

E3 Numeracy

Unit 4

Dimensions

How big?

I often work with Pam in the baby clinic. Every three months she checks the length of the baby and the size of the head. She does this to make sure the baby is growing and putting on weight as it should be. To measure the length of a baby, we measure from the top of its head to its toe.

The size of the baby's head is measured around the circumference.



Activity 1

Pam knows that a baby boy of three months old should have the following dimensions:

- a length between 55 and 67 centimetres (cm)
- a head circumference between 38 and 45 cm.

With another person, show each other roughly how long you think these lengths are and compare your lengths with an accurate measure such as a ruler.

- 1 Was your length estimate longer or shorter than the accurate measure?

.....

Joyti has measured the length of her three-month-old baby as 60 cm.

Pam says Joyti's baby is in the range expected.

Michelle's three-month-old baby boy is 56 cm in length.

- 2 Estimate how long that is and check it on a ruler.

- 3 Is the length in the range expected?

Michelle's baby's head is 39 cm in circumference.

- 4 Estimate this length. Check it on a ruler or tape.

- 5 Is the head circumference in the range expected?

Activity 2

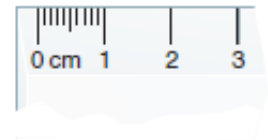
Look at the ruler on the next page and find the millimetre marks and the centimetre labels.

- 1 The millimetres have been marked in the first centimetre.
Draw the millimetres on the rest of the line.

2 Complete these statements:

a millimetres (mm) = 1 centimetre (cm).

b millimetres (mm) = 2 cm.



3 With another person, use a tape measure to measure the circumference of your head. Measure in cm and mm. Then measure the other person's head. Now let the other person take the measurements.

Record your results in the table and write the units clearly.

	Circumference of your head		Circumference of the other person's head	
Your results	cm	mm	cm	mm

Pam also goes to the local school to measure the height of the five-year-old children.

She measures the children's height in centimetres (cm) or metres (m).

Pam expects five-year-old children to be between 92 cm and 1.15 m tall.

Joe says he is 1 m 15 cm tall. This is written as a decimal: 1.15 m.

Rachel is 1 m 10 cm tall. This is written as 1.10 m or 1.1 m.

Both Joe and Rachel are in the range expected.

Remember

100 cm = 1 m



Activity 3

1 Jason measures 1 m 11 cm. As a decimal he is m tall

2 Duane measures 1 m 20 cm. As a decimal he is m tall.

Shazia is 1 m 7 cm tall. This is written as 1.07 m.

3 Suresh measures 1 m 5 cm. As a decimal he is m tall.

4 a Is anyone outside the range expected?

b Name of the child

5 Measure your height and the height of another person. Measure in centimetres and metres. Record your results in the table.

	Your height		The other person's height	
Your results	cm	m	cm	m

Healthy weight

Pam also knows that keeping healthy means keeping body weight under control. The more underweight or overweight someone is, the more their health is at risk.

With your group discuss why weight is important if you want to be healthy. Weight and height are linked. Taller people usually weigh more.

Rules and tools

- The metric system includes metres and kilograms.
- Feet, inches, stones, pounds and ounces are imperial units.

Using the healthy weight chart, Pam advises people if they are underweight, a healthy weight or overweight.

Height in metres (and feet)	Underweight if less than (kg)	Healthy weight (kg)	Overweight if more than (kg)
1.52m (5 feet)	46.2	46.2–57.8	57.8
1.68m (5 feet 6 inches)	56.4	56.4–70.6	70.6
1.83m (6 feet)	67.0	67.0–83.8	83.8

Rachel is 1.52 metres tall and her weight is 47 kg. Melvin is 1.83 m and weighs 80 kg. So, Melvin is taller and heavier than Rachel. They are both within the recommended range.

Activity 4

Pam visits the Community Centre to advise people on how to keep healthy. She measures their height and weight. Read the information below and say whether each person is underweight, overweight or a healthy weight. What do you think Pam should advise?

- 1 Michael is 1.68 m tall and weighs 88 kg.

.....

- 2 Denzel is 1.83 m tall and weighs 71 kg.

.....

- 3 Giten is 1.68 m tall and weighs 55 kg.

.....

Activity 5

When weighing a person, Pam uses scales that measure in kilograms. However, when she measures a portion of food, she uses grams.

Remember

1000 grams (g) = 1 kilogram (kg)

What units would Pam use to measure the weight of

1 a baby?

Estimate the weight of a newborn baby.

2 a teaspoon of baby food?

Estimate the weight of a teaspoon of baby food.

Activity 6

Pam has found a recipe that she thinks is healthy and tastes good.

She uses scales to weigh the vegetables needed for the recipe.

