SOFT SKILLS
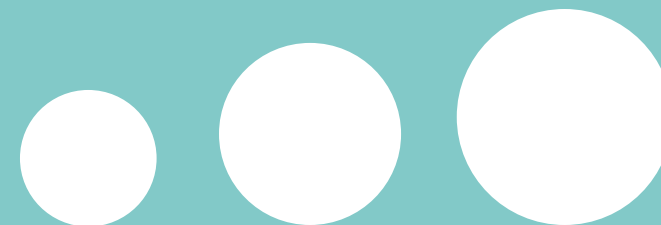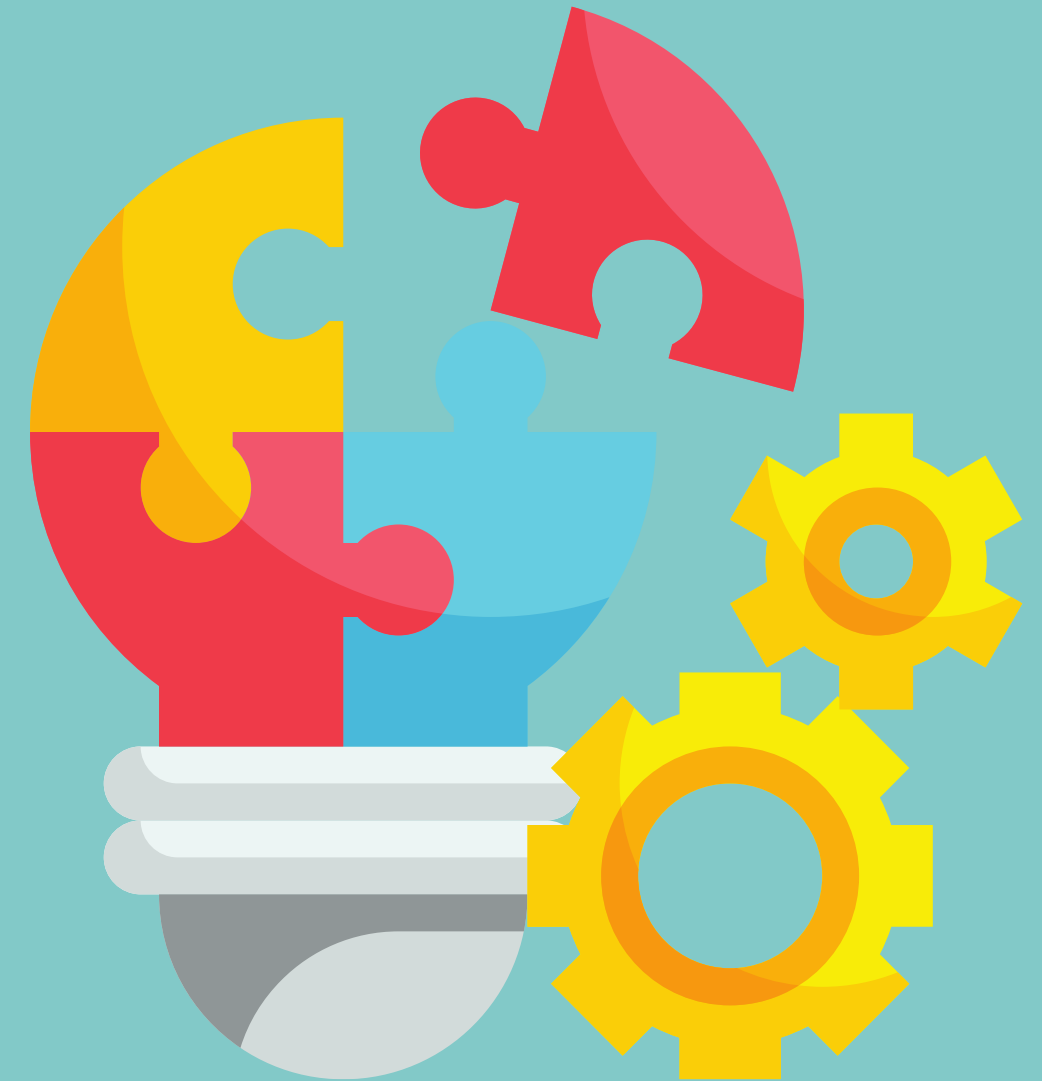
Soft Skills for Youth Employment

PROBLEM SOLVING

SOFT SKILLS
FOR YOUTH
EMPLOYMENT
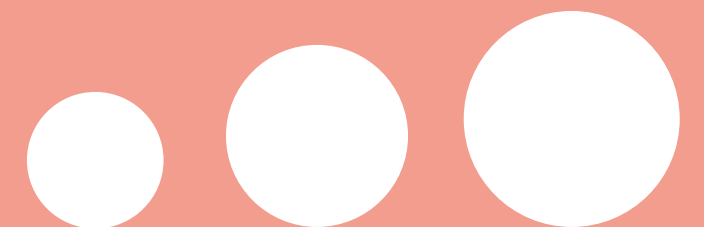
2022-1-TR01-KA220-YOU-000087078

PROBLEM SOLVING

2.0
hours

individually or in a group

- Big sheets of papers
- A4 papers
- Markers

AIM OF THE TRAINING

- Getting to know the stages of problem solving,
- Self-awareness of own approach to problem solving

Co-funded by
the European Union

A Decision Tree is a decision assistance tool that uses a tree-like model of options and their probable effects. This machine learning algorithm is well-liked for jobs involving both regression and classification. Decision trees assist in the structured and methodical visualization and decision-making process by modeling options based on the characteristics of the data and their possible outcomes.

