Erasmus+ Project

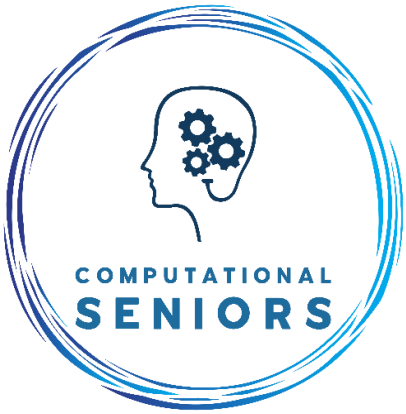
Key Action 2: Strategic Partnerships for Adult Education Sector

COMPutational Seniors:

Enhancing low-qualified adults' Inclusion through Computational Thinking

2024-1-ES01-KA220-ADU-000244899

WP4 Learning Box
Didactic Guide for Users
for Adult Education





The COMPutational Seniors project is co-funded by the European Union. The views and opinions expressed in this document commit only of the author(s) and do not necessarily reflect those of the European Union or the Spanish Service for the Internationalization of Education (SEPIE). Neither the European Union nor the SEPIE National Agency can be held responsible for them.

CC BY NC SA

Table of Contents

1. Introduction 4
1.1. Purpose and scope 4
1.2. Intended readership 4
1.3. Position among the project results 5
1.4. How to use this Guide 5
2. The Learning Box 6
2.1. Unplugged activities and why they are used 6
2.2. Computational Thinking in adult education 7
2.3. Competence areas 8
2.4. Levels of difficulty 9
2.5. What the collection contains 9
3. The person-centred model 10
3.1. What the model requires 10
3.2. The five dimensions of choice 10
3.3. Implications for the trainer and the guidance counsellor 10
4. Reading an activity sheet 11
4.1. The structure of a sheet 11
4.2. The left sidebar 11
4.3. The right panel 11
4.4. The second page 12
4.5. Supporting materials 12
4.6. A reading routine before delivery 12
5. Catalogue of the Learning Box 13
5.1. How the catalogue is organised 13
5.2. Innovation competences 13
5.3. Information literacy competences 14
5.4. Life and career competences 14
5.5. Coverage of the collection 16
6. Building a personalised learning pathway 16
6.1. Starting from the learner 16
6.2. Single activities 16
6.3. Progression within a competence area 16
6.4. Pathways across competence areas 17
6.5. Estimating the time required 17
7. Preparing a session 18
7.1. Group size and composition 18
7.2. Room and layout 18
7.3. Printed materials 18
7.4. Preparing yourself 18
7.5. Accessibility 19
8. Facilitating a session 19
8.1. The stance of the trainer 19
8.2. The session frame 19
8.3. Opening the session 20
8.4. During the task 20

8.5. Scaffolding 20
8.6. Equitable participation 21
8.7. Common difficulties 21
9. The debrief 21
9.1. Why the debrief carries the learning 21
9.2. A four-move structure 22
9.3. Questions by pillar 22
9.4. Closing 23
10. Observing and evidencing learning 23
10.1. From objectives to evidence 23
10.2. An observation grid 23
10.3. Self-assessment in accessible formats 24
10.4. Keeping a record 24
11. Adapting activities to your context 24
11.1. Language 24
11.2. Cultural adaptation of scenarios 24
11.3. Adapting for older learners 25
11.4. Adapting for learners with low literacy 25
11.5. Adjusting the level 25
11.6. What should not be changed 25
12. Frequently asked questions 26
12.1. Do I need to understand Computational Thinking before I start? 26
12.2. Must I tell participants that they are doing Computational Thinking? 26
12.3. Can activities be run with a single learner? 26
12.4. How many activities make a worthwhile programme? 26
12.5. What if my group has no experience of the theme? 26
12.6. Can I use the activities with mixed groups of adults and young people? 26
12.7. What do I do if an activity does not work with my group? 26
13. Glossary 27
14. References 28

1. Introduction

1.1. Purpose and scope

This Guide accompanies the COMPutational Seniors Learning Box of Unplugged Activities, the principal result of Work Package 4. Its function is mainly practical, as it explains how an adult educator selects activities from the collection, prepares them, delivers them with a group, and evaluates what the group has gained. The proposal defines this result as a didactic guide designed to help practitioners get the most out of the resources provided.

The Guide does not restate the design rationale contained in the WP4 Methodology. That document addresses the partners who wrote the activities and sets out the criteria their work had to satisfy. The present Guide addresses the people who will use the finished collection, and assumes no involvement in its production.

Everything in the Guide applies to the collection as delivered. Where a recommendation derives from the testing phase carried out in Poland, Spain, Lithuania and Greece between April and June 2026, this is stated, so that readers can distinguish evidence gathered with real learners from advice grounded in the pedagogical literature.

1.2. Intended readership

The Guide is written for adult trainers, facilitators, tutors, guidance counsellors and volunteers working with adults in formal and non-formal settings. No prior knowledge of computing, programming or mathematics is required, either of the reader or of the learners. Readers who have never encountered Computational Thinking will find the concepts introduced in Section 2 sufficient for confident delivery.

The settings for which the collection was designed include:

- adult education centres and second-chance education providers;
- Universities of the Third Age and other senior learning associations;
- vocational schools running evening or part-time classes for adults;
- community centres, civic associations and neighbourhood organisations;
- public libraries and cultural centres;
- social inclusion, employment guidance and integration services.

