Rethinkers
Brains ready for tomorrow

1

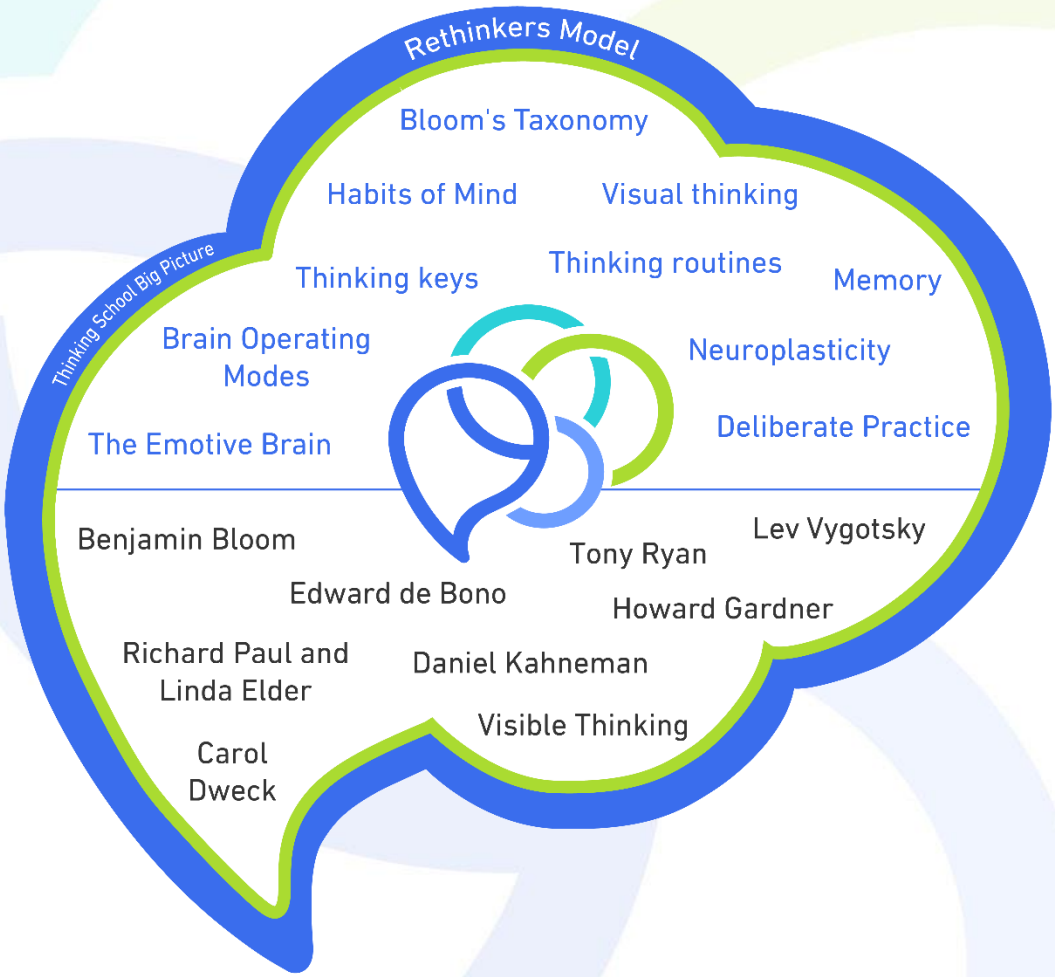
# THINKING SCHOOLS

## Path 1

# THINKERS KEYS

**Rethinkers Model**

**Thinking School Big Picture**



# Introduction to Teaching Critical Thinking

The methodology of teaching critical thinking is considered an important field in shaping a child's personality. The ultimate goal of education is to develop individuals who are more adaptable to the 21 century and its requirements.

When a child is trained in managing their thoughts and increasing the speed of their mental processes to keep up with cognitive and technological advancements (such as the internet), we achieve the synthesis of a capable personality. This person feels confident and secure as they navigate the pathways of the 21 century.

**From reviewing the available theoretical literature on thinking programs, the following can be deduced:**

- Thinking, its development, and nurturing it are rights of all Arab children.
- The mission of education is to provide all the necessary means to enhance the effectiveness of a child's thinking within a strong and robust Arab culture.
- No one can improve a child's thinking except his parents or teachers who possess advanced thinking skills or suitable cognitive processing abilities.
- Every child has the ability to utilize different thinking tools; it is inherent within them.
- Providing appropriate thinking requires the teacher to possess sufficient skills to uncover the child's true abilities and activate suitable experiences to stimulate and employ thinking processes.
- Thinking is a mental process and a skill that requires tools and techniques that can be sharpened and intensified, particularly within materials presented by the expert teacher.

**Psychological Atmosphere in the Classroom:**

The theoretical literature provides us with the characteristics of a classroom where various metacognitive thinking skills are employed. The following can be identified as the characteristics of such a classroom:

- Democracy and freedom prevail in the classroom.
- The child's abilities, potentials, and readiness are respected.
- Warm and cooperative human relationships are fostered.

- The child feels that the classroom is a place for living, not just preparation for life.
- The child's personality develops, and their position among peers is determined.
- Confidence is nurtured in children, leading them to become seekers of knowledge and truth.

These classrooms are usually the most suitable for the developmental nature of children, where they can grow holistically, and the desired educational goals can be achieved. The teacher can be closer to their psychological characteristics, expressing love and respect for the children. The child's feelings of security and self-respect develop, thanks to the teacher's role in interacting with the students.

## Developing Thinking Labels:

By adopting the assumption that it is the child's right to use their mind to the fullest extent, we can generate thinking labels that deserve to be adopted and become an important component of the teacher's thinking. Here are some of these labels:

- Developing thinking transforms the child from a passive and beautiful member to an active and beautiful positive child.
- The child is a being with a distinct mind, tools, and needs, and should not be evaluated or adapted by adults.
- The child's mind, personality, and learning methods should not be changed to fit the teacher's tools. Personal formats and individuality are essential for the child's well-being and health.
- The child is a unique, independent, and persevering being with their own distinct characteristics. There is no single mental message that suits all children in the same class.

Therefore, the teacher's attitudes towards the child plays a great part in the development of the child's thinking and foster a positive relationship and interaction between them. Positive attitudes towards interaction improve the adaptation of both the teacher and the child in the classroom, creating a warm, beloved, and safe educational environment. In such an environment, the child can express themselves freely, drawing on their inner potential and experiences.

**Activity: The Concept of Thinking**

Dear participant: In collaboration with members of your group, provide a suitable definition of thinking that reflects the group's perspective.

## The Nature of Thinking:

Thinking, in its simplest definition, refers to a series of mental activities that the brain engages in when it encounters stimuli received through one or more of the five senses: touch, sight, hearing, smell, and taste. Broadly speaking, thinking is the process of searching for meaning in a situation or experience. This meaning can sometimes be clear and other times hard to grasp, requiring deep contemplation and careful examination of the components of the situation or experience (Barell, 1991) that an individual goes through.

**Thought:** Engaging the mind in utilizing knowledge to reach the unknown.
**Thinking:** Engaging the mind in problem-solving to reach a solution.
**Intellect:** Gathering ideas, contemplating and pondering in the pursuit of meaning.
This is in terms of language. However, in terminology, it may be appropriate to go beyond the problematic definition surrounding this term and provide the definition of thinking that I believe to be: the mental process through which the mind organizes the experiences and knowledge of an individual in order to make a specific decision regarding a particular problem or topic. There are numerous different and sometimes contrasting definitions regarding the concept of thinking.

Based on that, thinking is a continuous mental process that individuals engage in as long as their minds are sound, particularly when faced with a dilemma or when they desire to achieve a gain. It is influenced by an individual's culture, experiences, environment, and surrounding circumstances, and it aids them in problem-solving and decision-making.

**From the previous definition, we conclude that thinking requires:**

1. A framework that organizes an individual's experiences and knowledge.
2. A repository that contains and preserves them until they are summoned.

3. A specific psychological and social environment (thinking cannot occur in a vacuum but rather in a specific environment).

**Components of thinking:**
**Thinking is a complex concept that consists of three components:**

1. Complex cognitive processes (such as problem-solving) and less complex processes (such as comprehension, application, and reasoning), as well as metacognitive processes of guidance and control (teaching thinking).
2. Knowledge specific to the subject matter or topic (teaching thinking).
3. Personal predispositions and factors (attitudes, objectivity, inclinations) (teaching thinking).

**Is there a need for teaching thinking?**

The automation of thinking and training in utilizing its tools (the mind) and sharpening it are requirements of the new era. Today's child surpasses the adults around them in understanding, organizing, and synthesizing the information in their environment. The child is capable of developing thinking skills in a much shorter time than their parents, teachers, and adults in their society.

In this advanced technological world, the child faces a vast amount of knowledge, technical expertise, and experiences that they cannot wait until they reach the mental weaning stage. Therefore, they need an early weaning stage to explore the world and its elements and to maintain confidence in controlling their components. This is achieved when the child is trained in processing information, techniques, and experiences rapidly. Thinking is the substance of the mind, and its function, characteristics, and requirements work together in the input and output system, resulting in cognitive designs, coherent ideas. Training to refine, enhance, and develop thinking achieves the goal.