This is a basic explanation of how a decision tree functions:

Node: Each node in the tree reflects a judgment or a test on a certain characteristic (attribute). Branches connect nodes to one another.

Branch: Every branch points to the subsequent node in the tree and signifies the result of a choice or an experiment.

**Leaf:** The ultimate choice or result is represented by the terminal nodes of the tree, also referred to as leaves.

Splitting is the process of breaking a node up into smaller nodes according to a particular property. To make selections, it entails choosing the characteristic that provides the greatest information.

Decision criteria is a particular feature used at each node to inform a choice. This decision-making criterion may be multi-class (having several possible outcomes) or binary (yes/no).

Decision Path is the sequence of choices that lead to a final choice or result is represented by the path that runs from a root node to a leaf node.

The building of a **Decision Tree** includes recursively splitting the data depending on the features until a specified stopping criterion is fulfilled. Building a tree that accurately categorizes or forecasts the target variable is the aim.
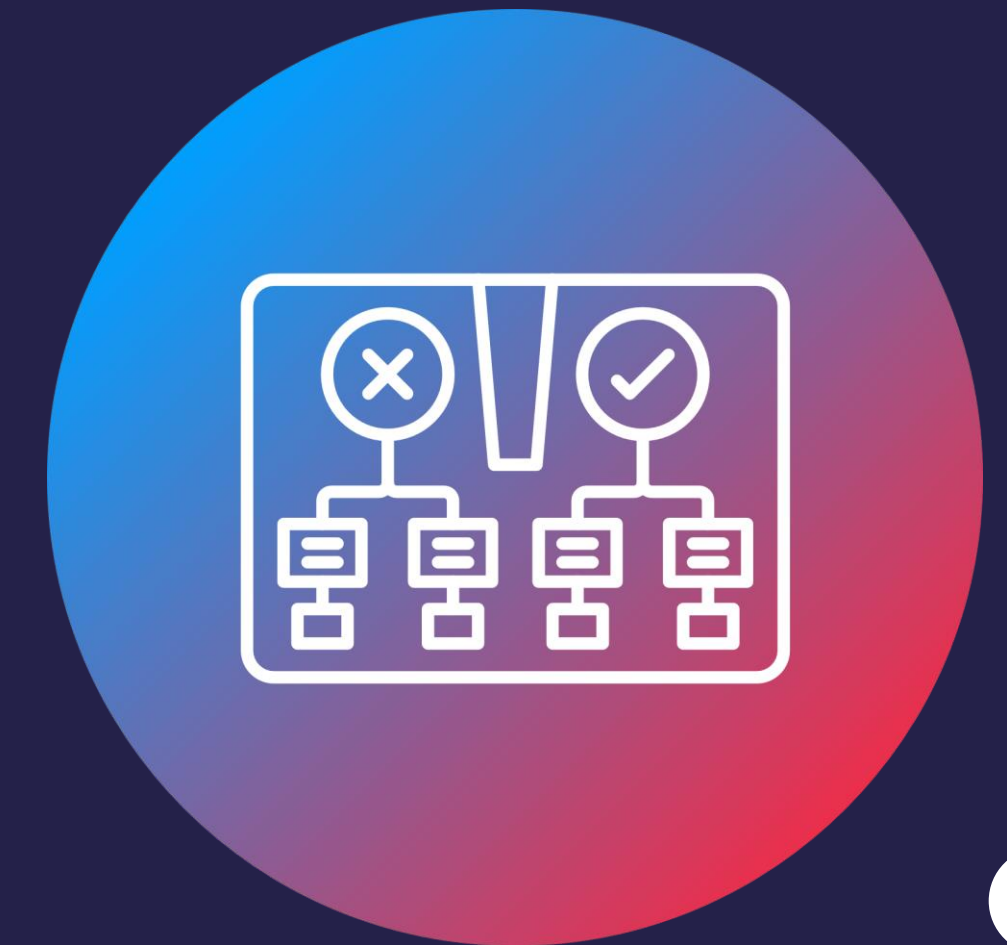
Advantages of Decision Trees

- **Interpretability:** Decision Trees are easy to understand and interpret, making them a valuable tool for visualizing decision-making processes.
- **No Data Normalization Required:** Decision Trees can handle both numerical and categorical data without the need for data normalization.
- **Handle Non-linearity:** They can capture non-linear relationships between features and the target variable.

