

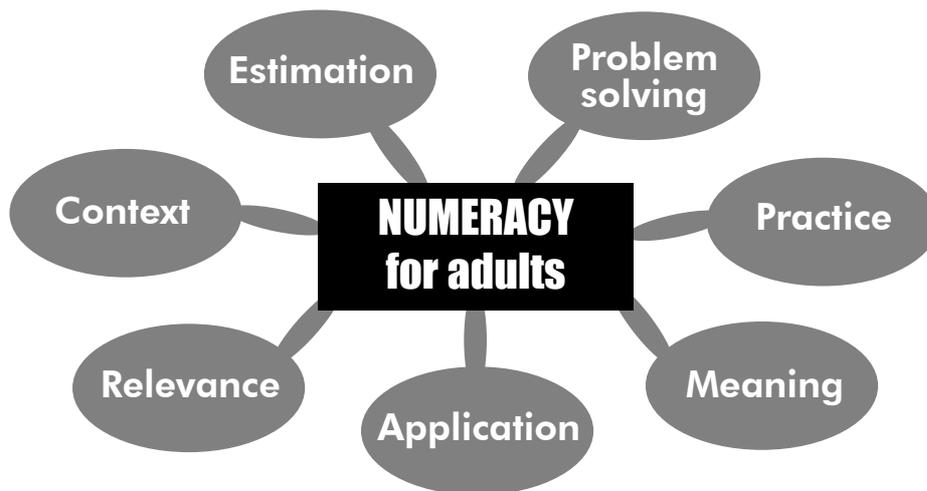


TUTORS' TIPS

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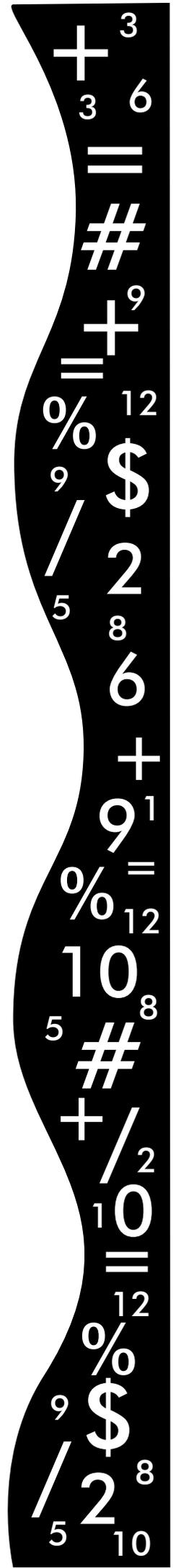
Numeracy for Adults

The traditional teaching of mathematics has made it irrelevant and uninteresting to many students. If this has happened, students are likely to "turn off" using maths or even develop maths anxiety. Adults who have had this experience need a very different teaching approach. Rather than a focus on the rote learning of facts and rules in isolation, it is crucial that the student is shown how mathematics / numeracy can be applied to personal or work situations, so that he or she is motivated to learn the associated skills. In the adult context, numeracy refers to the practical or functional use of mathematics.



Principles of teaching adult numeracy

- Choose tasks that allow success
- Have opportunities for learning to occur through interaction and co-operation, such as discussion or pair / group work
- Provide practical hands on activities that build on student's own experiences
- Negotiate the curriculum and respond to interests and experiences
- Use adult contexts that draw on student's background, interests and experiences
- Use gender inclusive teaching strategies with mixed sex classes
- Encourage students to reflect on their learning and become aware of how they learn best
- Raise awareness of the social, economic and political systems influencing our lives
- Acknowledge differences in the backgrounds and level of skills of the students
- Make learning enjoyable through provision of a range of activities and teaching approaches that stimulate interest and discussion.



Model Numeracy Activity

This activity was based on a project in a Melcann Solutions Brochure, (pages 10 & 11), instructions for building a barbecue, available from hardware shops.

Be aware that this is quite an advanced activity, suitable for a Level 2 / 3 NRS student. Students at lower levels would benefit from more hands on activities, such as measuring, cutting or using concrete materials for operations.

To complete the exercises, you will need this extra information.

