional language effectively
- Demonstrate understanding of correct earthquake response through narrative

Materials, Resources and Tools

VR headsets or YouTube 360° earthquake videos; writing paper or word processor; peer review checklist
Supplementary worksheet: Worksheet 4 (Annex I) – Earthquake Hazards

Activity 4 | Grades 4–6 (Ages 9–12)

Title: "Tectonic Plates in Motion" – PhET Simulation Activity

Theme/Topic: Earthquakes / Geology

STEAME Domains: Science · Technology · Engineering

Learning Objectives

- Understand how tectonic plate movement causes earthquakes and volcanic activity
- Investigate divergent, convergent, and transform plate boundaries
- Connect plate tectonics to real geographical hazard zones

Methodology and Approach

Digital simulation using PhET Interactive Simulations (Colorado University). Students control plate movement variables and observe resulting geological events. Inquiry-based exploration is followed by targeted analysis questions.

Procedure

- Teacher introduces tectonic plates: structure of the Earth, lithosphere, 7 major plates
- Students open PhET plate tectonics simulation: phet.colorado.edu/plate-tectonics
- Explore divergent boundaries: what happens when plates pull apart? (ocean ridge, rift valley)
- Explore convergent boundaries: what happens when plates collide? (mountain formation, subduction zone, earthquake, tsunami)
- Explore transform boundaries: what happens when plates slide sideways? (earthquake fault lines)
- Students complete a three-column table: Boundary Type / Movement / What Happens (earthquakes? volcanoes?)
- Final challenge: overlay findings on a world map — do earthquake zones match plate boundaries?

Learning Outcomes

- Explain why tectonic plate movements cause earthquakes
- Describe and distinguish the three types of plate boundaries
- Use evidence from simulation to explain why certain regions are earthquake-prone

Materials, Resources and Tools

Computers/tablets; phet.colorado.edu/plate-tectonics; world map outline; three-column analysis worksheet

Activity 5 | Grades 4–6 (Ages 9–12)

Title: "Seismograph & Seismic Waves" – AR with Merge Cube

Theme/Topic: Earthquakes / Physics · Technology

STEAME Domains: Science · Technology · Engineering · Arts

Learning Objectives

- Understand how a seismograph records seismic waves
- Distinguish between P-waves (body waves) and S-waves (surface waves)
- Use AR technology to visualise 3D geological structures

Methodology and Approach

Augmented Reality (AR) exploration using Merge EDU Cube. Students examine 3D models of a seismograph and seismic wave propagation. AR engagement is followed by interpretation of real seismogram recordings. Develops spatial thinking and technology literacy.

Procedure

- Teacher introduces the Merge Cube app and demonstrates scanning the cube to access 3D content
- Students explore the 3D seismograph model: identify drum, pen, spring mechanism, base
- Explore the seismic wave simulation: observe P-waves (compressional) vs. surface waves
- Introduction to online oscilloscope: students observe wave patterns at academo.org/virtual-oscilloscope
- Provide a real seismogram reading — students identify: quiet baseline / P-wave arrival / stronger surface waves / peak amplitude
- Drawing activity: students sketch a seismogram and label key features
- Discussion: "How does a seismologist use a seismogram to locate an earthquake's epicentre?"

Learning Outcomes

- Describe how a seismograph detects and records ground motion
- Distinguish P-waves and surface waves on a seismogram
- Use AR technology confidently to examine scientific models

Materials, Resources and Tools

Merge Cube (physical) + Merge EDU app; tablets; academo.org oscilloscope; printed seismogram; labelling worksheet

Activity 6 | Grades 4–6 (Ages 9–12)

Title: "Earthquake Magnitude" – Maths and the Richter Scale

Theme/Topic: Earthquakes / Mathematics

STEAME Domains: Science · Math · Technology

Learning Objectives

- Understand what earthquake magnitude measures and how it is scaled
- Apply mathematical comparisons to real seismic data
- Practice interpreting numerical data in a scientific context

Methodology and Approach

Cross-curricular maths integration. Students use real earthquake magnitude data in mathematical calculations and comparison tasks. The logarithmic nature of the Richter scale is explored descriptively (no logarithms required at this level).

Procedure

- Introduction: what does a magnitude 4 earthquake feel like vs. magnitude 6? Show a descriptive scale chart
- Students receive a table of 10 real historical earthquakes with magnitudes and locations

- c. Maths tasks: order earthquakes from weakest to strongest; calculate the difference in magnitude between pairs; find the mean magnitude of the dataset
- d. Research extension: use the internet to find the 5 strongest earthquakes ever recorded — create a timeline or bar chart
- e. Discussion: "Greece ranks 6th in the world for seismic activity. What does this mean for our buildings, our schools, our cities?"
- f. Students write a short explanation: "Why are building codes important in earthquake-prone countries?"

Learning Outcomes

- a. Order earthquake events by magnitude and interpret the scale
- b. Calculate mean, range, and differences from a numerical dataset
- c. Explain why building regulations matter in high-seismicity regions

Materials, Resources and Tools

Historical earthquake data table; calculators; graph paper or Excel; internet access for research extension

Activity 7 | Grades 4–6 (Ages 9–12)

Title: "Flood Risk Mapping" – Digital Thematic Maps

Theme/Topic: Floods / Geography · Data Literacy

STEAME Domains: Science · Technology · Math · Engineering

Learning Objectives

- a. Read and interpret flood risk zones on digital maps
- b. Connect geographical features (rivers, topography) to flood vulnerability
- c. Evaluate real historical flood data spatially

Methodology and Approach

Thematic map analysis using online geographic information systems (GIS-lite tools). Students access European and national flood mapping portals to examine real flood risk data, developing spatial literacy and evidence-based reasoning.

Procedure

- a. Teacher introduces the European Floods Viewer (discomap.eea.europa.eu/floodsvviewer)
- b. Students search for their local region and identify flood risk zones (coloured polygons)
- c. Task 1: Identify areas at high / medium / low flood risk in their region
- d. Task 2: Navigate to the Greek historic flood map (mapsportal.yopen.gr) — identify areas with historic flood events
- e. Task 3: Compare: Do the historic flood areas match the current risk zones?
- f. Students annotate a printed map of their region with flood-risk findings
- g. Discussion: "What could a city planner do with this information? How should it affect where we build schools and hospitals?"

Learning Outcomes

- a. Read and interpret flood risk zones on a digital thematic map
- b. Compare historic flood event data with current flood risk mapping
- c. Apply spatial analysis to make evidence-based urban planning recommendations

Materials, Resources and Tools

Computers/tablets; discomap.eea.europa.eu; mapsportal.yopen.gr; printed regional map; annotation pens
Supplementary worksheet: Worksheet 9 (Annex I) – Rainfall and Flood Risk Data

Activity 8 | Grades 4–6 (Ages 9–12)

Title: "Flood Variables" – Scientific Inquiry Experiment

Theme/Topic: Floods / Scientific Method

STEAME Domains: Science · Math · Engineering

Learning Objectives

- Design and conduct a controlled experiment to test one variable affecting flooding
- Apply the scientific method: hypothesis → method → result → conclusion
- Connect experimental findings to real-world flood management

Methodology and Approach

Full scientific inquiry cycle. Each group selects one variable (soil type, slope angle, vegetation cover, rainfall intensity) and investigates its effect on runoff and flood formation. Results are compared across groups.

Develops rigorous scientific thinking.