**And the necessity of teaching thinking can be determined for the following reasons:**

**First:** If you give someone a fish, they will eat for a day, but if you teach them how to fish, they will eat for a lifetime.

**Second:** Learning how to process knowledge and experiences is more valuable than the knowledge itself and its quantity. Therefore, learning how to acquire information is more important than learning the information itself.
**Third:** Focusing on the function of thinking is more important than focusing on the outcome of thinking. Which is more important, getting a raisin from a grape or knowing how to make a raisin?
**Fourth:** A mind filled with experiences, strategies, and processing methods surpasses a house filled with books and references.
**Fifth:** The satisfaction of a mental product exceeds the accomplishment of memorizing information produced by someone else.
**Sixth:** The need for curricula to focus on teaching how to think and learn rather than teaching how to memorize.
**Seventh:** Productive thinking is the thinking that becomes the goal of planning and education. How to ascend to the mountain peak is more important than the process of mechanically climbing the mountain.

Therefore, the student becomes the subject and the goal in order to dedicate efforts towards achieving proficient thinking.
The problem with a child's thinking is that they lack the necessary tools to regulate the course of their thinking. In order for them to acquire this ability, the necessary thinking readiness must be present or emerge, which is often influenced by the developmental stage they are going through.

The child lacks mechanisms to regulate their thinking processes and does not have the ability to monitor what is happening within their mind, what is related or unrelated to the learning topic that needs to be processed. This calls for attention to teaching thinking skills and incorporating them within the curriculum.

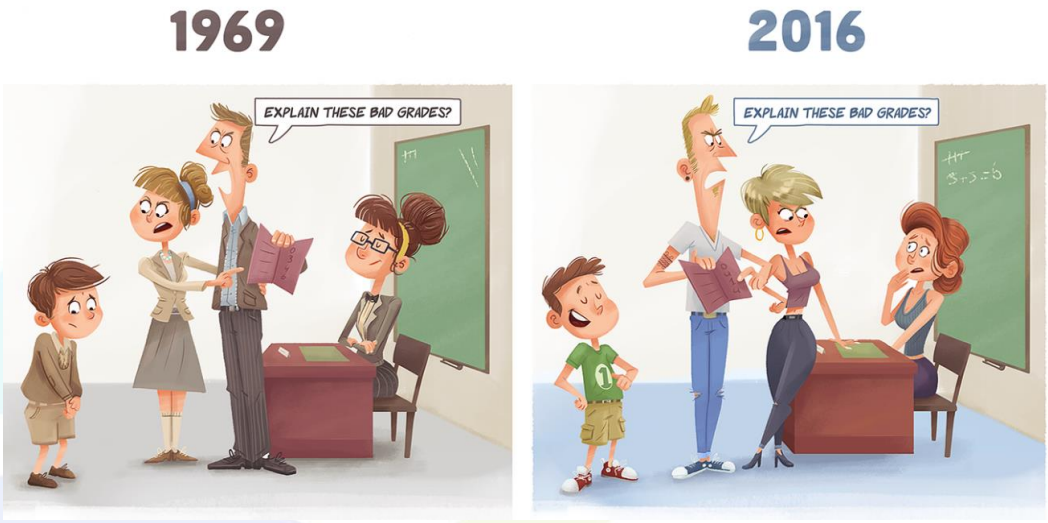
**Ensuring the mastery and application of these skills in learning situations contributes to:**

**First:** Increasing the learner's self-confidence.
**Second:** Enhancing their ability to regulate and control the processes of linking, deducing, and recalling.
**Third:** Improving academic achievement.
**Fourth:** Enhancing their adaptation and well-being in school and society.

**From the previous discussion, it can be concluded that thinking, learning, and employing them:**

1. Increases the child's humanity.
2. Enhances their value and importance.
3. Accelerates their preparation and readiness for society.
4. Refines their abilities and makes them more suitable for future demands.
5. Increases their activity and vitality.
6. Enhances their positive understanding of their academic and social self.
7. Transitions them from being passive recipients to active and organized individuals.
8. Transforms them into seekers of knowledge and processors of it, Instead of just memorizing and storing information.

The need to teach thinking skills becomes evident here, as it serves as an effective tool for achieving goals by employing the knowledge, skills, and experiences possessed by individuals in a proper manner. Sound thinking enables a person to adapt to their surrounding circumstances and deal with problems and difficulties they encounter by utilizing their information, skills, and experiences. The more advanced these tools are, the stronger and more enduring their impact becomes. Thinking is the decisive factor in success in life, and the more capable one is in thinking, the greater their success. Therefore, modern education has emphasized training thinking processes and refining thinking skills, enabling learners to effectively utilize the information and skills they acquire in achieving the desired success. It also enables them to keep up with the continuous changes occurring in various aspects of life.




**Definition of Thinking Skills:**

Thinking skills are specific processes that we practice and utilize intentionally to process information, such as comparison, classification, interpretation, analysis, and more.

**Another definition clarifying the relationship or difference between thinking and thinking skills:**

Thinking is a mental process in which individuals interact with their experiences and situations, generating ideas, analyzing them, evaluating them, reorganizing them, and encoding them with the aim of integrating them into their cognitive structure, utilizing thinking skills.

**Developing Thinking Skills:**

Philosophy, psychology, and neuroscience are the three most important sources of knowledge about thinking, with a central focus on the social environment and the local culture of students, which should be considered during training.

**Global perspectives, programs, and strategies for teaching thinking:**

There is no doubt that thinking has significant importance, which is why those who are interested in their development and life have devoted attention to it. They have witnessed

its impact on progress, advancement, and the continuous stream of inventions and technologies that have emerged in the modern world.

They found that there is a pressing need to allocate more time for teaching thinking, leading them to develop specialized materials, programs, and strategies for this type of education, transforming them into programs with clear tools.

**Theories of Teaching Thinking Skills:**

There are several theories that have been proposed regarding how to teach thinking skills, and these theories can be divided into:

**Global Approaches to Teaching Thinking**

1. **Direct Instruction of Thinking Skills**

This approach focuses on directly teaching thinking and its skills separate from the content of the subjects. Advocates of this approach believe that it leads to better outcomes as it develops the minds of both teachers and learners, ultimately contributing to societal development. One prominent advocate of this approach is Edward de Bono. Programs associated with this approach include CoRT, De Bono's Six Thinking Hats, Edward de Bono's CoRT Thinking Program, Edward de Bono's Lateral Thinking Program, and Tony Ryan's Thinkers Keys.

2. **Integration within the Curriculum (Thinking-Based Education)**

This approach involves integrating thinking skills within the curriculum content. Supporters of this approach argue that the cognitive processes learned through this method are enhanced when applied across all subjects. Thinking skills are integrated into the curriculum, starting from the concepts and meanings embedded in the subjects,

leading to new experiences in which students engage and solve problems. Robert Swartz is a prominent advocate of this approach.

3. **Education for Thinking Development (Provocative Thinking Education)**

This approach focuses on creating an environment that stimulates thinking, utilizing elements such as formulating thought-provoking activities and questions.
By creating a stimulating environment for thinking, and incorporating elements such as thought-provoking activities and questions, this approach aims to foster thinking skills.

It combines the first and second approaches, where students learn thinking tools correctly and then integrate them within the school curriculum to ensure continuity. This is the approach adopted by thinking schools.

**Facilitators of implementing thinking programs in schools include:**

- Training and equipping teachers with this approach.
- Developing the necessary materials within the prescribed curriculum or activities at different educational stages.
- Adopting a mindset of openness by the school, its administration, teachers, parents, and observers to test and experiment with new ideas for the benefit of the child.

**Famous thinking teaching programs include:**

- CoRT program for teaching thinking skills.
- Six Thinking Hats program.
- Critical Thinking program.
- Creative Problem-Solving program.
- SCAMPER program for imagination and creativity development.
- TRIZ program.
- Thinkers Keys program by Tony Ryan.

**As for the programs of thinking schools, they include:**

**Creative Thinking Skills:**

Researchers in the field of cognitive psychology did not settle for the previous definitions of creative thinking, but they sought more specific definitions, particularly procedural definitions.
These definitions are characterized by their measurability and observation through psychological tests designed to measure individual creative abilities.
One of the researchers who adopted this type of definition is Guilford, based on the fundamental idea that creativity is not a single ability but rather a combination of abilities. These abilities were identified through a complex statistical method called factor analysis, which revealed the existence of five abilities:

1. **Fluency:** Fluency is defined as the ability to generate a large number of ideas and solutions to problems. It leads to a good understanding of the learned information. It is characterized by producing a large number of ideas and mental images within a specific time frame. It also refers to the ability to generate as many alternatives, ideas, problems, or applications as possible when responding to a specific stimulus or question within a fixed unit of time. This skill essentially involves recalling and retrieving information available in the learner's cognitive structure, such as experiences, concepts, or facts. Therefore, a person who can give ten ideas in one minute is considered more fluent than a person who gives only seven ideas in one minute (Michael, 2003).