Guidance counsellors are a particular case among these readers. Their work with an individual client, rather than a standing group, makes them natural users of Sections 3 and 6, which match activities to a person rather than to a curriculum.

1.3. Position among the project results

COMPutational Seniors produces several results that address Computational Thinking in adult education from different angles. The table below situates the present Guide among them.

Result	What it provides	Primary audience
WP2 Open Educational Resources and learning platform	Online modules that introduce Computational Thinking and its application in adult education	Adult trainers
WP3 e-Guide	Guidance on integrating Computational Thinking into wider adult education practice	Adult trainers
WP4 Methodology (R1)	The design framework, quality criteria and activity template used to produce the collection	Activity developers
WP4 Learning Box (R2.1, R4)	The activity sheets and their supporting materials, in English and in all partner languages	Trainers and learners
WP4 Didactic Guide (R2.2, this document)	How to select, prepare, deliver, evaluate and adapt the activities	Trainers and guidance counsellors
WP4 Testing Guidelines and Reports (R3, R5)	The piloting protocol and the evidence it produced	Partners and evaluators

1.4. How to use this Guide

Sections 2 to 5 describe the collection and need to be read once. Section 3 sets out the person-centred model on which the whole result rests and should not be skipped, because it governs how the later practical sections are meant to be applied. Sections 6 to 9 cover planning and running sessions and are intended for consultation before each delivery. Sections 10 and 11 deal with evaluation and adaptation, and become relevant once a trainer has run several activities and wishes to refine the approach for a particular group. Section 12 answers questions raised repeatedly during the testing phase.

A trainer with a session to prepare next week and no time to read the whole document should read Section 4, then Sections 7 and 8, then the debrief questions in Section 9.

2. The Learning Box

2.1. Unplugged activities and why they are used

An unplugged activity is a structured learning experience that develops Computational Thinking and transversal competences without a computer, tablet, telephone or any other electronic device. Activities may use printed cards, paper, dice, tokens, string or everyday objects, but the work itself is carried out through reasoning, discussion and physical manipulation.

The absence of technology is a deliberate design choice, not a limitation. It removes, at a stroke, the barriers of digital literacy, device availability, connectivity, and cost that exclude many of the adults this project addresses. It also places the full cognitive demand of the task on the learner's own reasoning and on interaction within the group, where the target competences are formed.

An unplugged activity is not a simplified activity. Several activities in this collection are conceptually demanding and will occupy an experienced group for ninety minutes. What distinguishes them is the absence of a machine, not the absence of difficulty.

2.2. Computational Thinking in adult education

Computational Thinking is a way of analysing and resolving problems using principles drawn from computer science, applied here without any computer. The project works with four pillars, which the activity sheets refer to consistently.

Pillar	**What it means, and where adults already do it**
Decomposition	Breaking a complex problem into smaller parts that can be handled one at a time. Adults do this when they plan a house move, organise a family event or prepare a set of documents for an administrative procedure.
Pattern recognition	Noticing regularities, repetitions and similarities within a problem or across several problems. Adults do this when they see that the same category of expense recurs every month, or that a difficulty at work has arisen before in a different form.
Abstraction	Setting aside detail that does not matter for the decision at hand, and keeping what does. Adults do this when they summarise a long document, compare two offers or explain a situation to someone who was not present.
Algorithmic thinking	Designing an ordered sequence of steps that reliably produces a result. Adults do this when they write down a procedure for a colleague, follow a recipe or plan a route with several stops.

A fifth process, debugging, appears in several activities but is not listed as a separate pillar. It consists of testing a proposed solution, finding where it fails and correcting it. In group work, it is often where the most learning occurs, and Section 9 returns to it.

The activities rarely engage a single pillar in isolation. A sheet that marks decomposition and algorithmic thinking will usually require some abstraction as well. The marked pillars indicate what the activity is built to elicit and what the debrief should therefore address.

2.3. Competence areas

Each activity is assigned to one of three competence areas, drawn from the European LifeComp framework and from the project's own priorities. The assignment reflects the competences the activity structure genuinely elicits, not every competence it might conceivably touch.

Competence area	**Competences addressed**
Innovation competences	Creativity, critical thinking, problem solving, communication, collaboration
Information literacy competences	Accessing, understanding and critically analysing information; interpreting visual and digital content; recognising media influence and bias.
Life and career competences	Flexibility and adaptability, initiative and autonomy, sociability and intercultural competence, productivity, leadership and responsibility

The three areas are not sealed off from one another. An activity classified under information literacy will still require collaboration if it is run in groups. The classification indicates where the activity places its emphasis and where its learning objectives were written, and it is the basis on which the collection is organised for browsing.

2.4. Levels of difficulty

Every activity carries one of three levels. The level refers to the conceptual and procedural demand of the task, not the learners' educational attainment.

Level	Characteristics
Beginner	Suitable as a first encounter with Computational Thinking. Assumes no prior familiarity with the vocabulary. The task has a single clear goal and a short chain of reasoning. Accessible to all three target learner profiles.
Intermediate	Assumes some familiarity with the basic vocabulary, acquired either from a previous activity or from the trainer's introduction. Involves multi-step reasoning, group coordination, or both.
Advanced	Engages several pillars at once, often with competing constraints and no single correct answer. Requires learners to reflect on their own reasoning. Best used with groups that have completed several earlier activities.