Disadvantages of Decision Trees

- **Overfitting:** Decision Trees are prone to overfitting, especially when the tree is too complex and fits the training data too closely.
- **Instability:** Small changes in the data can lead to significantly different tree structures.
- **Bias Toward Dominant Classes:** In classification problems, Decision Trees can be biased toward classes with more instances.
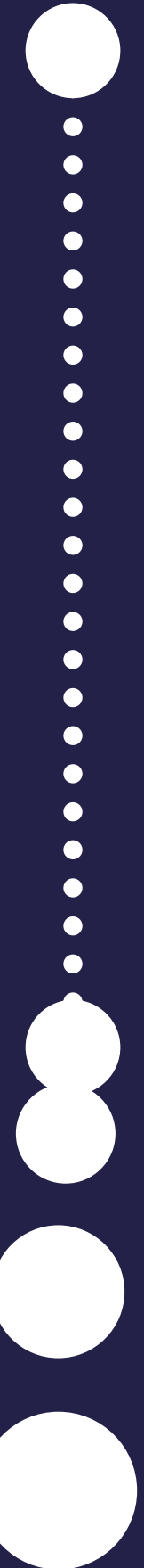
Finding effective answers to complicated or unclear problems requires analysis, which is a soft skill in problem solving. In the personal, professional, and academic spheres, among others, it is an essential life skill.
Strong problem-solving abilities enable people to approach problems methodically, pinpoint the origins of problems, and create creative and workable solutions.

Soft skills like problem-solving are highly appreciated in the workplace since they help with decision-making, productivity, and navigating dynamic and complex contexts. It is a flexible and necessary skill for both personal and professional success because it can be used to a wide range of businesses and professions. Strong problem-solving abilities are highly valued by employers since they enhance a team's or organization's overall performance and creativity.
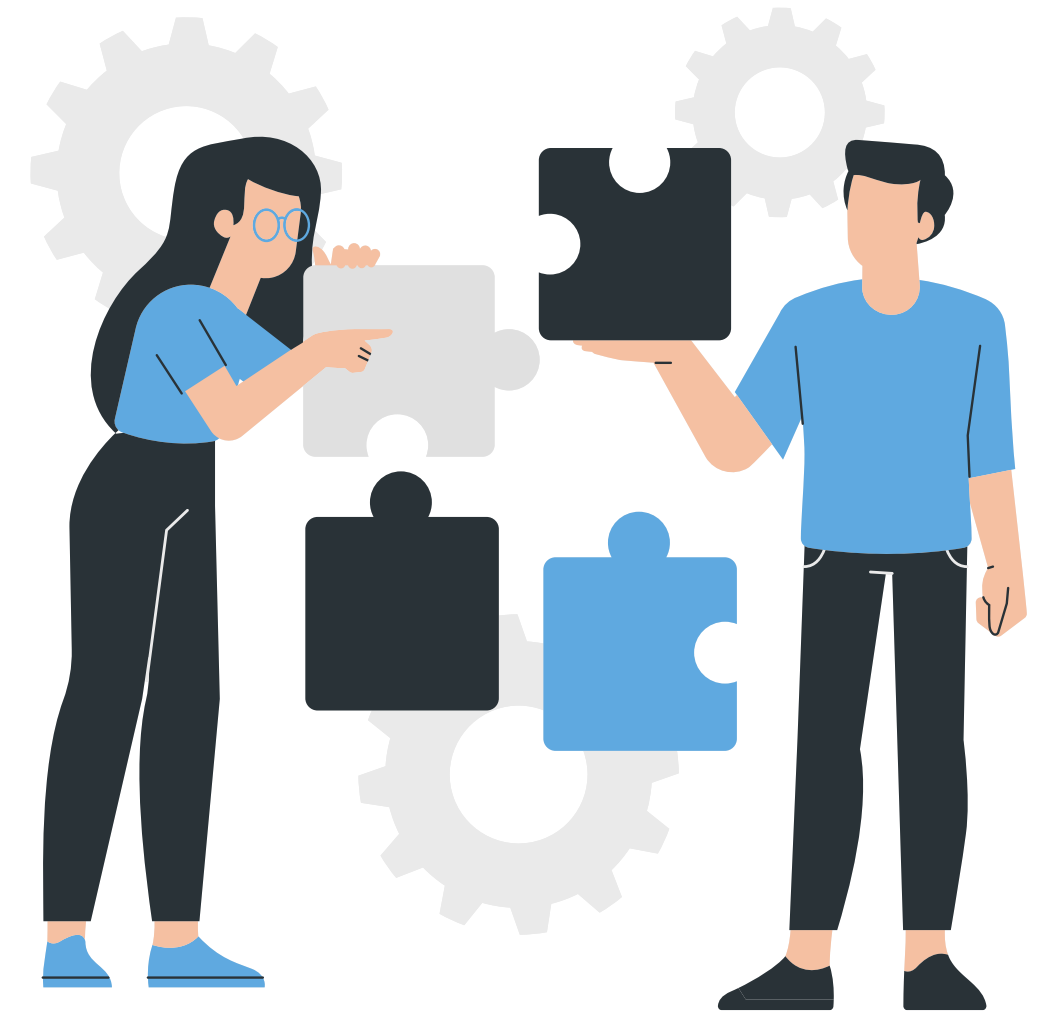
KEY ELEMENTS OF PROBLEM SOLVING

Co-funded by
the European Union

Analytical thinking is the capacity to dissect difficult issues into smaller, more manageable components and conduct methodical analyses of each.

Critical thinking is the process of analyzing data objectively, taking into account many viewpoints, and coming to well-informed conclusions based on the information at hand.

