

‘How can I use Problem Solving in my classroom?’

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Problem solving is found not just in Maths, but in **all subjects**....

Eg Architecture, Engineering Economic, Environmental, Science. Etc

It involves **Searching** for the means

Reflecting consciously how to attain the end.

(Keep in mind that there may be **more than one** solution.)

“Problem solving is the most important aspect of school mathematics.”

Cf. Qld & N.S.W. Maths Syllabus

*“The whole maths curriculum is now organized **around** problem solving.”*

www.ceo.wa.edu.au

This also provides links to other interesting sites.

“ Problem solving is a process of accepting a challenge and striving to resolve it.”

Polya (1940)

Students learn best in an environment where they can **explore**, allow **language** and **socialization** from which they can make sense of complex ideas.

Aspects of Problem Solving.

1. Difficulty of the mathematics. (Maths skills already understood and known)
2. Language used. (Literacy/comprehension skills and used in NAPLAN)

Problems need to move **from easy**, ie too much information **to harder**, (contextual knowledge)

Thinking needs to move from :

1. Straightforward identification of known processes to
2. Strategic thinking to re-interpret.

Process of Problem Solving

1. Understand the problem
2. Develop a plan
3. Carry out the plan
4. Reflect on one’s work.

Strategies

1. Look for a pattern
2. Simplify the pattern
3. Guess & check (trial & error)
4. Draw a diagram or graph
5. Make a table or list
6. Model the problem with concrete material
7. Act out the problem
8. Check the answer
9. Make a fresh start

Teacher to Provide

1. Introduction and motivation
2. Form groups
3. Appropriate place
4. Time for discussion – thought-- activity
5. Teacher to interact.

Types of Problems

1. Translation - From verbal to mathematical form
2. Application – Real world problems
3. Processes – Strategies
4. Puzzle – enjoyment, interest, fun.

Accept the Challenge

“Children are **creative and imaginative**.

Some think..... Visually

Oral- verbal mode

Written. “ from “*Children Solve Problems*” by Edward De Bono

Problems must be relevant, not appear too difficult and capture child's imagination. Children can learn quicker when teaching other children(their peers).

Teachers to **ask leading questions** (**open-ended**) which lead to children coming to their **own solutions**, (**Discovery approach**) rather than be told the answer.

At times it is the method of solution rather than the answer.

It is important that the teachers be available to answer questions and give hints and suggestions if necessary. This can allow for **creativity and lateral thinking**.

The teacher **can listen** to the children, **observe** them, **assess** their achievement and **evaluate** the effectiveness of the activity.

Latest research shows that it can be more beneficial for teachers to provide many models and **answers to problems FIRST**, by modeling simple problem solutions and strategies, then offer extrapolations so children can apply what they know into other situations.

My mission now is to develop the creative thinking processes in students by engaging their mind, firing their imagination and strengthening their motivation towards life and learning. Children learn when they play.

“If I can awaken a sense of wonder and interconnectedness to everything in our lives by helping to educate students using practical materials in maths problem solving in a fun way, then I believe the lesson will be a success.”

Thank you for inviting me to your school.

Geoff Todman

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