Testing showed that the level indication should be treated as a starting point rather than a verdict. Groups with strong life experience in the domain of a given scenario frequently handled an advanced activity comfortably, while an unfamiliar domain made a beginner activity harder than expected. Section 11 explains how to raise or lower an activity's demand without rewriting it.

2.5. What the collection contains

The Learning Box comprises fifty-six activities distributed across the three competence areas and the three levels. Each activity consists of a two-page sheet, and more than half of the activities are accompanied by supporting materials such as scenario cards, planning boards, worked tables or maps, supplied as separate files for printing.

The collection is available in English and in the languages of the partnership: Greek, Lithuanian, Polish, and Spanish. The activity sheets are organised in folders by language, then by competence area, then by level, so that a trainer can navigate directly to the activities that match a defined need.

Section 5 lists the full contents. A trainer approaching the collection for the first time is advised to read three or four complete sheets from different competence areas before consulting the catalogue, since the sheets are easier to compare once their common structure is familiar.

3. The person-centred model

3.1. What the model requires

The proposal describes the Learning Box as a person-centred model in which learners choose what to learn, how to learn, when to learn, in what order and at what pace. This statement describes how the collection is meant to be used, and it has consequences that reach into every practical decision described in the rest of this Guide.

A trainer who works through the collection in a fixed order, at a fixed pace, with a fixed group, is using a curriculum. The collection supports that use, and Section 6 shows how to construct such a sequence. But the result was designed to permit something else as well: a learner, or a small group of learners, deciding with the trainer which competence matters to them now, which scenario resembles their own situation, and how quickly they wish to proceed. The modular design of the collection makes this possible.

3.2. The five dimensions of choice

Dimension	What it means in practice
What	The learner chooses the competence area, and often the theme. Someone anxious about official correspondence and someone planning to start a small business need different starting points, and the catalogue in Section 5 serves both from the same collection.
How	Activities can be run with a whole group, in pairs, or one-to-one with a guidance counsellor. Several can be worked through in writing, in speech, or by arranging physical cards, which matters for learners with low literacy.
When	Activities are self-contained. They do not have to be delivered on a weekly timetable, and the collection can be used opportunistically when a group raises a relevant concern.
In what order	Apart from the level progression described in Section 6, there is no prescribed order. Notes fields on individual sheets suggest natural predecessors or successors where these exist.
At what pace	Durations on the sheets are estimates. Section 8 gives shortened and extended timings for the standard session frame, and testing confirmed that pace is the variable most often needing adjustment.

3.3. Implications for the trainer and the guidance counsellor

Giving learners this degree of choice changes what the trainer does before a session. Instead of deciding alone which activity comes next, the trainer holds a short conversation with the group or the individual about what would be useful, then selects from the catalogue accordingly. Section 6 sets out how to run that conversation and how to turn its outcome into a pathway.

For guidance counsellors, the implication is more direct. An activity worked through with a single client, chosen because it mirrors a situation the client is facing, is at once a learning

experience and a structured way of examining that situation. The carpool coordination and financial instability activities have both been used this way during testing.

Learner choice does not extend to an activity's internal structure. Once an activity has been selected, its steps, constraints, and debrief carry the learning, and Section 11 identifies the elements that should not be altered.

4. Reading an activity sheet

4.1. The structure of a sheet

Every activity in the collection uses the same two-page sheet, so that a trainer who has read one can navigate any other. The first page has a coloured sidebar on the left with the activity metadata, and a wider panel on the right with the learning content. The second page carries the steps and any tables the activity requires.

4.2. The left sidebar

Field	How to read it
Theme	The real-world domain around which the activity is built. Use this field first when matching an activity to what a group has said it needs.
Duration	The total estimated time including introduction and debrief, usually as a range. Treat the upper figure as the realistic one for a group meeting for the first time.
Level	Beginner, intermediate or advanced, as defined in Section 2.
Computational Thinking steps used	The pillars the activity is built to elicit, marked with a tick. Each ticked pillar corresponds to an identifiable moment in the steps, and these are the moments the debrief should return to.
Methodological approach	One or more of gamification, challenge-based learning, collaborative learning and experiential learning. This tells the trainer what kind of session to expect and how to pitch the introduction.

4.3. The right panel

Field	How to read it
Activity name	A short title, kept consistent across all language versions so that partners and trainers can refer to the same activity unambiguously.
Description	Two to four sentences written for the learner. This text can be read aloud at the start of the session with no adaptation.
Target group	The learner profiles for which the activity is suitable, marked with a tick. If none of the ticked profiles matches the group, the activity will need the adaptations described in Section 11.

Field	How to read it
Learning objectives	Three to five statements of what participants will be able to do by the end. These are the trainer's reference point when deciding whether the session achieved its purpose.
Competence areas	The specific competences the activity elicits, marked within the three areas. Useful when a group or an individual has asked to work on something in particular.
Learning outcomes	Observable behaviours or products that show the objectives have been met. Section 10 explains how to use this field as the basis of an observation grid.
Notes	Setup requirements, materials to prepare, accessibility or cultural adaptations, and cross-references to related activities. Always read this field before the session, since it states the preparation burden.

4.4. The second page

The second page contains the numbered steps of the activity, written in plain imperative language and addressed to the trainer. Steps state what participants do, what the trainer does, roughly how long the phase should take, and which facilitation questions to ask where reflection is expected. Where an activity requires structured data, such as role cards, scenario summaries or an evaluation grid, this appears as a table on the same page.

