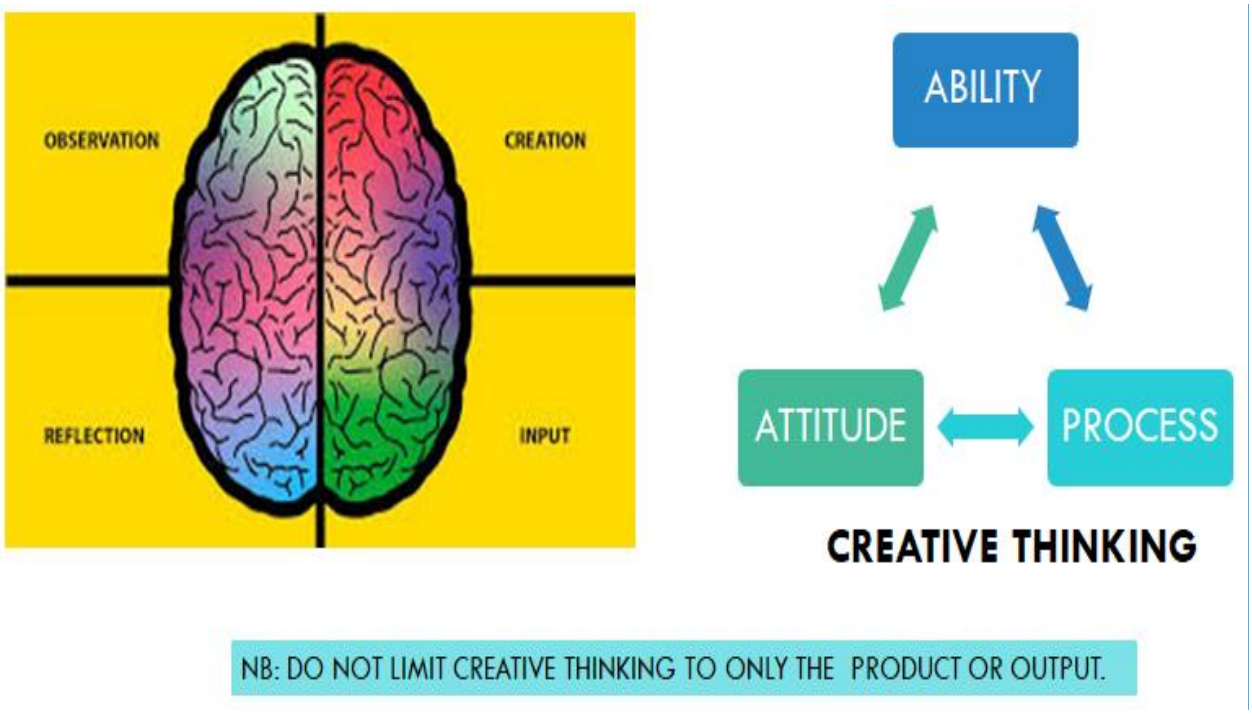
What is thinking?

You would have answered this question based on the ideas that came to your mind while you were doing the Exploration Activity above. The diagram below should help you to check your answer to the questions you were asked above.

Connecting Pillars of Thinking & Creativity



Thinking is using your brain (mind) to make sense of the world and to make decisions about how you will respond. Reasoning is the term that is often used when we speak about thinking. Your experiences help you to think. The activities you do at home and at school are some of the ways you gain experiences. The ideas in your mind can be grouped in various ways. Mathematics can help you to form categories of ideas as you reason.

