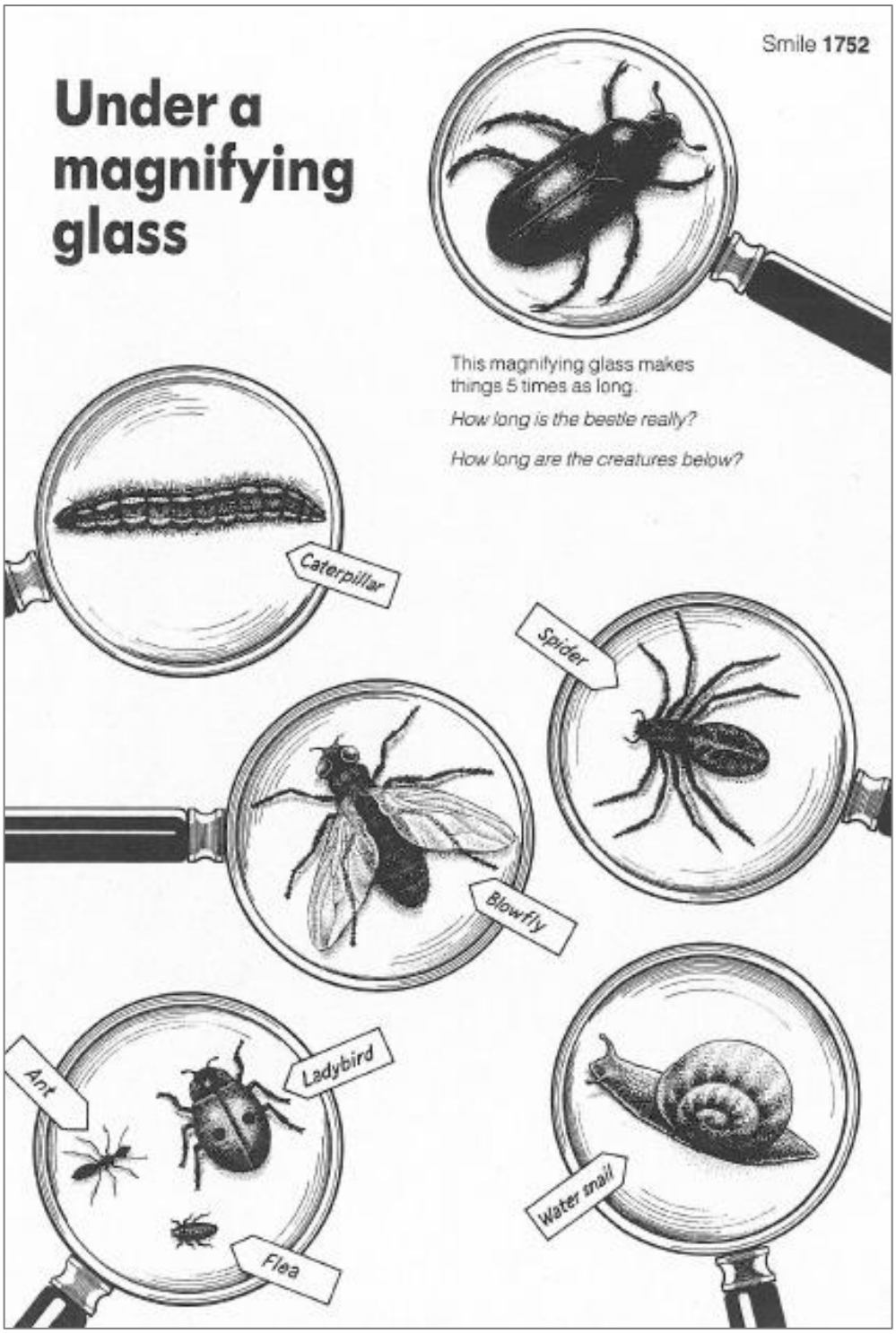
Ratio

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

These examples are taken from the ratio packs. There are two packs of activities and a booklet containing activities on the Golden Ratio 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/rxze4

