WMC/CFB

Wood Manufacturing Council/Conseil des fabricants de bois

NUMERACY
Essential Skills Assessment Tool

Questions and Answers

2009

Introduction

Numeracy refers to workers' use of numbers and the requirement to think in quantitative terms.

There is a distinction between workers' use of numbers and their level of understanding of the underlying concepts involved. For example, a worker can take a number from a computer printout to put in a report without knowing how it was calculated. The level of difficulty of a task is determined by the math tasks performed and the background knowledge required.
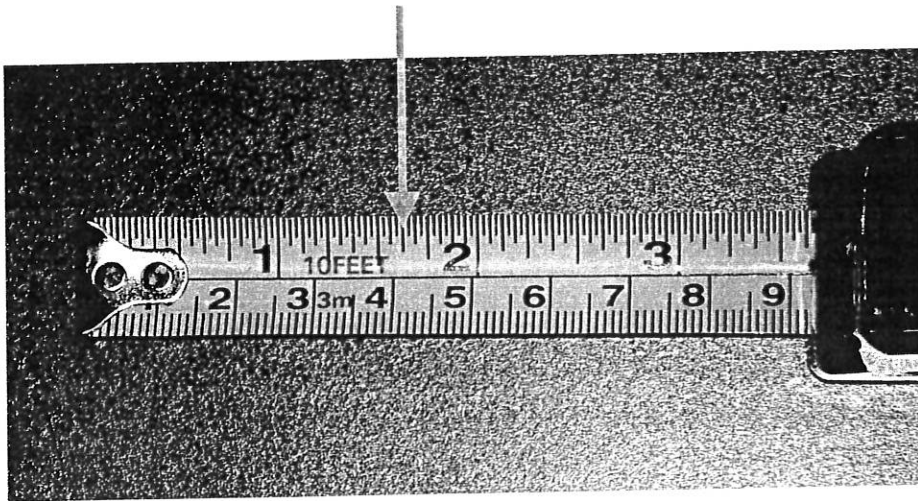
Complexity Level	Operations Required	Translation
Level 1	Only the simplest operations are required and the operations to be used are clearly specified. Only one type of mathematical operation is used in a task.	Only minimal translation is required to turn the task into a mathematical operation. All information required is provided.
Level 2	Only relatively simple operations are required. The specific operations to be performed may not be clearly specified. Tasks involve one or two types of mathematical operation. Few steps of calculation are required.	Some translation may be required or the numbers needed for the solution may need to be collected from several sources. Simple formulae may be used.
Level 3	Tasks may require a combination of operations or multiple applications of a single operation. Several steps of calculation are required.	Some translation is required but the problem is well defined. Combinations of formulae may be used.
Level 4	Tasks involve multiple steps of calculation.	Considerable translation is required.
Level 5	Tasks involve multiple steps of calculation. Advanced mathematical techniques may be required.	Numbers needed for calculations may need to be derived or estimated; approximations may need to be created in cases of uncertainty and ambiguity. Complex formulae, equations or functions may be used.

Numerical calculation is rated within **four application settings**.

- **Money Math** - financial transactions, such as handling cash, preparing bills or making payments;
- **Scheduling or Budgeting and Accounting** - managing time and money as resources, planning and monitoring their use, assessing best value, and reducing waste. (The difference between handling money and carrying out accounting tasks is not always clear. The definition of money math indicates the need for a *transaction*).
- **Measurement and Calculation** - measuring and describing the physical world; and •
Data Analysis - analysis of numerical data such as an extrapolation of information, and determination of trends or statistically significant effects.

NUMERACY
COMPLEXITY LEVEL 1

1. A desk assembler looks at his tape measure:

What fraction of an inch is indicated by the arrow? (image not to scale)

A. 3/8 inch ☐

B. 5/8 inch ☐

C. 3/4 inch ☐

D. 7/8 inch ☐

Item Number:	1
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	Measurement and Calculation Math

1.

A.	3/8 inch	☐
B.	5/8 inch	☒
C.	3/4 inch	☐
D.	7/8 inch	☐

Rationale:

A is incorrect.

B is correct as the arrow points to 5/8 inch.

C is incorrect.

D is incorrect.

2. A cabinetmaker worked 13 hours installing cabinets in a washroom at a rate of $17.00/hour. What will the total cost of installing the cabinets be?

