WORLD CONFERENCE ON STUDENT - CENTERED LEARNING APPROACHES

CREATING INTERDISCIPLINARY INTEGRATIVE MAPS IN PRIMARY EDUCATION

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Abstract. The article considers the interdisciplinary integrative map as a practical planning tool for primary school teachers. An integrative map is a structured visual model that shows how the content, skills and learning outcomes of different subjects connect around a common theme, problem or concept. The article defines the concept, describes the main types of integrative maps, formulates the principles on which they should be built and proposes a step-by-step algorithm for creating them. A sample map for the theme "Water Around Us" (Grade 3) illustrates the approach. The article concludes that integrative maps help teachers move from isolated subject lessons to coherent, meaningful learning, while also identifying the conditions needed for their effective use.

Keywords: integrative map, interdisciplinary integration, curriculum mapping, thematic planning, primary education, STEM, concept map, learning outcomes.

1. Introduction

Primary school children do not experience the world divided into subjects. A walk in the school garden, a visit to a market or a rainy day raises questions that belong at once to mathematics, natural science, language, art and technology. Yet the traditional school timetable often presents knowledge as a set of separate subjects, each with its own textbook, schedule and assessment. As a result, pupils may learn facts without understanding how they relate to each other or to real life.

Interdisciplinary integration is one of the main responses to this problem, and it is central to modern approaches such as STEM, STEAM and project-based learning. However, integration does not happen by itself. Teachers need a clear tool that allows

them to see where subjects meet, to avoid repetition and gaps, and to plan lessons in which knowledge from one subject supports another. The interdisciplinary integrative map is such a tool.

The purpose of this article is to clarify the nature of integrative maps, to describe their types and principles of construction, and to propose a practical algorithm that primary teachers can use when designing integrated units.

2. The Concept and Types of Integrative Maps

An **interdisciplinary integrative map** is a visual and structured planning document that shows the connections between the content, skills, values and learning outcomes of two or more subjects within one theme, problem or key concept, over a defined period of study. It answers three questions: *What* will pupils learn in each subject? *How* are these elements connected? *What* integrated result will pupils achieve?

The idea draws on several traditions. Heidi Hayes Jacobs (1997) developed curriculum mapping as a way for teachers to see the whole curriculum and align it across subjects and grades. Robin Fogarty (1991) described ten models of curriculum integration, from fragmented to fully integrated designs. Concept mapping, introduced by Novak and Gowin (1984), showed how visual representations of ideas support meaningful learning. Integrative maps combine these ideas into a practical tool for the classroom teacher. In practice, four main types can be distinguished:

Thematic (topic web) maps place a central theme in the middle and show the contribution of each subject around it. They are the simplest and most common type in primary school.

Conceptual maps are built around a cross-cutting concept (e.g., "change", "balance", "systems") and show how it appears in different subjects.

Competency (skills) maps trace how one skill — such as measuring, comparing, classifying or explaining — is developed in several subjects at the same time.

Curriculum mapping matrices are tables in which rows are subjects and columns are weeks or units. They allow teachers to align timing so that related topics are taught at the same time.

3. Principles of Building Integrative Maps

For an integrative map to be a working tool rather than a decorative scheme, it should follow several principles:

Meaningfulness. The central theme must be relevant and interesting to children and connected to their life experience.

Curriculum compliance. Every element in the map must correspond to the learning outcomes of the national curriculum for that grade; integration should not add extra load.

Natural connections. Links between subjects should be genuine. Artificial connections ("we count raindrops, so this is mathematics") weaken learning.

Balance of subjects. Each subject keeps its own logic and key concepts; integration should enrich, not dissolve, subject knowledge.

Age appropriateness. Content, activities and amount of work must match the cognitive and physical abilities of primary pupils.

Activity orientation. The map should lead to concrete activities — investigations, projects, experiments — and to a final integrated product.

Assessability. Expected outcomes are formulated so that they can be observed and assessed.

4. Algorithm for Creating an Integrative Map

Based on the principles above, the following sequence of steps is proposed for primary teachers:

Analyse the curricula of all subjects for the given grade and term and identify topics that are close in content or time.

Choose the integrating core — a theme, problem or concept (e.g., "Water Around Us", "Our Healthy Breakfast", "Seasons").

Formulate the overall goal and a guiding question for pupils ("Why is water important, and how can we save it?").

Define the contribution of each subject: content, skills and specific learning outcomes.

Identify the links between subjects and show them on the map with arrows or shared columns.

Plan activities and the final product — a project, exhibition, model or presentation that requires knowledge from several subjects.

Plan assessment: criteria, rubrics, observation sheets and self-assessment.

Align the timetable so that connected topics are taught in the same week.

Implement, reflect and revise the map after the unit, using pupils' results and teachers' observations.