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



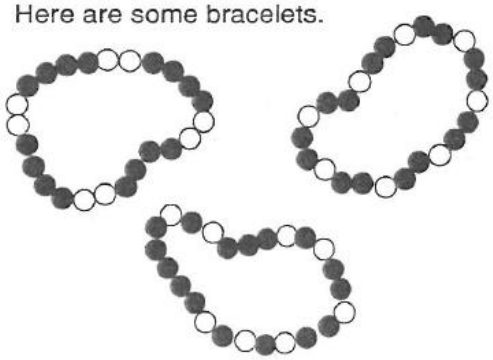
Smile 2267

Introducing Ratio

You will need worksheet 2267a.

Ratio is the comparison between two or more values.

Here are some bracelets.



Each bracelet consists of **24** beads.

Each bracelet has **16 red** beads and **8 white** beads.

For each bracelet there are **16 red** *beads and* **8 white** *beads.*

The **ratio** *of* **red** *beads to* **white** *beads is. . .* **16:8**

The ratio of **red** *beads to* **white** *beads expressed in the* **simplest form** *is . . .* **2:1**

The ratio **16:8** is equivalent to the ratio **2:1** because for every **2 red** beads there is **1 white** bead.

Introducing Ratio Worksheet

1. Cut out the **Description** **Ratio** **Ratio in its simplest form** and **Bracelet**
2. Match each **description** to a **ratio** and a **ratio in its simplest form**. *(There are 5 groups.)*
3. Colour a bracelet for each **description** to show the ratio of **red beads** to **white beads**.

Description	Ratio	Ratio in its simplest form	Bracelet
There are **8 red** beads and **16 white** beads.	The ratio of **red** beads to **white** beads is **6 : 18**	**red beads** : **white beads** **1 : 5**	
There are **6 red** beads and **18 white** beads.	The ratio of **red** beads to **white** beads is **8 : 16**	**red beads** : **white beads** **1 : 3**	
There are **4 red** beads and **20 white** beads.	The ratio of **red** beads to **white** beads is **18 : 6**	**red beads** : **white beads** **3 : 1**	
There are **21 red** beads and **3 white** beads.	The ratio of **red** beads to **white** beads is **4 : 20**	**red beads** : **white beads** **7 : 1**	
There are **18 red** beads and **6 white** beads.	The ratio of **red** beads to **white** beads is **21 : 3**	**red beads** : **white beads** **1 : 2**	

Unibond mixtures

The five problems in this booklet are all concerned with making mixtures which are specified by the ratio of *chemical* to *water*.

Mixtures

"Unibond" is an adhesive used both in industry and around the home.

When undiluted it is a powerful wood glue and can also be used for sticking down formica and other plastics.

In its various diluted states it can be used to prime concrete surfaces (1 part Unibond : 5 parts water), or as the water base to make plaster more adhesive (3 : 1), or any of the uses listed in the table.

UNIBOND SOLUTIONS	USED FOR	UNIBOND	WATER
STIFFENING	STIFFENING FABRIC FOR BLINDS ETC.	1	20
A	PRIMING POROUS OR DUSTY SURFACES	1	5
B	PRIMING GLOSS SURFACES FOR PAPERHANGING, ASBESTOS	1	1
C	SAND AND CEMENT BONDING	3	1
D	BONDING WOODWORK AND LAMINATES	5	1
E	FINAL BONDING FOR DIFFICULT SURFACES	UNDILUTED	
SLURRY	2 PARTS SHARP SAND, 1 PART CEMENT, 1 PART UNIBOND AND 1 PART WATER.		

Problem A

Kristy needs 2 pints of solution D (5 : 1) to stick a new formica top on the kitchen worktop.

5 pints of Unibond and 1 pint of water would give the correct mixture, but this would be very wasteful.

