3

Using multiplication

Mathematical goals

This session is designed to enable learners to:

- understand how to use repeated addition to help with multiplication;
- understand the meaning of various representations of multiplication, for example 2 × 4, 2 lots of 4.

Materials required

For each pair or small group of learners you will need:

- Card set A – *Multiplications* (two pages);
- Card set B – *Representations*;
- Card set C – *Hexagon jigsaw* (three pages).

For each learner you will need:

- Sheet 1 – *Twin-packs*;
- Sheet 2 – *Triple-packs*;
- Sheet 3 – *Multi-packs*;
- mini-whiteboard, marker and cloth.

Optional:

- Sheet 4 – *Solution*, large enough to show the whole group the completed hexagon and the shaded triangles;
- Counters or tiles.

Notes

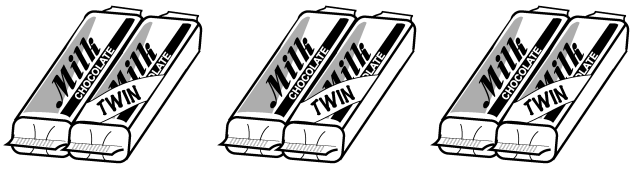
Suggested approach

Beginning the session

Give each learner a copy of Sheets 1, 2 and 3. Ask learners to write on their mini-whiteboards how many chocolate bars I would have if I bought, for example, three twin-packs, or four triple-packs, or two multi-packs, or a combination of packs. Encourage learners to use the sheets to help them find the answers. Continue until all learners are answering confidently and correctly.

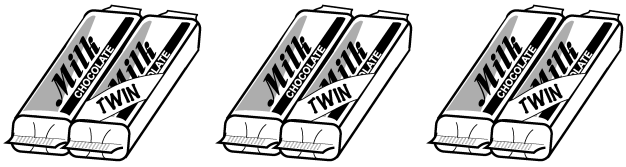
Whole group discussion

On the left side of the board, draw a picture of three twin-packs, as shown below.



Ask learners how many chocolate bars there are and write the answer (6) next to the picture as '= 6'. Discuss other ways in which the same number of chocolate bars can be represented, for example '2+ 2 + 2', or '3 × 2', or '3 lots of 2', or '3 times 2', or other diagrammatical representations. Add each representation to form a chain.

You may end up with something like:



= 6 = 3 lots of 2 = 3 × 2 = 2 + 2 + 2 = 3 times 2 = ⁘

Working in groups

Ask learners to work in pairs or small groups. Give each pair Card set A – *Multiplications* (two pages), and the upper set (18 cards) from Card set B – *Representations*.

Ask learners to place each of the 18 cards from Card set B next to the correct multiplication in Card set A. They should finish with three cards from Card set B in a row next to each card from Card set A.

Card set B also provides some blank cards for learners to write other possible representations (such as '3 lots of 4') which they can add to their rows.

Learners who finish quickly, or who might need more practice, could choose their own multiplication, then make up rows of equivalent representations of the multiplication they have chosen.

Working in groups

Give each group of learners (up to four in a group) Card set C – *Hexagon jigsaw* (three pages).

Point out that each triangle has at least two sides with either a number or a multiplication sum. Explain that the task is to fit the triangles together to form a hexagon such that adjacent sides of the triangles show the same value. Learners should work together to complete the hexagon, helping each other through discussion.

If learners have completed Session 1 – *Adding two-digit numbers*, they will be familiar with a hexagon puzzle. If not, show Sheet 4 to demonstrate the completed hexagon. Explain that learners should aim to complete the shaded (inner) triangles first, then the outer triangles. Do not show Sheet 4 long enough for learners to 'spot' some of the triangles!

They can use a mini-whiteboard or counters to help them if they need to, but they should not use calculators to perform the multiplication. Ask them to take turns. If one learner is not sure that another's 'matching' is correct, he or she should challenge the other to explain it.

They may find it helpful to write the answers on the cards, rather than have to remember them, but this will mean that you cannot re-use this set of cards.

As you move round the room, listen to learners' explanations and make a note of any obvious misconceptions that emerge, for whole group discussion at the end of the session. If you notice any mistakes, ask learners to show you how they calculated the answer.

Learners may need some time to complete this task. Reassure them that speed is not important.