    A. $169.00   ☐

    B. $208.00   ☐

    C. $221.00   ☐

    D. $289.00   ☐

Item Number:	2
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	Accounting Math

2.

    A. $169.00   ☐

    B. $208.00   ☐

    C. $221.00   ☒

    D. $289.00   ☐

Rationale:

A is incorrect as it has been miscalculated as follows:

    13 hours x 13 hours = 169 (hours)

B is incorrect as it has been calculated as follows:

    13 hours x $16.00 = $208.00

C is the correct answer and it has been calculated as follows:

    13 hours x $17.00 = $221.00

D is incorrect as it has been miscalculated as follows:

    17 hours x $17.00 = $289.00

3. A furniture assembler purchases a hammer at the local hardware store at a cost of $27.00. He hands the cashier a $50.00 bill. How much change will the furniture assembler expect to receive?

A. $13.00 ☐

B. $17.00 ☐

C. $23.00 ☐

D. $27.00 ☐

Item Number:	3
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	Using Money Math

3.
  A. $13.00 ☐

  B. $17.00 ☐

  C. $23.00 ☒

  D. $27.00 ☐

Rationale:

A is incorrect as it has been miscalculated as follows:

$50.00 - $37.00 = $13.00

B is incorrect as it has been miscalculated as follows:

$50.00 - $33.00 = $17.00

C is the correct answer and has been calculated as follows:

$50.00 – $27.00 = $23.00
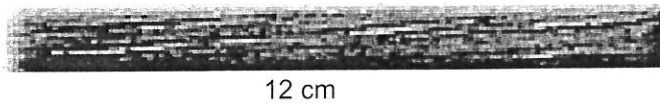
D is incorrect as it has been miscalculated as follows:

$50.00 - $23.00 = $27.00

4. A pallet maker is assembling a customized pallet for a client and has to select the last piece of lumber from the following four wood scraps:
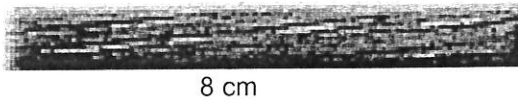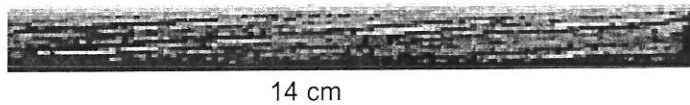
A

10 cm

B

12 cm

C

8 cm

D

14 cm

Since the pallet maker wants enough wood in case he makes a mistake when cutting, he needs to pick the longest piece. Which of the following four choices is the longest piece?

A.   Option A – 10cm   ☐

B.   Option B – 12cm   ☐

C.   Option C – 8cm   ☐

D.   Option D – 14cm   ☐

Item Number:	4
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	Data Analysis Math

4.

A. Option A – 10cm ☐

B. Option B – 12cm ☐

C. Option C – 8cm ☐

D. Option D – 14cm ☒

Rationale:

A is incorrect since it is 4cm shorter than D

B is incorrect since it is 2cm shorter than D

C is incorrect since it is 6cm shorter than D

D is correct

5. Mary, a prefabricated housing assembler, has logged the following hours she worked on four different houses:

	Smith's House	Jones' House	Wilson's House	McKay's House
Total Hours	18 hours	21 Hours	25 Hours	26 hours

Mary is only budgeted to work for 25 hours on a house. On which house is Mary over-budget?

A.   Smith's House   ☐

B.   Jones' House   ☐

C.   Wilson's House   ☐

D.   McKay's House   ☐

Item Number:	5
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	Scheduling or Budgeting and Accounting Math

5.

    A. Smith's House   ☐

    B. Jones' House   ☐

    C. Wilson's House   ☐

    D. McKay's House   ☒

Rationale:

A is incorrect. Mary is under-budget by 7 hours.

    18 hours (actual) - 25 hours (budget) = - 7 hours

B is incorrect. Mary is under-budget by 4 hours.

    21 hours (actual) - 25 hours (budget) = - 4 hours

C is incorrect. Mary is on-budget.

25 hours (actual) - 25 hours (budget) = 0 hours

D is correct. Mary is over-budget

    26 hours (actual) - 25 hours (budget) = 1 hours

6. Darryl, a warehouse hand, is receiving an order of wood planks and needs to verify that the information on the invoice is correct.