2. **Flexibility:** It refers to the ability to see things from different perspectives or angles and to work with diverse strategies. This ability involves mental processes that distinguish individuals who can shift their thinking direction from one angle to another from those who become rigid in their thinking. It also refers to the ability to generate a variety of different ideas or responses and to shift from one type of thinking to another. Flexibility is the opposite of mental rigidity, and it means liberating oneself from self-imposed limitations, cognitive rigidity, or functional inflexibility (where subjects have only one goal). Flexibility also requires generating divergent solutions.

3. **Originality:** Originality is considered the most closely related skill to creativity and creative thinking. It refers to the ability that manifests in an individual's behavior when they actually create something new. In this sense, originality signifies novelty or rarity. However, there is another condition that must be met alongside novelty for the creation to be considered original, which is its suitability for the intended purpose or function of the innovative work. Original ideas presented by students are described as ideas that do not repeat their peers' ideas, are out of the ordinary, and are unconventional. The skill of originality in thinking differs from the skills of fluency and flexibility in that it does not refer to the quantity of creative ideas presented by the student, but rather relies on the value, type, novelty, and authenticity of those ideas.

4. **Elaboration:** Elaboration refers to the ability to add new and diverse details to an idea, problem-solving approach, or concept in order to develop, enrich, and execute it. It is the individual's ability to clarify ideas and includes the capacity for criticism and judgment of acquired knowledge. The process of elaboration or providing details contributes to completing a situation or topic under investigation or solution. Completing the construction is based on the information given to build upon various aspects, making it more detailed. The given information indicates the initial step to start, and each step contributes to building the next step. The individual's ability to add details is considered a divergent thinking skill.

5. **Sensitivity toward problems:** Guilford defines sensitivity toward problems as the individual's ability to see problems in things, tools, or social systems that others may not perceive, or to think about introducing improvements that can be made to these systems. Groen adds that this ability refers to the individual's awareness of the existence of problems, needs, or weaknesses in the environment or situation. This is beneficial as some individuals are quicker than others to notice these problems or elements in a given situation.

The process of problem discovery is considered the first step in seeking a solution. This is followed by adding new knowledge or introducing improvements and modifications to existing knowledge or products. This ability includes noticing unusual, abnormal, or even

perplexing things in one's environment and then working on reorganizing and utilizing them or raising questions about them (Groen, 2007).

**Creative thinking and logical thinking.**

If logical thinking relies on the rules of logic and follows the correct and familiar steps to reach the truth, creative thinking, on the contrary, does not adhere to conventional methods. It is often associated with breaking away from familiar rules and common patterns.

**Logical thinking utilizes the rules of logic, while creative thinking does not adhere to logical rules. Instead, it often goes beyond them in most cases.**

Creative thinking sets out in search of novelty and unfamiliarity, avoiding the necessity of disregarding logical facts. Therefore, creative thinking processes appear to be linked to the unconventional, negation of the familiar, reversal of the familiar, exaggeration, or minimizing it, and other techniques that we will discuss in detail.

**Critical Thinking:**

**The concept of critical thinking:**

The term "critique" means to distinguish or extract, as in distinguishing genuine coins from counterfeit ones (Ibn Mandhur). "Critique of poetry" means to highlight its flaws or merits (Al-Mu'jam Al-Wasit). An art critic is a writer whose work involves distinguishing between good and bad artistic works, authentic and false ones. Critical thinking is derived

from the Latin origin "Criticus" or the Greek origin "Kritikos," meaning the ability to discriminate or the ability to make judgments.

John Dewey defined critical thinking as the deliberation in giving judgments and suspending them until verification. Habib Ali defined it as a responsible type of thinking that facilitates decision-making processes based on specific criteria and standards, as well as self-evaluation and sensitivity to diverse situations. Gerlid defined it as thinking with the aim of developing it and making its outcomes meaningful and significant to the individual.

Critical thinking can be defined from the author's perspective as the process of examining, verifying, and evaluating what one hears, reads, sees, or touches (discussions, claims, evidence, conflicts, attitudes, generalizations, beliefs, perspectives, sensations, imaginations, and other judgments) in order to reach valid conclusions, decisions, or solutions characterized by truth, objectivity, and stability.

**Characteristics of a critical thinker:**

- Examines information and judges it with a high degree of logical reasoning.
- Does not accept matters and data without subjecting them to criticism from all aspects.
- Does not accept incidents and facts as they are narrated, nor readily believe them.
- Raises relevant questions about the topic being addressed or the issues being researched.
- Seeks evidence to support assumptions and beliefs and makes judgments based on factual information obtained.
- Defers judgments until all relevant information about the subject is gathered.
- Makes fair and accurate decisions to the highest possible degree.
- Presents situations with honesty and clarity.
- Has the ability to infer and contemplate.
- Has a high degree of self-directed learning.
- Is bold and does not conform or imitate.
- Consistently relies on logic in selecting and applying standards.
- Emphasizes precision and clarity to a great extent.
- Has an open mind to new ideas.
- Has a high ability to identify problems (sensitivity).

- Acknowledges deficiencies in understanding, comprehension, or necessary information.
- Does not argue about something they know nothing about.
- Desires to examine beliefs, assumptions, opinions, and verify their validity.
- Knows when they need more information about something.
- Listens to others and shows interest in what they say.
- Constantly evaluates oneself and adjusts opinions and attitudes based on newly acquired facts.
- Recognizes the difference between a result that "might be true" and a result that "must be true."
- Believes that people have different ideas about word meanings.
- Questions anything that appears unreasonable or incomprehensible to them.
- Tries to separate emotional thinking from logical thinking.
- Considers all elements of a situation equally important.
- Searches for causes and alternatives.
- Avoids common mistakes when analyzing different matters.
- Utilizes reliable scientific sources and refers to them.
- Reflective rather than impulsive.
- Welcomes and accepts the feelings, perspectives, and views of others.
- Capable of distinguishing between facts and opinions.
- Recognizes bias in opinions.
- Assumes responsibility in society with confidence.
- Enjoys challenges.
- Deliberate change is their motto.
- Believes that there is no one way to solve a problem and no single correct answer. Believes that mistakes can be useful.
- Believes that temporary failure may be the price for success and progress in the future.

**Critical Thinking Skills:**

**First Skill:**

**The ability to distinguish between facts and opinions.**

This skill is manifested in an individual's ability to differentiate between information and statements in terms of whether they represent facts or personal opinions. Facts are based on scientific experimentation and are not open to discussion; they can be determined with certainty.
On the other hand, opinions are based on perceptions, preferences, and personal tastes. They are unrelated to scientific experimentation, subject to debate and refutation, and are not subject to standards of right or wrong.

**Example:**

| **Paragraph** | **Fact** | **Opinion** |
|---|---|---|
| Television is more enjoyable than the radio. | | √ |
| Rain falls in the Levant during winter. | √ | |

**Training activity:**

Dear trainee, distinguish between facts and opinions by placing a √ symbol in front of the paragraph in the appropriate place.

| **Paragraph** | **Truth** | **Opinion** |
|---|---|---|
| Mathematics is more difficult than physics. | | |
| Living in the countryside is better than living in the city. | | |
| The Peugeot car is more luxurious than the Honda car | | |

**The second skill:**

The ability to identify the motivations behind behaviors.
This skill involves an individual's ability to identify the underlying motivations or drivers behind people's behaviors. Motivations differ from causes in that they stem from the individual's own self.

Examples:

| **Behaviors** | **The main motivations behind those behaviors are:** |
|---|---|
| Ali, a farmer, goes to his field after the Fajir prayer every day | Because their happiest moments in life are found in the field. |
| Maryam, a teacher, enrolls in a postgraduate program at the university. | Because she has ambition and determination to pursue further studies. |

Training Activity

Dear trainee, what are the motivations behind the individuals' behaviors listed in the table below? Place a √ symbol in front of the paragraph in the appropriate place.

| **Behaviors** | **The main motivations behind those behaviors:** |
|---|---|
| Khaled avoids attending lectures at the university | |
| Omar, a doctor, stays in his clinic from morning until midnight | |
| Alaa, a young man, begs at traffic lights | |

**The third skill:**

The ability to perceive the relationship between cause and effect.
This skill involves an individual's ability to perceive and describe the connection between two events, where the first event is the cause of the occurrence of the second event. The effect reveals what happened, while the cause explains why it happened.

**Examples:**

| **Causes** | **Result** |
|---|---|
| - Because he volunteers diligently in the community service association in the area. | Abdulrahman receives respect and appreciation from the people in his region. |

| | |
|---|---|
| - Manar failed the communication skills course. | Manar failed the communication skills course. |

**Training activity:**

Dear trainee, mention the reasons behind each of the following results:

| **Result** | **Cause** |
|---|---|
| Reem fails the practical driving test. | |
| Hamdi's car overturned on the highway. | |
| Umar ibn Abd al-Aziz was given the title of the fifth caliph of the Rightly Guided Caliphs. | |

**Training activity:**

Dear trainee, specify the result of the reason given in the following table:

| **The result** | **The main reason** |
|---|---|
| | Ayman works diligently and skillfully at the pharmaceutical company. |
| | Marian spends large amounts of money on charitable and benevolent works. |
| | Tamer follows thrilling and violent programs on satellite stations. |

**Training Activity:**

Dear trainee, based on the problems in the table, determine the causes and consequences

| **Problems** | **Causes** | **Results** |
|---|---|---|
| High unemployment rates in developing countries. | | |
| Increased average age of marriage among young people in Arab countries. | | |
| Spread of theft in society. | | |

**The fourth skill:**

The ability to distinguish between statements containing facts, general principles, and famous sayings.