4.5. Supporting materials

More than half of the activities come with supporting materials in separate files: scenario cards, planning boards, sample correspondence, maps or task cards. These are listed in the Notes field of the sheet. They are supplied separately because they are printed and cut differently from the sheet itself, and because they usually need to be produced in multiple copies, one set per group.

4.6. A reading routine before delivery

Before running an activity for the first time, work through the sheet in the following order. Testing indicated that trainers who omitted this preparation encountered difficulties the sheet had already anticipated.

- Read the description and the steps end to end, without stopping, to form a picture of how the session will unfold.
- Read the Notes field and list everything that has to be printed, cut or brought.
- Look at the ticked Computational Thinking pillars and identify the exact moment in the steps where each one is exercised.
- Read the learning objectives and outcomes, and decide what you will look for in the room as evidence.
- Work through the core task yourself, on paper, as a participant would. This is where you will discover the ambiguities your group will find.

- Decide your timing, using the shortened, standard or extended frame from Section 8.

5. Catalogue of the Learning Box

5.1. How the catalogue is organised

The catalogue below lists the collection by competence area and, within each area, by level. Activities appear under the competence area to which their authors assigned them, which is also the folder in which they are filed.

The final column indicates the Computational Thinking pillars each activity is built to elicit, using the following abbreviations: D for decomposition, P for pattern recognition, A for abstraction, and AT for algorithmic thinking.

5.2. Innovation competences

Activity	Level	Pillars
Managing a household budget during inflation	Beginner	D, P, A, AT
Urban mobility: choosing the best route in a city	Beginner	D, P, AT
The resource allocation paradox	Beginner	D, P, A
The weekly grocery shopping	Beginner	D, P, AT
The skill barter network builder	Beginner	P, A
Natural disasters: wildfire, earthquake and flood response	Intermediate	D, P, A, AT
Optimising heating with heat pumps or traditional systems	Intermediate	D, P, AT
The social media crisis	Intermediate	D, P, A, AT
The car that needs attention	Intermediate	D, P, A, AT
What should I choose? Smart decisions with AI tools	Intermediate	D, P, A, AT
Fix the chatbot! Understanding chatbots by finding mistakes	Intermediate	D, P, A, AT
The community event planner	Intermediate	D, AT
The job interview escape room	Intermediate	D, P, A
The zero-waste upcycling engineers	Intermediate	D, AT
Multigenerational logistics	Intermediate	D, P, AT
The flight disruption recovery plan	Advanced	D, P, A, AT

Activity	Level	Pillars
The home repair cascade	Advanced	D, A, AT
Understanding chatbots through role play	Advanced	D, P, A, AT

5.3. Information literacy competences

Activity	Level	Pillars
Planning a summer trip on a budget	Beginner	D, P, A, AT
Using public services online	Beginner	D, P, AT
The improved sleep schedule	Beginner	P, A, AT
The digital subscriptions overlap.	Beginner	D, P, A
The lost passwords	Beginner	D, A, AT
The emergency decision committee	Intermediate	D, P, A, AT
The recipe with limited ingredients	Intermediate	D, A, AT
The library return rush	Intermediate	D, A, AT
The waste sorting decision framework	Intermediate	D, P, A, AT
The organisation of personal documents	Intermediate	D, A, AT
The online order chaos	Intermediate	D, P, A
The insurance selection	Advanced	P, A, AT
The shared housing system failure	Advanced	D, P, A
Is this safe? Understanding digital risks	Advanced	D, P, A, AT
Fake news and disinformation	Advanced	D, P, A, AT

5.4. Life and career competences

Activity	Level	Pillars
Organising work in a small family business	Beginner	D, P, A, AT
Reducing the energy consumption of a typical household	Beginner	D, P, AT
The email overload	Beginner	D, P, A
My strength circle	Beginner	D, P, A

Activity	Level	Pillars
What should I do? Health decisions through voting	Beginner	D, P, A
How resilient are we? Staying calm in critical situations	Beginner	D, P
The smart shopper challenge	Beginner	D, P
Safe first aid kit and medication management	Beginner	D, P, AT
Architect of family memories: organising archives	Beginner	D, A
Scheduling shifts in a hospitality or tourism business	Intermediate	D, A, AT
Starting a small online business	Intermediate	D, P, AT
The job interview	Intermediate	P, A, AT
The study-work balance	Intermediate	D, P, A
My health plan board: organising healthy habits step by step	Intermediate	D, P, A, AT
My busy day challenge: organising everyday tasks and managing time	Intermediate	D, P, A
Garden master: the companion planting challenge	Intermediate	D, P, AT
The well-being algorithm	Intermediate	D, A, AT
The payment of monthly bills	Advanced	D, P, A, AT
The carpool coordination	Advanced	D, P, A, AT
The financial instability loop	Advanced	D, P, A, AT
The adaptive learning plan	Advanced	D, P, A, AT
Car or public transport? Making smart travel choices	Advanced	D, P, A, AT
Lost and found challenge: recovering a phone at a large airport	Advanced	D, AT

5.5. Coverage of the collection

The distribution below shows where the collection is richest, which matters when constructing a pathway at a particular level.

Competence area	Beginner	Intermediate	Advanced
Innovation competences	5	10	3
Information literacy competences	5	6	4
Life and career competences	9	8	6
Total	19	24	13

All four Computational Thinking pillars are represented at every level and in every competence area, so a pathway constructed within a single area will still exercise the full range.

