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| **Mathematics** | | | |
| **Fluency** | **Understanding** | **Problem Solving** | **Reasoning** |
| An emphasis of skills in choosing and using appropriate procedures flexibly, accurately and efficiently. It is also about recall of knowledge and concepts. | It is when students make connections between related concepts and use the familiar to develop ne ideas. | There are two key elements: the solving of unfamiliar problems and the solving of meaningful problems. | The capacity of logical thought and actions, such as analysing, evaluating, explaining, inferring and generalising. |
| Develop skills in:   * **Choosing** appropriate procedures * **Carrying out** procedures flexibly, accurately, efficiently & appropriately * **Recalling** factual knowledge & concepts | Develop the ability to:   * **Build a robust knowledge** of adaptable & transferrable ideas * **Make connections** between related ideas * **Apply** the familiar to **develop** new ideas | Develop the ability to:   * **Make choices** * **Interpret** * **Formulate** * **Model** * **Investigate** * **Communicate** solutions effectively | Develop an increasingly sophisticated capacity for logical thought & actions such as:   * **Analysing** * **(Proving)** * **Evaluating** * **Explaining** * **Inferring** * **Justifying** * **Generalising** |
| So what does it look like when they demonstrate fluency?  They:   * **Produce** answers efficiently * **Recognise** robust ways ways of answering questions * **Choose** appropriate methods * **Recall definitions** * **Use facts** * **Manipulate information** and processes | So what does it look like when they demonstrate understanding?  They:   * **Connect** related ideas * **Represent** concepts in different ways * I**dentify** commonalities and differences between aspects of content * **Describe** their thinking in a subject specific way * **Interpret** subject specific information | So what does it look like when they formulate and solve problems?  They:   * **Design** investigations * **Plan** approaches * **Apply** existing strategies to seek solutions * **Verify** that answers are reasonable | So what does it look like when they demonstrate reasoning?  They:   * **Explain** their thinking * **Deduce** strategies * **Justify** strategies & conclusions * **Adapt** the known to the unknown * T**ransfer** learning from one context to another * **Prove** ( or provide evidence) that something is true or false * **Compare** or contrast related ideas and explain their choices |
| This document was shared by Professor Martin Westwell and Margot Foster at the Murray and Mallee Regional Leaders day, Feb. 28th , 2013 | | | |