Whole group discussion

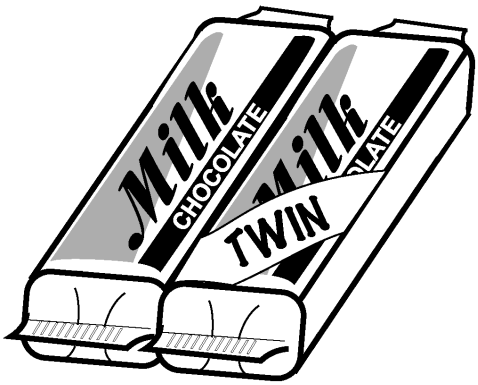
Discuss any problems that arose during the hexagon activity. If learners are still unsure about using repeated addition and/or

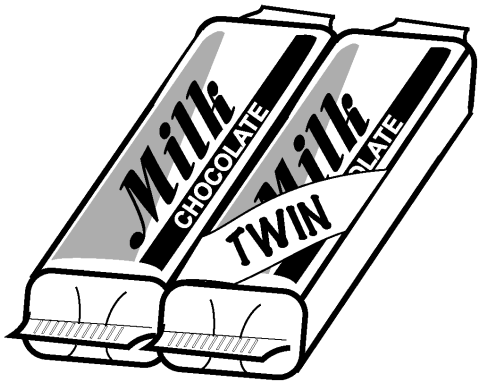
diagrams to calculate multiplication, practise a few more on mini-whiteboards, encouraging learners to show all their working on the mini-whiteboards as well as their answer.

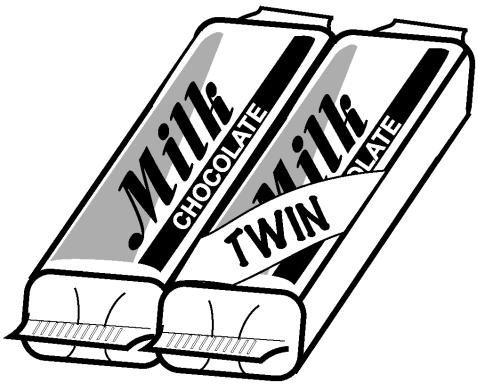
Reviewing the learning

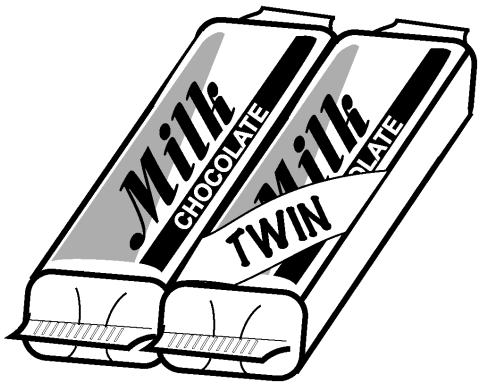
Give learners some counters or tiles, and ask them to find as many multiplication pairs as possible for, for example, 24, 36, 60. Repeat using other suitable numbers.