Weights:	1 brick	4 kg
	reinforcing rod	2 kg
	1 fire grill rod	2 kg
	1 hotplate retaining rod	2 kg
	1 hotplate	20 kg

Dimensions of a brick: length 24cm
width 12 cm
height 7.5cm

Perimeter of a rectangle is
(length + breadth) x 2 $P = (L+B)2$

Area of a rectangle is
length x breadth $A = L \times B$

Volume of a rectangular prism
is area of base x height $V = AH$

1000 g = 1 kg

10 mm = 1 cm

100cm = 1 m

First estimate your answers, then check by doing the calculation or using a calculator.

Q1 Find the cost of :

- 220 bricks _____
- 4 bags of concrete _____
- 6 bags of mortar _____
- 6 reinforcing rods _____
- 13 fire grill rods _____
- 3 hotplate retaining bars _____
- 1 hotplate _____

Total cost of materials needed to build a barbecue _____

Costs:

1 brick	\$2.00
1 40kg bag of mortar	\$10.50
1 fire grill rod	\$1.40
1 hotplate.....	\$45.80

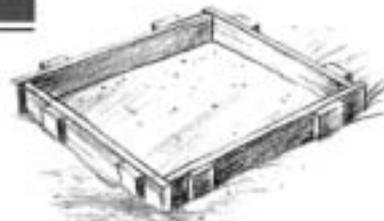
Barbecue

Never laid a brick in your life?

You'll need 220 standard bricks, 4 x 40 kg bags of Melcann General Purpose Concrete, 6 x 40 kg bags of Melcann General Purpose Mortar, 6 reinforcing rods, 13 fire grill rods, 3 hotplate retaining bars and a hotplate.

STEP ONE

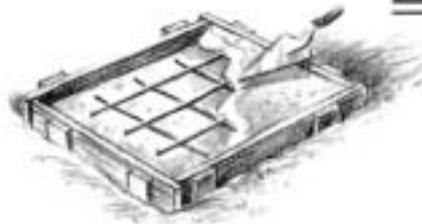
Dig a foundation area about 63cm wide 110cm long and 10cm deep. Level it, box it in using old boards, then soak the site with water. This stops the soil from drawing water from the fresh concrete and weakening it.



1 Prepare the site

STEP TWO

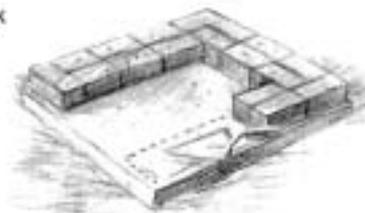
Mix your Melcann General Purpose Concrete as described on the pack. Aim to make it a firm mix. Not too wet. Now half-fill the boxed area, lay the reinforcing rods in the concrete, then pour the rest of the mix over them. Fill up to the top of the boards and level off the slab with a straight edge of timber. Allow to cure for a week.



2 Laying the slab

STEP THREE

Build up the barbecue without mortar to settle on a design, allowing 10mm gaps for mortar. Run chalk around the bottom layer of bricks, then mix your Melcann General Purpose Mortar. Spread it 10mm thick over the chalked area. Using a spirit level, set the first course of bricks into this mix.



3 Setting the foundation

Q2 Find the weight of:

- 220 bricks _____
- 4 bags of concrete _____
- 6 bags of mortar _____

- 1 40kg bag of concrete.....\$9.95
- 1 reinforcing rod.....\$1.20
- 1 hotplate retaining bar\$1.30



STEP FOUR

Lay 3 more courses, overlapping the bricks for added strength, then set in the fire grill rods. Continue until you've got eight courses built and lay in the hot-plate bars. Then build up the final two courses. Clean off excess mortar with a trowel.



4 Laying the bricks

- 6 reinforcing rods _____
- 13 fire grill rods _____
- 3 hotplate retaining bars _____
- 1 hotplate _____
- Total weight of materials needed to build a barbecue _____

Q3 What are the dimensions of the brick in millimetres?