Categories in Quantitative Reasoning

Patterns

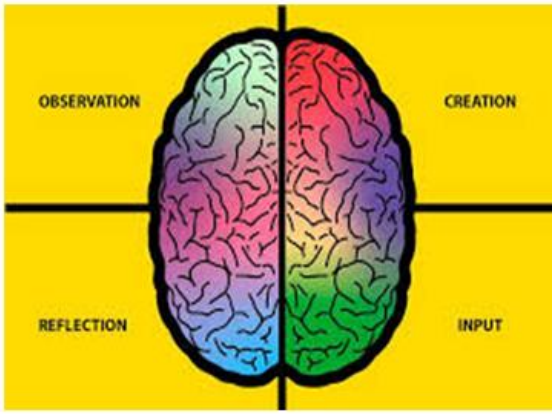
Representing Quantities

Comparing Quantities

Approximation/Estimation

Data Analysis

Problem Solving



Link pillars with one or more categories of reasoning.

Categories of Verbal Reasoning

Analogy

Classification

Essential Part

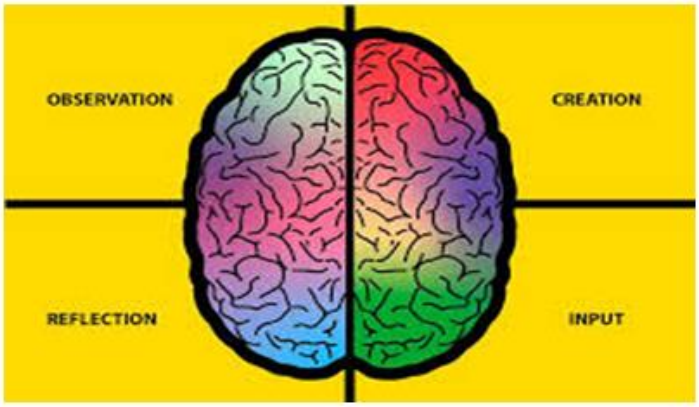
Sequencing

Text Completion

Reading

Artificial Language

Logical Deductions



Link pillars with one or more categories of reasoning.

Here is an activity to help you to see the importance of mathematics in a real life situation.

MATHEMATICS AND SHOEMAKING

What do you know about shoemaking?

List types of shoe you know.

Puma sneaker, Clarkes, Kickers

---Crocs---

What do you notice about the shoes you are wearing?

They have sizes

---They have a brand name---

SHOEMAKER DADDY
Sidney Beck

His workshop's open now I see
He will not notice - it's just me.
His tools, his nails, his leatherware,
His hammers large and small are there,
All ready for his hands to bear
When he returns to take his chair.
The shoes he makes are neat each pair,
And some are leather dark or fair,
They're crafted all with love and care.
So here's my secret silent prayer :
I hope he takes me on his knee
And makes me some in small size three.

How is mathematics used in shoemaking?

List three (3) areas of mathematics that a shoemaker must consider when making a pair of shoes.

Measurement
Statistics
Numbers

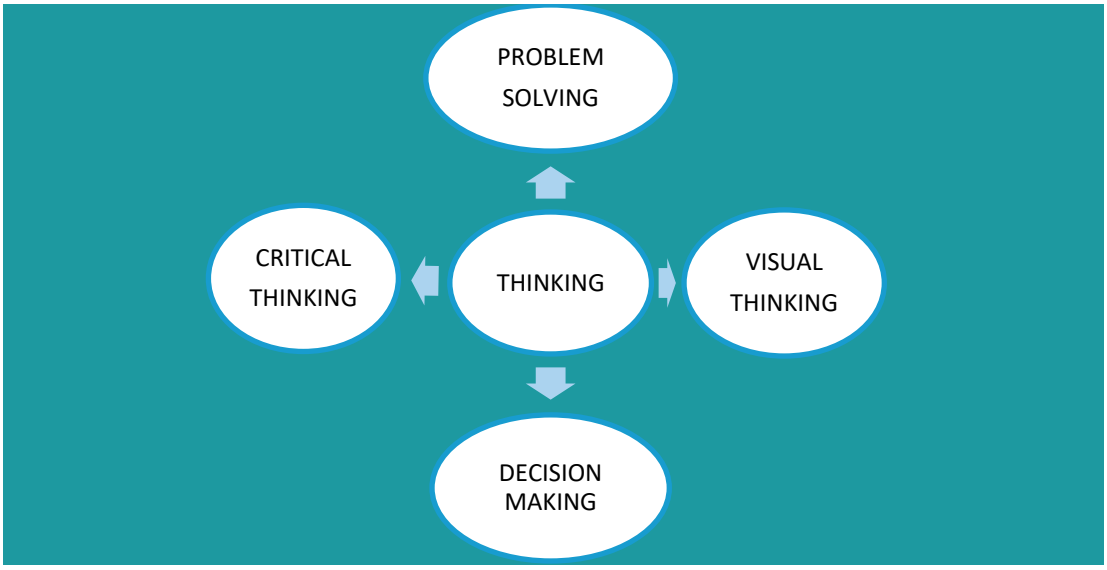
Identify the unit of measure used in shoemaking.