6. Building a personalised learning pathway

6.1. Starting from the learner

Section 3 established that the collection is meant to be used from the learner's starting point rather than from a fixed syllabus. In practice, this begins with a short conversation, of ten to fifteen minutes, held either with a group at the start of a programme or with an individual client.

Four questions are usually sufficient to identify a starting point:

- What kind of situation in your own life do you find hardest to organise or decide about?
- When something needs sorting out, do you prefer to work it through on your own or with other people?
- Have you done anything like this before, in a class or a course?
- How much time can you realistically give to this, and over what period?

The first question points to a competence area and often to a specific theme. The second indicates whether to favour collaborative activities or one-to-one work. The third informs the choice of level. The fourth determines the length of the pathway and the session frame from Section 8.

6.2. Single activities

Every activity in the collection is a complete session in its own right. A trainer who has one meeting with a group, or a counsellor with a single appointment, can select one activity, run it with its debrief, and expect a coherent outcome. This is the most common use of the collection and requires no further planning.

6.3. Progression within a competence area

Where several sessions are available, the simplest structure is a progression within one competence area, moving from beginner to advanced. This suits a group with a shared concern, such as learners preparing to return to employment, and it allows the vocabulary introduced in the first session to be reused throughout.

The pattern below has been used successfully during testing.

Session	Level	Purpose
1	Beginner	Introduce the four pillars through a familiar situation. Keep the debrief short and concrete.
2	Beginner	Reuse the vocabulary from session 1 in a different theme, so that the concepts are seen to transfer.
3	Intermediate	Introduce group coordination and multi-step reasoning. Extend the debrief.
4	Intermediate	Introduce competing constraints. Ask learners to name the pillars they used before you name them.
5	Advanced	Work with an open problem that has no single correct answer. Devote a third of the session to reflection.

6.4. Pathways across competence areas

A pathway can also be built around a theme that cuts across the three areas. A group interested in household finance, for example, can be taken through the household budget activity from the innovation area, the digital subscriptions and insurance activities from information literacy, and the monthly bills and financial instability activities from life and career. The competence emphasis shifts from session to session while the domain stays constant, which supports transfer without requiring learners to adjust to an unfamiliar context each week.

6.5. Estimating the time required

A standard session runs to ninety minutes including the introduction, the task, the debrief and any evaluation. A five-session pathway therefore requires around seven and a half hours of contact time, plus preparation. Testing showed that groups meeting for the first time consistently needed the upper end of the stated durations, and that the debrief was the phase most often cut short when time ran out. Plan the debrief first and let the task absorb the pressure, rather than the reverse.

7. Preparing a session

7.1. Group size and composition

The collection was designed and tested for groups of about ten participants with one trainer. This size allows genuine group dynamics while still letting the trainer reach every participant during the task. Activities involving several small teams generally work with pairs or with groups of three to five, so a group of ten divides conveniently.

Larger groups are workable if a second facilitator is available. Testing sessions in Lithuania and Greece ran with twenty to twenty-seven participants. They remained productive, but the trainers concerned reported that individual support during the task became difficult and that the debrief had to be restructured to keep everyone involved.

Mixed groups deserve particular attention. Where a group spans a wide range of ages, working backgrounds or education levels, the working pace varies substantially between participants. Section 8 describes how to handle this without leaving anyone behind or holding anyone back.

7.2. Room and layout

Activities require a room in which participants can sit in small groups around tables and see one another. Fixed seating in rows makes most of the collection difficult to deliver. Wall space or flipchart stands are useful, since several activities ask groups to display their work for others to examine.

7.3. Printed materials

The testing phase produced clear findings on printing, and these should be treated as requirements rather than preferences when working with older learners.

- Print participant-facing text at a minimum of fourteen points, and prefer sixteen where the material will be read at arm's length or in poor light.
- Print cards at a size that can be handled comfortably and read without glasses where possible, which in practice means a card no smaller than a standard playing card and usually larger.
- Use strong contrast between text and background, and avoid printing text over images or coloured panels.
- Produce one complete set of materials per small group, plus one spare set. Groups that share a single set spend the session waiting rather than working.
- Check the translated version against the original before printing. Testing in Poland and Greece confirmed that materials were used entirely in the national language, and translation errors in scenario cards are difficult to recover from mid-session.

7.4. Preparing yourself

Try to work through the core task on paper before the session. This is quite an important piece of preparation because it reveals the points at which the instructions can be read in more than one way, and those are the points at which your group will stop and ask.

Prepare a worked example. The testing reports recommend providing a short, already solved instance of the task, shown from the start, to help alleviate the low confidence some learners might feel and shorten the time spent on the first step. Keep it visibly simpler than the real task, so that it demonstrates the method without giving away the solution.

7.5. Accessibility

Check the following before every session with a group of older adults, since each item corresponds to a difficulty actually encountered during testing.

- Are large-print copies available for participants who arrive without reading glasses?

- Can every instruction that appears in writing also be delivered orally?
- Is there an alternative to writing for participants who find it difficult, such as arranging cards or speaking their answer to a partner?
- Is the session length realistic for the physical stamina of the group, and is a break scheduled?
- Does the evaluation at the end avoid requiring a computer or a small-print form? Section 10 gives alternatives.