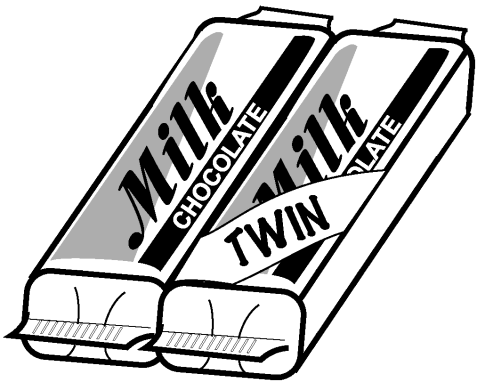
Sheet 1 – *Twin-packs*

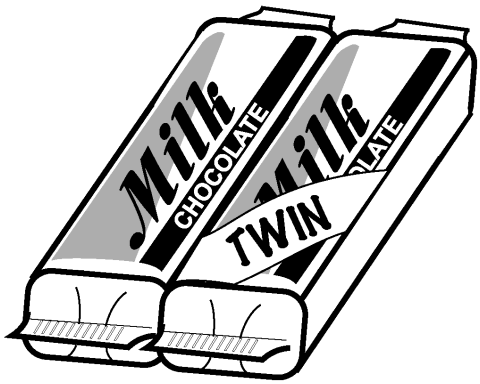


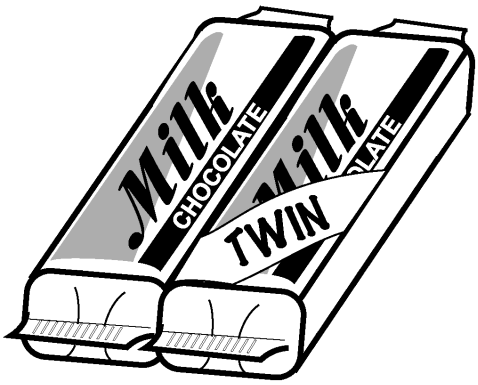


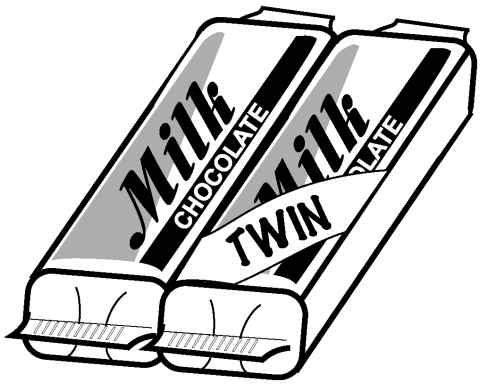




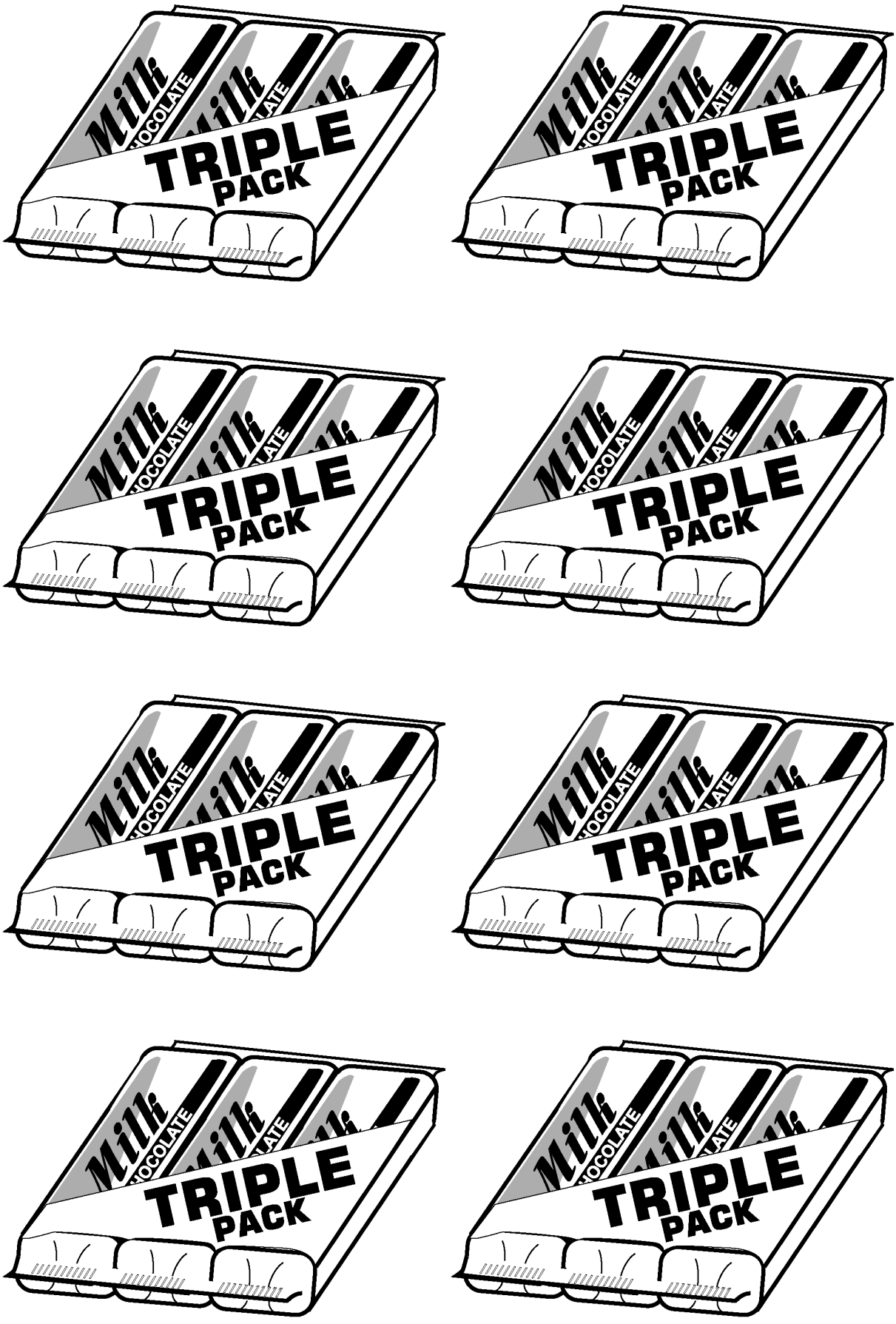




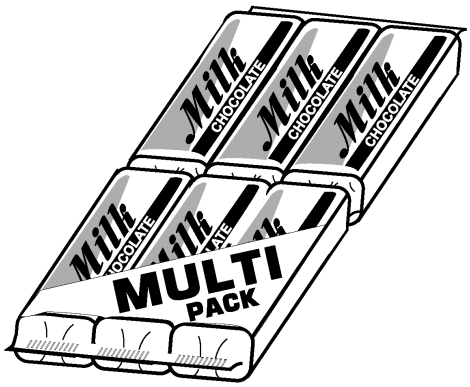


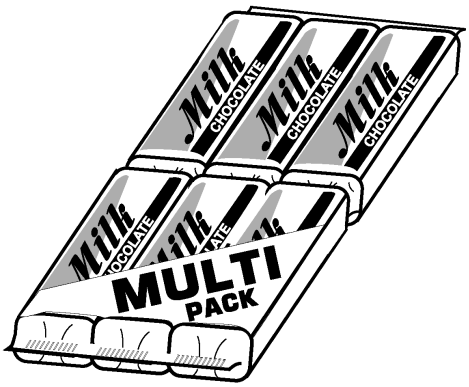