1. Why?

To make 2 pints of mixture, Kristy uses $1\frac{2}{3}$ pints of Unibond and $\frac{1}{3}$ pint of water.

2. Would the ratio $1\frac{2}{3} : \frac{1}{3}$ give the correct mixture?

3. What fraction of Kristy's mixture is water?

Problem B

Dave is laying new tiles around the bath. First of all he needs to prime the surface of the plaster. He makes 6 pints of solution A.

1. How many pints of water does he use?

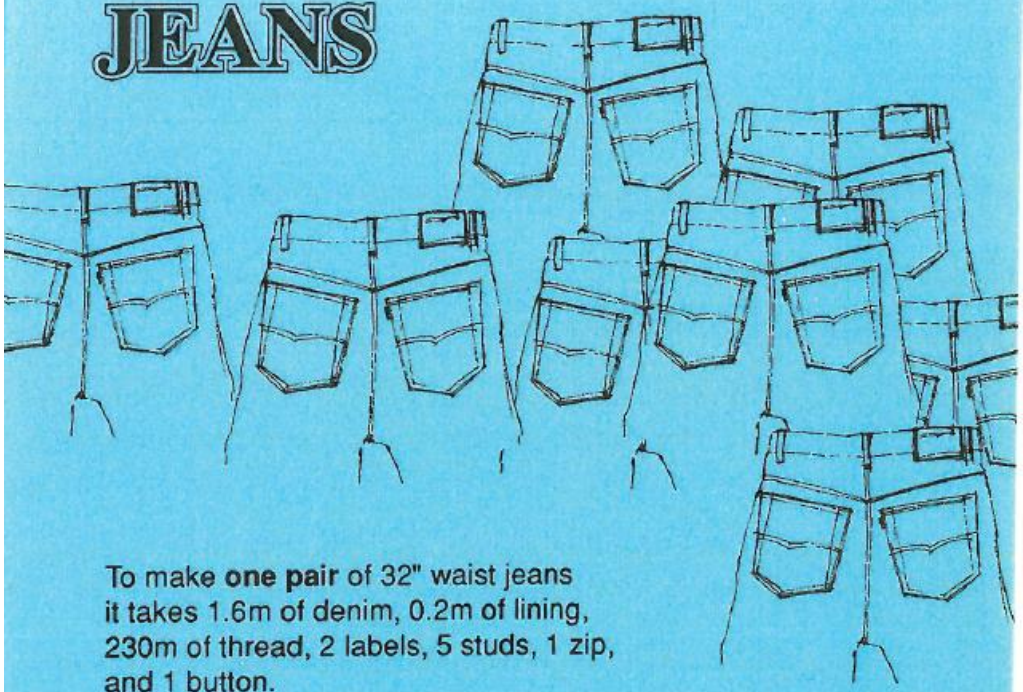
2. How many pints of Unibond does he use?

3. What fraction of the final solution is Unibond?

Dave finds that he needs less than half of this mixture.

4. What quantities of water and Unibond would have given a mixture of 3 pints of solution A?

JEANS



To make **one pair** of 32" waist jeans it takes 1.6m of denim, 0.2m of lining, 230m of thread, 2 labels, 5 studs, 1 zip, and 1 button.

You have accepted the following prices for the raw materials.

Denim	£250 per 100m roll
Lining	£106 per 100m roll
Thread	£5 per 5000m cone
Labels	£15 per 1000
Studs	£20 per 1000
Zips	£12.50 per 100
Buttons	£3 per 100

A spreadsheet might help.

1. Find a good way of setting out all the information you need:
   a) to order the correct quantity of all the raw materials you will want.
   b) to calculate the cost of the raw materials for one pair of jeans.

2. a) Denim goes up in price by 5%.
   How does this affect the cost of one pair of jeans?
   b) If there was a 5% increase in one of the raw materials which one would have the greatest effect on the cost of one pair of jeans?