Creativity - coming up with novel concepts and thinking beyond the box to produce original solutions. Unconventional methods are frequently taken into consideration when tackling creative problems.

Key elements of problem solving

Effective decision-making involves carefully analyzing the circumstances, balancing the advantages and disadvantages of various options, and taking any repercussions into account.

Flexibility is the ability to change course quickly and readily in response to new information or unforeseen difficulties.

Collaboration - effectively addressing and resolving issues with others in a group setting. This calls for skillful dialogue, attentive listening, and the capacity to draw on a variety of viewpoints.

Key elements of problem solving

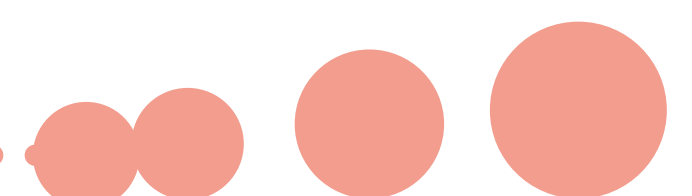**Resilience** is the ability to overcome obstacles and disappointments, maintain concentration on the task at hand, and grow from mistakes.

Time management is the skill of efficiently allocating resources and time to solve issues quickly and adhere to deadlines.

DEVELOPMENT OF PROBLEM SOLVING SKILLS

Mastering the art of problem-solving requires enhancing your capacity to assess circumstances, recognize obstacles, and come up with workable answers. The following are some methods to improve your ability to solve problems:

- Understand the Problem
- Gather Information
- Define Goals and Objectives
- Brainstorm Solutions
- Evaluate Options
- Prioritize Solutions
- Make Decisions

- Implement the Solution
- Monitor and Evaluate
- Reflect on the Outcome
- Seek Feedback
- Learn from Others
- Develop Analytical Skills
- Practice Consistently
- Stay Open-Minded

PROBLEM SOLVING BARRIERS

Even though problem-solving abilities are very valuable, there may be a number of obstacles that prevent someone from addressing difficulties successfully. Some of the barriers:

- Lack of information – the ability to solve problems might be hampered by incomplete or erroneous information. It is difficult to come up with workable remedies if the situation is not well understood.

- Emotional blocks – excessive feelings of stress, anxiety, or fear can impair judgment and make it difficult to reason. Emotional responses can result in rash decisions made instead of careful problem-solving.

- Fixed mindset – people with a fixed mindset, which holds that their intelligence and skills are unchangeable, may be less open to learning new things and adapting to new situations. On the flip side, a growth mindset promotes the idea that skills may be acquired by work and education.

PROBLEM SOLVING BARRIERS

- Excessive reliance on former solutions – ineffective problem–solving might result from relying too much on previous solutions without taking the particularities of the current situation into account. Every circumstance can call for a different strategy.

- Cognitive biases – people's perceptions and interpretations of information can be influenced by preconceived ideas, assumptions, and cognitive biases, which can result in skewed decision–making.

- Fear of failure – being afraid of making mistakes or not being able to solve a problem can stifle original thought and the investigation of different strategies. Overcoming this obstacle requires accepting failure as a teaching opportunity.
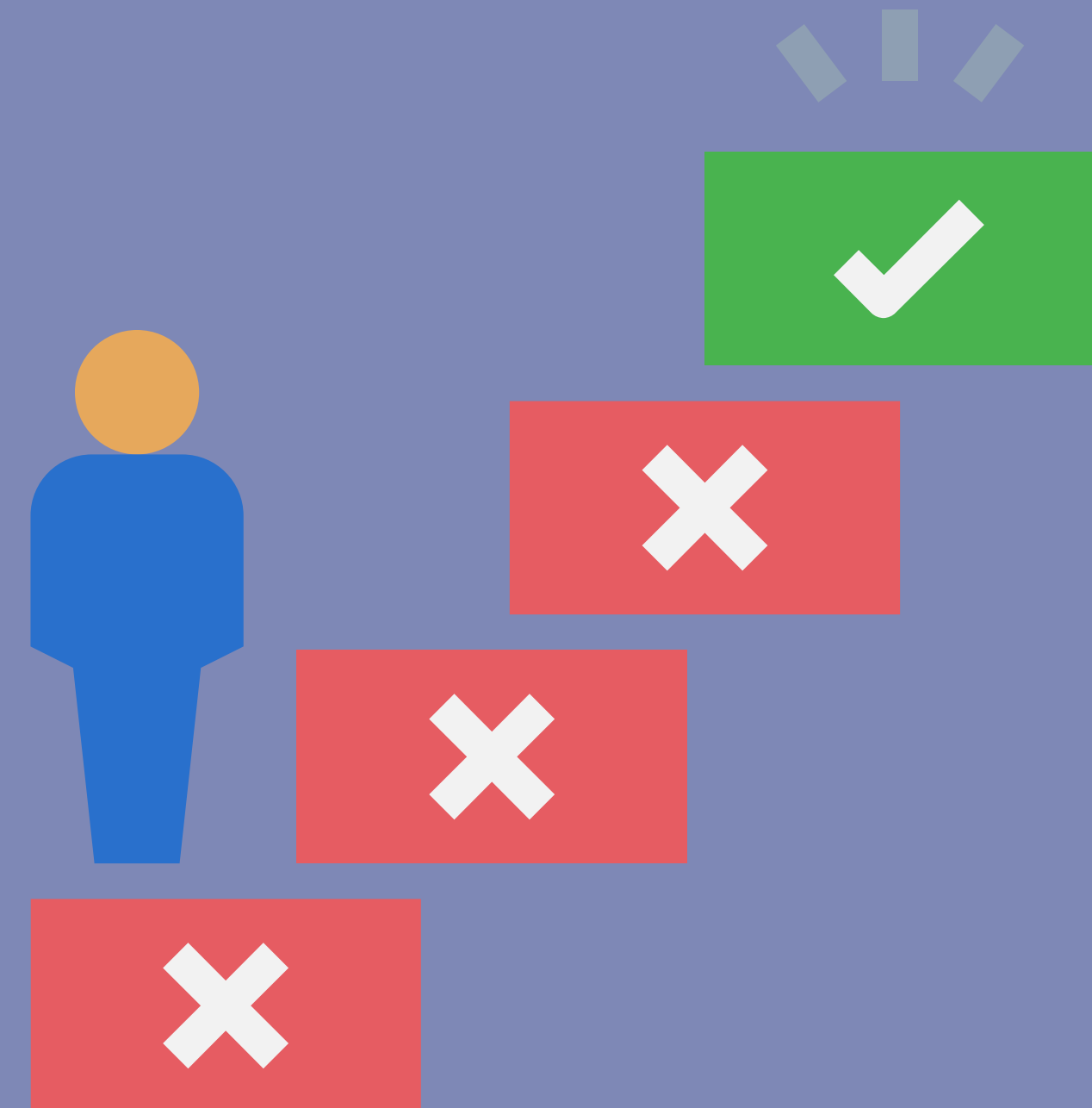
PROBLEM SOLVING BARRIERS

