**Stage 1 Essential Mathematics**

**Assessment Type 2: Folio**

**Design and Cost a Deck**

**The Task**

You are to design and cost a deck to be placed in a garden space for a client who wants a deck for outdoor dining. The client wants a deck that would comfortably fit a table and chairs that will seat at least 6 people. The ground that the deck will be built over is level.

You will investigate two different options in terms of size and/or shape for the deck, and make a recommendation to the client on which design to go with. The client has given you a budget of up to $8,000.

You will investigate the costs of the materials and take this into consideration when delivering your final report with quotes for both options.

**Part 1**

Investigate the size of outdoor dining settings and determine the approximate size that your deck will need to be to allow for the table and chairs to be comfortably used on your deck.

Create two different deck designs based on one or more 2D shapes. One of the designs can be a quite simple shape (e.g. a rectangle) and the other should combine two or more shapes (e.g. an L-shape or a square with a semicircle each end).

**Part 2**

Investigate the basic design structure of a deck. The following link may be useful:

<http://www.bunnings.com.au/diy-advice/outdoor-garden/backyard/decking/how-to-build-your-own-deck>

You will need to investigate things like:

* how deep to dig the footings
* how far apart to have the floor joists
* the height of the deck floor above ground level.

Familiarise yourself with the following terms:

Timber posts (90mm x 90mm), bearers (125mm x 75mm), joists (100mm x 50mm), decking, dry concrete, stirrup bracket, Dynabolts, coach screws, framing anchors, timber finish paint or oil, decking nails.

**Part 3**

1. Draw a scaled plan (the view of the deck from above) for each of the decks that you have designed. Each scaled diagram should be drawn no smaller than half of a single A4 sheet of paper.
2. For each design, calculate the total amount of each material you are going to use and list it (showing any calculations).
3. Determine the total cost of each design. Use a local building website (Stratco, Home, Bunnings etc.) to assist you with costings. Make sure to consider error margins when costing your materials.
4. Create a costings report or quote for each design.

**Part 4**

Complete the report outlined below and submit it to your teacher.

**The Report**

**Introduction**

Read the whole task and write an introduction that outlines what you will be doing in this task in your own words. Explain what you are planning on constructing and your budget.

**Mathematical Investigations**

Complete Parts 1, 2 and 3.

The two separate designs must include all real measurements and the scale used.

All items used in the designs should be clearly identified and costed appropriately.

**Discussion**

Compare different aspects of the two designs and discuss in detail which you would recommend the client build.

Include a discussion of things that could affect the accuracy of the results.

**Appendix**

Include evidence of your costings etc. in the appendix.

**The report is to be a maximum of 6 A4 pages.**

**Performance Standards Stage 1 Essential Mathematics**

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|  | Concepts and Techniques | Reasoning and Communication |
| **A** | Knowledge and understanding of mathematical information and concepts in familiar and unfamiliar contexts.Highly effective application of mathematical skills and techniques to find efficient and accurate solutions to routine and complex problems in a variety of contexts.Gathering, representation, and interpretation of a range of data in familiar and unfamiliar contexts.Appropriate and effective use of electronic technology to find accurate solutions to routine and complex problems. | Accurate interpretation of mathematical results in familiar and unfamiliar contexts. Highly effective use of mathematical reasoning to draw conclusions and consider the appropriateness of solutions to routine and complex problems.Proficient and accurate use of appropriate mathematical notation, representations, and terminology.Clear and effective communication of mathematical ideas and information to develop logical and concise arguments. |
| **B** | Knowledge and understanding of mathematical information and concepts in familiar and some unfamiliar contexts.Effective application of mathematical skills and techniques to find mostly accurate solutions to routine and some complex problems in a variety of contexts.Gathering, representation, and interpretation of data in familiar and some unfamiliar contexts.Mostly appropriate and effective use of electronic technology to find mostly accurate solutions to routine and some complex problems. | Mostly accurate interpretation of mathematical results in familiar and some unfamiliar contexts.Effective use of mathematical reasoning to draw conclusions and consider the appropriateness of solutions to routine and some complex problems.Mostly accurate use of appropriate mathematical notation, representations, and terminology.Clear and appropriate communication of mathematical ideas and information to develop some logical arguments. |
| **C** | Knowledge and understanding of simple mathematical information and concepts in familiar contexts.Application of some mathematical skills and techniques to find solutions to routine problems in familiar contexts.Gathering, representation, and interpretation of data in familiar contexts.Generally appropriate and some effective use of electronic technology to find solutions to routine problems. | Generally accurate interpretation of mathematical results in familiar contexts. Appropriate use of mathematical reasoning to draw conclusions and consider the appropriateness of solutions to routine problems. Generally appropriate use of familiar mathematical notation, representations, and terminology.Appropriate communication of mathematical ideas and information. |
| **D** | Basic knowledge and some understanding of simple mathematical information and concepts in some familiar contexts.Application of basic mathematical skills and techniques find partial solutions to routine problems in some contexts.Some gathering, representation, and basic interpretation of simple data in familiar contexts.Some appropriate use of electronic technology to find solutions to routine problems. | Some interpretation of mathematical results in some familiar contexts.Attempted use of mathematical reasoning to consider the appropriateness of solutions to routine problems.Some use of familiar mathematical notation, representations, and terminology.Attempted communication of simple mathematical ideas and information.  |
| **E** | Limited knowledge or understanding of mathematical information or concepts.Attempted application of basic mathematical skills or techniques, with limited accuracy in solving routine problems.Some gathering and attempted representation of simple data in a familiar context.Attempted use of electronic technology in to find a solution to a routine problem. | Limited interpretation of mathematical results.Limited awareness of the use of mathematical reasoning in solving a problem.Limited use of mathematical notation, representations, or terminology.Attempted communication of an aspect of mathematical information. |