Procedure

- Teacher presents 4 variable options: (A) slope — flat vs. steep terrain; (B) ground cover — bare soil vs. grass vs. pebbles; (C) rainfall rate-slow drizzle vs. heavy downpour; (D) drainage channels — present vs. blocked
- Each group selects one variable and writes a hypothesis: "We think that if [variable] increases, then [outcome] because..."
- Groups set up trays with soil, measure rainfall input and runoff output
- Conduct the experiment and record results in a table
- Groups rotate to share findings — create a class summary board
- Final discussion: "Which factors most increased flooding? How are these replicated in real cities? (e.g., sealed surfaces, deforestation, blocked drains)"

Learning Outcomes

- Write a clear scientific hypothesis and method
- Record experimental results accurately in a table
- Compare results across groups and draw evidence-based conclusions
- Connect experimental variables to real-world flood causes

Materials, Resources and Tools

Trays, soil, sand, gravel, artificial grass/turf, watering cans or bottles, rulers, measuring cups; observation worksheets

Supplementary worksheet: Worksheet 7 (Annex I) – The Flood Experiment

Activity 9 | Grades 4–6 (Ages 9–12)

Title: "Our School's Flood Risk Map" – Community Mapping Project

Theme/Topic: Floods / Geography · Civic Education

STEAME Domains: Science · Math · Engineering · Social Studies

Learning Objectives

- Survey the school grounds and immediate surroundings for flood vulnerability
- Identify physical features that increase or decrease flood risk (drains, slopes, sealed surfaces)
- Produce a risk-annotated map and write an action report for school management

Methodology and Approach

Project-based learning with authentic community action outcomes. Students conduct a real field survey, analyse their findings, and produce a report that could genuinely inform school safety planning. Connects DRR education directly to lived experience.

Procedure

- Introduction: "A risk survey helps us understand where our school might be at risk from flooding. We are going to do a real one!"
- Groups are assigned different zones: school building, car park, sports court, garden, entrance road
- Field survey checklist: drain condition (clear/blocked), surface type (soil/tarmac/concrete), slope direction, any signs of previous water pooling
- Return to classroom: compile findings on a large school map using coloured stickers (green = low risk, amber = medium, red = high risk)
- Write 3 recommendations for the school management (e.g., "Clear the drains near the back entrance")
- Present the risk map to the teacher or headteacher as a real community action

Learning Outcomes

- Conduct a structured field survey using a prepared checklist
- Annotate a map with evidence-based flood risk assessments
- Formulate realistic, practical recommendations based on findings

Materials, Resources and Tools

School map (printed large), field survey checklist, coloured stickers/markers, clipboards; camera or phone for photos

Supplementary worksheet: Worksheet 9 (Annex I) – Rainfall and Flood Risk Data

Activity 10 | Grades 4–6 (Ages 9–12)

Title: "Flood Preparedness Plan" – Class Emergency Action Plan

Theme/Topic: Floods / Civic Education · Social Studies

STEAME Domains: Science · Social Studies · Language Arts

Learning Objectives

- Develop a comprehensive class emergency plan for a flood scenario
- Apply structured problem-solving to a real preparedness challenge
- Practise collaborative decision-making and written communication

Methodology and Approach

Problem-solving and collaborative planning (PSL — Problem-Solving Learning). Groups are given a realistic flood scenario and must produce a formal written plan. The planning process develops critical thinking, negotiation, and civic responsibility.

Procedure

- Scenario: "Heavy rain is forecast for the next 3 days. Your school is near a river that has flooded before. You are the class emergency committee. Prepare an action plan."
- Groups work on different sections: Before (preparation checklist), During (in-school procedures), After (recovery and checking in on community)
- Each section must include: Who is responsible? What needs to be done? What resources are needed?
- Groups combine sections into a single class Flood Emergency Action Plan
- Present and review the plan: Does anything contradict? Is anything missing?
- Compare with the school's actual emergency plan (if available) — discuss similarities and differences

Learning Outcomes

- a. Produce a structured, realistic emergency action plan with clear responsibilities
- b. Distinguish between pre-disaster, during-disaster, and post-disaster phases
- c. Evaluate and improve a plan through constructive peer review

Materials, Resources and Tools

Planning templates (Before/During/After), scenario card, large paper for combined plan; optional: real school emergency plan for comparison

Supplementary worksheet: Worksheet 6 (Annex I) – Natural Disasters & Safety Measures; Worksheet 8 – Flood Safety: Before, During, After

Activity 11 | Grades 4–6 (Ages 9–12)

Title: "Rain Gauge Project" – Data Collection and Analysis

Theme/Topic: Weather / Floods · Mathematics

STEAME Domains: Science · Math · Technology · Engineering

Learning Objectives

- a. Design and build a functional rain gauge from recycled materials
- b. Record precipitation data over an extended period
- c. Analyse collected data and connect rainfall patterns to flood risk

Methodology and Approach

Extended scientific inquiry project combining construction (engineering), data collection (science), and data analysis (mathematics). Sustained engagement over two weeks develops patience, consistency, and long-term scientific habits.

Procedure

- a. Groups build a rain gauge from a 1.5L plastic bottle: cut top, invert and insert as funnel, add scale markings in mm using a ruler and permanent marker
- b. Place rain gauges in an exposed outdoor location (secured against wind)
- c. Each morning after any overnight rain: measure, record in group data table, reset to zero
- d. After 2 weeks: create a bar chart of daily rainfall, calculate total and mean daily rainfall
- e. Research: what is the threshold rainfall level that has historically caused flooding locally?
- f. Discussion: "If rainfall exceeded the threshold on day X, what should citizens have done to prepare?"

Learning Outcomes

- a. Build and calibrate a functional scientific instrument
- b. Collect and organise time-series data accurately
- c. Interpret trends and connect rainfall data to flood risk thresholds

Materials, Resources and Tools

Plastic bottles (1.5L), scissors, permanent markers, rulers, tape; data recording booklet; graph paper or spreadsheet

Supplementary worksheet: Worksheet 9 (Annex I) – Rainfall and Flood Risk Data

Activity 12 | Grades 4–6 (Ages 9–12)

Title: "The Minoan Civilization and Natural Disasters" – History + DRR

Theme/Topic: Earthquakes / Volcanoes · History

STEAME Domains: Science · Arts · Technology · Social Studies

Learning Objectives

- Analyse how the Thera volcanic eruption and associated tsunami affected Minoan civilisation
- Apply DRR concepts (vulnerability, exposure, resilience) to a historical case study
- Use digital tools (Sketchfab 3D, StoryboardThat) for creative historical exploration

Methodology and Approach

Context-Based Learning using history as the thematic context for DRR. Students become "digital archaeologists" examining the Palace of Knossos, then connect geographical vulnerability to the civilisation's decline. History and science are integrated through creative narrative production.

Procedure

- Teacher sets the scene: "We live in 1600 BC on the island of Crete. We hear rumbling from the volcano on the island of Thera..."
- Students explore a 3D virtual reconstruction of Knossos on Sketchfab — locate storage rooms, water channels, coastal exposure
- Complete a table: Knossos Location / Advantage / Disaster Risk (e.g., "Near the sea → Trade, BUT → Tsunami risk")
- Teacher-supervised experiment: "Volcano in a Box" (baking soda + vinegar) — students observe what would be destroyed first (crops, ships, houses)
- StoryboardThat activity: create a 4-panel comic — daily life / volcano erupts / tsunami arrives / family decides to flee
- Roleplay: "The Council of Knossos" — students argue whether to evacuate or stay and why

Learning Outcomes

- Explain how geographical location and geological events shaped the Minoan civilisation's risk
- Apply DRR concepts (vulnerability, exposure) to a historical case study
- Create a narrative (comic) that connects historical events to disaster response decisions

Materials, Resources and Tools

Computers; Sketchfab (Palace of Knossos 3D), StoryboardThat; baking soda and vinegar for experiment; analysis table; roleplay scenario cards

Activity 13 | Grades 4–6 (Ages 9–12)

Title: "Stop Disasters!" – Strategic Planning Digital Game

Theme/Topic: Natural Hazards / Urban Planning

STEAME Domains: Science · Technology · Math · Social Studies

Learning Objectives

- Simulate urban disaster risk reduction planning decisions
- Understand trade-offs between building costs and disaster resilience
- Develop strategic thinking and consequence-mapping skills

Methodology and Approach

Game-based learning (digital). Students use the UN-produced "Stop Disasters!" game to design communities that are resilient to floods, earthquakes, or wildfires. The game provides immediate feedback on the consequences of planning decisions.