- Group thinking – in a group context, people may favor consensus over critical thinking out of a desire for harmony or uniformity within the group. This can impede original thought and lead to inferior solutions.

- Communication barriers – ineffective team communication can prevent ideas and information from being shared, which is essential for solving problems effectively. Lack of clarity or misunderstandings can make collaboration difficult.

- Stability – the inability to explore other viewpoints or solutions and an excessively inflexible way of thinking can make it difficult to adjust to changing conditions.

- Resource limitations – the process of solving problems may be hampered by a lack of funds, time, or access to essential resources. When resources are scarce, people may need to come up with innovative and practical solutions.
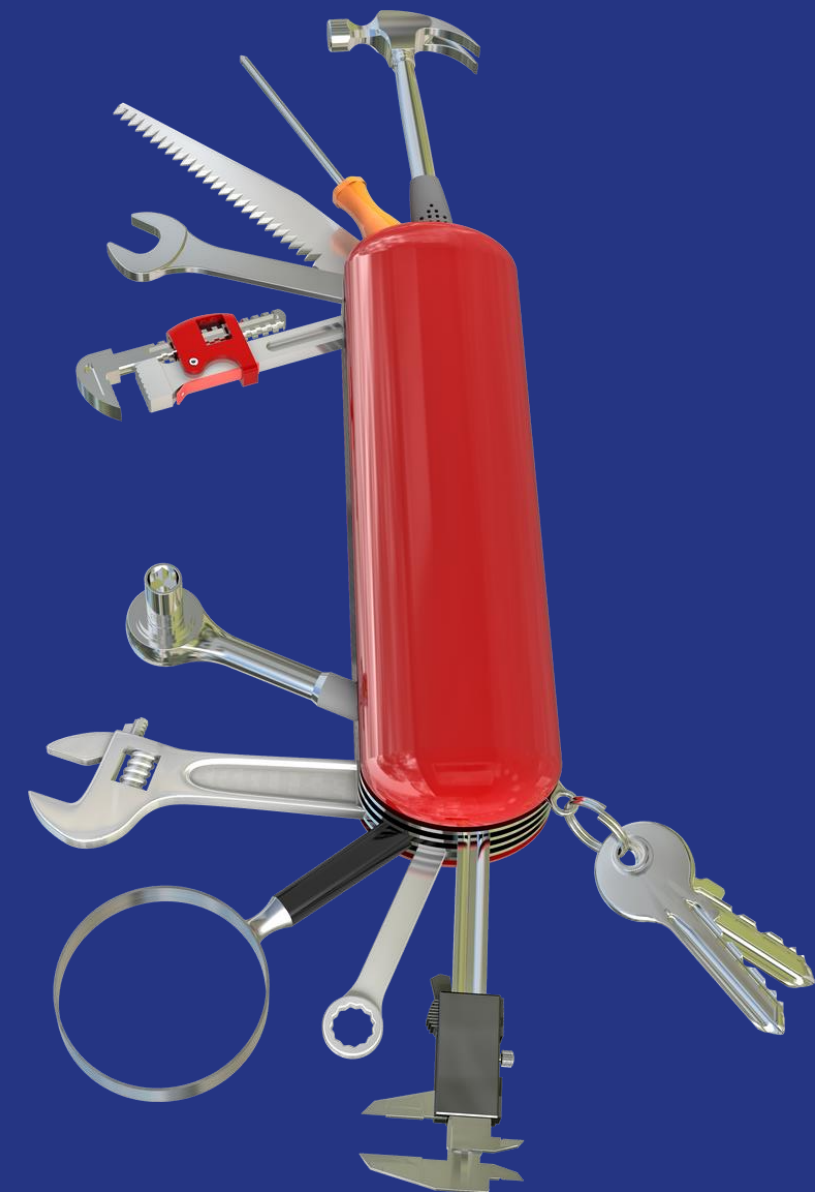
USEFUL TOOLS

Multiple techniques and tools can support the development of problem solving skills.