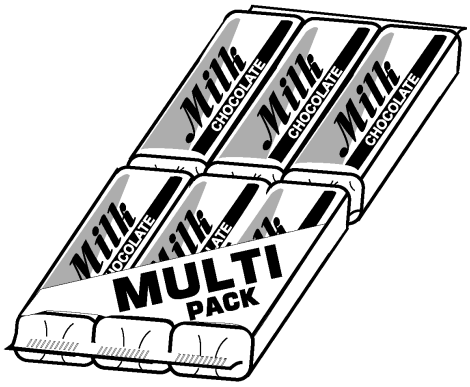
Sheet 2 – *Triple-packs*

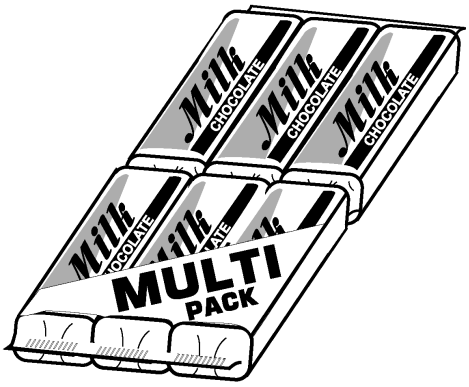


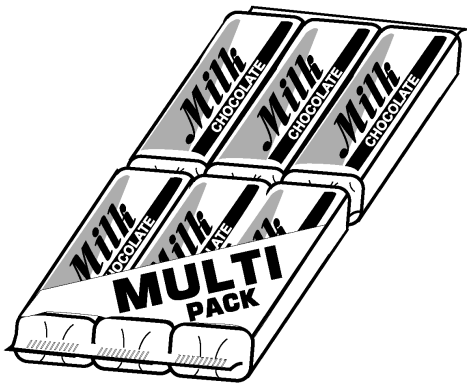
Sheet 3 – *Multi-packs*

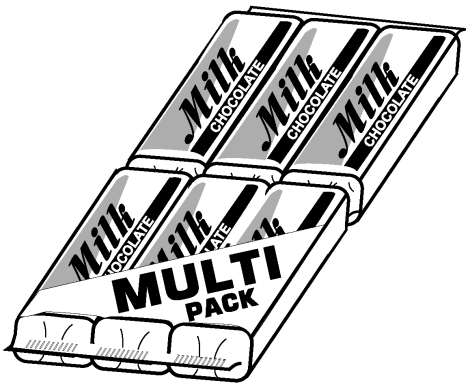


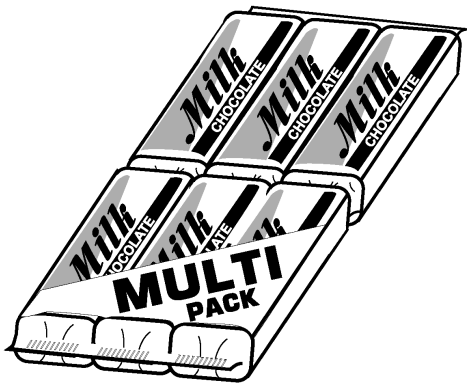


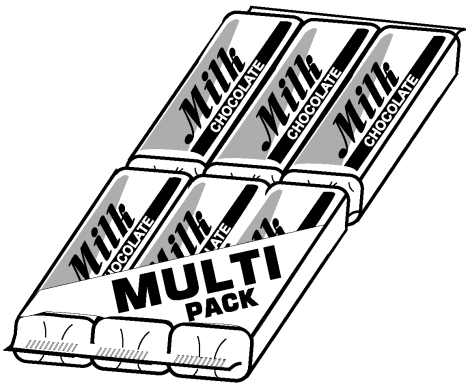












Card set A – *Multiplications* (page 1 of 2)

$5 \times 3 =$

$3 \times 4 =$

$5 \times 4 =$

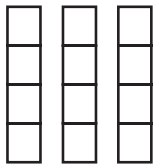
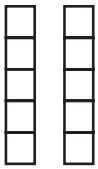
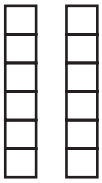
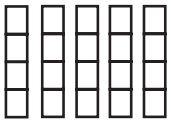
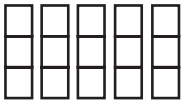
Card set A – *Multiplications* (page 2 of 2)