5. Example: The Integrative Map "Water Around Us" (Grade 3)

The table below presents a fragment of an integrative map designed for a two-week unit. The guiding question is "Why is water important, and how can our family save it?"

Table 1

Integrative map for the theme "Water Around Us" (Grade 3)

Subject	Content and activities	Learning outcomes
Natural science	States of water; the water cycle; experiments with melting, evaporation and filtering	Describes the states of water and explains the water cycle in simple terms
Mathematics	Measuring volume in litres and millilitres; collecting family water-use data; bar charts	Measures and compares volumes; builds and reads a simple bar chart
Native language / Reading	Texts and poems about water; writing a short appeal "Save Water!"	Reads for information; writes a short persuasive text
Technology / Labour	Designing and building a simple water filter from bottles, sand and gravel	Follows the design cycle; uses tools safely

Fine arts	Poster for a water-saving campaign	Expresses an idea through colour and composition
Integrated product	Class exhibition "Every Drop Counts" with filters, charts and posters	Explains the results to parents, using knowledge from several subjects

The map clearly shows how one measurement activity in mathematics provides data for the science discussion and the persuasive text, and how the final exhibition brings all subjects together. The teacher can see at a glance which outcomes each subject contributes and where pupils' learning will meet.

Once the thematic content is defined, it is fixed in time using a curriculum mapping matrix. Table 2 shows how the same unit is distributed across two weeks so that connected topics are taught close together and each step prepares the next.

Table 2

Timetable alignment matrix for the unit "Water Around Us"

Subject	Week 1: Exploring water	Week 2: Saving water
Natural science	States of water; melting and evaporation experiments	The water cycle; why clean water is limited
Mathematics	Litres and millilitres; measuring with jugs and cups	Family water-use survey; building a bar chart
Native language / Reading	Reading informational texts and poems about water	Writing the appeal "Save Water!"
Technology / Labour	Testing materials: which ones let water through?	Designing, building and testing a water filter
Fine arts	Drawing water in nature: rivers, rain, clouds	Creating posters for the campaign
Integrated outcome	Class "water journal" with observations and measurements	Exhibition "Every Drop Counts" for parents

The matrix makes the logic of the unit transparent: in the first week pupils explore and collect knowledge, and in the second week they apply it to a real problem and create a product.

6. Using the Integrative Map in the Teaching Process

The map is useful throughout the unit, in three phases.

Before the unit, the map serves as a planning and coordination tool. Teachers use it to select resources, prepare materials for experiments, agree on common terms (for example, "volume", "measure", "cycle") and plan when each subject will contribute.

During the unit, the map guides the logic of lessons. At the beginning of each lesson, the teacher can briefly refer to the map and remind pupils how today's activity connects with what they did in other subjects: "Yesterday in mathematics we measured how much water we use; today in science we will find out where this water comes from." Such explicit links help children build a connected picture of knowledge.

After the unit, the map becomes a tool for reflection and assessment. Pupils return to it to summarise what they have learned in each subject and how the pieces fit together. The teacher compares planned and achieved outcomes, notes which links worked well and which remained formal, and revises the map for the next year.

An especially valuable practice is **co-creating maps with pupils**. In Grades 3–4, children can be invited to brainstorm around a central theme: "What would we like to know about water? Which lessons could help us?"

7. Benefits and Conditions for Effective Use

The use of integrative maps brings clear benefits. For **pupils**, learning becomes coherent and meaningful: they see why knowledge is needed and transfer skills between subjects. For **teachers**, the map reduces duplication, saves teaching time, makes planning transparent and supports collaboration with colleagues. For **school leaders and parents**, it provides a clear picture of what children are learning and why.

At the same time, effective use requires certain conditions: teachers' methodological preparation in integrated planning; time for joint planning; flexibility of the timetable; and a bank of ready-made sample maps that teachers can adapt.

Practice also shows several typical mistakes that teachers should avoid when creating integrative maps:

Overloading the map by trying to include every subject in every theme. Two to four well-connected subjects are often more effective than six weak links.

Formal or artificial links that exist on paper but do not change what pupils actually do or understand.

Losing subject content, when integrated activities become enjoyable but pupils do not achieve the required subject outcomes.

Lack of a final product, which leaves the unit without a clear purpose and makes integrated assessment difficult.

8. Conclusion

The interdisciplinary integrative map is an effective instrument for implementing integrated and STEM-oriented learning in primary education. It turns the general idea of integration into a concrete plan, showing the contribution of each subject, the connections between them and the expected integrated result. Built on the principles of meaningfulness, curriculum compliance, natural connections and activity orientation, and created through a clear sequence of steps, integrative maps help primary teachers design learning that reflects the wholeness of the world as children experience it.

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