



## Make sense of problems and persevere in solving them



Make meaning of a problem and look for entry points to its solution

Analyze givens, constraints, relationships, and goals

Make conjectures about the meaning of the solution

Develop a plan

Monitor and evaluate progress and change course if necessary

Check answers to problems and determine if the answer makes sense



## Reason abstractly and quantitatively



Make sense of quantities and their relationships

Represent symbolically (ie: Equations, expressions)

Manipulate equations (attends to the meaning of the quantities, not just computes them)

Understands and uses different properties and operations



## Construct viable arguments and critique the reasoning of others



Understand and use definitions in previously established results when justifying results

Attempts to prove or disprove conjectures through examples and counterexamples

Communicates and defends their mathematical reasoning using objects, drawings, diagrams, actions, verbal and written communication



## Model with mathematics



Solve math problems arising in everyday life

Apply assumptions and approximations to simplify complicated tasks

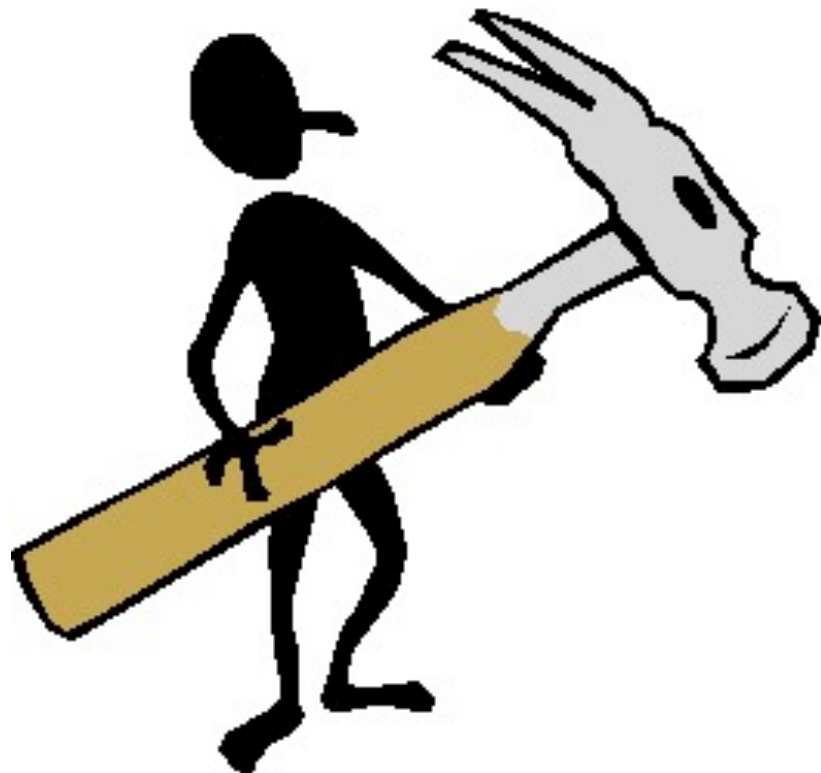
Use tools such as diagrams, two-way tables, graphs, flowcharts and formulas to simplify tasks

Analyze relationships mathematically to draw conclusions

Interpret results to determine whether they make sense



## Use appropriate tools strategically



Decide which tools will be most helpful (ie: ruler, calculator, protractor)

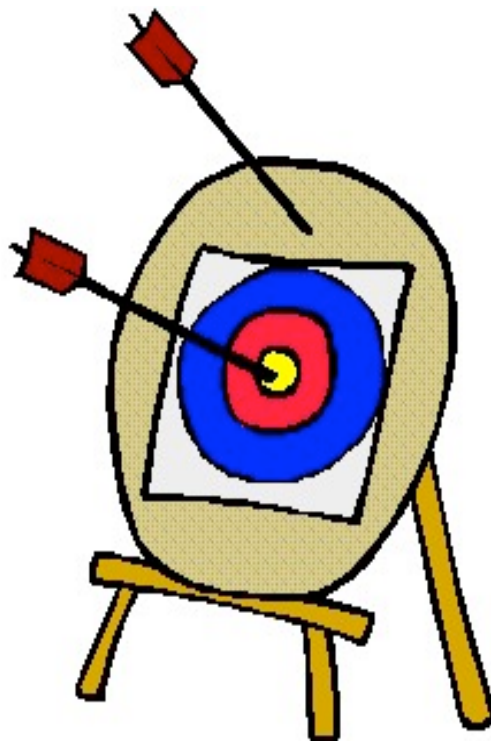
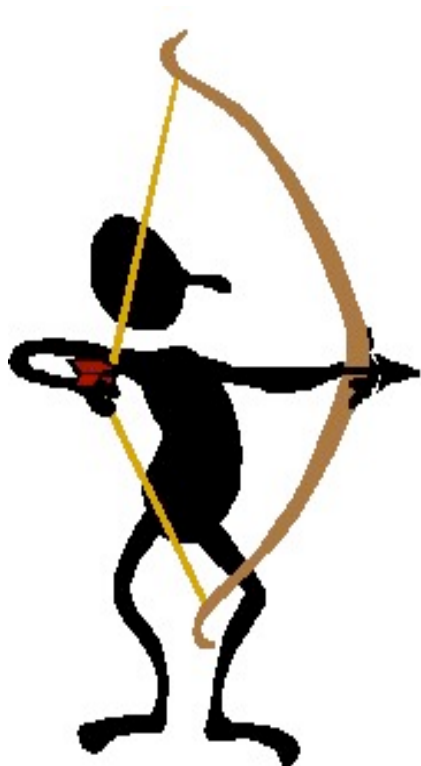
Detect possible errors by strategically using estimation and other mathematical knowledge