This skill manifests in an individual's ability to differentiate between facts, principles, and famous sayings. Facts are based on scientific experimentation and are not subject to debate; they can be firmly established. General principles are based on assumptions that have been proven through study and experimentation but have not reached the level of law or absolute truth; their outcomes can be predicted with a high probability, but it is difficult to make definitive conclusions. Famous sayings are based on the experiences and wisdom of people in the past who had a good reputation.

**Examples:**

| Sentence | General Principle | Truth | Famous Saying |
|---|---|---|---|
| A bird in the hand is worth two in the bush | | | √ |
| Light travels in straight lines | | √ | |

**Training activity**

Dear trainee, classify the following sentences into facts, principles and aphorisms according to the following table, by placing a √ sign in front of the paragraph and in the appropriate place:

| Sentence | General principles | Facts | Famous sayings |
|---|---|---|---|
| The volume of the displaced liquid equals the volume of the immersed body. | | | |
| The Prophet Muhammad (peace be upon him) said, "Choose the best sperm, for indeed, the offspring is determined by the quality of the sperm." The Prophet Muhammad spoke the truth. | | | |
| Dress according to the taste of others, and eat according to your own taste. | | | |

**The fifth skill:**

The ability to recognize different perspectives.

This skill involves an individual's ability to recognize and accept the opinions, ideas, and viewpoints of others.

**Training activity:**

Dear trainee, many parents believe that their children, aged approximately 14 to 20 years old, are incapable of distinguishing between right and wrong due to their limited life experience and tendency to be reckless. They openly express this belief, and such statements often provoke anger in their children, who accuse their parents of living in the past. What is the opinion of both parents and children regarding this issue?

| **Parent's Opinion** | **Children's Opinion** |
|---|---|
| | |
| | |

**The sixth skill:**

The ability to detect logical fallacies in arguments and discussions.

This skill involves an individual's ability to examine information, ensure its accuracy, and identify logical fallacies present in arguments and discussions.

**Examples:**

| Sentence | Correct | Incorrect | Correction if necessary |
|---|---|---|---|
| The Kuwait is a large country, so it must have diverse climates. | | √ | The Kuwait is a small country and does not have diverse climates. |
| The ostrich is a bird, and all birds are capable of flying. Therefore, the ostrich flies | | √ | The ostrich is a bird and does not fly because not all birds are required to fly. |

**The seventh skill:**

The ability to distinguish between relevant and irrelevant words and phrases related to the topic.

This skill involves an individual's ability to identify words, phrases, and things that are connected or related to the intended topic, as well as words, phrases, and things that are unrelated to the topic. This skill is related to understanding the characteristics of things and categorizing them based on those characteristics. The more categories an individual can form in their mind, the more things they can place in those categories, making their thinking more flexible and creative.

**Examples:**

| Words | Not related to the topic |
|---|---|
| Sphere, cube, rectangle, cylinder | Rectangle is not three-dimensional |
| Riyadh, Amman, Cairo, Latakia, Muscat | Latakia is not a capital |

**Training activity:**

Dear trainee, differentiate between words related or connected to the intended topic and words unrelated to the topic, according to the following table:

| **Words** | **Not related to the topic** |
|---|---|
| Cow, rabbit, chicken, cat. | |
| Tripoli, Jeddah, Latakia, Riyadh. | |
| Uqbah ibn Nafi, Tariq ibn Ziyad, Musa ibn Nusayr, Omar Mukhtar, Muhammad ibn al-Qasim | |

**Training activity:**

You have lost your mobile phone and want to announce it. What are the important details and information that could help you find it?

According to the following table, mark √ next to the relevant statements for announcing the phone.

| **Details and Information** | **Relevant** |
|---|---|
| It was a birthday gift | |
| Its color is silver | |
| It was lost in a taxi | |
| Its type is Nokia N96 | |
| Everything inside the store is priced 50% lower than the usual price | |

## The eighth skill:

**Induction**

Induction is a mental process aimed at reaching conclusions or generalizations that go beyond the available evidence or the information provided by prior observations.
Its validity cannot be guaranteed solely based on the available evidence, even if the assumptions are correct. However, induction is directed towards exploring rules and laws, solving new problems, finding new solutions to old problems, or developing new hypotheses.

**Examples:**

Dear trainee, based on the vocabulary or words in the following table, what do you infer?

| **Words** | **Induction** |
|---|---|
| Amman, Paris, Riyadh, Algiers, Abu Dhabi, Doha. | Capital cities |
| Goat, cow, sheep, camel | Milk-producing animals |

**Training activity:**

Dear trainee, what do you infer based on the vocabulary or words in the following table?

Induction:

| **Vocabulary** | **Induction** |
|---|---|
| | Plate, spoon, fork, cup |
| | Stage actor, mechanic, lawyer, coffee maker |
| | Apple, cheese, egg, meat, chicken |

**The ninth skill:**

Inference or Deduction

Inference or deduction is a logical process aimed at reaching conclusions or acquiring new knowledge based on established assumptions or premises and available information. The inference that is made is logically indisputable but may still be incorrect.

**Example:**

| | | |
|---|---|---|
| **Premises** | All swans are birds<br><br>All doves are birds | |
| **Conclusion** | Therefore, all doves are swans | False |

**Training activity**

**1-**

| | |
|---|---|
| **Premise** | All numbers that start with 1 are odd numbers<br>551 starts with 1. |
| **Conclusion** | |

**2-**

| | |
|---|---|
| **Premise** | Hind's hair is curly.<br>All people with dark skin have curly hair |
| **Conclusion** | |

**Training activity:**

Dear trainee, what are the confirmed conclusions in the following story? Mark √ next to the statements that actually occurred.

The teacher saw a student rushing out of one of the classrooms and accidentally bumped into the physical education teacher, causing him to fall to the ground. The student continued running without stopping or paying attention to what happened to the physical education teacher.

| | |
|---|---|
| The student was inside the classroom | |
| The student's father is waiting for him outside the school | |
| The physical education teacher fell to the ground. | |
| The student stole something from the classroom and rushed out | |
| The teacher inside the classroom violently hit the student | |
| The student's mother informed him over the phone about a distressing event at home | |

**The characteristics of classroom climates that promote the teaching of critical thinking skills are:**

- Providing opportunities to deal with real-life situations or presenting realistic scenarios.
- Learner-centeredness, where the focus is on the learner, making them the center of the learning process.
- Encouraging collaboration and interaction among learners and teachers.
- Allowing learners to express their opinions, defend them, and respect the opinions of others.
- Fostering exploration, inquiry, a love of knowledge, and enhancing learners' responsibility for what they learn.

Additionally, teachers play a crucial role in the success of critical thinking education programs. The implementation of any critical thinking teaching plan depends on the quality of teaching practiced by the teacher in the classroom. Important characteristics that teachers should possess to create an environment conducive to the success of the critical thinking teaching and learning process include: actively listening to students, providing sufficient time for contemplation and reflection, creating opportunities for discussion and expression, encouraging active learning that involves generating ideas, asking questions that engage higher-order thinking skills, accepting and valuing students'

opinions, respecting differences among students, fostering self-confidence, and providing appropriate feedback.

**The concept of the curriculum:**

There was a long-standing concept of the curriculum that prevailed before this concept evolved due to comprehensive studies conducted in the field of education and psychology. These studies have changed many concepts regarding the nature of the learner and their psychological characteristics. Additionally, social changes and advancements in technology, particularly in the late 20th century, have played a significant role in changing this concept. All these changes in the field of educational thought have greatly contributed to the transformation of the concept of the curriculum from its narrow framework limited to textbooks or prescribed materials to a broader understanding. The textbook is considered one of its elements and components, but it is not the curriculum itself.

**The traditional and narrow concept of the curriculum:** The concept of the curriculum among educators was synonymous with knowledge. For them, the curriculum represents the subjects that learners study.

**The modern and expanded concept of the curriculum:** The developments in the field of education have played a crucial role in forming a broader and more comprehensive educational thinking, which has contributed to changing the concept of the curriculum. It has moved from the narrow understanding that was limited to the prescribed curriculum or textbook to a modern concept that is more expansive and inclusive.