8. Facilitating a session

8.1. The stance of the trainer

In these activities, the trainer works as a facilitator rather than as an instructor. The distinction is not decorative. Computational Thinking is developed by the learner performing the reasoning, and a trainer who resolves the difficulty on the group's behalf removes the learning along with the difficulty.

The practical form of this stance is akin to the Socratic method: ask open questions, ask for the reasoning behind an answer, make competing views in the group explicit, and let a group discover that its first approach does not work. Whenever a group might end up stuck, then the useful intervention will be a question that narrows the problem rather than an instruction that solves it.

This might end up more difficult to implement in practice than it appears, especially with learners who lack confidence and who will ask directly to be told the answer. The response that has worked in testing is to then answer a different question: to restate what the group has already established, and ask what would have to be true for the next step to follow.

8.2. The session frame

All activities in the collection fit a common four-phase frame. The table gives a shortened, standard and extended version, so that the same activity can be delivered in an hour or in two.

Phase	**Shortened**	**Standard**	**Extended**
Introduction and worked example	5 min	10 min	15 min
The task	35 min	50 min	70 min
Debrief	15 min	25 min	30 min
Evaluation and close	5 min	5 min	10 min
Total	60 min	90 min	125 min

Use the extended frame by default for groups meeting for the first time, for groups working in a second language, and for groups of older learners. Testing identified timing as the variable most often in need of adjustment, and the shortened frame should be used only with a group whose pace is already known.

8.3. Opening the session

State the purpose of the activity before starting it. Adults engage with a task once they understand why they are being asked to do it, and the description field on the sheet is written to be read aloud for this purpose. Follow it with the worked example, then check that the task is understood before groups begin by asking one participant to restate what their group is about to do.

8.4. During the task

Circulate continuously and listen more than you speak. What you are listening for is the reasoning, not the answer: whether the group is breaking the problem down, whether anyone has noticed a repetition, what they are choosing to ignore, and whether their sequence of steps would actually work if someone followed it.

Note what you hear as it happens. These observations are the substance of the debrief and of the evidence described in Section 10, and they are difficult to reconstruct afterwards.

Where the pace within a group varies widely, give faster participants a role rather than an extension: asking them to record the group's reasoning, test the proposed sequence against an awkward case, or prepare the group's explanation for the debrief keeps them engaged without leaving others behind.

8.5. Scaffolding

Learners with limited formal education frequently hesitate at the first step, not because the task is beyond them but because they are unwilling to be seen to make a mistake. The testing reports identified this as the most common obstacle and recommended graduated support.

Level of support	**What the trainer does**
First	Restate the goal of the step in different words, and stop.
Second	Ask a narrowing question that isolates one part of the problem.
Third	Point to the worked example and ask what was done there.
Fourth	Offer the first move only, then withdraw and let the group continue.

Move down this list only when the previous level has been given time to work. Beginning at the fourth level, if a group looks uncomfortable, convert the activity into a demonstration.

8.6. Equitable participation

Group tasks tend to be dominated by the most confident speakers unless the structure prevents it. Where an activity assigns roles, use them. Where it does not, assign them anyway: someone to record, someone to keep time, someone to present. Rotate these roles between activities so that the same participants do not always occupy the same position.

8.7. Common difficulties

Difficulty	Response
The group produces an answer within two minutes and considers the task finished.	Ask them to test it: give them an awkward case that their solution does not handle. The second attempt is where the learning happens.
One participant does all the work.	Introduce a rule that a different member must explain each step before the group moves on.
The group asks to be told the correct answer.	State that there is more than one workable answer, and ask what would make one better than another.
A participant says the activity is childish.	Connect it explicitly to the real situation in the theme, and ask how they currently handle that situation. This objection almost always disappears at the debrief.
The group finishes far ahead of the others.	Ask them to write their procedure so that another group could follow it without explanation. This is genuine additional work, not filler.
Participants cannot transfer the reasoning to their own lives	Devote more of the debrief to the transfer question, and plan a second activity in the same theme. Roughly thirty per cent of participants in the Polish testing reported needing this reinforcement.

9. The debrief

9.1. Why the debrief carries the learning

In experiential learning, the activity supplies the experience, but learning forms when participants step back and make sense of what happened. Kolb's cycle names these phases as concrete experience, reflective observation, abstract conceptualisation and active experimentation, and an activity that stops at the end of the task has completed only the first of them.

This has a direct practical consequence. When a session overruns, the debrief is the phase most often sacrificed, and it should be protected. A task cut short with a full debrief teaches more than a task completed with no debrief at all.

9.2. A four-move structure

The following structure fits the twenty-five-minute standard debrief and can be compressed or extended.

Move	Question type	Purpose
Recall	What did you actually do?	Establish a shared account of the session before interpreting it. Let each group speak briefly.

Move	Question type	Purpose
Examine	What was difficult, and why?	Surface the reasoning. This is where the Computational Thinking becomes visible and nameable.
Name	What kind of thinking was that?	Attach the vocabulary to what participants have just done, rather than the reverse. Introduce or reinforce the pillar names here.
Transfer	Where does this happen in your own life?	Connect the reasoning to situations outside the room. This move determines whether the session has lasting value.

9.3. Questions by pillar

Use the questions below with any activity in the collection. Select those matching the pillars ticked on the sheet.