$4 \times 2 =$

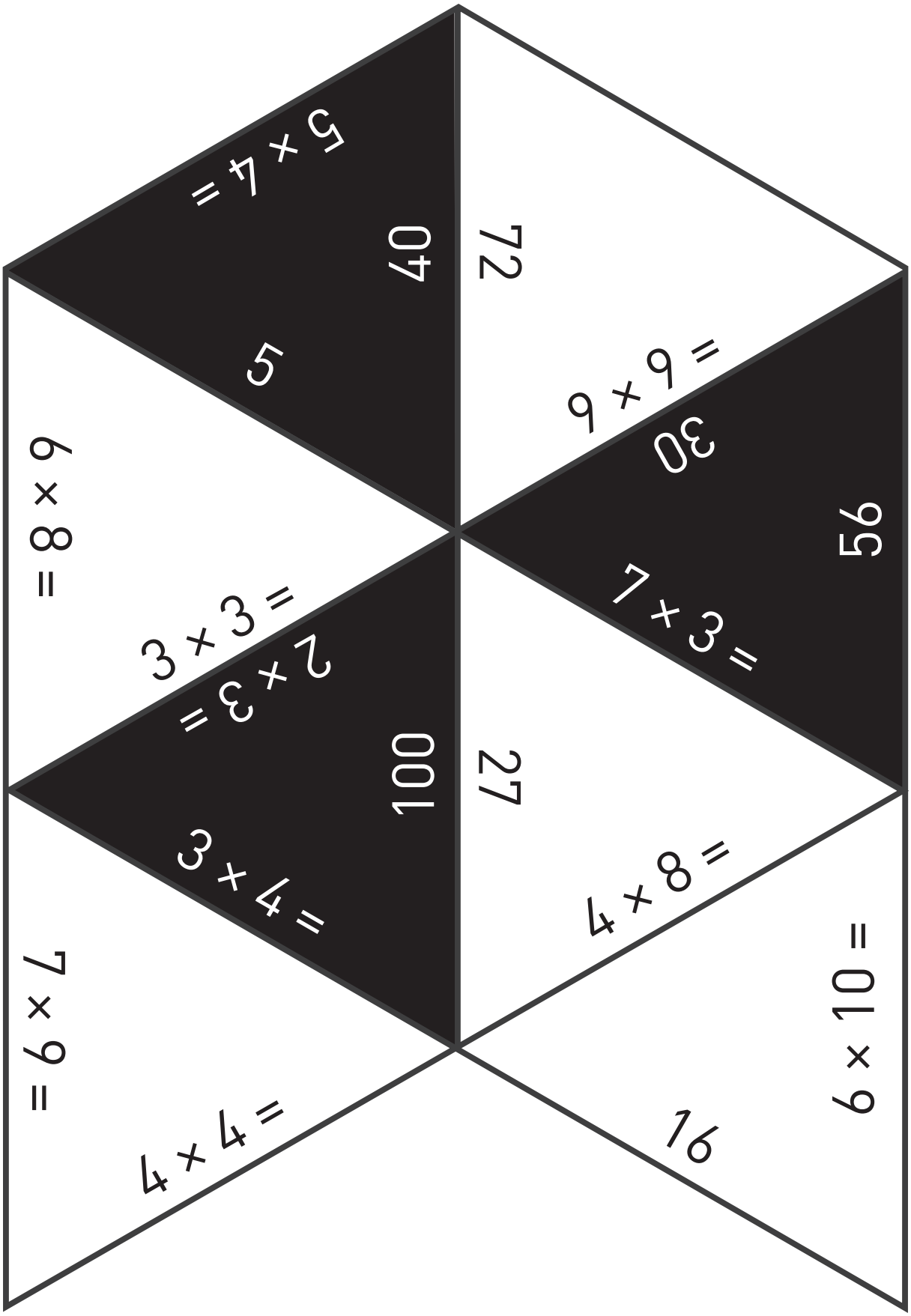
$2 \times 6 =$

$2 \times 5 =$

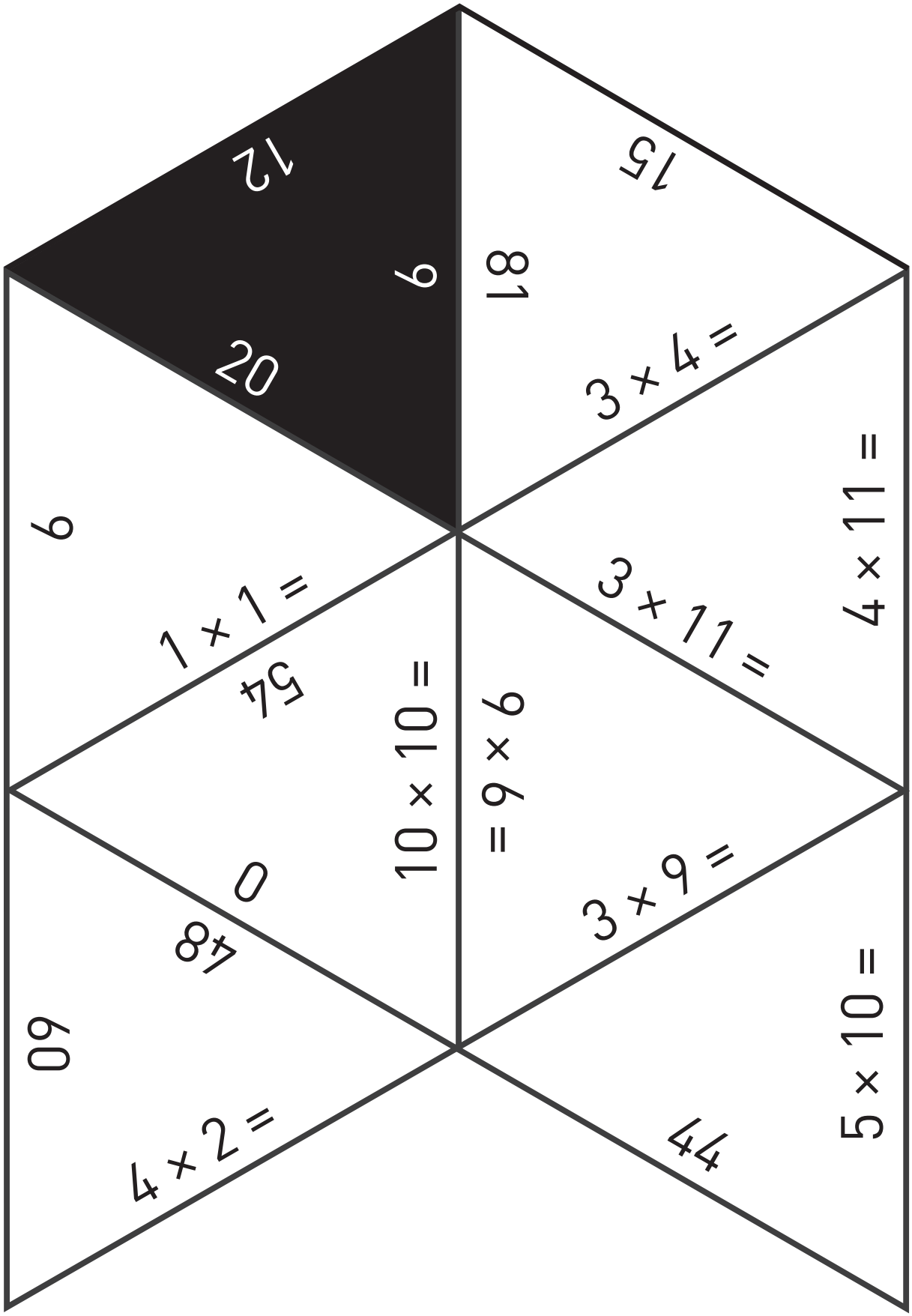
Card set B – *Representations*

					