**Hidden Curriculum**

- It has many names such as hidden curriculum, informal curriculum, unplanned curriculum, unintended curriculum, implicit curriculum, and tacit curriculum.
- The unplanned curriculum refers to all the experiences, knowledge, and activities that students engage in or learn outside the prescribed curriculum voluntarily, without the supervision or knowledge of the teacher in most cases. (Avandi et al., 1989)

**The elements of the curriculum that indicate the presence of thinking tools are as follows:**

| | | |
|---|---|---|
| Teaching methods: How the thinking tool will be presented | Content: The integration of the tool and the lesson's content and its procedures | Objectives: Identifying the specific goal for using the thinking tool in instruction |
| Teaching aids: The materials or resources needed to implement the activity | Assessment: How the proficiency in using the thinking tool will be evaluated | Activities: The pre-planned activity for utilizing the thinking tool |

**The strategy of using mind maps, which integrates thinking tools into the curriculum:**

Integrating thinking skills into the curriculum helps students develop a deeper understanding of the subject matter and continuously engage with the content. It also provides more opportunities for students to learn how to think effectively. Robert Schwartz and Sandra Parks emphasize that when thinking skills are taught through the curriculum in a proper manner, students are more likely to integrate these thinking habits into all the different ways of thinking they use. Teaching through mind maps leads learners to actively participate in constructing a coherent and integrated cognitive structure linked to a fundamental concept. Consequently, it creates a conducive learning environment for collaborative learning.

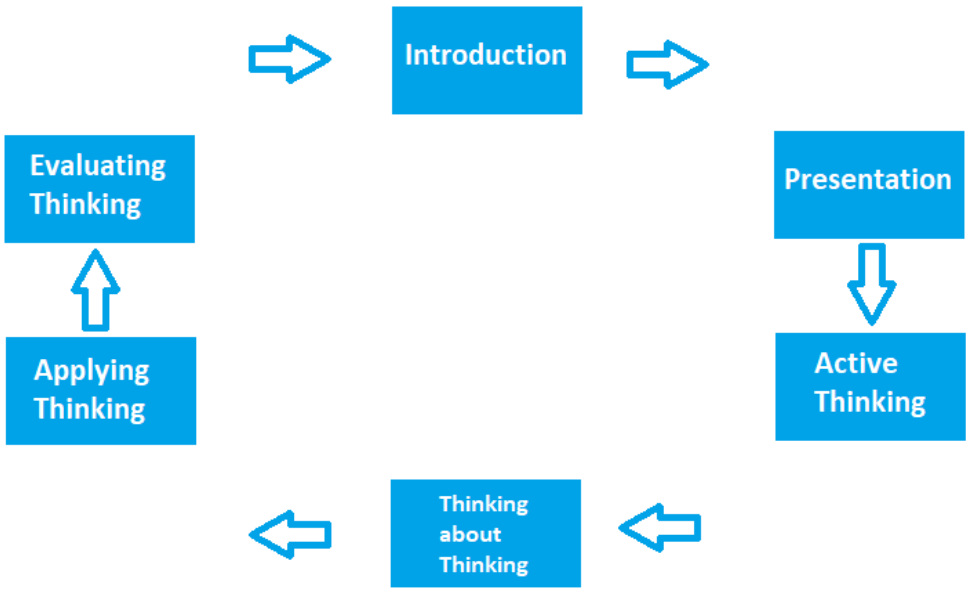
**The philosophy of mind mapping is based on three main principles aimed at improving students' thinking skills (Schwartz & Perkins, 2002):**

- The clearer the teaching of thinking, the greater its impact on students. When the classroom environment promotes a culture of intellectual stimulation, the influence of thinking instruction on students becomes more significant.
- The more the teaching atmosphere fosters a conducive mental climate, the more students are capable of reaching better thinking methods.
- The integration of thinking instruction with lesson content enhances students' thinking about the subject matter. The more these two aspects are merged, the more students' thinking is enriched in relation to the material being studied.

These three principles provide the foundation for integrating thinking skills during the process of teaching content. This integration is based on utilizing the organization of curriculum lessons. The curriculum is not merely a collection of disconnected pieces of information but rather a material that students use to form their judgments. Therefore, it is expected that information related to the topic of nutrition, for example, would have an impact on students' dietary habits. Hence, it is essential to teach students how to effectively utilize the information and principles they learn in school to make decisions and solve problems efficiently.

**Teaching Procedures Based on Integration Mind Maps:**

Teaching procedures with integrated thinking maps are carried out in six steps: (Lesson Introduction - Skill Presentation - Active Thinking - Thinking about Thinking - Applying Thinking - Evaluating Thinking) by Robert Schwartz and Sandra Parks, 2004.



**Lesson Introduction:**

This step aims to prepare students for learning both the content of the lesson and the thinking skill being taught. Key teaching procedures in this step include:

- Introducing students to the lesson topic, providing a general overview of its content and the thinking skill involved.
- Communicating the lesson objectives, which include both content and skill goals, and activating students' prior knowledge related to the lesson content and their previous experiences related to the skill. This is done through asking questions that stimulate their existing knowledge and experiences about the content and the skill. It also emphasizes the importance of the skill in students' lives and the situations and contexts in which it is used.

**Skill Presentation:**

The teacher demonstrates practically to the students how to perform the skill, using guided questions.

**Active Thinking:**

This step starts with teaching students the content and ensuring their understanding of it. They then engage in a thinking activity, individually or collaboratively, where the teaching of the skill is directly integrated with the lesson content.

**Thinking about Thinking:**

In this step, students engage in reflective and metacognitive activity, contemplating their thinking (in the active thinking step) through additional questions posed by the teacher that invite them to reflect on their thinking process.

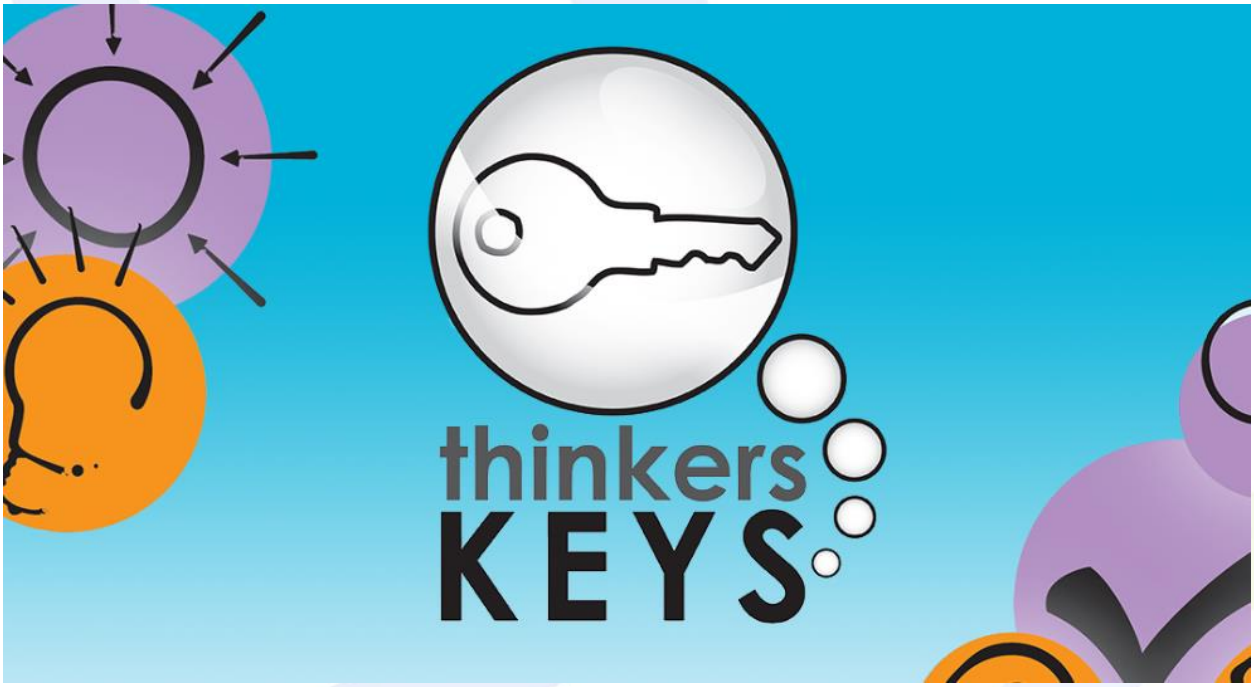
**Applying Thinking:**

Students practice new thinking activities that aim to transfer their learning outcomes of the thinking skill to real-life situations beyond the instructional context. There are two types of these activities.

**Evaluating Thinking:**

Students are guided to engage in individual activities that target the evaluation of their performance in the thinking skill taught, utilizing guided questions, homework activities, or role-playing games.

**Introduction to Thinker's Keys:**



**What does the Thinker's Keys program consist of?**

The program consists of 10 orange cards and 10 purple cards. The orange cards address creative thinking skills and are used when you want to generate new and different ideas. The purple cards address critical thinking skills and are used when you want to think in a logical and organized manner.

Each of the ten keys carries a symbolic image with a specific meaning related to the thinking strategy to be followed.

**There is also an electronic version of the Thinker's Keys program available to utilize technology for effective thinking.**

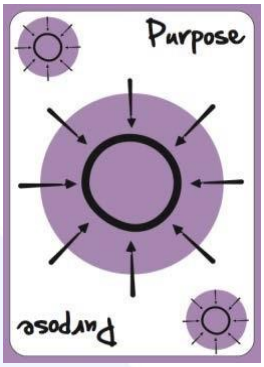
**The following table illustrates the twenty Thinker's Keys:**

| Creative Thinking Keys | Critical Thinking Keys |
|---|---|
| Improvements Key | Purpose Key |
| Brainstorming | Info Key |
| Combination Key | Decision Key |
| Brick Wall Key | Action Key |
| Challenge Key | Reflection Key |
| Prediction Key | Perspectives Key |
| In Common Key | Question Key |
| BAR Key | Three Whys Key |
| Inventions Key | Rubrics Key |
| Reverse Key | Consequences Key |

**The training program includes:**

- Training sessions to introduce the twenty Thinker's Keys, their usage, and training activities that students apply with the guidance of the teacher to understand each key and how to use it.
- It also includes practical activities, situations, and projects related to daily life, which are comprehensively addressed by using a series of Thinker's Keys that have been identified and understood. Students themselves apply these keys.

