Bringing Your Class to the Living Laboratory

Teachers' Comprehensive Guide (04)

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Erdpuls Teachers' Guide

Bringing Your Class to the Living Laboratory

For Classroom Teachers and Educators

Institution: Erdpuls Müllrose - Center for Sustainability Literacy, Citizen Science and Reciprocal Economics

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Changelog

Version	Date	Changes
1.1	February 2026	Initial generation for OER publication; institution name and license applied
1.0	—	Not released

Who This Guide Is For

This guide is written for the **classroom teacher** accompanying a school group to Erdpuls Müllrose. It is a companion to the three student learning guides (Guides 01, 02, 03 for Grades 1–4, 5–8, and 9–12). Your role during the Erdpuls visit is not to teach — the Erdpuls facilitators manage the session — but you are the essential bridge between what happens in the field and what happens in the classroom before and after.

This guide gives you: the theoretical framework that underpins the Erdpuls program, the Brandenburg curriculum connections, practical pre-visit and post-visit classroom activities, assessment approaches that work for place-based learning, and a template for communicating with parents and guardians.

Understanding the Erdpuls Approach

The Phenomenological Method in Plain Terms

The Erdpuls program uses a method called **phenomenological observation**: students encounter a phenomenon (soil, landscape, economic exchange) with their full senses before they receive any conceptual framework for understanding it. The instruction *"sense first, interpret later"* runs through everything.

This is probably the reverse of how most environmental education works in the classroom. Typically, a class studies the carbon cycle, then visits a forest to "see it in action." At Erdpuls, the sequence is inverted: students smell, touch, count, and measure a specific patch of soil first; then they discover what they need to know in order to understand what they found.

The reason for this inversion is practical. Students who have genuine questions — questions that arose from their own direct observation — engage with conceptual content in a completely different way from students receiving information before they have a reason to want it. Curiosity is not a learning style; it is a cognitive state that must be activated before abstract content lands properly.

Your role as teacher: The most important thing you can do during the Erdpuls session is to resist the impulse to explain or provide context when students express confusion. Confusion is the beginning of inquiry. If a student says "I don't understand why the soil was so different near the wall," the right response is not the answer — it is: *"That's a great observation. What ideas do you have?"* The Erdpuls facilitator will build on the student's own hypothesis; your job is to protect the space for the hypothesis to form.

The 4A-Pathway

All Erdpuls programs are structured around a four-stage pedagogical pathway:

Stage	Question	Age Group Emphasis
Awareness	What is here?	Grades 1–4: primary focus
Acknowledgment	How does this connect to me?	Grades 5–8: primary focus
Attitude	How do I feel about what I found? What does it mean?	Grades 9–12: primary focus
Action	What will I do because of this?	Grades 9–12 and self-directed adult learners

The pathway is not a one-time arc — it spirals. A child who achieves Awareness at age 7 may return at age 12 and move through Acknowledgment and Attitude with the same landscape. The Erdpuls visit is most powerful when it is repeated across school years.

Anthroposophical Developmental Framework

The Erdpuls program draws on Rudolf Steiner's developmental stage framework to calibrate the depth and approach of each guide. Teachers do not need to be familiar with anthroposophy to benefit from this framework — the key practical implications are:

Grade Band	Developmental Characteristic	Practical Implication for Teachers
Gr. 1–4 (Ages 6–10)	Will-forces dominant; learning through doing and imitation; world is good and trustworthy; sensation is primary	Do not correct or evaluate during the session; honor what children say they observed; expect movement, not sitting
Gr. 5–8 (Ages 11–14)	Awakening causal reasoning; peer identity central; "why" questions emerging; abstract thinking beginning	Let students formulate their own explanations before offering the correct one; use peer discussion before whole-class discussion
Gr. 9–12 (Ages 15–18)	Individual judgment emerging; ethical dimensions accessible; capacity for systemic thinking; "what do I owe the world?"	Genuine open questions only; trust students with real instruments and real data; the most valuable outcome is a question, not an answer

The Five Competency Clusters

Erdpuls aligns all program content to five competency clusters. These correspond closely to Brandenburg Gestaltungskompetenzen (Design Competencies) and can be mapped directly to your curriculum goals:

Cluster	Definition	BNE Gestaltungskompetenz Alignment
Environmental Literacy	The capacity to read and understand living systems through direct sensory encounter	4.1.1, 4.1.2, 4.1.3
Scientific Inquiry	Observation, measurement, hypothesis formation, data analysis, open-data contribution	4.1.4, 4.2.1, 4.3.2