Procedure

- Introduction: "You are a city planner. You have a limited budget and must build or upgrade buildings to protect your community from a natural disaster. Every decision has consequences!"
- Students choose their scenario: flood / earthquake / wildfire / hurricane
- Play the game (stopdisastersgame.org) individually or in pairs, making building and land-use decisions
- At the end of each round: record the score (lives saved, economic damage) in a results table
- Compare strategies between groups: "Who saved the most lives? What did they do differently?"
- Discussion: "Which decisions were hardest? What real-life urban planning challenges does this reflect?"
- Extension: students write a 1-paragraph "planning report" justifying their 3 key decisions

Learning Outcomes

- Identify at least 3 urban design strategies that reduce disaster risk
- Explain the concept of risk trade-off in planning decisions
- Compare and evaluate different risk reduction strategies using game data

Materials, Resources and Tools

Computers/tablets; stopdisastersgame.org; results recording table; planning report template

Activity 14 | Grades 4–6 (Ages 9–12)

Title: "Wildfire Risk Analysis" – Thematic Maps and Data

Theme/Topic: Wildfires / Geography · Climate

STEAME Domains: Science · Technology · Math · Geography

Learning Objectives

- Understand the conditions that create high wildfire risk (temperature, wind, humidity, vegetation)
- Analyse wildfire distribution maps and identify high-risk regions
- Connect climate change trends to increasing wildfire frequency

Methodology and Approach

Thematic map analysis combined with data interpretation. Students examine wildfire risk and occurrence data, connect environmental conditions to risk levels, and develop evidence-based spatial reasoning.

Procedure

- Teacher presents the "fire triangle" at landscape scale: dry vegetation (fuel) + low humidity + high temperatures and wind = extreme wildfire risk
- Students access climate data for their region: meteo.gr/climatic.cfm — find temperature and humidity data for July and August
- Map activity: examine a wildfire occurrence map — identify which regions are most affected
- Data table: students record mean July temperature and mean annual precipitation for 5 cities, then rank each city from highest to lowest wildfire risk (with justification)
- Discussion: "How has the number of wildfires in Greece changed over the past 20 years? What are the main causes?"
- Students write a short briefing note: "3 facts a firefighter should know about wildfire risk in [our region]"

Learning Outcomes

- Explain how climatic conditions create wildfire risk
- Rank regions by wildfire risk using quantitative data and justify the ranking
- Identify the role of climate change in increasing wildfire risk

Materials, Resources and Tools

Computers; meteo.gr; wildfire occurrence map (printed or digital); data table; briefing note template
Supplementary worksheet: Worksheet 1 (Annex I) – Fire Experiment Observation; Worksheet 2 – The Secrets of Fire

Activity 15 | Grades 4–6 (Ages 9–12)

Title: "Map Storytelling" – Natural Disasters Through ArcGIS Story Maps

Theme/Topic: Natural Hazards / Geography · ICT

STEAME Domains: Science · Technology · Arts · Math

Learning Objectives

- a. Explore professional map storytelling as a communication tool
- b. Analyse a disaster event (flood, earthquake) using spatial data and narrative
- c. Create or annotate a digital story map incorporating text, maps, and multimedia

Methodology and Approach

Digital storytelling using geographic information tools (ArcGIS Story Maps or Google Maps). Students examine a real disaster story map, then create their own version. Combines critical analysis of existing media with active production.

Procedure

- a. Teacher demonstrates an ArcGIS Story Map of a real flood event (link from esri.com/arcgis-blog)
- b. Analysis questions: "What story does this map tell? What data is shown? What is effective or unclear?"
- c. Students choose a real disaster event from recent history (local or international)
- d. Using a prepared template (printed maps + text boxes, or digital tool), students create a 3-slide story map: (1) Background: where and when; (2) What happened and why; (3) Impacts and response
- e. Each slide must include: a map, at least 3 data points, and a text explanation
- f. Share story maps and give 2 pieces of peer feedback using the "Star + Wish" format

Learning Outcomes

- a. Evaluate a professional disaster story map for clarity and content
- b. Create a structured story map integrating spatial data and narrative text
- c. Give and receive constructive feedback on peer work

Materials, Resources and Tools

Computers; ArcGIS Story Maps (public access) or Google Maps; printed map templates; peer feedback cards

Activity 16 | Grades 4–6 (Ages 9–12)

Title: "VR Immersive Experience" – Experiencing Natural Disasters Safely

Theme/Topic: Natural Hazards / Technology

STEAME Domains: Technology · Science · Arts · Language Arts

Learning Objectives

1. Experience a natural disaster scenario empathetically and safely through VR
2. Identify emotional responses and connect them to real preparedness motivation
3. Evaluate VR as an educational tool for DRR awareness

Methodology and Approach

Immersive VR experience (AR/VR tools) followed by structured reflection. Students use VR headsets or 360° YouTube videos to experience earthquake or flood scenarios. Post-experience activities process emotional responses and connect to factual DRR content.

Procedure

- a. Setup: VR headsets loaded with 360° earthquake or flood videos, or tablets/computers showing 360° YouTube videos
- b. Pre-experience briefing: "This is a simulation. You are safe. Notice what you see, hear, and feel."
- c. Students experience the 3–5 minute immersive video

- d. Immediate reflection in pairs: "What did you notice? What was most striking? How did you feel?"
- e. Class discussion: "How might real disaster survivors feel? What would you wish you had done to prepare?"
- f. Knowledge connection: teacher links emotional responses to the importance of preparedness, evacuation plans, and community resilience
- g. Written response: "3 things I will tell my family about disaster preparedness after today"

Learning Outcomes

- a. Describe a natural disaster scenario from a first-person empathetic perspective
- b. Explain how emotional preparedness complements physical preparedness
- c. Articulate the educational value and limitations of VR simulation

Materials, Resources and Tools

VR headsets (or tablets/computers); 360° natural disaster YouTube videos; reflection worksheet; family letter template

Activity 17 | Grades 4–6 (Ages 9–12)

Title: "Earth Structure 3D Explorer" – AR with Merge Cube

Theme/Topic: Earthquakes / Earth Science

STEAME Domains: Science · Technology · Arts

Learning Objectives

1. Explore the internal structure of the Earth in 3D
2. Identify each Earth layer and connect its properties to earthquake generation
3. Use AR technology as a scientific investigation tool

Methodology and Approach

Augmented Reality exploration (Merge EDU Cube). Students manipulate a 3D Earth model, examining and labelling layers. The AR context provides spatial understanding that 2D diagrams cannot achieve. Followed by a diagram-drawing consolidation task.

