

Percentages

Here are some examples of activities, games or puzzles which can be used to support mathematics learning.

These examples are taken from the percentages packs. There are two packs in this collection. The mathematical demand increases as you work through the packs. The complete packs can be downloaded at <https://www.stem.org.uk/rxzdz>

Answers to cards can be found at <https://www.stem.org.uk/rxxo5>

Smile Worksheet 1095

Percentages

The Latin word 'centum' means a hundred.
Some words which include 'cent' have a connection with a hundred.
Which of these words have a connection with a hundred?

centigrade centre recently cent
bicentenary century centipede
centimetre

If you are not sure look them up in a dictionary.
Can you find any others?

Latin word 'per' means 'each'.
Per cent means per hundred or each hundred.
The symbol for per cent is %.

Shading

Fraction

Divide

Decimal

1 out of each 100 = $\frac{1}{100} = 1\%$

20 out of each 100 = $\frac{20}{100} = 20\%$

5 out of each 100 = $\frac{5}{100} = 5\%$

Complete **A**

1. $\frac{9}{100} = \%$	3. $\frac{19}{100} = \%$	5. $\frac{61}{100} = \%$	7. $\frac{1}{4} = \frac{\quad}{100} = \%$
2. $\frac{13}{100} = \%$	4. $\frac{53}{100} = \%$	6. $\frac{1}{2} = \frac{\quad}{100} = \%$	8. $\frac{100}{100} = \%$

B Complete these tables.

	Shading	Fraction	Decimal		%
1)		$\frac{1}{10}$	0.1	$\frac{10}{100}$	10%
2)		$\frac{3}{10}$	0.	$\frac{30}{100}$	%
3)		$\frac{7}{10}$	0.	$\frac{\quad}{100}$	%
4)		$\frac{9}{10}$	0.	$\frac{\quad}{100}$	90%
5)		$\frac{10}{10}$	0.	$\frac{\quad}{100}$	%
6)		$\frac{8}{10}$	0.8	$\frac{\quad}{100}$	%

	Shading	Fraction	Decimal		%
7)		$\frac{1}{2}$	0.	$\frac{\quad}{100}$	%
8)		$\frac{1}{10}$	0.	$\frac{\quad}{100}$	%
9)		$\frac{3}{4}$	0.	$\frac{\quad}{100}$	%
10)		$\frac{2}{5}$	0.	$\frac{\quad}{100}$	%
11)		$\frac{6}{10}$	0.6	$\frac{\quad}{100}$	%
12)		$\frac{4}{10}$	0.	$\frac{\quad}{100}$	%

Percentage Puzzle

You will need: scissors, glue

- Cut out the numbers at the bottom of this sheet.
- Place them on the sheet to make four true statements.
- Do not stick them down until you are sure that all four statements are true.

	% of	=



10	15	20	25	35	45
50	65	70	75	80	150

Smile 2024

Excess Luggage



Airline passengers may take a certain amount of luggage free of charge. Extra luggage has to be paid for.

Why do airlines charge for excess luggage?

Free luggage

First Class up to 30kg
Economy Class . . . up to 20kg



Air fares from London

Destination	First Class £	Economy Class £
Addis Ababa	1089	529
Brussels	95	95
Cairo	862	339
Nairobi	1346	629
New York	1571	510
Paris	111	90
Rio de Janeiro	1720	801
Rome	406	171
San Francisco	1774	481
Tokyo	2284	1125

Excess luggage charge

Every extra kilogram (kg) costs
1% of the First Class fare.

Ngozi is travelling Economy Class
to New York.

She has 26kg of luggage.
20kg will go free.
6kg has to be paid for.

Each kg costs 1% of £1571

1% of £1571 = £15.71

6 x £15.71 = £94.26

So Ngozi's excess luggage charge
is £94.26

Copy this table and fill it in.

Passenger	Destination	Class	Weight of luggage	Excess Luggage	Charge
Ngozi	New York	Economy	26kg	6kg	£94.26
Prilesh	Rome	First	26kg		
Paul	Rio de Janeiro	Economy	27kg		
Yuen Ling	Brussels	First	41kg		
Chris	Tokyo	Economy	28kg		
Maria	Addis Ababa	Economy	19kg		

Luggage charges to Rome.

Copy this table and fill it in.

Weight of luggage kg	Luggage Charge	
	First Class	Economy Class
15		
17		
19		
21		
23		
25		
27		
29		
31		
33		
35		
37		

Is 20kg of luggage enough for most journeys?

Is it worth going over the limit?

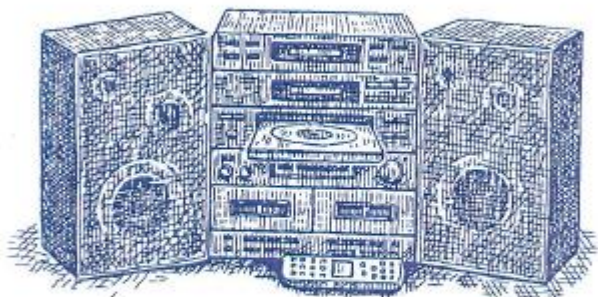
Do airlines use a fair way of charging for excess luggage?

Can you think of a fairer way?

SMILE 2038

1.

The price of a CD player in November was £400.
On December 1st the price was increased by 15%.



In the January sales the price of the CD player was reduced by 15%.

The sale price was not £400.
Why not?

3.



Not to
scale.

The height of this can is 126.5mm.

If the diameter remains constant what would be the height of a normal size can?

Percentage Problems

2.

"10% of the wood consumed each year is used as paper, 87.5% of which is used by rich countries."



What percentage of the wood is used by rich countries for paper?

Source: Norman Myers (ed) The Gaia Atlas of Planet Management.

4.

"The world is now losing its tropical forest at the rate of 7% per year."

If this trend continues, what percentage of the existing forest will be left in 5 years time?

Show that, 10 years from now, just under half of the tropical forest will have disappeared.

How much will remain after ... 50 years

... 100 years?

You may find a spreadsheet useful.



Source: Forest Resources, Food and Agriculture Organisation 1985.