Often, the scales are divided into 100 g units, but not all the lines are labelled.

Arrow A on the scales here shows the weight of the mushrooms at 250 g.

1 Which arrows give the weights of the following vegetables in the recipe?

300 g potatoes

650 g butter beans

400 g chopped tomatoes

850 g pumpkin

The recipe is enough for four people. To make enough for eight people, you need to double the amount of each ingredient in the recipe.

For example, you would need $650 \text{ g} \times 2 = 1300 \text{ g}$ of butter beans.

2 What weight of potatoes would you need? g

3 What weight of mushrooms would you need? g

Warming Winter Soup

- serves 4

1 large onion

300 g potatoes

650 g butter beans

250 ml stock

2 carrots

250 g mushrooms

400 g chopped tomatoes

850 g pumpkin



Liquid measures

Pam tells everyone how important it is to measure medicines accurately. When she is talking to mothers and fathers about how to give medicines, she shows them how to measure small amounts of liquid using millilitres (ml).

Remember

1000 millilitres (ml) = 1 litre

Activity 7

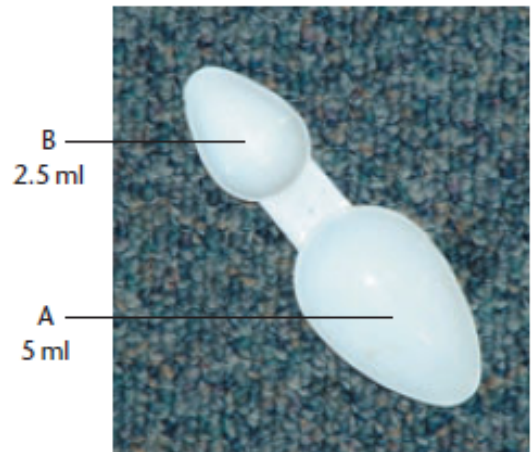
Pam visits Marcus, whose six-year-old son, Tom, has a high temperature. Pam suggests that Marcus gives Tom 5 ml of junior paracetamol, four times a day.

If his temperature does not come down, Marcus should ring NHS Direct on 0845 46 47 for more advice or take Tom to the doctor.

- 1 What is the total amount of junior paracetamol Tom will have in a day?

Because it is important to be accurate, Pam suggested that Marcus use a medicine spoon.

- 2 Which part of the spoon should Marcus use?
A or B?
- 3 How many times should Marcus fill the spoon for each dose?

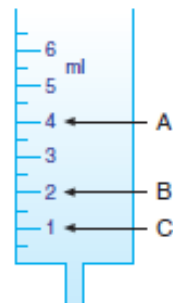


Activity 8

- 1 Next, Pam visits Jabeen. Her baby was born early. Because of this, the amount of iron in the baby's blood is low.

Each day, Jabeen must feed the baby 2 ml of medicine with iron in. It is a small dose so it is important to be accurate. Pam suggests she uses a 'liquid medicine measure'.

- a Should Jabeen fill the measure to label A, B or C?
- b How much iron will the baby be given in a week?
- 2 Another baby, George, has to be given antibiotics. He must have a dose of 4 ml, twice a day.
 - a Should Pam fill the liquid medicine measure to label A, B or C?
 - b What is the total dose of antibiotics the baby must have in one day?

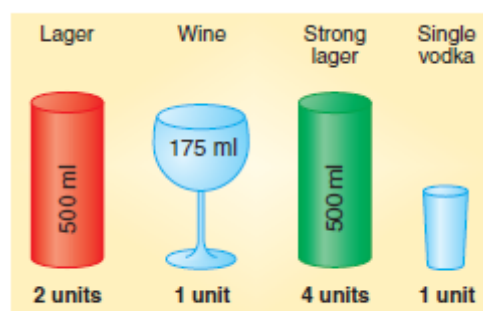


At the community centre Pam often gives advice on diet and alcohol intake.

Pam's advice is not to drink too much alcohol so as not to put your health at risk.

Men should drink no more than four units of alcohol a day. Women should drink no more than three units of alcohol a day.

Pam has a card that shows how to work out the number of units.



Gerry drinks ordinary lager. Each can contains two units of alcohol, so Pam recommends that Gerry drinks no more than two cans a day.

That is $2 \times 500 \text{ ml} = 1000 \text{ ml} = 1 \text{ litre}$.