1. **The Purpose Key**




**Objective:**

- Identifying the goal and purpose when approaching any task and focusing on what needs to be achieved.
- Clarity of purpose in meetings and discussions to make them productive and avoid going in circles without progress.

**Illustrative Example:**

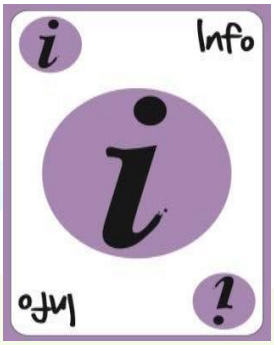
"You are working with a group of people discussing the harmful presence of waste around the school."

**What would be the real objective of this discussion?**

Listen to the students' suggestions... One suggestion would be to encourage people to dispose of waste in designated bins.

Example in a classroom setting: What is the purpose of learning the multiplication table

2. **The Info Key (Information)**



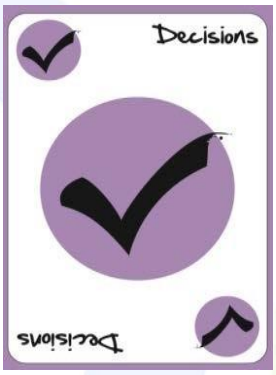

**Objectives:**

- Obtaining extensive and valuable information about the subject being studied.
- Conducting in-depth research and supporting thinking processes during research.
- Organizing and arranging information according to a specific criterion.
- Transitioning from being a recipient of information to becoming a seeker of knowledge.

**Additional uses of the Info Key for thinking include:**

- Gather information about the senses, then rank the five senses in order of importance from most important to least important.
- Write a list from A to Z of values, emotions, and attitudes within your family members. Example: Gather information about a Western scientist or poet.

3. **The Decision Key**




It is important for the student to be in a position of choice and then question why they made that decision. Activity: You are a lawyer and currently have two options: either work in a government position or start your own business.

| Proposed Decision | Criterion 1 | Criterion 2 | Criterion 3 | Criterion 4 | Criterion 5 | The Total: |
|---|---|---|---|---|---|---|
| Self-employment | | | | | | |
| Government job | | | | | | |

**Activity: The Good Friend**

Throughout your academic and social life, you encounter a number of individuals, and some of them become your friends.

**Question:** Recall a friend and mention why you chose them by listing six qualities of a good friend.

**Classroom question:** You have two story titles to choose from. Select one and explain why you chose it.

Apply those qualities (criteria) to yourself and assess yourself. Are you a good friend?

What decision will you make to improve your relationships with your friends?

4. **The Action Key.**

**Objectives:**

- Train to organize thoughts into actionable plans (our ideas become actions).
- Creating implementation plans puts individuals in a challenge that helps them apply and develop ideas without losing them.
- This key is the planning key because good planning is the first step towards implementation.

**How to apply the Thinking Key:**

- When you want to accomplish a specific task, start by creating an implementation plan.
- Outline the steps you need to take to execute the task from start to finish.
- Includes the implementation plan.

**Activity:**
Create your own "Community Service Campaign" with your group and develop an action plan for its success (define the location, target audience, campaign title, and who will be responsible). You can use drawing to assist you.

---

---

**Class Activity:**
(Laboratory Experiment - Science): Identify the causes of iron rust by developing a plan to conduct the experiment.

---

*****Other Aspects:**

The Implementation Key is also beneficial for developing implementation plans for small and large projects. This includes specifying the "what," "who," and "when," as well as establishing evaluation criteria for each task within the project. It also involves setting start and end times for each task and finally, indicators to assess the project's success.

5. **The Reflection Key.**


**Importance of the Reflection Key:**

- Reflecting on what has been accomplished and the level of mastery achieved.
- Acquiring the skill of self-dialogue and developing ideas (thinking about thinking).

- Discovering new ways to improve task performance in future instances.
- Developing the skill of self-evaluation before seeking evaluation from others.

**Example:**

You are a creative writer who has finished writing an article on a specific topic. Take a moment to reflect on the piece you have written:

**Ask yourself the following questions:**

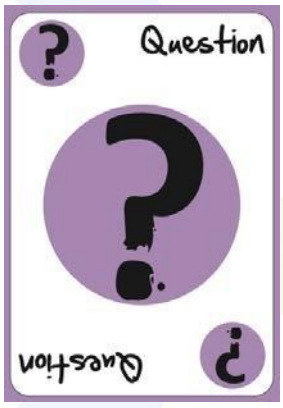
- What did you accomplish well?
- How can you further improve it?

**Your turn now:**

In a classroom session, use the Reflection Key.

Ask your students to create a report, PowerPoint presentation, or even write a story. After they have finished, ask them to reflect on what they have accomplished and make any necessary edits or improvements.

6. **The Perspectives Key.**




### Objective of the Key:

- Explore different perspectives.
- Expand understanding and examine the subject from multiple angles.

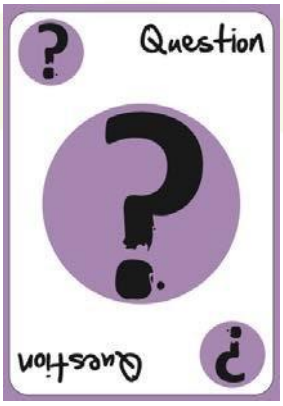
**Activity:**

Share your opinion on chocolate, and then consider the opinion of a chocolate factory owner, a nutrition consultant, and a young child in school.

**Classroom Activity:**

Provide different perspectives on World War 1?

7. **The Question Key.**




This tool is used to ask a set of questions with a specific pre-determined answer or topic.

**Objectives:**

- Acquire the skill of asking important questions in life.
- Pose challenging questions to enhance understanding and delve deeper into what is being learned.
- Recognize the significance of fundamental questions in exploring the concepts of a subject.
- When using the key, students are required to ask questions themselves instead of relying solely on the teacher for a predetermined topic or assignment.

**How to Apply the Key:**

1. Engage in critical thinking by asking key questions while studying a unit or topic.
2. Pose a question that challenges the understanding of the topic and encourages deep thinking.
3. The answers to the questions should not be limited to a simple "yes" or "no." It is preferable to begin with "what," "why," and "how."

Note: You may need to train your students on question-building tools.

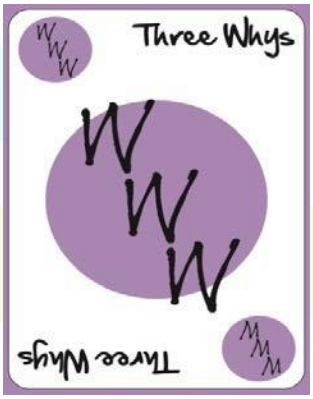

**Class Activity: Here is the answer... Where is the question?**

For each of the following words, pose a suitable question where the word is the answer:

Pollution - Desert - Beautiful gift - Hospital

- Pose questions on the topic of the rotation of the Earth around the Sun.

8. **The 3 Whys Key.**




**Objectives:**

- Acquiring the skill of deep thinking about what surrounds you.
- Understanding the true reasons behind things happening.

**How to apply the thinking key:**

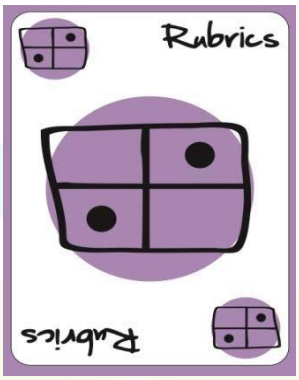
1. Start with a statement or phrase, such as "We should go to school."
2. Ask the question: Why should we go to school?
3. Answer the question, for example: "To acquire knowledge and skills."
4. Ask another question based on the previous answer: Why should we acquire knowledge and skills?
5. Answer the previous question, for example: "To become stronger, educated individuals and improve our lives."

**Example:**

For the statement, "Vegetables and fruits are essential in meals."

- Ask the question: Why are they essential? Answer: Because they contain vitamins and minerals necessary for body growth.
- Ask the question based on the previous answer: Why does the body need to grow? Answer: So that the person can grow bigger and become stronger.
- Ask the question based on the previous answer: Why should we be stronger? Answer: To be physically capable and lead a healthier lifestyle.

## 9. The Rubrics Key




**Objectives:**

- Acquiring the skill of establishing criteria for assessing performance levels.
- Developing the ability to judge the quality of work and make efforts to improve it.

**How to apply the thinking key:**

1. When performing a specific task or completing a certain work, it is important to understand the expected level of achievement.
2. Create a list of skills required to perform the task.
3. Establish criteria to assess the mastery of each skill from the listed skills.
4. Develop a grading scale called "The Rubrics" that includes the skills, descriptions of proficiency levels, and evaluations such as "Weak," "Good," and "Excellent."
5. Provide guidance for improving the desired performance level.