Wood	Qty	Price	Total
Maple	50	$2.50	$125.00
Oak	46	$2.00	$90.00
Cedar	120	$3.00	$360.00
Teak	10	$5.50	$55.00

Darryl finds one error on the invoice. Which wood order has been totalled incorrectly?

A. Maple ☐

B. Oak ☐

C. Cedar ☐

D. Teak ☐

Item Number:	6
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	Money Math

6.

A. Maple ☐

B. Oak ☒

C. Cedar ☐

D. Teak ☐

Rationale:

A is incorrect.

B is correct. The total should be $92.00 (46 x $2.00)

C is incorrect.

D is incorrect.

7. Martin, a cabinetmaker, is speaking with a potential customer on the phone. The customer says she would like her cabinets installed some time next week. Martin reviews his schedule below. Available time is indicated in the schedule by a white square.

	Monday	Tuesday	Wednesday	Thursday	Friday
8 – 9					
9 – 10					
10 – 11					
11 – 12					
12 – 1	Lunch	Lunch	Lunch	Lunch	Lunch
1 – 2					
2 – 3					
3 – 4					

Martin estimates the job will take three hours to complete. If he would like to finish the job in one day, when is the next free time slot?

A.   Tuesday   ☐

B.   Wednesday   ☐

C.   Thursday   ☐

D.   Friday   ☐

Item Number:	7
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	Scheduling or Budgeting and Accounting Math

7.

A. Tuesday ☐

B. Wednesday ☒

C. Thursday ☐

D. Friday ☐

Rationale:

A is incorrect. There is not a three hour block available.

B is correct. This is the first day that a three hour block is available.

C is incorrect. Wednesday's three hour block is earlier than Thursday's.

D is correct. Wednesday's three hour block is earlier than Friday's.

8. Sam, a CNC band saw operator, needs to cut trim for her current project. Each piece of trim needs to be 2.5' long. If Sam's plank is 8' long, how many pieces of trim can she cut from it?

    A.   3   ☐

    B.   4   ☐

    C.   5   ☐

    D.   6   ☐

Item Number:	8
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	Measurement and Calculation Math

8.

    A. 3 ☒

    B. 4 ☐

    C. 5 ☐

    D. 6 ☐

Rationale:

A is correct. $8 \div 2.5 = 3.2$ (there will be 6" left over)

B is incorrect.

C is incorrect.

D is incorrect.

9. Bill is a planer operator. He needs to ensure that all of the boards he is planning are from 10.2 to 10.8 mm thick. If Bill currently has the following four boards on his bench, which one needs more planing?

Board A	Board B	Board C	Board D
10.3	10.4	10.9	10.7

Which board requires more planing?

A. Board A ☐

B. Board B ☐

C. Board C ☐

D. Board D ☐

Item Number:	9
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	

9.

A. Board A ☐

B. Board B ☐

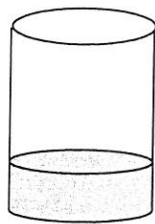C. Board C ☒

D. Board D ☐

Rationale:

A is incorrect. This is within the allowable limits.

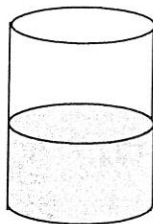B is incorrect. This is within the allowable limits.

C is correct. 10.9 mm is wider than the maximum allowable 10.8 mm.

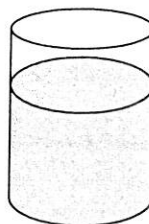D is incorrect. This is within the allowable limits.

10. Claudia, a labourer, empties the bins of sawdust from the ventilation system when they are ¾ full. Which of the following sawdust bins is approximately ¾ full?
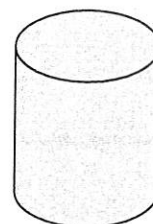
| Bin A | Bin B | Bin C | Bin D |

A.   Bin A   ☐

B.   Bin B   ☐

C.   Bin C   ☐

D.   Bin D   ☐

Item Number:	10
Skill:	Numeracy
Complexity Level:	1
Skill Component Addressed:	Estimation Math

10.

    A. Bin A   ☐

    B. Bin B   ☐

    C. Bin C   ☒

    D. Bin D   ☐

Rationale:

A is incorrect. The bin is only about ¼ full and does not need to be emptied.

B is incorrect. The bin is only about ½ full and does not need to be emptied.

C is correct. The bin is almost ¾ full so Claudia can empty this by herself.

D is incorrect. This bin is more than ¾ full and Claudia must find someone to help her empty the bin.