



EARTHE

Activity 2

Digital toolkit for innovative curriculum and methodological development

Module - Problem solving

Method - Logic Games and Puzzles

Class activities

Module 4 – Problem Solving

Class activity 1. - Problem Grid Challenge (Analytical Reasoning)

Related method: Logic Games and Puzzles

Target group

Age: Adults (25+)

Gender: All genders

Level of studies: Suitable for all levels; it is especially good for those practicing structured problem solving

Status: Employed / unemployed / in transition

Fewer opportunities: Puzzles can be adapted for low-literacy participants via symbols/visuals. It may especially be interesting for educators who wish to sharpen logical reasoning and teach structured problem-solving methods transferable to curriculum design and classroom facilitation.

Learning outcomes

After finalising this activity, learners will be able to:

- Use grid-based (a structured table) deduction to solve multi-variable problems.
- Articulate step-by-step reasoning and translate it into teaching strategies.
- Work collaboratively to build and verify logical inferences.

Duration

45-60 minutes

Materials and resources

Printed logic grid puzzles of varying difficulty (1 per group), Pens, scratch paper, flip chart for final solution, Timer



Activity description

Teams work together to solve logic grid puzzles—for example, matching participants to outcomes based on a series of clues. As they progress, they carefully document each step of their reasoning, showing how they arrive at each conclusion. Once the puzzle is solved, teams reflect on the thinking process and map it to an instructional strategy, exploring how logical reasoning, structured problem-solving, and collaborative discussion can be applied in teaching and learning.

Detailed Implementation Steps

Introduction

Demonstrate a small example logic grid (2x2) and show how to mark possibilities/contradictions. Imagine you have two people, Alice and Bob, and two pets, a cat and a dog. The goal is to figure out who owns which pet. Learners can mark possibilities in the grid—placing a check for a possible match and an X to indicate a contradiction. For instance, if Alice does not own the cat, an X is placed in that cell, automatically narrowing down other options. This visual approach encourages step-by-step deduction: each decision reduces the number of possibilities, guiding learners toward the correct solution.

Main activity

Each group receives a puzzle and works through clues, marking the grid and noting each inference. Facilitators move between groups, offering guidance to those who encounter difficulties, for example by suggesting techniques like eliminating impossible options or spotting hidden patterns.

Once the groups believe they have solved their puzzle, they present their completed grid to the class, highlighting at least two key deductions and explaining the reasoning that made them confident in their solution.

Conclusion and reflection

Which deduction strategies were most useful? How can you teach students to slow down and document reasoning?



Assessment / Evaluation Method

Is grid fully resolved and consistent? (Yes/No)

Each group must explain two deduction steps and show evidence from the clues.

Debriefing questions proposed: *What is the first elimination you make if a clue states “X is not Y”?* (short answer)

How do you use cross-referencing of clues? (short answer)

Give one classroom application for this technique. (short answer)

Adaptation Tips

Start with 3-clue puzzles and build complexity.

Use single quick puzzles and a class-wide timed race.

Share printable PDFs and use breakout rooms to collaborate.



Module 4 – Problem Solving

Class activity 2. - Collaborative Riddle Relay (Communication & Reasoning)

Related method: *Logic Games and Puzzles*

Target group

Age: Adults (25+)

Gender: All genders

Level of studies: Suitable for all levels; also, it may be suitable for mixed-level groups

Status: Employed / unemployed / in transition

Fewer opportunities: Riddles can be presented orally or through pictures to ensure accessibility for everyone, including those with different learning styles or abilities.

Learning outcomes

After finalising this activity, learners will be able to:

- Practice clear verbalisation of reasoning steps under time pressure.
- Coordinate team roles (solver, scribe, messenger) effectively.
- Reflect on communication breakdowns and improve clarity.

Duration

45 minutes

Materials and resources

Set of 6–8 short riddles or logic tasks (one per relay station), Envelopes or QR codes for clues, Pens, paper, timer

Activity description

Teams participate in an engaging relay challenge. One team member starts by reading and attempting to solve a riddle. Once the riddle is successfully solved, the answer unlocks the next challenge for the following team member. This sequence continues until all riddles



are completed. The activity encourages rapid problem-solving, clear and concise communication, and smooth handovers between participants.