Pillar	Debrief questions
Decomposition	How did you divide the problem up? Was there another way to divide it? Which part turned out to be the hardest, and did you expect that?
Pattern recognition	What repeated? Did you notice you were doing something you had done before? What did the successful approaches have in common?
Abstraction	What did you decide to ignore? What made you confident that it did not matter? Was anything you ignored important after all?
Algorithmic thinking	If a stranger followed your steps exactly, what would go wrong? What did you have to make explicit that you would normally leave unsaid?
Debugging	At what point did you realise the first approach would not work? What told you? What did you change, and why that rather than something else?

9.4. Closing

Close by asking each participant for one thing they will do differently, or one situation in which they will try this. Recording these on a flipchart takes three minutes and gives the group a visible product of the session. It also gives the trainer a starting point for the next meeting and evidence for the record described in Section 10.

10. Observing and evidencing learning

10.1. From objectives to evidence

Each activity sheet states learning objectives, describing what participants will be able to do, and learning outcomes, describing what can be observed from outside. The outcomes are written to be observable precisely so that a trainer can use them as an evaluation instrument without constructing one.

Assessment in this collection is formative. Its purpose is to inform the trainer's next choice of activity and to give learners a sense of their own progress, not to grade anyone. No activity in the collection carries a pass mark.

10.2. An observation grid

The grid below can be completed during the task and takes little attention away from facilitation. Copy the outcomes from the sheet into the first column before the session.

Observable outcome	**Not yet**	**Emerging**	**Established, with a note of what was seen**
Divides the problem into parts without prompting			
Identifies a repetition across cases			
States what can be disregarded, and why			
Produces a sequence another person could follow			
Tests a solution and revises it			
Contributes to the group's reasoning			

10.3. Self-assessment in accessible formats

The testing phase found that written and online evaluation forms excluded a substantial proportion of participants. In one Lithuanian group of thirty, ten completed a written questionnaire independently, while twelve responded only once the questions were read aloud and answered by a show of hands. In an online group of two, one participant could not submit the form. Several participants stated that they had no computer at home.

Feedback methods should therefore fit the group rather than the convenience of the record. The testing reports recommended the following alternatives.

- Read each question aloud and collect answers by a show of hands, recording the counts yourself.

- Use cards with simple faces or symbols that participants hold up, which avoids both reading and writing.
- Hold a short oral exchange with three or four participants after the session and note their responses.
- Where a written form is used, print it at fourteen points or larger and allow participants to complete it in pairs.

Reserve online questionnaires for participants who have said they are comfortable with them, and never rely on one as the only record of a face-to-face session.

10.4. Keeping a record

A short note after each session, recording which activity was used, how many participants attended, what was observed against the outcomes, and what the group asked for next, is sufficient. Over a pathway, this record shows progression, supports the personalisation described in Section 3, and provides the material required for any reporting the organisation owes to funders.

11. Adapting activities to your context

11.1. Language

The collection exists in all partner languages, and activities should be delivered in the group's language. If a trainer must work from the English version, translate the scenario materials in advance rather than improvising, since scenario cards carry the task constraints and an imprecise rendering changes the problem.

Check that the four pillar names are translated consistently across every activity you use with the same group. Learners acquire this vocabulary across sessions, and a change of term between sessions undoes that.

11.2. Cultural adaptation of scenarios

Scenarios describe situations in adult life, and some details will not transfer between countries. Prices, institutions, administrative procedures, transport arrangements and household norms can all be substituted freely. Replace them with equivalents your group will recognise, keeping the problem structure and number of constraints unchanged.

Testing confirmed the value of this. The activities that performed best were those rooted in daily routines participants recognised immediately, such as shopping, gardening, and reducing energy bills, and recognition depends on local details being right.

11.3. Adapting for older learners

- Use the extended session frame, and schedule a break.
- Read all written instructions aloud as well as displaying them.
- Enlarge printed materials, and keep spare large-print sets available.
- Draw explicitly on the experience in the room. Older learners bring extensive practical knowledge, and activities that invite it are markedly more successful than those that do not.

- Allow more time for the transfer move of the debrief, which is where this experience becomes most valuable.

11.4. Adapting for learners with low literacy

- Accept spoken or drawn responses wherever an activity asks for writing.
- Pair a participant who writes easily with one who does not, with the roles named as recorder and reasoner so that neither is diminished.
- Replace written cards with pictorial ones, or read every card aloud at the start.
- Keep the worked example on display throughout the task rather than showing it once.

11.5. Adjusting the level

You can make an activity easier or harder without changing its structure.

To make an activity easier	To make it harder
Reduce the number of constraints in the scenario. Supply part of the solution as a starting point. Lengthen the time allowed. Give the worked example in fuller detail.	Add a constraint that conflicts with an existing one. Remove a piece of information the group expects to have. Require the group to justify the choice against explicit criteria. Ask for a procedure a stranger could follow unaided.

11.6. What should not be changed

Some elements carry the learning and should be left intact.

- The Computational Thinking pillars the activity is built to elicit, and the steps in which they occur.
- The debrief. Shorten it if you must, but do not omit it.
- The requirement that the activity remain unplugged at every stage.
- The open character of problems in advanced activities. Supplying a single correct answer removes the reasoning the activity exists to develop.

12. Frequently asked questions

12.1. Do I need to understand Computational Thinking before I start?

You need Section 2 of this Guide and the activity sheet you are delivering. The four pillars are named and illustrated there, and the debrief questions in Section 9 are written so that a trainer can use them without further study. Trainers who wish to go further will find the WP2 modules and the WP3 e-Guide useful.