Inches

Did you know that the top 5 most common materials used in shoemaking are:

1. leather
2. textile/fabric
3. synthetics
4. rubber
5. foam

The four (4) types of Mathematical thinking



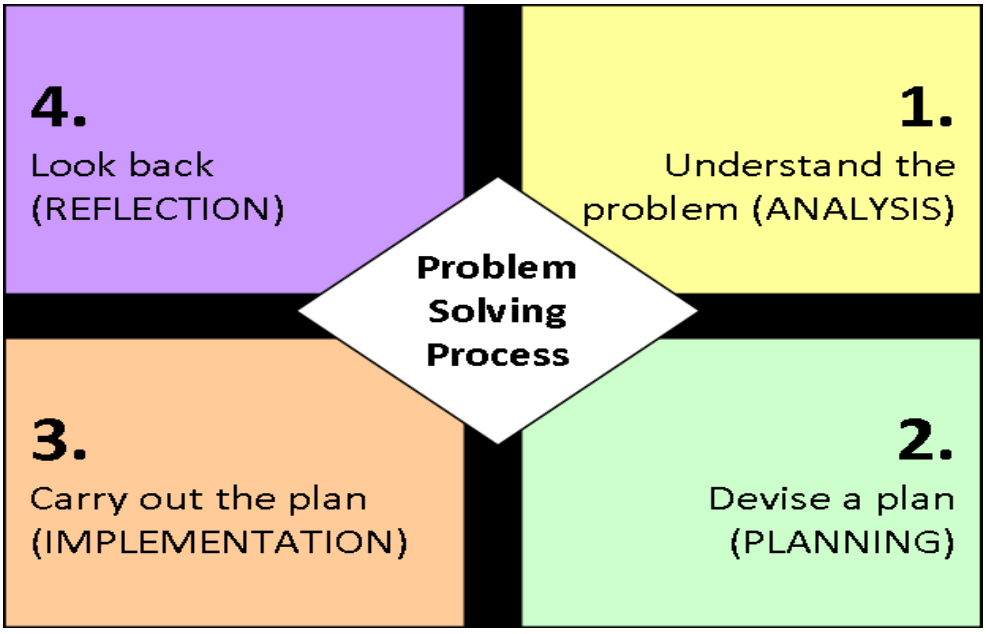
CRITICAL THINKING

Here are the questions to help thinking critically:

- What do you know?
- What do you need to know?
- What are important thinking strategies you can use.
- Which strategies did you use and why?
- How well did the strategies work?

PROBLEM SOLVING: NON-ROUTINE

Some problems are complex and there are many ways to solve them. These problems will require you to use your creative thinking skill. Some of the steps involved are shown below.



VISUAL THINKING

Visual Thinking?