- Length 24 cm = _____ mm
- Width 12 cm = _____ mm
- Height 7.5 cm = _____ mm

Q4 Look at Step 1

- What will be the perimeter of the foundation?
_____ cm
- What will be the area of the foundation?
_____ cm²
- What will be the volume of the slab?
_____ cm³

Q5 Look at Step 3

- What will the height of the first course of bricks be from the ground level?
- You will need to change the measurements from centimetres to millimetres first.
- Height of slab + height of brick + thickness of mortar _____ mm
- Now change the answer to centimetres.
_____ cm

Q6 Look at Step 4

- If there are 10 courses of bricks, what will the height of the barbecue be from the ground level?
- Height of slab + 10 x height of brick + 10 x thickness of mortar _____ mm
- Now change the answer to centimetres.
_____ cm
- Can you estimate this in metres?
_____ m

Numeracy Concepts and Skills involved in sample lesson:

- Metric measurement (mm, cm, m, cm², cm³, g, kg)
- Estimation
- Shapes
- Dimensions
- Length / Breadth / Height

- Perimeter of a rectangle
- Area of rectangle
- Volume of a rectangular prism
- Addition
- Multiplication
- Division
- Fractions
- Calculating costs

Numeracy Activities for Adults

If numeracy is applied to everyday life situations, students can see a reason to learn the skills required. These activities could be the basis for practical exercises.

- **Directions** - look up a street directory, use maps, use co-ordinates, compass directions.
- **Tell the time** - digital, analogue and 24 hour time, add and subtract time, convert minutes, hours, days, use a calendar, use a diary, read transport timetables, use a stop watch.
- **Shopping** - understand money units, relate money to decimals, make a list and estimate costs, calculate best buys, use percentage to calculate cost of sale items, hire purchase, check totals and change.
- **Banking** - deposit or withdraw money, fill out forms, write numbers in words, costs of cheque account, balancing cheque account, account keeping fees.
- **Paying bills** - total amounts, budgeting, work out repayments, cost of loans, cost of credit cards or hire purchase.
- **Buying a house or car** - compare interest rates, work out repayment costs per month / year, depreciation or appreciation rates.
- **Measuring for dressmaking, cooking, decorating, building, gardening** - using measurement tools, understand metric measures, metric abbreviations, estimation, using rules to find perimeter, area, volume, mass, fractions, percentages, temperature, capacity.
- **Driving** - understanding speeds, distances, price of registration, fuel consumption, insurance, servicing, budgeting for expenses, road safety and RBT statistics, cost of a taxi
- **Gambling** - dog or horse racing, Lotto, using ratio to work out the odds, probability, margins, graphs, distances on racetrack
- **Drinking** - measurement, amounts in bottles and cartons, cost of alcohol, working out if consumption is over the limit for driving.
- **Travel** - comparing fares for rail, bus, car & train, costing, organising and booking transport and accommodation, rentals, budgeting, exchange rates, weather, timetables, time differences overseas, map reading.
- **Health** - medical directions and quantities, claiming hospital or medical expenses, medical insurance rates.
- **Income tax** - basic operations, percentage rates for health rebates, family allowances.
- **Cooking** - reading recipes, shopping for ingredients, measurement - weight, volume, temperature, time.
- **Reading newspapers / brochures** - find factual information, interpret bar graphs, pie graphs, tables, using index, page numbers.
- **Sport** - shapes & dimensions of fields & equipment, handicaps, scoring, points tables, percentages, aggregates, averages, time records, directions, map reading.
- **Telephoning** - mobile phone costs, Telstra charges, phone rental or purchasing costs, long distance call rates, phone card charges, understanding phone bill.

References and Resources:

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Bottomley, Sue, *Beginning Money Skills for Adults Books 1-3*
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Goddard & Regan, *The Value of Time*
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Goddard, Ruth, Marr, Beth & Martin, Judith, *Mathematics, a New Beginning*

Hight, Kristine, *Maths Matters, Teaching Numeracy to Adults*
Lloyd, Sue, *Numeracy More Than Numbers*
Lukin, Annabelle & Ross, Linda, *The Numeracy Handbook*
Marr, Beth, Anderson, Chris & Tout, Dave, *Numeracy on the Line*
Marr, Beth & Tout, Dave, *A Numeracy Curriculum*
Ross, Linda, *The Numeracy Workbook*
Wearne, Chris, *Car Costs: Six Units of Maths Around the Theme of Car Ownership*

Numeracy on CDs

Measuring Up - Protea
Maths for the Real World - Davidson