12.2. Must I tell participants that they are doing Computational Thinking?

Not at the start. Evidence from testing shows that adults engage with the situation rather than the terminology. Introduce the vocabulary at the naming move of the debrief, once participants have performed the reasoning and have something to attach the words to.

12.3. Can activities be run with a single learner?

Many can, and guidance counsellors have done so during testing. Activities marked as collaborative will lose part of their purpose, since the interaction is where the competence is exercised—still, activities built around analysis and sequencing transfer well to a one-to-one setting. The debrief becomes a conversation rather than a group discussion.

12.4. How many activities make a worthwhile programme?

Five sessions are enough to establish the vocabulary and demonstrate transfer, using the progression in Section 6. A single session is worthwhile in its own right. Testing indicated that participants need more than one encounter before they apply the reasoning independently, so where only one session is possible, devote a larger share of it to the transfer move.

12.5. What if my group has no experience of the theme?

Choose a different activity. The catalogue in Section 5 is organised so the same competence and level can be reached through several themes, and recognising the situation is what makes these activities work.

12.6. Can I use the activities with mixed groups of adults and young people?

Yes, and the Spanish testing sessions did so, spanning ages from eighteen to over fifty-five. Expect the working pace to vary more widely than in a homogeneous group, and use the role allocation described in Section 8 to keep the faster participants productively occupied.

12.7. What do I do if an activity does not work with my group?

Note what happened, adapt it using Section 11, and try the same activity again with a different group before concluding that it is unsuitable. Record the observation and pass it to the project partners, since the collection is intended to be refined in use.

13. Glossary

Term	Definition
Abstraction	The Computational Thinking process of identifying the essential features of a problem and setting aside those that do not affect the outcome.
Algorithm	An ordered sequence of steps that reliably solves a problem or completes a task.
Algorithmic thinking	The Computational Thinking process of designing, following and evaluating algorithms.

Term	Definition
Andragogy	The theory and practice of adult learning, emphasising self-direction, prior experience, relevance and internal motivation.
Challenge-based learning	A pedagogical approach in which learning is organised around an authentic problem that participants investigate and resolve.
Competence areas	The three-part classification used in this collection: innovation, information literacy, and life and career competences.
Computational Thinking	A set of problem-solving processes drawn from computer science and applied without a computer, comprising decomposition, pattern recognition, abstraction and algorithmic thinking.
Debriefing	The structured reflection that follows an activity, in which participants examine what they did and attach concepts to it.
Debugging	The process of testing a solution, locating where it fails, and correcting it.
Decomposition	The Computational Thinking process of breaking a complex problem into smaller, manageable parts.
Experiential learning	A pedagogical approach in which learning proceeds through a cycle of experience, reflection, conceptualisation and experimentation.
Facilitation	A mode of teaching in which the trainer supports the learners' own reasoning through questioning rather than instruction.
Gamification	The use of game mechanics in non-game settings to increase engagement and motivation.
Learning Box	The complete collection of unplugged activities produced by Work Package 4 of the COMPutational Seniors project.
Learning objectives	Statements of what participants will be able to do at the end of an activity.
Learning outcomes	Observable behaviours or products that demonstrate the objectives have been achieved.
LifeComp	The European Framework for Personal, Social and Learning to Learn Key Competences.
Pattern recognition	The Computational Thinking process of identifying similarities, regularities and repetitions within and across problems.
Scaffolding	Temporary support that enables a learner to complete a task they could not yet complete unaided, withdrawn as competence develops.
Universal Design for Learning	A framework for designing learning experiences that offer multiple means of representation, engagement and expression.

Term	Definition
Unplugged activity	A structured learning activity that develops Computational Thinking without any electronic device.
Worked example	A short, already-solved instance of a task, shown before the task itself, to demonstrate the method without revealing the solution.

14. References

- Bell, T., Witten, I. H., and Fellows, M. (1998). Computer Science Unplugged: Off-Line Activities and Games for All Ages. University of Canterbury.
- CAST (2018). Universal Design for Learning Guidelines, version 2.2. Wakefield, MA: CAST.
- COMPutational Seniors (2026). WP4 Methodology: Guidelines for Creating Unplugged Activities for Adult Education. Project result R1.
- COMPutational Seniors (2026). WP4 Testing Guidelines. Project result R3.
- COMPutational Seniors (2026). WP4 Summary Report of the Testing Phase. Project result R5.
- European Commission (2020). LifeComp: The European Framework for Personal, Social and Learning to Learn Key Competences. Luxembourg: Publications Office of the European Union.
- European Commission (2022). DigComp 2.2: The Digital Competence Framework for Citizens. Luxembourg: Publications Office of the European Union.
- Knowles, M. S., Holton, E. F., and Swanson, R. A. (2015). The Adult Learner, 8th edition. London: Routledge.
- Kolb, D. A. (1984). Experiential Learning: Experience as the Source of Learning and Development. Englewood Cliffs, NJ: Prentice Hall.
- Selby, C., and Woollard, J. (2013). Computational Thinking: The Developing Definition. University of Southampton.
- Shute, V. J., Sun, C., and Asbell-Clarke, J. (2017). Demystifying computational thinking. Educational Research Review, 22, 142-158.
- Wing, J. M. (2006). Computational thinking. Communications of the ACM, 49(3), 33-35.