3+3+3+3+3	2+2+2+2	4+4+4	4+4+4+4+4	6+6	5+5
8	15	12	10	20	12

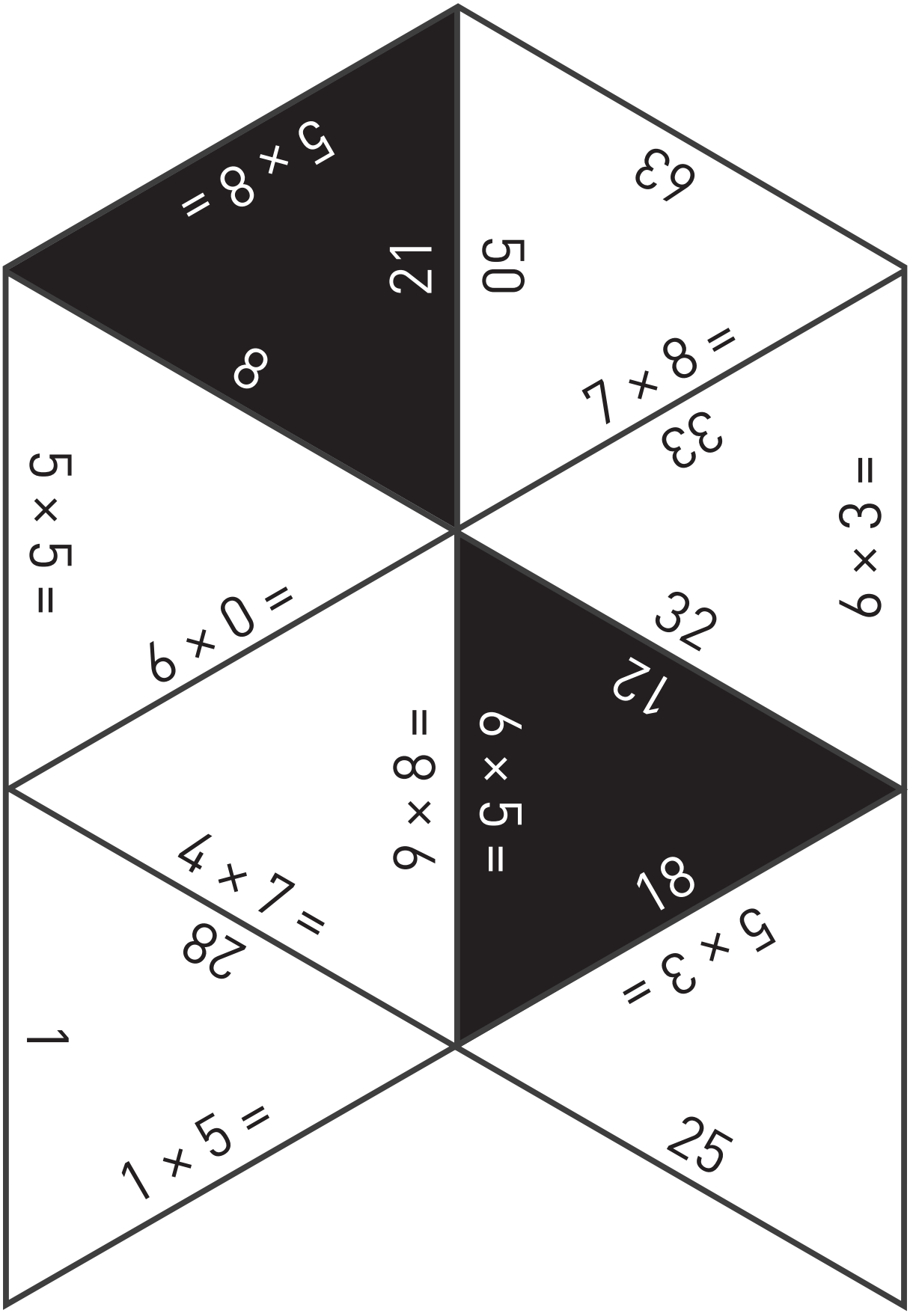
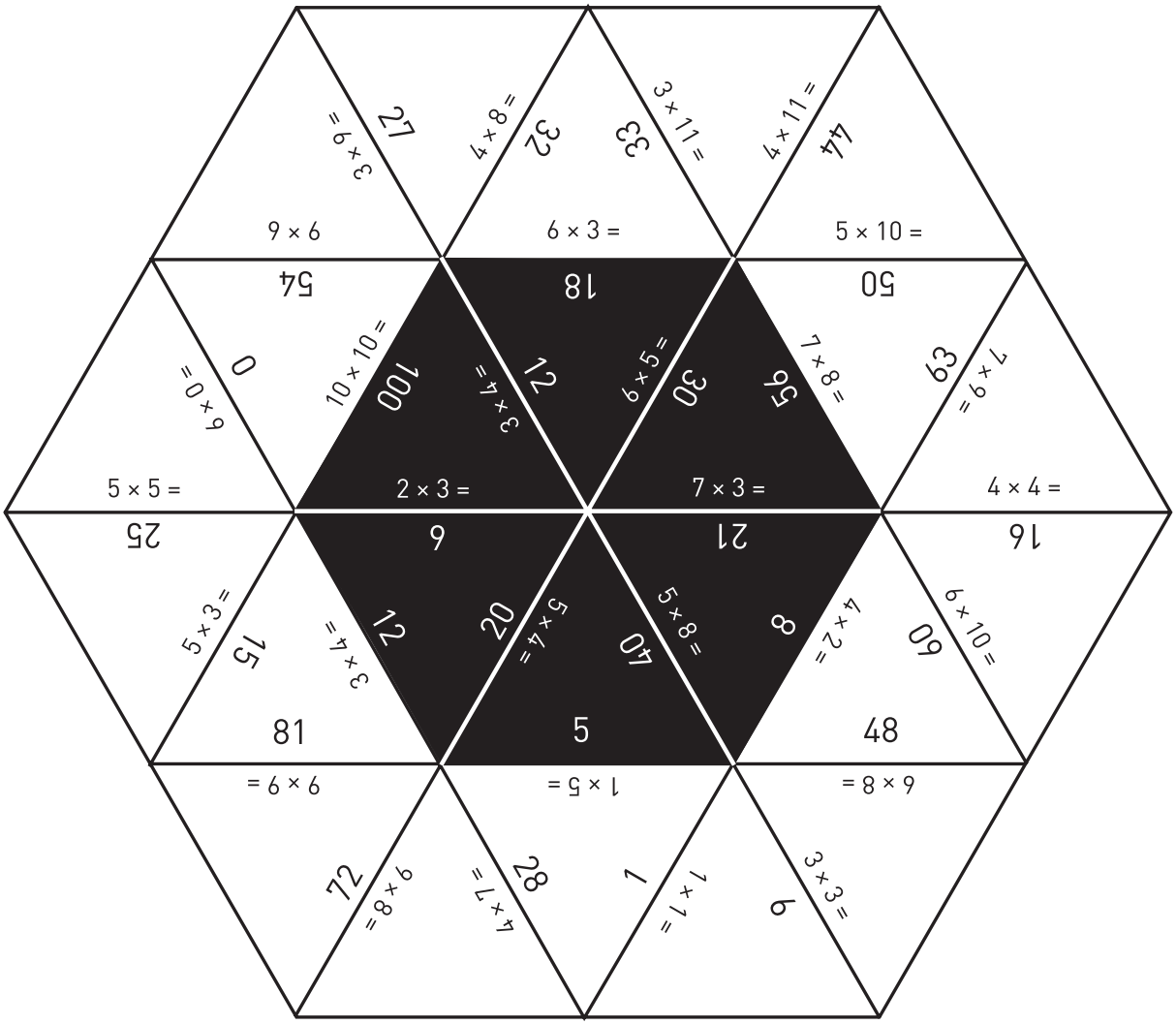
Card set C – *Hexagon jigsaw* (page 1 of 3)



Card set C – *Hexagon jigsaw* (page 2 of 3)



Card set C – *Hexagon jigsaw* (page 3 of 3)



Sheet 4 – *Solution*