

Study : Assessing the level of numeracy skills in type 1 diabetic children and their caregivers and to ascertain an association with diabetes control.

Questionnaire-Demographics

Study Number	
Date of birth / Age	
Base hospital	
Address	
School	
Current grade / grade attained	
Have you had to repeat a grade? If yes, which grade?	
Duration of diabetes	
Average HbA1c level	
Insulin regimen	
Meal plan	
Diabetes complications	

Basic Mathematical Skills (sections arranged according to equivalent grades)

SECTION 1

Question 1

Complete the following sequence:

10, _____, _____, 40, 50, _____, _____, _____, 90, _____

Question 2

Write the following numbers in words:

1 _____

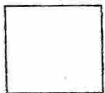
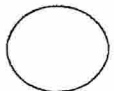
5 _____

20 _____

26 _____

Question 3

What are the following shapes:



Question 4

Calculate the following:

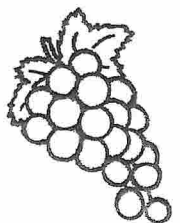
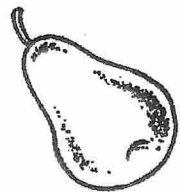
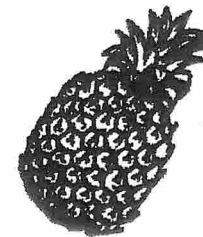
$$1 + 2 = \underline{\hspace{2cm}}$$

$$4 + 5 = \underline{\hspace{2cm}}$$

$$10 + 8 = \underline{\hspace{2cm}}$$

Question 5

Circle the common objects:



SECTION 2

Question 1

Complete the following sequences:

25, _____, _____, 40, 45, _____, _____, _____, 65

180, 182, _____, _____, _____, 190, 192

Question 2

Circle the correct fraction:

one half $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

one quarter $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

one third $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$

Question 3

Calculate the following:

$$10 + 14 = \underline{\hspace{2cm}}$$

$$5 \times 4 = \underline{\hspace{2cm}}$$

$$2 \times 6 = \underline{\hspace{2cm}}$$

Question 4

Arrange the following in the correct order:

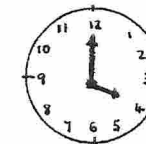
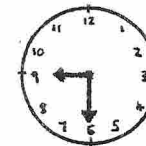
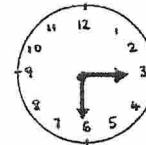
Monday

Sunday

Friday

Question 5

What time is shown on the following clocks?

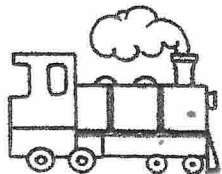
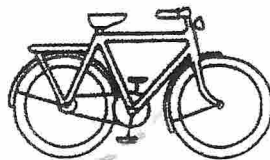
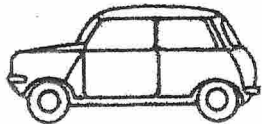


Question 6

Group the following:

1) transport vehicles

2) houses



SECTION 3

Question 1

Complete the following:

20, 40, _____, _____, 100

Question 2

If I give you R5 and you buy sweets for R2, how much money do you have left?

Question 3

Calculate the following:

$$100 + 55 = \underline{\hspace{2cm}}$$

$$20 \times 10 = \underline{\hspace{2cm}}$$

$$50 \div 5 = \underline{\hspace{2cm}}$$

Question 4

Complete the following:

1 hour = _____ minutes

$\frac{1}{2}$ min = _____ seconds

1 cm = _____ mm

Question 5

How many days in the week?

List them in the correct order:

Question 6

How many months in one year?