Procedure

- a. Students use Merge Cube + Merge EDU app to load the "Structure of the Earth" 3D model
- b. Rotate and zoom the cube to examine: crust, mantle (asthenosphere), outer core, inner core
- c. Use the World and Cube views to explore different visualisations of each layer
- d. Record in a table: Layer name / Approximate depth / Material / Solid or Liquid?
- e. Teacher explanation: how does mantle convection drive tectonic plate movement, which causes earthquakes?
- f. Students draw a cross-section diagram of the Earth from memory and label all layers
- g. Extension: access the "Tectonic Plate Movement" 3D model on Merge Cube and compare plate boundary types

Learning Outcomes

- a. Name and describe the layers of the Earth and their key properties
- b. Explain how the structure of the Earth contributes to earthquake occurrence
- c. Produce an accurate labelled cross-section diagram of the Earth

Materials, Resources and Tools

Merge Cube (physical) + Merge EDU app on tablets; Earth structure data table; drawing paper; labels/coloured pencils

Activity 18 | Grades 4–6 (Ages 9–12)

Title: "Riskland" – Board Game for Disaster Preparedness

Theme/Topic: Natural Hazards / Civic Education

STEAME Domains: Science · Social Studies · Math · Arts

Learning Objectives

1. Explore multiple natural hazard scenarios through cooperative game play
2. Apply risk reduction knowledge to in-game decisions
3. Reflect on how collective preparedness reduces community risk

Methodology and Approach

Game-based learning using the "Riskland" or "Let's Get Prepared!" board game. Groups play cooperatively, encountering natural hazard scenarios and making preparedness decisions. Post-game discussion connects game mechanics to real DRR strategies.

Procedure

- a. Groups of 4 receive a "Riskland" or equivalent DRR board game
- b. Teacher explains rules: players move around a board, landing on event squares (flood, earthquake, fire) and must decide how to respond using resource cards
- c. Play three rounds — track community "resilience score" after each round
- d. After each round: debrief question — "What decision made the biggest difference to your score? Why?"
- e. Final comparative discussion: "Which group had the highest resilience score? What were their strategies?"
- f. Class summary: "What are the 5 most effective preparedness strategies we identified from the game?"

Learning Outcomes

- a. Apply DRR knowledge to make evidence-based in-game decisions
- b. Compare strategies and evaluate which preparedness actions have greatest impact
- c. Transfer game-based insights to real-world community resilience concepts

Materials, Resources and Tools

"Riskland" DRR board game (or "Let's Get Prepared!"), available through UNDRR; score tracking sheet; discussion prompt cards

Supplementary worksheet: Worksheet 6 (Annex I) – Natural Disasters & Safety Measures

Activity 19 | Grades 4–6 (Ages 9–12)

Title: "DRR Infographic Campaign" – Digital Media Production

Theme/Topic: Natural Hazards / Communication

STEAME Domains: Technology · Arts · Language Arts · Social Studies

Learning Objectives

- a. Design a high-quality digital infographic communicating DRR information to a target audience
- b. Select and present data clearly and accurately
- c. Develop digital design skills and media literacy

Methodology and Approach

Creative media production project (Arts integration + Technology). Students act as a "DRR Communications Team" and produce a real infographic that could be shared with parents, the wider school community, or on social media. Authentic audience purpose motivates quality.

Procedure

- a. Brief: "You are the DRR Communications Team for your region. Design an infographic to raise awareness about [earthquake / flood / wildfire risk] among families in your area."

- b. Groups research key facts: 3 statistics about the hazard in their region; 3 preparation tips; 3 emergency response rules
- c. Design the infographic using Canva (free school access): choose layout, icons, colour scheme, and typography
- d. Each infographic must include: title, hazard overview, risk data visualisation, action checklist, and emergency contacts
- e. Groups present their infographics to another class or post in school corridors
- f. Peer evaluation using a rubric: clarity, accuracy, design quality, audience appropriateness

Learning Outcomes

- a. Produce a visually effective and factually accurate DRR infographic
- b. Justify design and content choices for a specific target audience
- c. Evaluate peers' work using structured criteria

Materials, Resources and Tools

Computers; Canva (free school access); DRR research sources (seismoi.gr, meteo.gr, civilprotection.gr); infographic rubric

Activity 20 | Grades 4–6 (Ages 9–12)

Title: "Citizen Science: Earthquake Monitoring Network"

Theme/Topic: Earthquakes / Science · Civic Action

STEAME Domains: Science · Technology · Math · Social Studies

Learning Objectives

- a. Participate in authentic citizen science data collection for earthquake monitoring
- b. Understand how distributed community reporting improves scientific data quality
- c. Analyse patterns in citizen-reported earthquake data over time

Methodology and Approach

Citizen science and data literacy project. Students register on a felt-earthquake reporting platform and contribute real observations. They also analyse aggregated citizen data to identify patterns. Connects classroom learning to real scientific practice and civic engagement.

Procedure

- a. Introduction to citizen science: "Scientists need data from everywhere. When ordinary people report what they feel during an earthquake, it helps researchers map intensity across a region."
- b. Teacher registers the class on a "Did You Feel It?" reporting system (USGS, EMSC, or seismoi.gr)
- c. Students learn what to record if they feel shaking: location, time, intensity, what they observed (rattling objects, cracks, movement of liquids)
- d. Analyse existing citizen report maps: "Where did people feel this earthquake most strongly? Does it match the epicentre?"
- e. Maths task: calculate the average intensity score reported from 3 different cities for a specific earthquake event
 - f. Reflection: "What makes citizen science valuable? What are its limitations?"

Learning Outcomes

- a. Describe the concept and value of citizen science in disaster monitoring
- b. Correctly fill in a seismic intensity report form
- c. Analyse citizen science data maps and draw conclusions about earthquake intensity distribution

Materials, Resources and Tools

Computers; USGS "Did You Feel It?" (earthquake.usgs.gov/data/dyfi) or EMSC portal; intensity map print-outs; data analysis worksheet

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ANNEX I

THEMATIC SUPPLEMENTARY MATERIAL

This annex provides thematic supplementary worksheets developed to accompany the sample activities. They cover the thematic units Natural Disasters, Earthquakes, Wildfires and Floods/the Water Cycle, and can be photocopied and used directly in the classroom, taking into account age-specific features of each group. Each worksheet begins on a new page so that it can be printed and distributed on its own.

The table below shows which sample activity each worksheet accompanies. The same correspondence is repeated under the title of every worksheet ("Linked activities") and in the Materials & Digital Tools section of the activities concerned, so that the sheet can be located from either direction. Worksheets may be used with more than one activity, and teachers are free to adapt them to the hazard profile and curriculum of their own school.

#	Worksheet	Grades 1–3 activities	Grades 4–6 activities
1	Fire Experiment Observation	G1–3: A13, A14	G4–6: A14
2	The Secrets of Fire	G1–3: A13, A14	G4–6: A14
3	Recording Earthquakes	—	G4–6: A1, A2, A20
4	Earthquake Hazards	G1–3: A11, A12	G4–6: A3
5	The Water Cycle	G1–3: A1, A8, A18	—
6	Natural Disasters & Safety Measures	G1–3: A15, A16	G4–6: A10, A18
7	The Flood Experiment	G1–3: A1, A2, A4	G4–6: A8
8	Flood Safety: Before, During, After	G1–3: A6, A10, A20	G4–6: A10
9	Rainfall and Flood Risk Data	—	G4–6: A7, A9, A11

A = Activity; G1–3 = Grades 1–3 (Section 4.1); G4–6 = Grades 4–6 (Section 4.2). Every worksheet in this annex corresponds to at least one sample activity.

Worksheets

Worksheet 1 – Fire Experiment Observation

Group observation worksheet. Students record the results of experiments exploring which factors affect the spread of fire (dry grass, moisture, wind, soil/stones).

Linked activities: Grades 1–3: Activity 13 "The Fire Triangle" (experiment record sheet) · Activity 14 "Forest Fire Safety Rules". Grades 4–6: Activity 14 "Wildfire Risk Analysis" (as a prior-knowledge starter).