Detailed Implementation Steps

Introduction

The activity begins with a 10-minute introduction, where participants are briefed on their roles: the Solver, who works on the puzzles; the Scribe, who records the reasoning and answers; and the Messenger, who moves between stations. A sample relay round is demonstrated so everyone understands the flow.

Main activity

Clue stations are set up around the room, with each puzzle leading to the next station—for example, solving one puzzle reveals the number of the next station.

Teams start at different stations and work through each puzzle in timed rounds of 3 to 4 minutes. If a team gets stuck, they can request one hint, but with a small time penalty. Teams are encouraged to explain their reasoning aloud before moving on, fostering clear communication and shared problem-solving.

The first team to complete all stations is celebrated as the winner, and afterwards, all teams compare their times and discuss bottlenecks.

Conclusion and reflection

Participants reflect on the activity, discussing how effectively they communicated, whether instructions were clear, how assumptions were checked, and which role distribution worked best.

Assessment / Evaluation Method

Reflection questions: *What caused the biggest delay? How could your team have shortened the explanation without losing clarity?*

Adaptation Tips

Do the relay at tables with digital clue exchange.

Have multiple relays in parallel and compare strategies.

Use a sequence of locked Google Forms; answer to each form reveals the link to the next.



Module 4 – Problem Solving

Class activity 3. - Pattern Discovery & Transfer Workshop

Related method: Logic Games & Puzzles

Target group

Age: Adults (25+)

Gender: All genders

Level of studies: Suitable for any level of studies. It is particularly relevant to educators who teach analytical skills.

Status: Employed / unemployed / in transition

Fewer opportunities: It is possible to use simple visual patterns for broader accessibility. Participants detect patterns in puzzles, then explicitly transfer the method to a workplace problem (e.g., identifying patterns in attendance, errors, or learner feedback).

Learning outcomes

After finalising this activity, learners will be able to:

- Detect and articulate patterns from complex data or puzzle sets.
- Translate pattern-detection techniques into diagnostic tools for workplace problems.
- Construct a short plan to monitor pattern indicators moving forward.

Duration

60 minutes

Materials and resources

Sets of puzzles or visual pattern sheets (sequence completion, numeric patterns), Sample workplace datasets (anonymised attendance logs, feedback snippets), Flip chart, markers



Activity description

Participants start by tackling pattern-based puzzles, carefully observing and documenting each step of their discovery process. This initial exercise helps them develop clear, structured thinking and strengthens problem-solving skills. Once comfortable with the method, learners apply the same approach to a real workplace dataset, using the patterns they uncover to identify trends, highlight key insights, and propose meaningful monitoring indicators.

Detailed Implementation Steps

Introduction

Participants are shown a simple pattern puzzle, and the facilitator works through it out loud, explaining their thought process. They point out how to notice differences, repeated elements, or regular sequences in the pattern. This demonstration helps learners see how to approach problems step by step and encourages them to ‘think out loud’ while reasoning.

Main activity

Participants move into small groups for hands-on problem solving. Each group tackles two to three puzzles, carefully recording their reasoning step by step. This encourages attention to detail, logical thinking, and collaborative discussion.

Groups receive a short dataset, such as weekly attendance numbers or simple operational metrics. They identify two patterns or trends and hypothesise potential causes. Participants are encouraged to create simple visualisations, like sketches on a flipchart, to make patterns clearer and more tangible.

Each group proposes one or two measurable indicators for the patterns they discovered—for example, if they notice that attendance drops on Fridays, they might track the percentage of attendance per weekday over time.

Conclusion and reflection

Groups share the patterns, hypothesised causes, and suggested indicators with the whole group. The facilitator guides a discussion on which patterns are the strongest signals and



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why, reinforcing analytical thinking, the value of collaboration, and the connection between abstract reasoning and practical, data-driven decision-making.

Assessment / Evaluation Method

Was the pattern clearly described and supported by the data?

Reflection questions proposed:

Describe one method to detect a pattern in noisy data.

Give one example of an actionable indicator derived from a pattern.

Adaptation Tips

Use text excerpts for pattern detection (common complaints, word frequency).

Use one puzzle and one dataset only.

Share datasets as spreadsheets and let groups work collaboratively on a shared sheet.