SECTION 4

Question 1

Round off the following to the nearest whole number:

22.2 = _____

16.7 = _____

13.4 = _____

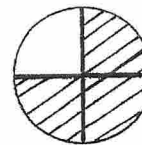
Question 2

Complete the following:

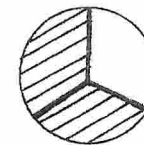
25, 20, _____, 10, _____

Question 3

Complete the following fractions:



$\frac{\quad}{4}$



$\frac{2}{\quad}$



$\frac{3}{\quad}$

Question 4

Complete the following:

$$25 \times 20 = \underline{\hspace{2cm}}$$

$$202 \div 2 = \underline{\hspace{2cm}}$$

Question 5

If $5 \times 3 = 15$

Then $15 \div \underline{\hspace{2cm}} = 5$

Question 6

Write the following in fraction form:

$$1 \div 6 = \underline{\hspace{2cm}}$$

$$1 \div 8 = \underline{\hspace{2cm}}$$

Question 7

Draw a box (in 3 dimension)

SECTION 5

Question 1

Complete the following:

$$255 \times 50 = \underline{\hspace{2cm}}$$

$$500 \div 25 = \underline{\hspace{2cm}}$$

Question 2

Complete the following sequence:

$$\frac{1}{2}, 1, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, 2\frac{1}{2}$$

Question 3

Round off the following to the nearest hour:

$$22\text{h}07 = \underline{\hspace{2cm}}$$

$$10\text{h}57 = \underline{\hspace{2cm}}$$

Question 4

Write the following equivalent fractions:

$$\frac{3}{4} = \frac{\hspace{1cm}}{8}$$

$$\frac{1}{\hspace{1cm}} = \frac{3}{27}$$

Question 5

Complete the following:

$$36 \text{ doubled} = \underline{\hspace{2cm}}$$

$$36 \text{ halved} = \underline{\hspace{2cm}}$$

Question 6

Work out the following equation using a calculator:

$$\sqrt{25 \times 100} =$$

Question 7

Calculate the following:

$$2.5 + 4.5 + 3 = \underline{\hspace{2cm}}$$

SECTION 6

Question 1

Convert the following into percentages:

$$60/100 = \underline{\hspace{2cm}} \%$$

$$25/100 = \underline{\hspace{2cm}} \%$$

Question 2

R45,75 is equivalent to cents

Question 3

If I get paid R5 a day, how much do I earn in 2 weeks?

Question 4

Complete the following:

$$2 \times \underline{\hspace{2cm}} - 8 = 0$$

$$5 + 5 - \underline{\hspace{2cm}} = 8$$

Diabetes Related Questions

Question 1

If 1 CARB = 15g

Then how many CARBS in - 60g ?

- 45g ?

- 75g ?

Question 2

1 CARB = 1 slice bread

= 1 fruit

= 1 biscuit

= ½ roll

= 1/3 cup rice

= 1 small yogurt

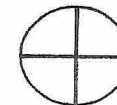
How many CARBS in:

2 slices bread + 1 small yogurt + 1 fruit ?

Question 3

Colour in the equivalent of the fraction on the picture graph:

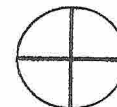
One half ($\frac{1}{2}$)



One third ($\frac{1}{3}$)



One quarter ($\frac{1}{4}$)



Question 4

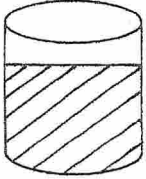
If ½ cup cereal = 1 CARB

Then 1 and ½ cups of cereal equals to how many CARBS?

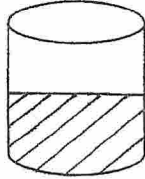
Question 5:

Match the following equivalents :

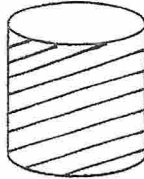
$\frac{1}{2}$ can



$\frac{3}{4}$ can



1 full can



Question 6 :

Round the following numbers to the nearest 10 :

-2

-5

-8

-12

-16

-19

Question 7

Round off the following answers to the nearest even number:

-8 protophane + 3 actrapid = ——— total units of insulin

Rounded off = ——— units

-8 protophane + 5 actrapid = ——— total units of insulin

Rounded off = ——— units

Question 8

If bedtime is at 10pm and supper at 6pm, how many hours after supper is bedtime?