Worksheet 1: Fire experimentation

Group: _____

Fill in the table based on what you observed in the experiments.

Material / Condition	Does it help fire? (Yes / No)	Why?
Dry grass		
Moisture / Rain		
Strong wind		
Stones / Soil		

Worksheet 2 – The Secrets of Fire

Group worksheet exploring the "fire triangle", using classroom experiments (candle under a jar) to explain how a flame goes out, distinguishing natural from human causes of fire, and suggesting prevention ideas.

Linked activities: Grades 1–3: Activity 13 "The Fire Triangle" (consolidation after the candle-and-jar demonstration) · Activity 14 "Forest Fire Safety Rules". Grades 4–6: Activity 14 "Wildfire Risk Analysis".

Worksheet 2: The secrets of fire

Group: _____

Activity 1: The Fire Triangle

For a fire to start, 3 things are needed. Can you fill them in on the sides of the triangle?

(Hint: Think back to the jar experiment!)

1. F _ _ _ (e.g. wood, paper)
2. O _ _ _ _ (found in the air we breathe)
3. H _ _ _ (e.g. a spark, the sun, lightning)

Activity 2: What Did We See in the Experiment?

(Put an X next to the correct answer)

A) When we covered the candle with the jar, the flame went out because:

- ☐ The candle got tired.
- ☐ The oxygen inside the jar ran out.
- ☐ The jar was cold.
-

B) When the wind blows, a forest fire:

- ☐ Goes out immediately.
- ☐ Grows bigger and spreads faster.
- ☐ Is not affected.

Activity 3: I Become a "Nature Detective"

Which of the following are natural causes of a fire? (Put an X next to the correct answer)

- ☐ Lightning striking a tree.
- ☐ A person lighting a barbecue fire.
- ☐ Very strong sunlight on a broken piece of glass.

Activity 4: I Protect the Forest

Write one idea for how we can help prevent forests from burning in summer:

Worksheet 3 – Recording Earthquakes

Research activity using a digital source (seismos.gr). Students record the 10 most recent earthquakes in a table and make observations about their distribution.

Linked activities: Grades 4–6: Activity 1 “Live Seismic Map Explorer” (data-recording sheet) · Activity 2 “Earthquake Data Analysis” (source table for the spreadsheet) · Activity 20 “Citizen Science: Earthquake Monitoring Network”.

Activity: Earthquakes in Greece

Visit the website seismos.gr and record the 10 most recent earthquakes. What do you notice?

#	Date / Time	Location	Magnitude	Depth
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Observations: _____

Worksheet 4 – Earthquake Hazards

Observation and video worksheet. Students observe an image, watch a video and note what they should and should not do during an earthquake. Each group then creates a poster about one phase: before/during/after.

Linked activities: Grades 1–3: Activity 11 “Earthquake Stories – What Would We Do?” · Activity 12 “Drop, Cover, Hold On!” (the poster task follows the drill). Grades 4–6: Activity 3 “The Earthquake Came Suddenly”.

Worksheet – Earthquake Hazards

1. I look at and observe the image.

Is there anything dangerous in the picture in case of an earthquake? What do you notice?

2. We watch the video "Dangers in case of an earthquake" (Photodentro platform).

Write what you should DO and what you should NOT DO during an earthquake:

3. Create a poster! (Group activity)

After studying the safety posters from the Greek Earthquake Planning & Protection Organisation (OASP), each group creates its own poster:

Group A: What I do BEFORE the earthquake

Group B: What I do DURING the earthquake

Group C: What I do AFTER the earthquake

Worksheet 5 – The Water Cycle

Digital worksheet on the water cycle. Students watch two video lessons, complete a matching exercise online (Hotpotatoes), then self-correct using animated explanatory images.

Linked activities: Grades 1–3: Activity 18 “A Drop Travels – Water Cycle Storytelling” (digital consolidation) · Activity 8 “Weather Observers” · Activity 1 “The Big Rain and the Flood” (background on the water cycle).

Worksheet – The Water Cycle

Name: _____

1. Make sure everyone has an internet connection. Press CTRL + left-click on the links provided below. The first one, "The Water Cycle Explained!", is a video lesson explaining the natural phenomenon in detail. The second, "The Water Cycle", explains the phenomenon through an animated video. Please pay attention — learning starts now!
2. Press CTRL + left-click on the "Hotpotatoes Assessment Exercise" link. This is a matching/closed-type exercise for consolidating the phases of the water cycle. Share your thoughts with each other in the class forum.
3. Time to self-correct by finding the solution to the exercise above. Watch the activity in the Free Viewer, which provides the answers through animated explanatory images that match the Hotpotatoes exercise.

Worksheet 6 – Natural Disasters & Safety Measures

A multi-part assessment worksheet combining True/False on core concepts, multiple-choice on evacuation plans, matching of natural phenomena, and gap-fill on volunteering and community response.

Linked activities: Grades 1–3: Activity 15 “Nature’s Dangers” · Activity 16 “Emergency Kit Treasure Hunt”.
Grades 4–6: Activity 10 “Flood Preparedness Plan” · Activity 18 “Riskland” (end-of-unit assessment).

Workshhet: "Natural Disasters & Safety Measures"

Name: _____

Date: _____

1. True or False (Core Concepts)

Read the statements carefully. Write (T) if true or (F) if false.

1. [.....] A natural disaster occurs only when a severe natural phenomenon meets a town or population that is not prepared.
2. [.....] When a dangerous natural phenomenon exists but no people or buildings are at risk, we say a major disaster has occurred.
3. [.....] Hazard maps work like a "mirror" that shows us the risks facing our area or school.
4. [.....] A shelter is a place we go only to play when it is raining.

2. Multiple Choice (The Evacuation Plan)

Circle the correct answer for each question:

1. What is the most important element for a proper evacuation plan at school or home?
 - a) Everyone running quickly towards the stairs shouting.
 - b) Having pre-determined, clear, and safe emergency exits.
 - c) Locking the doors behind us.
2. When organising a safety plan, who should we look after first?
 - a) Those who have the most expensive toys.
 - b) Vulnerable groups (elderly, young children, people with special needs).
 - c) Only ourselves.

3. Matching (The Disaster Dictionary)

Draw a line from the natural phenomenon to the correct description:

Natural Phenomenon	Description
1. Tsunami	A. Strong circular winds originating over the sea, causing massive storms.
2. Hurricane	B. A chemical reaction requiring oxygen, heat and fuel to spread.
3. Wildfire	C. A series of giant waves created after a powerful underwater earthquake.

4. Gap-fill (Becoming Volunteers!)

Fill in the blanks using the words: shelters, volunteer, prevention, 112

1. In schools it is very important to create _____ evacuation teams made up of students and teachers.
2. Municipal gyms, churches, and tent camps can be used as _____ for people who have lost their homes.
3. Maps and preparedness drills are part of _____ measures.
4. In case of a major emergency, the pan-European number we can call from our mobile phone is _____.

Worksheet 7 – The Flood Experiment

Observation sheet accompanying the flood simulation experiments ("The Big Rain and the Flood", "The Sponge and the Rain") for Grades 1–3. Students record what they observe as "rain" falls on the model village.

Linked activities: Grades 1–3: Activity 1 "The Big Rain and the Flood" · Activity 2 "The Sponge and the Rain" · Activity 4 "Building a Dam" (observation sheet for the testing rounds). Grades 4–6: Activity 8 "Flood Variables" (simplified version).