Mind Mapping: it helps to organize thoughts and brainstorm potential solutions to a problem.

SWOT Analysis: Analyzing strengths, weaknesses, opportunities, and threats can provide a structured approach to understanding a situation and formulating strategies.

Fishbone Diagram (Ishikawa or Cause-and-Effect Diagram) it helps to identify the root causes of a problem by breaking it down into categories such as people, processes, equipment, and environment.

Decision Matrix: A decision matrix is a systematic way to evaluate and compare different options based on predefined criteria, aiding in objective decision-making.

USEFUL TOOLS

Five Whys is a technique that involves asking "why" repeatedly to get to the root cause of a problem. It helps in uncovering underlying issues and understanding the chain of events.

Force Field Analysis helps to identify and evaluate the driving and restraining forces in a situation, helping to understand the factors that support or hinder a particular goal.

Scenario Planning – multiple possible future scenarios helps in preparing for uncertainties and developing flexible strategies.

TRIZ (Theory of Inventive Problem Solving) is a systematic approach to problem solving that leverages principles and patterns to find innovative solutions.

USEFUL TOOLS

Role-playing – simulating real-world scenarios through role-playing allows individuals to practice problem-solving in a controlled environment, enhancing their decision-making skills.

Simulation Games– interactive games or simulations that simulate problem-solving scenarios can provide a risk-free environment for individuals to develop and test their skills.

Brainstorming – encouraging free-flowing idea generation without criticism helps in generating a wide range of potential solutions to a problem.
solutions.

USEFUL TOOLS

The Kaizen philosophy (Continuous Improvement) emphasizes continuous improvement, encouraging individuals to identify and implement small, incremental changes to enhance processes and outcomes.

Learning from Failure – reflecting on past failures and learning from them is a powerful tool for personal and professional growth. Failure is often a stepping stone to success.

Design Thinking – a human-centered approach involves empathizing with users, defining problems, ideating solutions, prototyping, and testing. It fosters creativity and innovation.

Problem-Solving Courses and Workshops – participating in courses or workshops focused on problem-solving skills can provide structured learning and opportunities for hands-on practice.
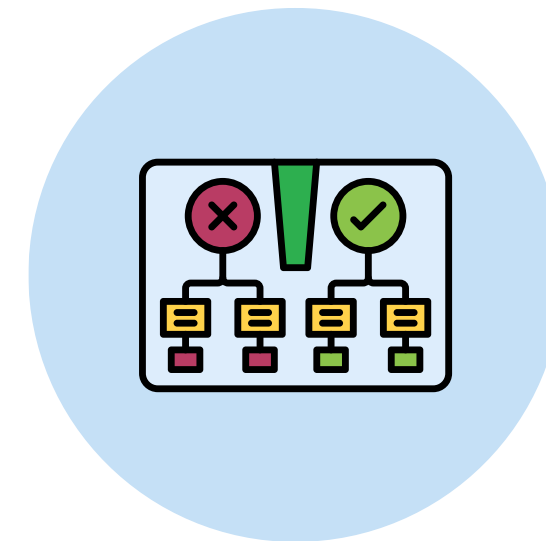
ACTIVITIES
(AS MUCH TIME AS YOU NEED)

SWOT analysis
activity 1

Decision Tree
activity 2

ACTIVITY 1
SWOT ANALYSIS

Instructions for the Individual Financial Management SWOT Analysis Exercise:

Consider your own financial strategies and habits for a while. Think about the following and write down your ideas for each category. Be truthful with yourself and consider the good as well as the difficult.

Develop a SWOT analysis.

What are the strengths, weaknesses, opportunities and threats?

- Strengths – What do you do well?
- Weaknesses – Where do you need to improve?
- Opportunities – What are your goals?
- Threats – What obstacles do you face?

Strengths
- Identify three advantages or strong points of your present money management strategies.
- Consider any routines or approaches that have helped you achieve financial success.

Weaknesses
- List three areas where your present financial management is lacking or difficult.
- Think about any routines or actions that could jeopardize your financial security.

Possibilities
- Examine three areas where your financial management could be strengthened.
- Consider resources or outside influences that you can use to improve your financial circumstances.