This is about:

- Thoughts in the form of images or pictures
- Communicating using symbols, shapes, key words to convey meaning

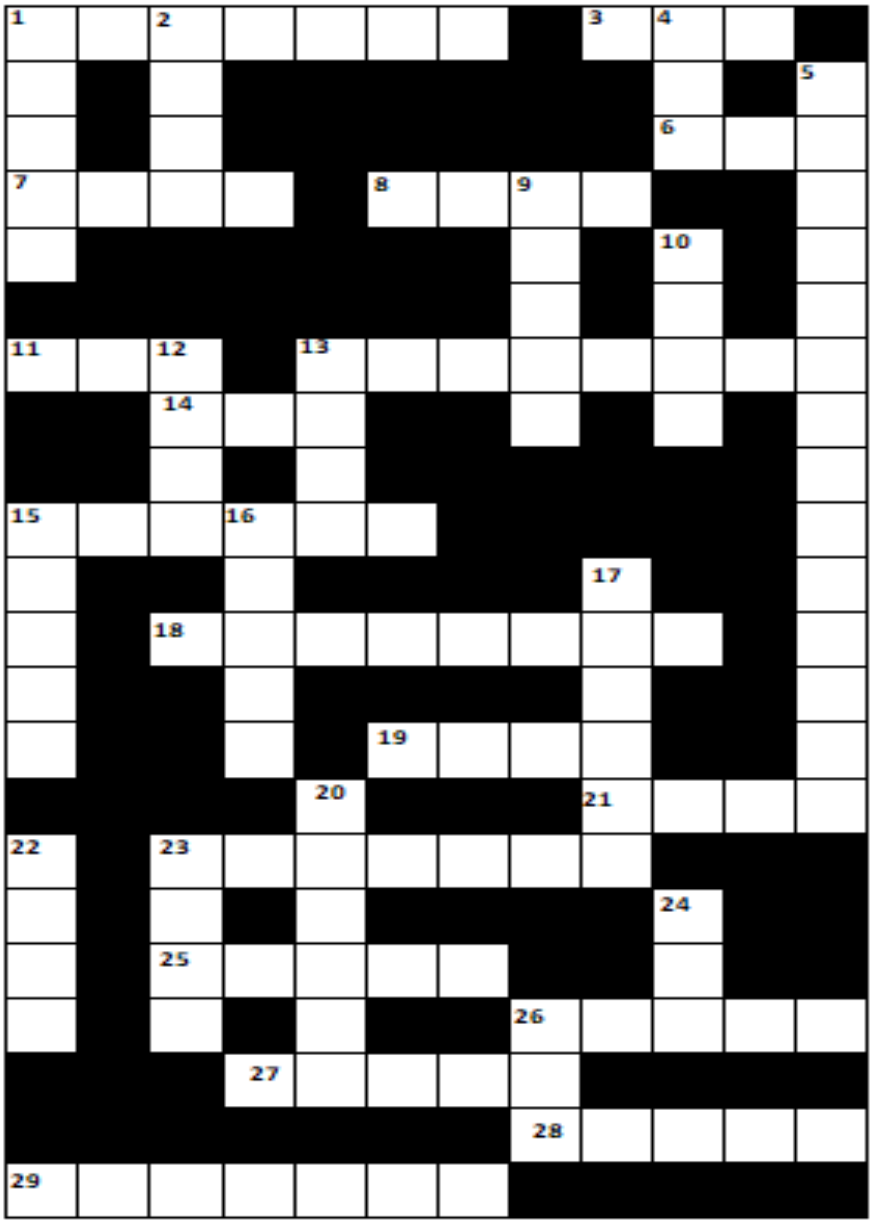
DECISION MAKING

Decision making is concerned with making choices to achieve goals. There is usually **NO clearly right or clearly wrong answers.**

<u>Below are questions that will help you in making decisions:</u>

Step 1: What is the decision you have to make?
Step 2: What information do you have to gather and how will you do so?
Step 3: What options or choices do you have?
Step 4: Which is the best option?
Step 5: How will you use the option you have chosen?
Step 6: What is the result of acting on the decision?

Mathematics Cross-Word Puzzle



ACROSS	DOWN
1. Refers to mean, mode, or median.	1. The amount of turning; measured in degrees.
3. Whole numbers ending with 1, 3, 5, 7, or 9.	2. Not odd.
6. 26^{th}, 15^{th} and 15^{th} letters of the alphabet.	4. The abbreviation for dozen.
7. Made of a set of points, which is extended in opposite directions infinitely.	5. To match.
8. Flat surface of a solid shape.	9. Straight line joining the ends of an arc of the circle
11. Adding two or more numbers or terms.	10. The product of 3 and 3.
13. Gives the direction of a travelling object; measured in degrees.	12. An average value.