Flood experiment – Observation sheet

Group: _____

Date: _____

1. What happened in each experiment? Fill in the table.

What we did	What I observed
Light "rain" (a little water)	
Heavy "rain" (a lot of water, quickly)	
Rain on dry soil	
Rain on soil that was already wet	

2. What protected the village from the water? (Tick what worked)

- ☐ The dam made of pebbles
- ☐ The higher ground (the hill)
- ☐ The trees and the plants
- ☐ Nothing – the water reached everything

3. Complete the sentence:

When it rains very hard and the soil cannot absorb any more water, then...

Worksheet 8 – Flood Safety: Before, During, After

Students classify safety actions into the three phases of a flood event. Suitable for Grades 2–6; with younger students the actions can be read aloud and discussed first.

Linked activities: Grades 1–3: Activity 6 “Flood Safety Comics” · Activity 10 “Flood Safety Poster” · Activity 20 “Before and After the Flood”. Grades 4–6: Activity 10 “Flood Preparedness Plan”.

Flood Safety – When do we do it?

Name: _____

The actions:

- A. We prepare an emergency kit with a torch, water and a first-aid kit.
- B. We move to a higher floor or to higher ground.
- C. We never walk or drive through flood water.
- D. We check the house carefully for damage before going back in.
- E. We listen to the radio and follow the instructions of Civil Protection.
- F. We keep the drains, gutters and streams near our house clean.

1. Write each letter (A–F) in the correct column:

BEFORE the flood	DURING the flood	AFTER the flood

2. Circle True (T) or False (F):

- a) Even 30 cm of moving water can sweep away a car. T / F
- b) Flood water can be dangerous even when it looks calm. T / F
- c) After a flood, we can immediately drink water from the tap. T / F

Worksheet 9 – Rainfall and Flood Risk Data

Accompanies the "Rain Gauge Project" and "Flood Risk Mapping" activities for Grades 4–6. Students work with rainfall data and interpret a flood-risk map legend.

Linked activities: Grades 4–6: Activity 11 “Rain Gauge Project” (data-analysis sheet) · Activity 7 “Flood Risk Mapping” (map-legend task) · Activity 9 “Our School’s Flood Risk Map”.

Rainfall and the flood risk

Name: _____

Date: _____

1. A school measured the rainfall for one week with its rain gauge:

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Rainfall (mm)	2	0	15	42	38	5	0

2. Answer using the table:

- a) Which day had the most rain? _____
- b) What was the total rainfall for the whole week? _____ mm
- c) What was the average (mean) rainfall per day? _____ mm
- d) On which two days do you think the risk of flooding was highest, and why?

3. On a flood-risk map, areas are coloured green, yellow or red. What do you think each colour means?

Green: _____

Yellow: _____

Red: _____

4. Draw the rainfall data as a bar chart on graph paper or in a spreadsheet. Remember to label both axes.

ANNEX II

eQUIZZES AND SELF-ASSESSMENT MATERIAL

This annex contains the assessment content developed within this output: a diagnostic pre-assessment questionnaire, the master content of the eQuiz self-assessment applications (digital interactive quizzes for the assessment of students' knowledge), and student self-assessment and reflection sheets. The quiz content is provided here in printable form; the same items are implemented as digital interactive eQuizzes.

The digital versions of the quizzes in this annex are implemented as interactive eQuizzes on free platforms such as Google Forms, LearningApps and Wordwall, and are made available through the project website, www.steame-life.eu.

Pre-Assessment Questionnaire

This questionnaire is used at the beginning of the unit to find out what students already know about natural disasters and safety measures. It is not graded — it is a diagnostic assessment tool.

Prior Knowledge Questionnaire

1. What are the 3 most essential items that a school "Emergency Survival Kit" should contain?

- _____
- _____
- _____

2. If we see smoke in the forest, what number should we call immediately and what information do we give?

3. How prepared do you feel to deal with an emergency (earthquake or fire) on a scale of 1 to 5? (Circle the one that best describes you.)

1	2	3	4	5
<i>Not at all</i>	<i>A little</i>	<i>Somewhat</i>	<i>Well</i>	<i>Very well</i>

Quizzes (eQuiz Master Content)

Quiz: Earthquake Safety

A 10-question multiple-choice quiz that checks whether students know the correct behaviour before, during and after an earthquake, and what a basic emergency kit should contain.

Quiz: Earthquake Safety

Name: _____

Date: _____

1. What should we do during an earthquake when we are inside the classroom?

- a) Run outside as fast as possible
- b) Stay calm and protect ourselves
- c) Climb on the desks

2. Which is a safe spot inside a house or classroom?

- a) Near the windows
- b) Under a sturdy table
- c) On the balcony

3. Should we use the lift/elevator during an earthquake?

- a) Yes
- b) Only if we are in a hurry
- c) No

4. If we are outside during an earthquake, we should go to:

- a) Near buildings
- b) An open space away from structures
- c) Under balconies

5. Which of the following should we have in an emergency kit?

- a) A torch/flashlight
- b) Toys only
- c) A television

6. What should we do if we see fallen power lines after an earthquake?

- a) Touch them
- b) Play near them
- c) Stay far away from them

7. What is the correct earthquake safety slogan?

- a) Run – Shout – Jump
- b) Drop – Cover – Hold On
- c) Hide – Run – Escape

8. After an earthquake we should:

- a) Follow the instructions of the adults
- b) Panic
- c) Enter damaged buildings

9. Why do we practise earthquake drills at school?

- a) Just for fun
- b) To learn how to protect ourselves
- c) To miss lessons

10. What is the most important thing during an earthquake?

- a) Staying calm and paying attention
- b) Running
- c) Shouting

Earthquake Quiz

An assessment quiz combining multiple-choice and True/False questions covering the definition of an earthquake, safe spots, prevention measures, and the emergency kit. Includes one open-ended question.

Earthquake Quiz

Name: _____

Date: _____

1. What is an earthquake?

- ☐ a) A severe thunderstorm
- ☐ b) A shaking of the ground
- ☐ c) A volcano

2. Earthquakes are mainly caused by:

- ☐ a) Rain
- ☐ b) The movement of tectonic plates
- ☐ c) Wind

3. Which spot is safest during an earthquake?

- ☐ a) Near glass windows
- ☐ b) Under a sturdy desk
- ☐ c) Standing on a chair

4. True or False?

During an earthquake we should immediately run to the staircase.

- ☐ True
- ☐ False

5. Which of the following should be in an emergency kit?

- ☐ a) Water and a torch/flashlight
- ☐ b) Toys only
- ☐ c) Decorative items

6. Which buildings are most at risk during an earthquake?

- ☐ a) Very tall and narrow buildings
- ☐ b) Low and sturdy buildings
- ☐ c) Buildings with a strong foundation

7. True or False?

We should remain calm during an earthquake.

- ☐ True
- ☐ False

8. What do we do after the earthquake?

- ☐ a) Follow the teacher's instructions
- ☐ b) Go back to the classroom on our own immediately
- ☐ c) Run without caution

9. Scientists who study earthquakes are called:

- ☐ a) Seismologists
- ☐ b) Astronauts
- ☐ c) Sailors

10. Write one earthquake safety measure:

Score: ☐ 9–10 correct: *Earthquake Expert!* ☐ 6–8 correct: *Great effort!* ☐ 0–5 correct: *Keep learning!*

Earthquake Preparedness Quiz

A multiple-choice and True/False quiz focused on preparedness: what to do before, during and after an earthquake, which spots are dangerous, and why we secure heavy objects.

Earthquake Preparedness Quiz

1. What should we do before an earthquake at school?

- A. Ignore instructions.
- B. Learn the evacuation routes and safe spots.
- C. Leave heavy objects on high shelves.

2. During an earthquake inside the classroom we should:

- A. Run to the staircase immediately.
- B. Stay calm and protect ourselves under a sturdy desk.
- C. Stand next to the windows.