Cluster	Definition	BNE Gestaltungskompetenz Alignment
Technology Competence	Operating sensor systems; understanding IoT networks; data ethics; open-source tools	4.1.2, 4.3.2
Economic Understanding	Recognizing non-monetary value; reciprocal exchange; commons contribution; UBECrc token economy	4.2.2, 4.2.3, 4.3.1
Social-Emotional Learning	Empathy with non-human life; team observation; sharing discoveries; personal response to ecological conditions	4.2.4, 4.3.3, 4.3.4

Brandenburg Curriculum Alignment

Primary (Gr. 1–4)

Subject	Specific Curriculum Connection	Guide 01 Phase
Sachunterricht	Living and non-living environments; seasonal change; local ecology	Phase 1 (Q1–Q8b); Seasonal Variations
Kunst	Observation drawing; representing the natural world	Earth Detective Cards; Class Soil Portrait
Deutsch	Vocabulary for sensory experience; story as reflection	Closing circle; Post-visit "Soil Story"
Mathematik	Counting (Life Count); simple comparison	Phase 2 (senseBox comparison); Token Seed counting

Middle School (Gr. 5–8)

Subject	Specific Curriculum Connection	Guide 02 Phase
Biologie	Soil ecology (Gr. 5–6); ecosystems and interdependence (Gr. 7–8)	Phases 1–2 (full protocol + sensor dialogue)

Subject	Specific Curriculum Connection	Guide 02 Phase
Geografie	Local landscape and land use; human impact on environment	Q11 (History); Q12 (Relationships)
Chemie	pH and chemical properties (Gr. 7–8)	Q6 (pH measurement)
Mathematik	Data collection and graphing; correlation	Comparative Data Board; post-visit analysis
Ethik	Value beyond money; community responsibility	Token economy (Phase 3)

Upper Secondary (Gr. 9–12)

Subject	Curriculum Connection	Guide 03 Track
Biologie (Oberstufe)	Ecosystem analysis; biodiversity; soil science	Track A
Geografie (Oberstufe)	Landscape systems; climate change; land use	Track A + B
Informatik	IoT systems; data ethics; open data	Track A (senseBox + openSenseMap)
Wirtschaft/Soziales	Alternative economics; commons theory	Track A (UBECrc design)
Projekttage / Facharbeit	Independent research design	Research Question Design Sheet

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Before the Visit: Classroom Preparation

All Grade Levels — One Week Before (1 Lesson)

"What do I already know about soil?"

Students draw or write their mental model of what is beneath the surface of the earth. These are collected and brought to the visit. The comparison between students' prior models and what they actually observe is a direct experience of how science works.

Do not correct or grade these pre-visit models. Their accuracy is not the point — they are baseline records of prior knowledge. Inaccurate models revised through direct observation produce stronger learning than accurate models received through instruction.

Grades 5–8 — Two Weeks Before (30 minutes)

The Exchange Map:

Ask students to map the exchanges in their daily life: *"Write down three things you gave to someone this week — not for money, just because. Three things someone gave to you. One thing you contributed to a group."* These maps are brought to the visit and connect directly to the Token Economy Phase (Guide 02, Phase 3).

Grades 9–12 — One Week Before (1 Lesson)

The Open Data Encounter:

Students explore openSenseMap (opensensemap.org) and iNaturalist (inaturalist.org) for 20 minutes, finding data from near their school or hometown. Discussion: *"Who collected this data? Why? Who can use it? What are the limits of trusting data you didn't collect yourself?"* This activates the data ethics dimension of Track A before the visit.

During the Visit: Your Role

Do: - Observe and take notes on what engages your students most — this is assessment data - Participate in activities yourself where possible; students at all ages engage more deeply when they see adults engaging genuinely - Note questions students cannot answer — these become post-visit lesson content - Manage logistics (restrooms, timing, group management) so the Erdpuls facilitator can focus on content

Don't: - Explain or answer content questions during observation phases — redirect to the student's own hypothesis - Hurry students away from something they are deeply engaged with; depth of engagement at one observation is worth more than coverage of all observations - Evaluate or grade during the session; the session is explicitly an experience-first environment where wrong answers are productive

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After the Visit: Classroom Integration

All Grade Levels — The Week After

Debrief (1 lesson): Open question: *"What do you remember most clearly from the visit? What are you still thinking about?"* List responses on the board. Do not evaluate. Then: *"Which of these do you want to understand better?"* This produces the agenda for the follow-up lessons.

Grades 1–4 (Post-Visit, 2 lessons)

The Soil Story: Students write or dictate a story from the perspective of one organism they observed. Drawings are welcome as the primary medium. Stories are compiled into a class book.

The Comparison: Bring a small jar of school garden soil. Students compare it to the Class Soil Portrait from the visit. *"What is different? Why might it be different?"* No right answer required — the question itself is the learning.

Grades 5–8 (Post-Visit, 2–3 lessons)

Data Analysis: Use the Comparative Data Board (photographed during the visit) to graph correlations. Which variables are most strongly related? Students propose and discuss causal mechanisms. This links to the mathematics curriculum (Gr. 5–8 data analysis).