Question 9

If a snack should be taken 2 hours after breakfast and if breakfast is at 7am, then at what time should the snack be taken?

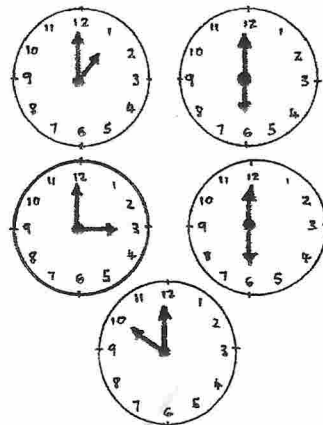
Question 10

If your insulin needs to be taken 30 minutes (half an hour) before breakfast and if breakfast is at 7am, then at what time should your insulin be taken?

Question 11

Match the following:

- 1) Breakfast at 6am
- 2) Snack at 10am
- 3) Lunch at 1pm
- 4) Snack at 3pm
- 5) Supper at 6pm



Question 12

Place the blood sugar levels in ascending order (from lowest to highest):

23, 27, 18, 7, 14

Question 13

Place the blood sugar levels in descending order (from highest to lowest):

17, 22, 5, 31, 3

Question 14

Target blood sugar levels should be between 4 and 10. Circle the target values:

	breakfast	snack	lunch	snack	supper	bedtime
Day 1	2	12	14	7	4	9
Day 2	22	4	5	16	18	20
Day 3	24	3	6	15	17	19
Day 4	21	26	28	8	30	10

Question 15

Using the following formula, round off the answers to the nearest whole number:

$$(\text{Blood sugar} - 6) / 3$$

If blood sugar = 18 then the answer is _____ rounded value _____

12 _____

11 _____

9 _____

Question 16

If you need to give 3 units of insulin every hour, after 3 hours how many units of insulin will be given?

Question 17

If you need to give 1 unit of insulin for every 10kg of body weight and if you weigh 50kg, then how many units of insulin needs to be given?

Question 18

If one fizzy drink has 12g of CARBS per 100ml, in a 500ml bottle, how many grams of CARBS are there?

Question 19

The following appeared on a food label:

	Per 100g	Per 50g serving
Protein	9g	4.5g
CHO	60g	30g
Fat	3g	1.5g

If every 100g has 60g of CHO and one serving has 50g, then how many grams of CHO are there in one serving?

Question 20

The following were blood glucose readings in a diary. Calculate the average readings using a calculator:

	Breakfast	Lunch	Supper
	13.2	9.9	8
	12	7.6	7
	15.4	9.5	9.1
Average values			

Which time of the day was the average highest?

Which time of the day was the average lowest?

OUTCOME OF DIABETES RELATED QUESTIONS

<u>Question</u>	<u>Skill tested</u>	<u>Score</u>	<u>Grade Level</u>
1	Division		3
2	Addition		3
3	Fractions + graphics		4
4	Multiplication		4
5	Fractions + graphics		3
6	Rounding off		3
7	Rounding off and addition		3
8	Time and subtraction		3
9	Time and addition		3
10	Time and subtraction		4
11	Reading time		3
12	Ascending order		3
13	Descending order		3
14	Identification and grouping data		3
15	Formulae and rounding off		5
16	Multiplication		3

17	Multiplication		3
18	Multiplication		3
19	Data extrapolation from tables		4
20	Averages and calculator skills		4

OUTCOME OF BASIC MATHS QUESTIONS

<u>Section/Grade</u>	<u>Section score</u>
<u>1</u>	
<u>2</u>	
<u>3</u>	
<u>4</u>	
<u>5</u>	
<u>6</u>	
<u>TOTAL SCORE (out of 70)</u>	

SCORING SYSTEM (determined according to grade-appropriate skills) :

Achieved = 2

Partially achieved (needed prompting) = 1

Not achieved = 0

Total score:-Basic maths skills (out of 70)

=

-Diabetes related questions (out of 80)

=

Final Total (out of 150)

=