Activity 9

- 1 Michael likes strong lager.
 - a What is the maximum number of cans of strong lager Pam would recommend he drinks in a day?
 - b How many ml of lager is this?
- 2 Sharon drank two glasses of wine with a meal. Each glass held 175 ml.
 - a How much wine did she drink? ml
 - b Does Pam think Sharon is above or below her limit?
- 3 Marcia has drunk one large glass of wine. A large glass holds 350 ml. Could Marcia have another large glass of wine and still be below her limit?
.....
- 4 A bottle of wine holds 750 ml.
 - a How many full 350 ml glasses of wine can you get from a bottle?
.....
 - b How many full 175 ml glasses of wine can you get from a bottle?
.....

Activity 11

Pam uses a measuring jug like the one shown.

- 1 Could Pam use this jug to measure the following items?
Ring your answer.

- | | |
|--------------------------|----------|
| a 5 ml of medicine | yes / no |
| b 275 ml of milk | yes / no |
| c 300 ml of orange juice | yes / no |
| d 1 litre of beer | yes / no |



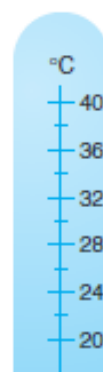
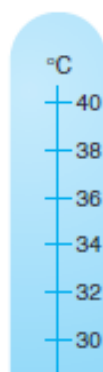
Temperature

Pam also advises on how to take a person's temperature accurately.

Activity 12

When Pam takes a child's temperature, she uses a thermometer. She sits the child on her knee, and tucks the thermometer under the child's armpit. The temperature is usually measured in Celsius or °C.

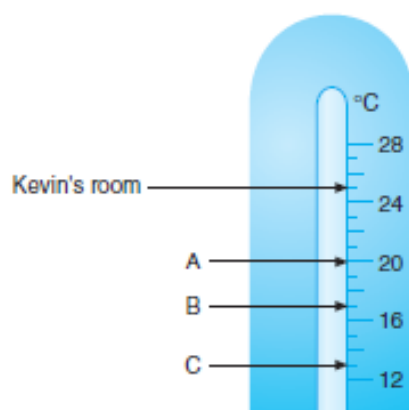
Normal body temperature is 37 °C. Mark this temperature on the thermometers below.



Activity 13

Pam advises parents that a baby's room should be kept at 18 °C. Kevin's room is 25 °C. It is too hot.

Read the room thermometer below. Are the temperatures too hot, about right, or too cold for the baby? Ring your answer.



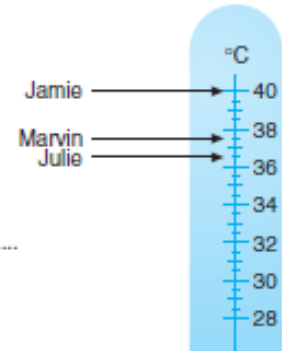
- 1 Room A temperature too hot / about right / too cold for the baby
- 2 Room B temperature too hot / about right / too cold for the baby
- 3 Room C temperature too hot / about right / too cold for the baby

Activity 14

Pam advises all mothers and fathers that the average temperature of a baby is 37°C . If a baby under six months old has other signs of illness and a temperature of 39°C or higher, then the parents should contact their doctor. At the baby clinic, Pam takes three babies' temperatures.

- 1 What is Jamie's temperature?
- 2 What is Marvin's temperature?
- 3 What is Julie's temperature?
- 4 Which babies have temperatures about normal?
.....

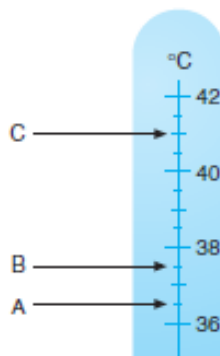
- 5 Which baby should Pam check further?
.....



Activity 15

Nicole, a three-year-old, has a fever with a temperature of 41°C .

- 1 Which mark on the thermometer scale shows Nicole's temperature?
.....



- 2 Discuss and write down what Nicole's mother should do.
.....
.....

Buying medicines

When visiting older people, Pam sometimes collects their medicines. She went to the pharmacy to buy some medicine for Bill.

The pharmacist asked for 'One pound, forty-seven', and rang up £1.47 on the till. The coins to pay for this are marked with ticks below.



Remember

- £1 is the same as 100 pence, so £1.47 is the same as 147p.
- Pam could have used other combinations of coins here.

Activity 16

- 1 Pam asked me to buy some medicine for Peter that costs £3.85. She has this change in her purse. Tick the coins needed to pay for the medicine.



- 2 £3.85 = pence
- 3 How much is left?

- 4 George has a headache and wants a packet of paracetamol that costs £1.05. He has these coins in his pocket. Tick the coins that would pay for the paracetamol.



- 5 £1.05 =p
- 6 Find a different way of paying £1.05. This time, draw a ring round the coins you use.

Activity 17

Pam has asked me to add up these prices for her. She has given me a calculator to do it.