Make models that enable visualization of the results and compare predictions with data

Use technological tools to explore and deepen understanding of concepts



## Attend to precision



Communicate precisely to others

Use clear definitions in discussion with others

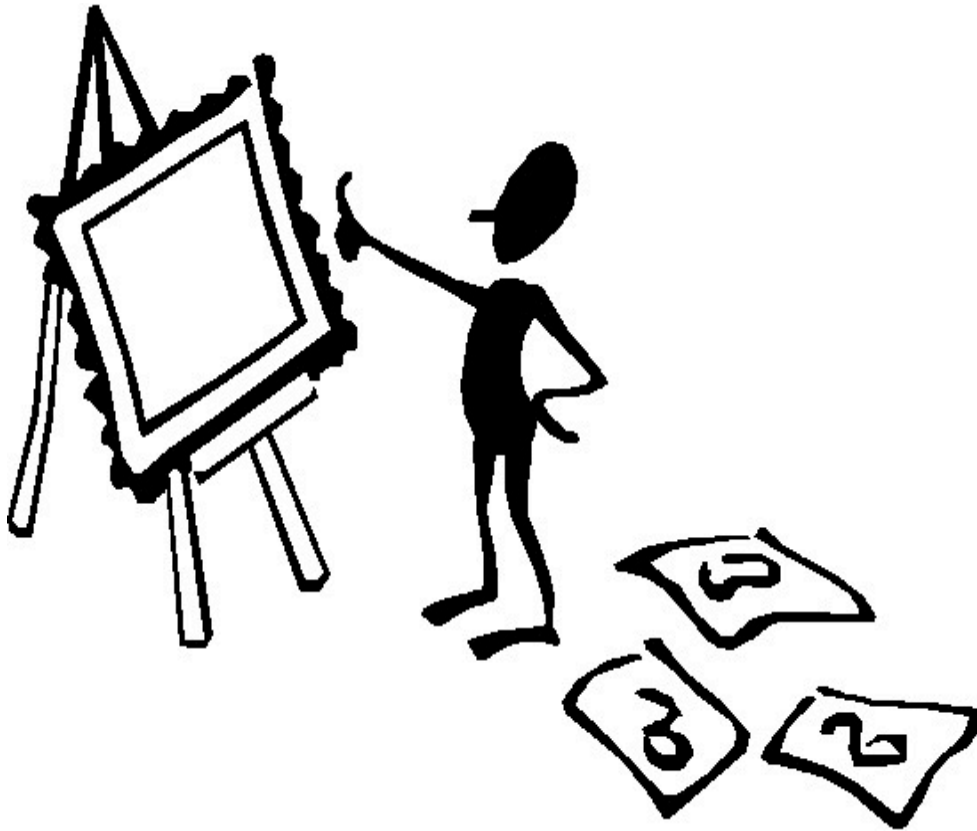
State the meaning of the symbols consistently and appropriately

Calculate accurately and efficiently

Accurately label axes and measures in a problem



## Look for and make use of structure



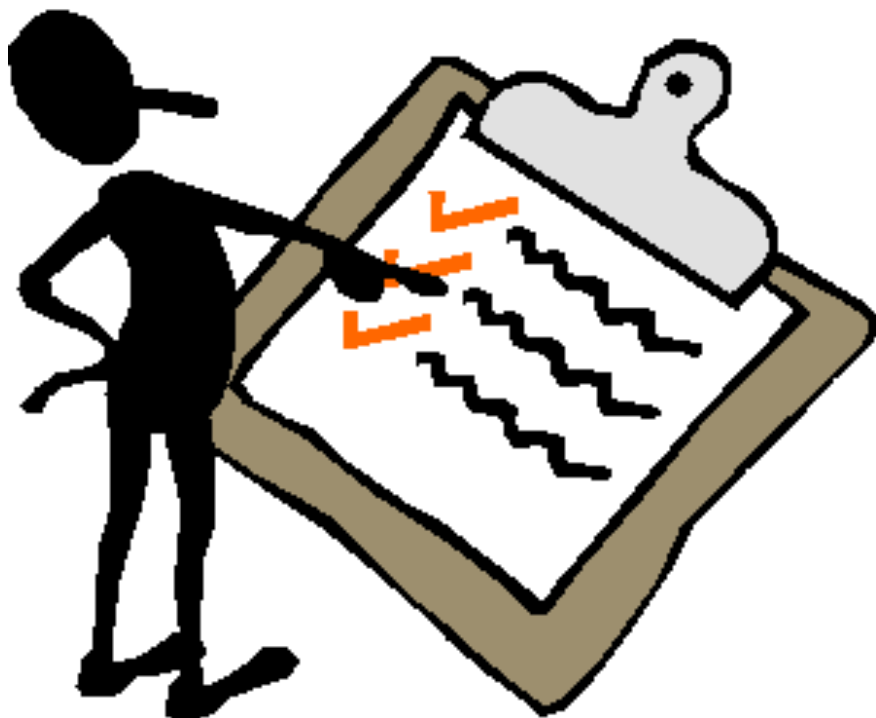
Look closely to determine a pattern or structure

Step back for an overview and shift perspective

See complicated things as being composed of single objects or several smaller objects



## Look for and express regularity in repeated reasoning



Identify calculations that repeat

Look both for general methods and for shortcuts

Maintain oversight of the process, while attending to the details

Continually evaluate the reasonableness of results