3. Which spot in the classroom is most dangerous during an earthquake?

- A. Under a sturdy desk.
- B. Next to large glass panels or a bookcase.
- C. In an open space away from falling objects.

4. After the shaking stops at school:

- A. We leave in an orderly manner following the teacher's instructions.
- B. We push to get out first.
- C. We go back to collect our belongings.

5. True or False: During an earthquake we should use the elevator/lift.

- ☐ True
- ☐ False

6. Which of the following is appropriate for an emergency kit?

- A. A torch, water, and essential useful items.
- B. Toys only.
- C. Glass bottles and heavy objects.

7. Why do we secure bookcases and heavy objects in the classroom?

- A. To make the classroom look nicer.
- B. So they don't move or fall during an earthquake.
- C. To have more space at the board.

8. True or False: After the earthquake we wait for instructions and go to the pre-arranged assembly point.

☐ True

☐ False

9. If we are in the school yard during an earthquake:

A. We stay away from buildings, balconies, and power lines.

B. We run close to the school walls.

C. We quickly go inside the building.

10. What is most important during an earthquake?

A. Calmness, cooperation, and following instructions.

B. Shouting loudly and running without order.

C. Grabbing our bag first.

Quiz: "What Have We Learned About Earthquakes?"

A comprehensive 10-question multiple-choice quiz (upper primary level) testing knowledge of the earthquake definition, tectonic plates, experiments (jelly, towers, seismograph), correct behaviour during an earthquake, and the emergency kit.

Quiz: "What Have We Learned About Earthquakes?"

1. What is an earthquake?

- a) Wind blowing very strongly
- b) The sudden shaking of the ground caused by the movement of rocks/plates inside the Earth
- c) The eruption of a volcano
- d) A very powerful wave in the sea

2. Which statement best describes the movement of tectonic plates?

- a) Plates always stay still
- b) Plates move very slowly, pushing, pulling apart, or sliding past each other
- c) Plates jump up and down like bouncing balls
- d) Plates can be seen easily with the naked eye on the Earth's surface

3. In the jelly experiment, what did we observe?

- a) The "houses" on the jelly shook less than on a hard surface
- b) The "houses" on the jelly shook more and fell more easily
- c) There was no difference
- d) The "houses" did not move at all

4. What does the tower experiment (straws or LEGO) show?

- a) The taller the tower, the weaker it always is
- b) Only the colour of the tower matters
- c) The way we build (support, shape, base) affects how well it withstands an earthquake
- d) Towers are not affected by shaking

5. What is the main purpose of a seismograph?

- a) To predict exactly when the next earthquake will happen
- b) To record ground vibrations as a line on paper
- c) To stop an earthquake
- d) To measure temperature

6. What should you do IMMEDIATELY when an earthquake starts inside the classroom?

- a) Run quickly out of the building
- b) Go to the window to see what is happening
- c) Drop – Cover – Hold On: crouch down, cover yourself under a sturdy desk, and hold on
- d) Stand upright in the middle of the room

7. Which of the following actions is CORRECT after an earthquake at school?

- a) Go back inside the classroom alone to collect your things
- b) Calmly follow the teacher and go to the assembly point in the schoolyard
- c) Jump out of the window to get out faster
- d) Run away from school in any direction

8. Which of the following is USEFUL in an earthquake emergency kit?

- a) A large jar of glass decorations
- b) A torch, batteries, and a small radio
- c) Toys only
- d) Clothes for all seasons only

9. Which statement is CORRECT about preparedness at home or school?

- a) We don't need to secure shelves and bookcases
- b) It is a good idea to know in advance where we will gather after an earthquake
- c) We don't need to practise earthquake drills; reading about theory is enough
- d) We always wait for someone to tell us what to do and don't think for ourselves

10. What is a good message to say to a younger child after an earthquake?

- a) "Don't cry, it was nothing, forget about it"
- b) "I understand you were scared; we were together, now we are safe and we know what to do"
- c) "We don't need to talk about earthquakes"
- d) "It's your fault you were so frightened"

Self-Assessment & Reflection

Assessment Rubric – Earthquakes (3 Levels)

A detailed teacher assessment rubric for the "Earthquakes" unit. Covers six criteria: comprehension, participation, identification of safe spots, application of safety rules, creativity, and cooperation.

Assessment Rubric – 3 Levels

Assessment Criteria	Level 1 – Needs Support	Level 2 – Satisfactory	Level 3 – Very Good
Understanding of earthquakes	Has difficulty recognising what an earthquake is and its causes.	Describes the basic causes and effects of earthquakes.	Clearly explains how earthquakes occur and their consequences.
Participation in activities	Participates minimally and frequently needs guidance.	Participates in most activities with little help.	Actively participates, cooperates, and contributes creatively to the group.
Identification of safe/dangerous spots	Has difficulty finding safe and dangerous spots.	Identifies most safe and dangerous spots.	Correctly identifies spots and suggests ways to improve safety.
Application of safety instructions	Knows few safety instructions and applies them with difficulty.	Applies basic earthquake safety instructions.	Correctly applies instructions and explains their importance.
Creativity and presentation	Presents limited ideas or incomplete work.	Presents understandable ideas and complete work.	Presents original, organised, and creative work.
Cooperation and role-taking	Has difficulty cooperating or taking on a role.	Cooperates satisfactorily and fulfils their role.	Cooperates excellently, supports the group, and takes on responsibilities.

Self-Assessment: "What Have I Learned About Earthquakes?"

Student self-assessment sheet with 6 statements (Yes / A little / No) and one open-ended question about what they would like to revisit. Encourages reflection and informs next teaching steps.

Self-Assessment Sheet: "What Have I Learned About Earthquakes?"

Full name: _____ Class: _____ Date: ____ / ____ / ____

Read the statements and put an X in the box that suits you best.

Statement	Yes	A little	No
1. I can explain in simple words what an earthquake is and why it happens.	☐	☐	☐
2. I know what to do during an earthquake in the classroom (Drop – Cover – Hold On).	☐	☐	☐
3. I can name 2–3 things we do before and after an earthquake to stay safe at school.	☐	☐	☐
4. I understood what the experiments (jelly, towers, seismograph) showed about soil and buildings.	☐	☐	☐
5. I can help a younger child feel calmer if an earthquake happens at school.	☐	☐	☐
6. I cooperated well with my classmates in the group.	☐	☐	☐

7. I would like to revisit: (Circle or underline)

● tectonic plates ● experiments ● safety rules ● something else: _____

Self-Assessment: "Learning About Earthquakes"

Self-assessment sheet using emoji faces (happy / neutral / confused). Students colour or mark how well they understand each piece of knowledge and skill. Three open-ended questions follow.

Student Self-Assessment: "Learning About Earthquakes"

Name: _____

Date: _____

Colour or mark what best describes you:

Statements	😊 Very well	😐 Fairly well	😞 I need help
I understood what an earthquake is.	☐	☐	☐
I learned how tectonic plates move.	☐	☐	☐
I can identify safe spots in the classroom.	☐	☐	☐
I know what to do during an earthquake.	☐	☐	☐
I cooperated well with my group.	☐	☐	☐
I participated actively in the activities.	☐	☐	☐
I can help others protect themselves from an earthquake.	☐	☐	☐

What did I enjoy most about the lesson?

What new thing did I learn?

What else would I like to learn?

Student Reflection Sheet

Reflection sheet with 5 open-ended questions (What did I learn? Which experiment helped me? What do I do in an earthquake? What do I say to a younger child? What do I want to revisit?) and a short self-rating. Suitable for printing.

Reflection Sheet: "What Have I Learned About Earthquakes?"