Threats
- List three possible risks or hazards to your money management.
- Examine outside influences or obstacles that could affect your capacity to maintain your financial security.
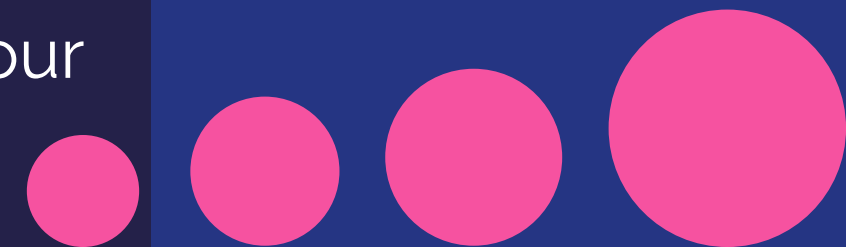
Co-funded by
the European Union

ACTIVITY 2 - DECISION TREE – 20 MINUTES

Picking a Weekend task

The circumstances

Consider that you wish to choose the ideal weekend activity for you based on a variety of considerations. To assist you in making this choice, let's construct a decision tree.
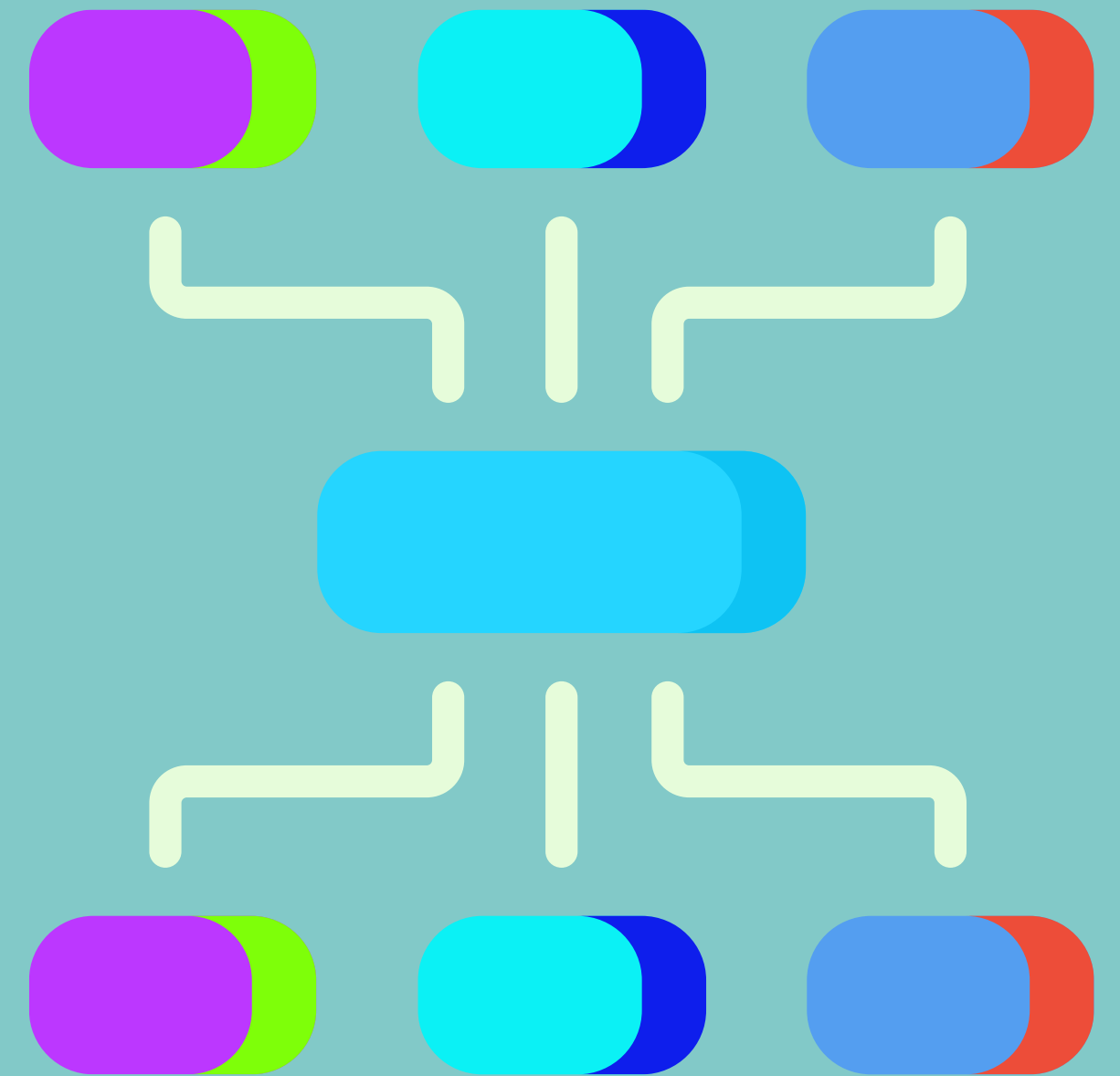
Factors:

Weather: sunny, overcast, rainy

Mood: dynamic, relaxed, spontaneous

Company: individualy, with relatives, or with colleagues

Potential Tasks: Engaging in Outdoor Sports; Marathon Films; Reading a Book; Museum Visit, Food preparation or Cooking
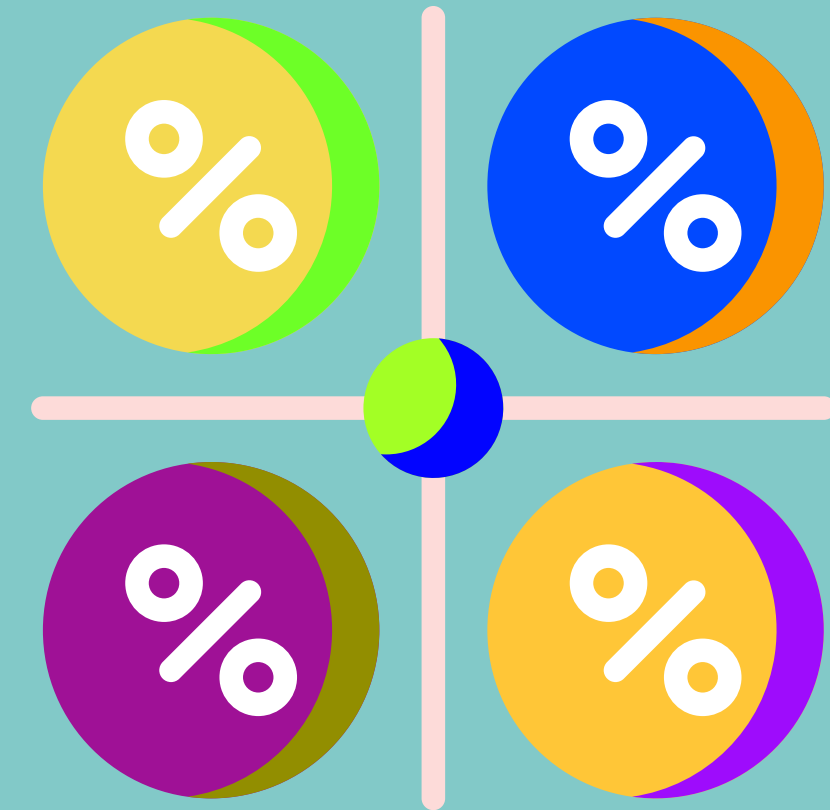
Co-funded by
the European Union

Guidelines:

- At the top of your paper, **draw the root node** and **write "Weekend Activity Decision."**
- First, create a decision node for the factor "Weather." Make branches for the conditions "Sunny," "Cloudy," and "Rainy."
- Establish a decision node for the second factor, "Mood," for every weather condition. Make branches for "Adventurous," "Relaxed," and "Energetic."
- For the third factor, "Company," make a decision node for every combination of weather and mood. Make branches for the categories "With Friends," "Alone," and "With Family."
- Note the suggested activity depending on your preferences at each leaf node (weather, mood, and company).
- Based on your selections for weather, mood, and company, your decision tree ought to direct you toward a particular activity.

Reflection Questions:

- What is the recommended activity for a sunny, energetic, alone weekend?
- How does the decision tree guide your choices based on different factors?
- What are the advantages of using a decision tree in this scenario?
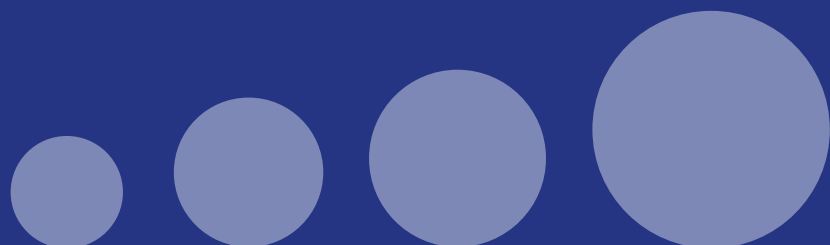
CONCLUSION AND WRAP UP (10 MINUTES)

How you felt during this training?
What you have learnt about problem solving?
What you have learnt about yourself?
What could be improved or changed?

WHERE TO FIND THEORY? USEFUL LINKS

- https://www.indeed.com/career-advice/career-development/creativity-skills
- https://hbr.org/2021/06/train-your-brain-to-be-more-creative
- https://positivepsychology.com/creativity/
- https://www.cambridge.org/elt/blog/2021/12/09/three-lessons-creative-thinking/ https://www.cambridge.org/elt/blog/2021/02/25/cambridge-life-competencies-creative-thinking/
- https://asana.com/pl/resources/decision-tree-analysis

REFERENCES

- Polya, G. (1973). "How to Solve It: A New Aspect of Mathematical Method." Princeton University Press.
- Dweck, C. S. (2006). "Mindset: The New Psychology of Success." Random House.
- Osborn, A. F. (1953). "Applied Imagination: Principles and Procedures of Creative Problem-Solving." Scribner.
- Covey, S. R. (1989). "The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change." Free Press.
- Kahneman, D. (2011). "Thinking, Fast and Slow." Farrar, Straus and Giroux.
- De Bono, E. (1999). "Six Thinking Hats." Back Bay Books.
- Heath, C., & Heath, D. (2010). "Switch: How to Change Things When Change Is Hard." Crown Business.
- Simon, H. A. (1979). "Rational Decision Making in Business Organizations." American Economic Review.
- Gino, F. (2013). "Sidetracked: Why Our Decisions Get Derailed, and How We Can Stick to the Plan." Harvard Business Review Press.
- Christensen, C. M. (1997). "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail." Harvard Business Review Press.

SOFT SKILLS
FOR YOUTH
EMPLOYMENT

2022-1-TR01-KA220-YOU-000087078

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

Co-funded by
the European Union