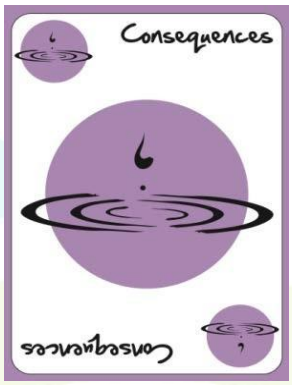
**Example:**

If the required task is to prepare a presentation on a specific topic, the following table shows the rubrics by which the quality of the presentation will be assessed:

The required skills are listed vertically in the table, and the proficiency levels are listed horizontally.

| Skills/Ratings | Weak | Good | Excellent |
|---|---|---|---|
| Creative aspects | The same effects were used in all slides | Various effects were used with colors | New slide effects and colors were used |
| Content quality | Superficial content without research evidence | Enjoyable content with multiple ideas | Engaging content and strong ideas supported by research evidence |

## 10. The Consequences Key




**Objectives:**

- Consider the consequences of decisions and actions taken.
- Realize that small actions can have significant consequences.
- Understand the immediate, near-term, and long-term consequences that may result from implementing something.

**How to apply the thinking key:**

1. Think about a specific topic, task, or decision and create a simple plan for it.
2. Consider the potential consequences that may arise from implementing the action or decision in real life.
3. The topic may have a single effect or a chain of consequences.

**Example:**

The school has decided to implement a project to recycle the paper it consumes as waste on a daily basis. What are the consequences of this?

- Families of the students may also start implementing the recycling process.
- Some nearby institutions may adopt the same idea.
- The environment becomes cleaner, and environmental awareness spreads among students and community members.

1. **The Prediction Key.**


**Objectives:**

- Acquire the skill of predicting future events based on current circumstances.
- Understand the importance of prediction in preparing for future changes.
- Develop a mindset and flexibility to embrace new ideas.

**How to apply the Prediction Key:**

1. While studying any subject, consider potential scenarios that may occur in the future.
2. Create expected possibilities that may happen in 10, 20, 50, or 100 years.
3. The future may differ significantly or slightly from the current situation, while some things may remain unchanged.
4. Engage in thought exercises to arrive at predictions about the future.

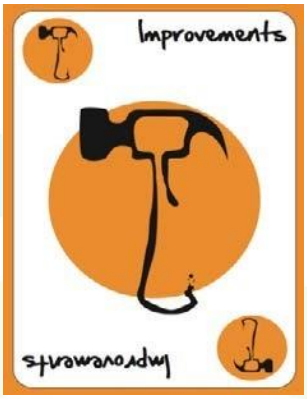
**Example:**

Predict how food will be prepared in 50 years from now...

By directing our minds to focus heat towards the food, it will cook itself. - Food may be cooked by robots, which are programmed based on personal preferences, and they will prepare the food at any time.

Class Activity: In the lesson on "Electricity Consumption," predict new electrical appliances that will emerge in ten years.

2. **The Improvements Key.**




**Objectives:**

- The ability to introduce improvements to things to make them better and more efficient.
- Continuously improving the characteristics of the same thing from multiple perspectives.

**How to apply the thinking key:**

1. Identify something or a situation that is not functioning well or is inactive.
2. Consider the aspects or characteristics that need improvement in this thing.
3. Think about the improvements and developments you can make to enhance these characteristics.
4. The working method involves creating a table with two columns:

- In the first column, list the characteristics you want to modify (What do you want to improve?).
- In the second column, record the improvements and developments you suggest (What is this improvement?).

**Example:**

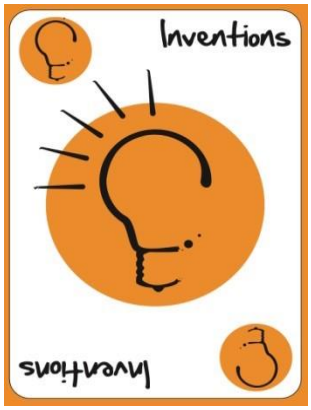
Bicycle: Let's assume you want to improve the characteristics of a bicycle:

| **What do you want to improve?** | **Improvements** |
|---|---|
| Avoid getting wet when using the bicycle in rainy weather | Design a small canopy that prevents rainwater from reaching the head and body |
| Ease the effort of riding the bicycle uphill | Design a small motor that stores energy while riding on slopes and flat roads, and releases this energy when climbing uphill |

| | |
|---|---|
| Enhance the comfort of the bicycle seat | Design wider seats with suitable cushioning |
| Other characteristics to consider | ..... |

**Class Activity:** In the winter season lesson, identify the (solar) umbrella and ask the students to make improvements to enhance it after identifying its flaws.

3. **The Inventions Key.**




**Objectives:**

- Acquire the skill of daring to propose new ideas, even if they are imaginative or funny.
- Thinking differently and finding alternative ways is essential for an advanced world.
- Designing new inventions based on daily needs and emerging problems.

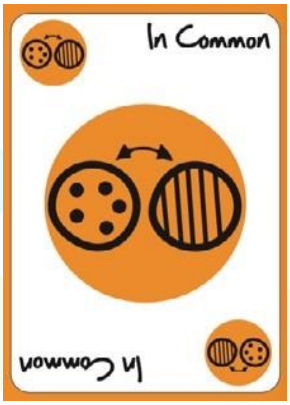
**How to apply the thinking key:**

This key is beneficial in developing new inventions used in everyday life aspects.

1. Think about a daily problem that requires solutions or a daily topic that needs to be approached differently.
2. Think about the new thing you desire to exist.
3. Start by sketching a design on paper or on the screen for the invention you wish to create.
4. Seriously consider building the new invention you designed and seek assistance from others.

**Activity:** Invent a device or application that solves a problem faced by you and your classmates at school. Mention the name of the device, its features, how it works, and draw a small prototype of it.

4. **The in Common Key**




**Objectives:**

- Acquire the skill of thinking deeply about situations and things.
- Find common points between two different things that appear completely unrelated.
- Apply the skill of making connections.

**How to Apply the Key:**

One of the wonders of creative thinking is that it can build common relationships between things that initially seem unrelated, leading to new inventions and innovations.

1. Name any two concepts or things that are different and don't appear to have any relationship between them.
2. The selection of the two things can be random.
3. Conduct brainstorming to think about each thing individually and create a list of their characteristics.
4. Extract the common points or aspects between the two different things or concepts

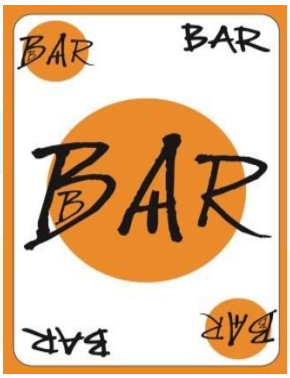
**Example:**

Books and Chocolate

- What are the common things between books and chocolate... At first glance, they may seem unrelated.
- Both provide you with pleasure, and you may want more of them.
- Each has a cover, and the cover gives you an idea of what's inside.
- You need to open each of them to access the content.
- Everyone tastes both of them differently.
- Each person has different preferences for types of both chocolate and books.

**Class Activity:** In our lesson about mothers, identify the similarities between a mother and a television, a mother and the sun.

5. **The BAR Key: Big , Add, Replace**




**Objectives:**

- Benefit from shortcuts in the process of understanding and remembering.
- Acquire the skill of making multiple modifications to the same thing, such as adding, amplifying, and replacing, to enhance it.
- Break away from routines and preconceived ideas, knowing that everything can be changed.

***** Use the three steps (BAR) to introduce modifications and changes to a specific thing.**

- Big (B): Make a part of the thing bigger, more important, or more useful.
- Add (A): Add an additional part to the thing or one of its aspects.
- Replace (R): Remove a part and replace it with something else.

It is possible to use a part of the key instead of all three steps.

**Example:**

- Using the BAR Key (Big, Add, Replace) to make modifications and changes to a laptop device.
- Big (B): Make the laptop screen expand to become four times larger than its current size, resembling a television screen.
- Add (A): Add additional buttons that change the color of the device from the outside.
- Replace (R): Replace the shape of the device with something other than the rectangular shape, such as oval, triangular, or other shapes.

**Class Activity:** Use the key to make improvements to the story of "The Boy Who Cried Wolf" or a written text or a scientific experiment or a mathematical problem.

6. **The Brainstorming Key.**


**Objectives:**

- Acquiring the skill of generating abundant and diverse ideas.
- Employing brainstorming when using other thinking keys.

**How to Apply the Key:**

1. The brainstorming key is used to obtain a multitude of solutions to a specific problem by asking the following question: How can we...?
2. The process of brainstorming involves the following elements:

- First: Generate numerous ideas abundantly about a specific topic or problem.
- Second: Refrain from judging ideas, neither positively nor negatively, during the idea generation phase.
- Third: Embrace all ideas, even the strange or silly ones.
- Fourth: Build upon the ideas of others to introduce new ideas.
- Fifth: Organize the generated ideas and exclude duplicates or those that are irrelevant to the topic.

