

# Functional skills 1

## Tiling patterns

**This group activity will help you to:**

- ⊞ recognise that a situation can be represented using mathematics;
- ⊞ choose how to model the situation;
- ⊞ examine patterns and relationships;
- ⊞ communicate results and solutions.

## Background

Tiles can be cut to fit awkward corners. A tiler has to work out how best to lay tiles so that there is as little waste as possible.

For example, carpet tiles have to be cut to fit the shape of the floor. Wall tiles have to be cut to fit the size and shape of the wall, and paving stones have to be cut to fit the shape of the patio.

## Problem 1

### Paving a patio



Paving tiles are 30 cm square.

You have to tile a rectangular patio that measures 3.6 m by 4.8 m.

You have decided to buy tiles in two colours and to design a pattern.

- a Create four different patterns for the patio. For each pattern, work out how many of each tile you need to buy.
- b The tiles are sold only in packs of 9 tiles. Which of your patterns is the cheapest?

## Problem 2

### Carpet tiles

You are having a makeover of your bedroom.



You are having new carpet tiles for the floor. They are a plain colour.

The carpet tiles are 30 cm square.

The floor is a rectangle measuring 400 cm by 200 cm.

Some of the tiles will have to be cut to fit.



How many tiles will you need to buy so that there is as little waste as possible?

Be prepared to justify your conclusions to other groups.

# Functional skills 2

## Where is the mathematics?

**This group activity will help you to:**

- 🕒 identify the mathematics in a situation;
- 🕒 identify mathematical questions to ask;
- 🕒 choose appropriate language and forms of presentation to communicate conclusions.

## Background

Mathematics is all around us.

Looking for the maths in a situation or in information will help you to understand how widely maths is used.

### Problem 1

**What mathematical questions could you ask about this picture?**



What answers would you give?

### Problem 2

**What mathematical questions could you ask about this picture?**



What answers would you give?

### Problem 3

What mathematical questions could you ask about this picture?



What answers to your questions would you give?

### Problem 4

What mathematical questions could you ask about this picture?



What answers to your questions would you give?

Be prepared to discuss your questions and answers with other groups.

# Functional skills 3

## Making fudge

**This group activity will help you to:**

- ⊖ make an initial model of a situation using suitable forms of representation;
- ⊖ change values to see the effects on answers in the model;
- ⊖ decide on the methods, operations and tools to use, including ICT;
- ⊖ consider how appropriate and accurate your results and conclusions are.

## Background information

Fudge is easy to make (though you have to take care with the hot mixture).

Here are the ingredients for making nine 250 g packs of fudge.

3 cans	condensed milk
350 g	butter
1.4 kg	soft brown sugar
450 ml	fresh milk



Say you make fudge to sell at a school fair or to take to a bring and buy sale.

If you are going to do this, you will want to make a profit.

This is what it might cost you to buy items in a supermarket.

397 g can condensed milk	£1.20
250 g butter	90p
1 kg soft brown sugar	£1.68
568 ml fresh milk	42p

## Problems

### The cost of making fudge

- 1 Assume you make 9 packs of fudge.
  - a What do you pay in total in the supermarket to buy enough of all the ingredients?
  - b What do you pay to make 1 pack of fudge?
  - c You can buy sugar only in an exact number of kilograms.  
How much extra do you pay for the sugar you don't use?
- 2 If you don't want to waste any sugar, how many packs of fudge would you need to make?
- 3 Assume you make 72 packs of fudge.
  - a How many cans of condensed milk do you need to buy?
  - b How many 250 g packs of butter do you need to buy?
  - c How many 1 kg bags of sugar do you need to buy?
  - d How many 568 ml bottles of milk do you need to buy?
  - e What do you pay in total in the supermarket to buy enough of all the ingredients?
  - f What do you pay to make 1 pack of fudge?
  - g Why is this answer different to the answer to 1b?

### Making a profit

- 1 A supermarket charges 99p for 221 g of its own brand of fudge.  
Do you think that this is a fair price?  
Give your reasons.
- 2 Assume you want to sell fudge at the school fair.
  - a How many packs of fudge will you make?  
What will you charge for 1 pack?
  - b Given the cost of supermarket fudge, do you think people will buy all your fudge?  
Why?
  - c How much profit will you make if you sell all your fudge?



What other questions could you ask about making fudge?  
Be prepared to present your arguments to other groups.

# Functional skills 4

## Choosing a mobile phone contract

**This group activity will help you to:**

- ① model a situation and change values to see the effects on answers;
- ② select the information, methods and tools to use, including ICT;
- ③ interpret results and draw conclusions.

## Background information

Most mobile phone networks have a vast range of tariffs, or plans. Spending time investigating the sort of deals you can get can save a fortune.

You need to know how much you use your mobile phone before you can choose the best plan for you.



Mobo Phone Company has two plans.

### Plan A

The monthly charge for a mobile phone on **Plan A** is £15. This includes 75 minutes of free calls and 75 texts.

After that there is a charge of 12p per minute and 10p per text.

### Plan B

The monthly charge for **Plan B** is £20. This includes 100 minutes of free calls and 300 texts.

After that there is a charge of 12p per minute and 10p per text.

## Problems

### Comparing the costs

- 1 Compare the costs of using Plan A and Plan B for 200 minutes talk and 100 texts in one month.

Don't forget to include the contract cost.



### Choosing a contract

- 2 This chart shows Lucy's mobile phone usage over 4 months.

Month	Minutes of talk time	Number of texts
January	100	90
February	90	140
March	88	120
April	100	150

Would Plan A or Plan B be better value for money for Lucy?  
Explain why.

### Pay as you go

- 3 PAYG Plan Z costs 15p a minute for calls and 15p for texts.

There is no monthly charge.

Would Lucy be better off or worse off if she used PAYG Plan Z for January to March?

By how much?

- 4 If you had to use one of Plan A, Plan B or PAYG Plan Z, which would you choose.

Why?



Be prepared to present your findings and conclusions to other groups.