The "One Question" Research: Each student researches the question they brought back from the session (the "My One Question" activity in Guide 02's closing). A 3-minute presentation in a subsequent lesson closes the 4A-Pathway from Attitude to Action.

Grades 9–12 (Post-Visit, 3–5 lessons or ongoing)

Research Question Development: The Research Question Design Sheet from the visit becomes the opening of a longer inquiry project. Students refine their question, identify available data sources (openSenseMap, iNaturalist, Erdpuls longitudinal dataset), and design a data collection protocol. For students writing a Facharbeit on environmental themes, the Erdpuls research question is a strong starting point.

Citizen Science Reporting: Students write a brief (1–2 paragraph) annotation to their openSenseMap or iNaturalist contribution explaining what they observed, what method they used, and what they found notable. This is a science writing exercise that produces a real, publicly accessible scientific contribution.

Assessment Approaches for Place-Based Learning

Place-based learning is poorly served by conventional assessment. A multiple-choice quiz on soil pH does not measure what a student gained from kneeling in soil, smelling it, measuring it with their own hands, and formulating a question from their own data. The following approaches are more appropriate:

Portfolio Assessment (all grade levels)

Collect: the pre-visit mental model drawing, the Earth Detective Card or Field Sheet from the visit, and the post-visit story or research question. The portfolio shows learning as a journey — from prior model to direct observation to deepened understanding — not as a test score.

Grading: Assess the degree of change between pre-visit model and post-visit understanding. A student whose pre-visit model was simple and whose post-visit understanding is richly detailed with specific observations has learned more than a student who arrived knowing everything already.

Observation Journal (Grades 5–12)

If students keep an ongoing observation journal across multiple visits or across seasons, the journal itself becomes the assessment artifact. Depth of observation, precision of language, quality of questions, and willingness to revise earlier conclusions are all assessable qualities.

Research Question Quality (Grades 9–12)

Assess the Research Question Design Sheet on: - Specificity of the observation (not "the soil was interesting" but "the soil near the north wall had a 68% moisture reading and 3× the life count of the open bed 5 meters away") - Clarity of the research question (testable? specific? original?) - Feasibility of the proposed method - Connection to available open data sources

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Parent and Guardian Communication Template

The following can be adapted as a letter or email home before the visit.

Dear Parents and Guardians,

Our class will be visiting **Erdpuls Müllrose** on **[date]** for a **[half-day / full-day]** learning program as part of our **[subject/topic]** unit.

What is Erdpuls?
Erdpuls Müllrose is an educational living laboratory and makerspace garden located at Müllrose, Brandenburg. It offers hands-on sustainability education programs for school groups, combining soil science, environmental monitoring, and community economics.

What will your child do?
Your child will spend time outdoors observing and measuring soil in the Erdpuls garden using simple instruments (magnifying glasses, pH strips, temperature probes). They will also encounter a small sensor system (called a senseBox) that monitors environmental conditions continuously, and will contribute their observations to an open environmental data platform.

What should they wear and bring?
- Clothing that can get dirty — we will be kneeling on the ground and handling soil - Sturdy outdoor shoes - Weather-appropriate clothing (we go out in most weather) - A packed lunch / water if this is a full-day visit - **No need for a special equipment** — everything is provided at Erdpuls

What about consent for photographs / data sharing?
[Insert your school's standard photograph consent procedure here.] All environmental data contributed to open platforms (openSenseMap, iNaturalist) is anonymous and non-personal.

Questions?
Please contact [teacher name and contact details].

We look forward to a productive and memorable visit.

Repeat Visits: The Seasonal Learning Cycle

The Erdpuls program achieves its deepest results when classes return across seasons. The comparison between a class's autumn and spring observations of the same soil patches — made in the same location, with the same instruments — produces genuine longitudinal data and activates the most powerful form of environmental learning: the discovery that a living place changes, responds, remembers.

If your school is able to schedule two or more visits per year to the same program, please contact Erdpuls to discuss a longitudinal program design. The class's accumulated observation record becomes a real contribution to the Erdpuls soil database and earns community-level recognition in the token economy.

Operational Information

Booking: Contact Erdpuls at erdpuls@ubec.network or https://erdpuls.ubec.network
Location: Müllrose, Brandenburg, Germany — approximately [insert transit details from major nearby towns]
Cost: Contact Erdpuls for current program pricing; reduced rates available for Brandenburg state schools
Maximum group size: 30 students per session; larger groups can be split across simultaneous sessions with advance notice
Accessibility: Contact Erdpuls in advance for participants with mobility, sensory, or other access requirements — the program can be adapted significantly
Cancellation: Please notify at least 48 hours in advance for weather-related or other cancellations

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