Full name: _____ **Class:** _____

Date: ____ / ____ / ____

Read the questions below carefully and answer in your own words. A short example is given under each question to help you.

1. What new thing did you learn about how an earthquake happens?

Example: I learned that earthquakes happen when tectonic plates move, press against each other, and sometimes slip suddenly.

2. Which experiment or activity helped you the most and why?

Example: The jelly experiment helped me the most because I could see that houses on soft ground shook more.

3. What should you do if an earthquake happens at school?

Example: I should Drop, Cover under my desk, and Hold On until the shaking stops.

4. What would you say to a younger child to help them calm down after an earthquake?

Example: I would tell them we are safe now, the teachers know what to do, and we should stay calm.

5. What would you like to revisit or learn better?

Example: I would like to revisit tectonic plates and how faults are exactly formed.

Short Rating – Put a ✓ in the box that suits you:

- ☐ I learned a lot and feel more prepared.
- ☐ I learned quite a bit, but I still have some questions.
- ☐ I need more help to understand the topic better.

Student Reflection – Complete the Sentences

Short reflection activity using sentence starters. Students complete them in writing or orally, then share one thought or feeling they gained from the lesson with the class.

Reflection: "I Think About What I Learned About Earthquakes"

Complete the sentences below:

- Today I learned that _____
- What impressed me most was _____
- I found it hardest to _____
- I worked with my group when _____
- Next time I will try to _____
- One important earthquake safety measure is _____
- I feel more prepared for an earthquake because _____

ANNEX III

DIGITAL AND MULTIMEDIA EDUCATIONAL MATERIAL

This annex catalogues the digital interactive multimedia educational material used across the 40 sample activities. All resources are free (or offer free school access) and were tested within the STEAME-DRREC teacher training sessions. Direct links to all resources, together with the interactive eQuizzes, are kept up to date on the project website, www.steame-life.eu.

Resource	Type	Related activities	Use in the classroom
seismoi-live.gr	Live seismicity map (Greece)	Grades 4–6: Act. 1, 19	Students locate recent earthquakes and record date, magnitude, epicentre and focal depth from real-time data
USGS Earthquake Map · earthquake.usgs.gov	Live global earthquake data · CSV download	Grades 4–6: Act. 1, 2, 6	Authentic data source for thematic maps, data tables and spreadsheet graphing
USGS “Did You Feel It?” · EMSC portal	Citizen-science reporting platform	Grades 4–6: Act. 20	The class contributes and analyses felt-intensity earthquake reports
PhET – Plate Tectonics · phet.colorado.edu	Interactive simulation	Grades 4–6: Act. 4	Exploring plate movement, boundary types and their link to earthquakes
Merge Cube + Merge EDU app	Augmented reality (AR)	Grades 4–6: Act. 5, 17	Holographic seismograph and Earth-structure models students hold in their hands (see Annex IV)
academo.org – online oscilloscope	Interactive online instrument	Grades 4–6: Act. 5	Visualising wave forms while studying seismic waves
Sketchfab – 3D model library	3D / AR visualisation	Grades 4–6: Act. 12	3D exploration of the Palace of Knossos and other models (see Annex IV)
EEA discomap.eea.europa.eu · mapsportal.yopen.gr	Digital thematic hazard maps	Grades 4–6: Act. 7	Reading and interpreting official flood-risk maps of Greece and Europe
meteo.gr	Weather and climate data portal	Grades 4–6: Act. 14, 19	Weather data for wildfire risk analysis and DRR infographics
Stop Disasters! · stopdisastersgame.org (UNDRR)	Serious strategy game	Grades 4–6: Act. 13	Planning a safer town within a budget – prevention and mitigation decisions
“Rescue Team – Flood” · y8.com	Educational mini-game	Grades 1–3: Act. 7, 19	Simple flood rescue simulation for young students
Canva (free school access)	Graphic design tool	Grades 1–3: Act. 6, 10 · Grades 4–6: Act. 19	Flood-safety posters, comics and DRR infographic campaigns
Book Creator	Digital book / comic tool	Grades 1–3: Act. 6	Digital flood-safety comic strips and class books

StoryboardThat	Digital storyboard tool	Grades 4–6: Act. 12	Storyboarding historical disaster narratives (Minoan civilization)
ArcGIS Story Maps · Google Maps	Map-based storytelling	Grades 4–6: Act. 15	Combining maps, text and images into natural-disaster stories
VR headsets · 360° YouTube videos	Virtual reality / immersive video	Grades 4–6: Act. 3, 16	Safe immersive experience of earthquakes and other hazards (see Annex IV)
civilprotection.gr	Official Civil Protection portal	Grades 4–6: Act. 19 · general reference	Official self-protection guidelines used as a research source
Google Forms · LearningApps · Wordwall	eQuiz / assessment platforms	All units · Annex II	Digital implementation of the eQuizzes and self-assessment applications

ANNEX IV

AUGMENTED REALITY (AR) MATERIAL

Augmented reality allows students to observe and manipulate three-dimensional scientific models – the interior of the Earth, a working seismograph, historical monuments – that would otherwise be impossible to bring into the classroom. Within STEAME-DRREC, AR material is used primarily in the Grades 4–6 activities, always combined with a worksheet so that the AR experience feeds into recording, analysis and discussion.

The Merge Cube

The Merge Cube is a physical cube which, when viewed through a tablet or smartphone camera with the Merge EDU applications (Merge Explorer, Object Viewer), “becomes” a holographic 3D object that students can hold and rotate in their hands.

- A free printable paper version of the cube is available from the Merge EDU website (mergeedu.com/cube): print on card, cut, fold and glue – each group of students builds its own cube at minimal cost.
- Activity 5 (Grades 4–6) – “Seismograph & Seismic Waves”: students hold a virtual seismograph, observe how it records ground motion, and label the parts of a printed seismogram.
- Activity 17 (Grades 4–6) – “Earth Structure 3D Explorer”: students peel back the layers of the Earth (crust, mantle, outer and inner core) and complete a data table with the properties of each layer.

3D and AR models with Sketchfab

Sketchfab hosts thousands of free 3D models that run in the browser and, on most tablets and phones, can be placed in the classroom in AR mode.

- Palace of Knossos 3D model – used in Activity 12 (Grades 4–6), “The Minoan Civilization and Natural Disasters”, to explore the site before discussing the earthquakes and the eruption of Thera.
- Models of Earth layers, geological faults and volcanoes can be projected on the interactive whiteboard or explored in small groups as an introduction or revision tool.

Practical guidelines for AR and VR in the classroom

- Test every application, model and QR code on the actual school devices before the lesson – school networks sometimes block app stores or streaming.
- Work in stations of 4–5 students per device and rotate roles (operator, recorder, reporter) so that every student both handles the AR model and records observations.
- Keep each AR session short (10–15 minutes) and always pair it with a paper task – a labelling worksheet, a data table or a drawing – so the technology serves the learning objective.
- Prepare an offline fallback (screenshots or a short screen recording of the AR model) in case of connectivity problems.
- For the VR experiences (Activities 3 and 16, Grades 4–6), preview all 360° videos in advance, keep sessions brief, and allow students who feel discomfort to watch on a flat screen instead of a headset.

AR/VR resources per activity

Resource	Application	Related activity
Merge Cube + Merge EDU	Virtual seismograph – seismic waves simulation	Grades 4–6: Activity 5
Merge Cube + Merge EDU	Earth structure – layers of the Earth in 3D	Grades 4–6: Activity 17
Sketchfab 3D / AR	Palace of Knossos – Minoan civilization and disasters	Grades 4–6: Activity 12
360° videos · VR headsets	Immersive experience of earthquakes and natural disasters	Grades 4–6: Activities 3 & 16