**Example:**

Problem: Some people take life seriously and without fun... How can we encourage people to be more joyful and optimistic about life?

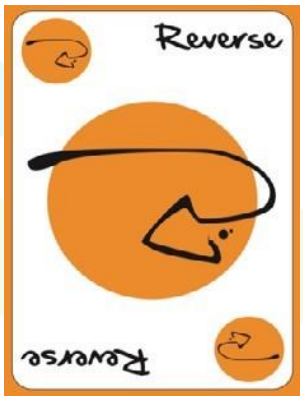
Some suggestions:

- Bringing a variety of clown masks and disguises and issuing a law that requires individuals to wear one of the masks once a week, creating a fun atmosphere for others.

**Class Activity 1:** Mention the largest number of mathematical problems whose result is 45.

**Class Activity 2:** Write the largest number of verbs in their modified form.

7. **The Reverse Key.**




**Objectives:**

- Acquire the skill of thinking about situations in a reverse or opposite manner.
- Recognize the importance of flipping facts to generate new ideas and fresh answers to conventional questions.

**How to apply the Reverse Key:**

The process of reversing is essential to break away from routine thinking and obtain new answers to preexisting questions. This can be achieved by:

- Asking the question: "What is something that cannot be done?" instead of "What is something that can be done?"

**Activity:** Identify the factors that do not contribute to the competitiveness of an organization in the market.

**Class Activity:** List the qualities that do not apply to a virtuous citizen.

8. **The Challenge Key.**


**Objectives:**

- Encourage fun thinking and make thinking flexible without limitations.
- Stimulate thinking in a different way and put unusual ideas into action.
- Provide justifications and reasons for new and unconventional ideas.

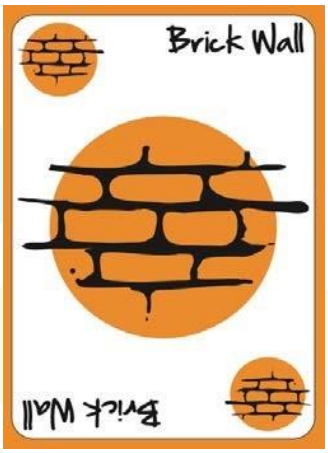
**How to apply the Challenge Key:**

1. Challenge yourself and others by proposing unusual and different ideas from conventional ones.
2. Present funny ideas, even if they seem imaginary or impossible to achieve.
3. Provide justifications and reasons to convince yourself and others that these ideas are necessary and achievable.
4. Try to be imaginative and playful to encourage others to think flexibly and accept new ideas.

**Activity:** Justify why it is advisable to change our passport every three years.

**Class Activity:** In the Technology lesson, provide justifications and explanations for the decision to implant a mobile chip in the brain instead of using the current mobile device.

9. **The Brick Wall Key.**




**Objectives:**

- Identify the obstacles that hinder our progress.
- Acquire the skill of perseverance and not giving up in the face of challenges that hinder our work and goals.

**How to apply the Brick Wall Key:**

1. Look at the things or factors that prevent us from achieving what we want.
2. Propose multiple ideas and solutions to overcome those obstacles.

**Example:**

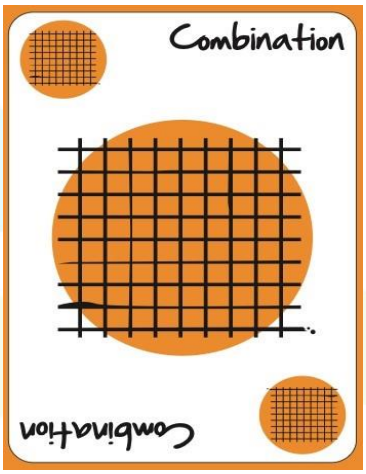
"We want our schools to promote social justice in the local community, but many people don't care about this idea." What is the solution...? Here are some ideas:

- Seek influential individuals to engage with people and encourage them about the idea.
- Start doing something that supports the idea and make people aware of how it works.

**Class Activity:** You have the following verbal math problem: "Give us the largest possible number of solutions."

You have a problem of water scarcity. Provide the largest possible number of solutions.

## 10. The Combination Key.




**Objectives:**

- Acquire the skill of problem-solving by merging two or more ideas.
- Reach new innovations through the combination of two elements together.

**How to apply the Combination Key:**

1. Propose names for some known objects or tools.
2. Write these objects in a table format, forming a matrix with horizontal rows and columns.
3. Select one object from the horizontal row in the table with another thing from the vertical column... and so on.
4. Name new features or a new product that can be applied in reality, either currently or in the future.

**Example:**

You have a laptop and a printer... as well as a pencil and chocolate as shown in the following table:

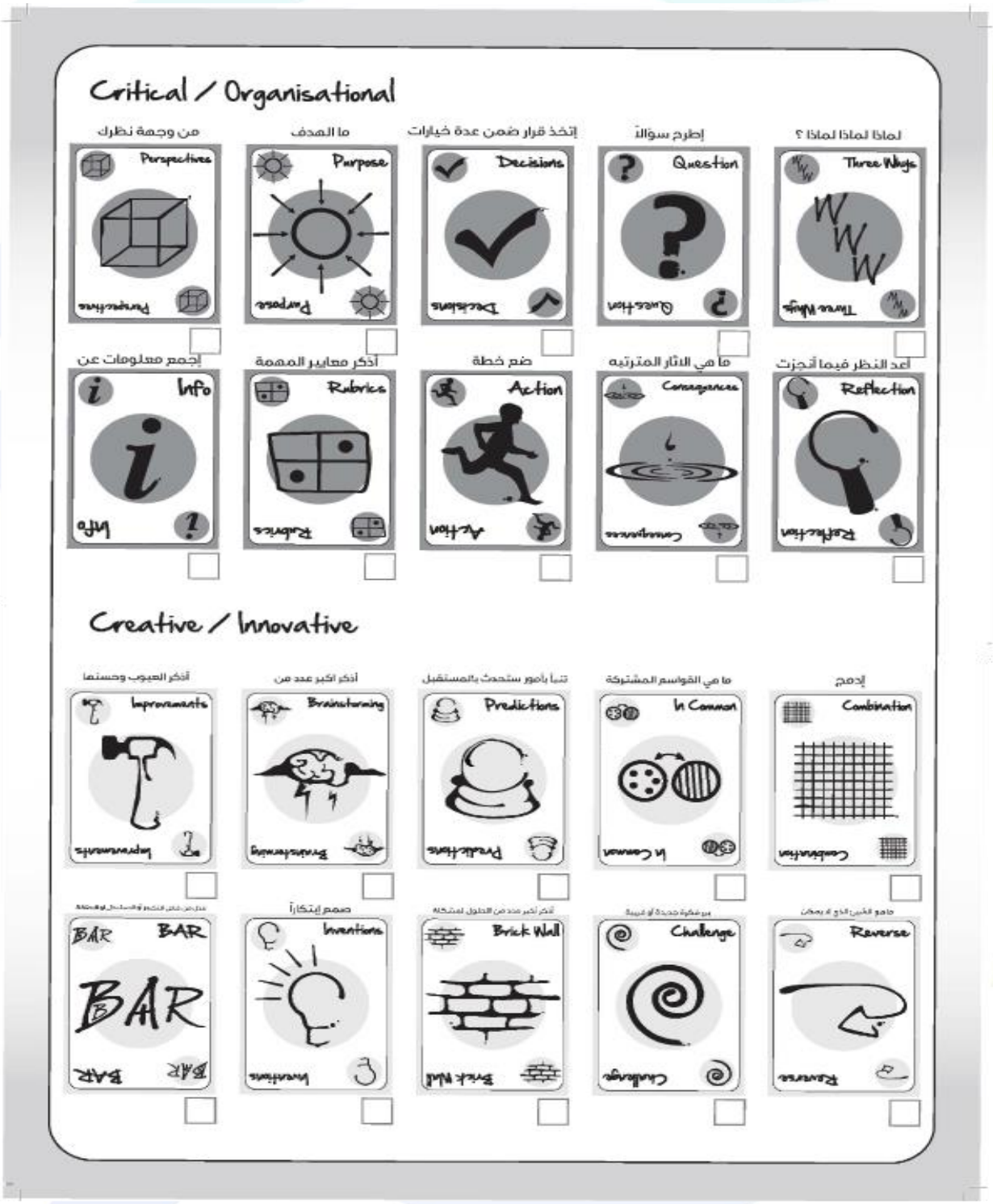
| | **Printer** | **Laptop** |
|---|---|---|
| **Chocolate** | Developing a print that emits the scent of chocolate when printing on paper | Developing a chocolate wrapper with changing images |
| **Pencil** | Developing a pen that prints words when spoken aloud | Developing a pen that writes on the laptop screen |

**Activity:** You have the following words, connect them to write a short story:

Lion, Foot, Key, Judge, Book, Nurse, Forest.


evaluaton
synthesis
analysis
application
understanding
knowledge

# 20 Thinking Keys



# THE END

## THINKING SCHOOLS

## Path 1

# THINKERS KEYS

Rethinkers
Brains ready for tomorrow

www.rethinkers.me