Olive wants antiseptic cream for £1.53 and a strip of plasters for 93p.

I have to put these amounts into the calculator in pounds.

£1.53 is 

93p is 

The total is £2.46.

Write down these calculations in the same way.

1 Frank wants:

- a bottle of shampoo for £3.26
- a comb for 85p
- a bar of soap for 72p.

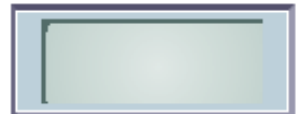
The total is



2 Mazie wants:

- a nail file for 72p
- nail scissors for £2.58
- throat sweets for 45p.

The total is



*When there is a stock take in the clinic, we have to write the amounts onto an official form. The form has to be filled out in **decimals**.*

Activity 18

Pam found three $1\frac{1}{2}$ litre tins of baby milk.

The form is filled in like this

Fill in the rest of the form.

- 1 Baby milk size $\frac{1}{2}$ litre, 5 tins
- 2 Baby milk size $2\frac{1}{2}$ litre, 4 tins

Food	Size of tins	Number
Baby milk	$1\frac{1}{2}$ litres	3

Activity H1

- 1 Estimate then measure.

	Estimate	Measurement
The length of your hand in mm		
The length of your arm in cm		
The height in metres of a man between 25 and 45 years old		

- 2 What instruments did you use to measure these lengths?

.....

Activity H2

- 1 Estimate then weigh.

	Estimate	Weight
Tin of beans		
Tin of baby food		

- 2 What instruments did you use to weigh tins?

.....

Activity H3

Pam's advice is that men should drink no more than four units of alcohol per day. Women should drink no more than three units per day.

Pam has a card that she shows people.



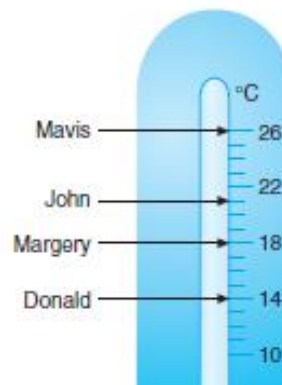


- 1 Henry usually drinks three 250-ml bottles of ordinary lager when he goes to the pub. How many millilitres of lager does he drink?
..... ml
- 2 Is he within Pam's recommended limit?
- 3 Tariq likes strong lager.
 - a What is the maximum number of 250 ml bottles Pam would recommend that he could drink in a day?
..... bottles
 - b How many millilitres of lager is this? ml

Activity H4

Pam advises older people to keep their rooms warm and comfortable in the winter at 21 °C.

Pam visits four older people and reads the temperature of their living rooms. The temperatures are shown on the thermometer. Read the temperatures and decide whether each person should turn the heating up, leave it alone or turn it down. Ring your answers.



- 1 Mavis's room Turn heating up / leave it alone/ turn heating down
- 2 John's room Turn heating up / leave it alone/ turn heating down
- 3 Margery's room Turn heating up / leave it alone/ turn heating down
- 4 Donald's room Turn heating up / leave it alone/ turn heating down

Activity H5

- 1 Pam has asked me to buy some more medicine for Peter. It costs £2.05. Peter has this change in his wallet. Tick the coins to pay for the medicine.
- 2 Discuss your answer with others in your group.



Activity C1

Draw a ring around each correct answer. (There might be more than one correct answer.)

- 1 Which of the following would you measure in mm?



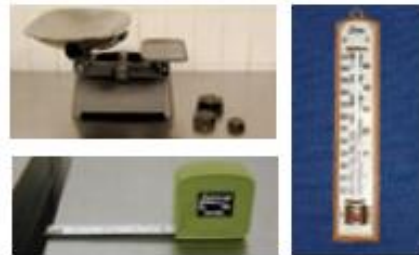
- 2 Which of the following would you weigh in kg?



- 3 Which of the following would you measure in ml?



- 4 Which of the following would you use to measure in degrees Celsius (°C)?



- 5 Which of the following is the same as $\frac{1}{2}$? 0.25 0.5 0.75

Activity C2

Pam asked me to buy some medicine for Peter that costs £2.55.
She has this change in her purse.



Write down **two** different combinations of coins that I could use to pay for the medicine.

- 1
2



Activity C3

Pam advises all mothers and fathers that the average temperature of a baby is 37°C . If a baby less than six months has other signs of illness and a temperature of 39°C or higher, the parents should contact their doctor.

At the baby clinic, Pam takes three babies' temperatures.

- 1 What is Gemma's temperature?
- 2 What is Marcus's temperature?
- 3 What is Sunita's temperature?
- 4 Which babies have normal temperatures?
- 5 Which baby should Pam check further?