14. A period of time.	13. Bottom line or surface of a figure.
15. To simplify a fraction.	15. Happens in a pattern.
18. To add a number to itself a given number of times.	16. To number.
19. The amount of material contained in an object.	17. Not an opened path.
21. Line segment where two faces meet.	20. 3 and 5 are ___ of 15.
23. A quadrilateral	22. An imperial measure.
25. Equal or similar in some way.	23. Special type of shape; like a roof top.
26. 8 is the third ____ of 2.	24. Opposite of column.
27. A number with only two factors.	26. Means each
28. Difference between the highest and lowest values in a set of numbers.	
29. The result of two or more numbers multiplied together.	

Linking Mathematics to Categories of Ability Assessment

Grade 4 Mathematics Content

Strand	Categories of Ability
Number • Sets • Number value • Fraction ideas • Estimation and mental calculation • Multiplication and division of whole numbers (up to 4 digits) including mental calculation. • Decimal	❖ Pattern: number (whole, fraction, decimal); ❖ Comparing numbers; ❖ Estimation and approximation; ❖ Problem solving (worded and real life situations. Please note that verbal categories such as analogies, classification, sequencing/ordering and logical deduction are applicable in the mathematics class. These help to build the language of mathematics as well as promote the processing of information. Puzzles and games are essentials tools to improve students' thinking.

Strand	Categories of Ability
Measurement • Units of measure. • Computing with units of measure. • Computing with length and area. • Estimating and comparing with measures.	❖ Comparing quantities; ❖ Approximation and estimation; ❖ Problem solving; ❖ Logical deduction; ❖ Analogy; ❖ Sequencing/ordering; ❖ Classification.

Strand	Categories of Ability
Geometry • Relationships between lines and angles. • Lines of symmetry. • Similarities and differences in shapes.	❖ Comparing; ❖ Pattern (geometric); ❖ Classification; ❖ Sequencing/ordering; ❖ Analogies; ❖ Logical deduction. The use of tangram pieces and jigsaws are essential.

Strand	Categories of Ability
Algebra • Using variables	❖ Pattern(block, coins, squares, counters); ❖ Shape sequence; ❖ Problem solving; ❖ Comparing.

Strand	Categories of Ability
Statistics and Probability • Collect, organize, interpret and display information. • Mean • Sampling population • Outcomes of an event	❖ Pattern; ❖ Data analysis; ❖ Collecting; ❖ Predicting; ❖ Comparing; ❖ Classification; ❖ Representing; ❖ Logical deduction; ❖ Problem solving; ❖ Interpreting.

Grade 6: Quantitative Reasoning Items

1. Which is the odd word below?
    a) Mean
    b) Mode
    c) Multiple
    d) Median

2. Nine times a variable *x* and five times another variable *y* results in sixty-two. What pair of values of *x* and *y* will satisfy the expression?
    a) *x = 9 and y = 5*
    b) *x = 5 and y = 9*
    c) *x = 4 and y = 5*
    d) *x = 3 and y = 7*

3. Imagine a flag with three vertical stripes, one red, one white and one blue. How many different flags can you imagine without repeating the colours?
    a) 12
    b) 6
    c) 3
    d) 1

4. Imagine some coloured blocks are laid out in a row: three red, two blue, three red, two blue and so on. How many blocks will be in the 9th position?
    a) 3 red blocks
    b) 2 blue blocks
    c) 10 blues blocks
    d) 15 red blocks

5. Imagine some coloured blocks are laid out in a row: three red, two blue, three red, two blue and so on. If there are 65 coloured blocks, how many would be red?
    a) 52
    b) 39
    c) 26
    d) 13