

## Reasoning and Problem Solving

### Multiply and Divide by 9

#### Developing

- 1a. Jen has represented  $4 \times 8$  in her array. She needs to add another column of 4 counters to show  $4 \times 9$ .
- 2a. Aryan could have 90, 99 or 108 donuts. He might need 10 ( $90 \div 9 = 10$ ); 11 ( $99 \div 9 = 11$ ) or 12 ( $108 \div 9 = 12$ ) boxes.
- 3a. Zaina is not correct because she has 5 packs.  $5 \times 9 = 45$  crayons. Zaina and Mason have an equal number of crayons.

#### Expected

- 4a. Lois has added 3 counters which represents 10 lots of 3. She needs to add another row of 9 counters to represent  $4 \times 9$  to represent the answer of 36.
- 5a. Sue could have 54, 63 or 72 buns. She might need 6 ( $54 \div 9 = 6$ ), 7 ( $63 \div 9 = 7$ ) or 8 ( $72 \div 9 = 8$ ) boxes.
- 6a. Lexi is correct because she has 6 packs.  $6 \times 9 = 54$  stickers. Dylan has 63 stickers, so he has more.

#### Greater Depth

- 7a. Hassan's calculation would be:  
 $6 \times 9 = 54$  and  $3 \times 9 = 27$   
 $54 + 27 = 81$   
or  $6 + 3 = 9 \times 9 = 81$  which is not equal to  $10 \times 9 = 90$ .
- 8a. Connor could have filled 5, 6, 7 or 8 racks. He might have 45 ( $5 \times 9 = 45$ ), 54 ( $6 \times 9 = 54$ ), 63 ( $7 \times 9 = 63$ ) or 72 ( $8 \times 9 = 72$ ) bikes.
- 9a. Sophie is incorrect because she has 5 bags.  $5 \times 9 = 45$  sweets.  $45 + 18 = 63$  sweets in total. Armin has  $7 \times 9 = 63$  sweets so they each have an equal number.

## Reasoning and Problem Solving

### Multiply and Divide by 9

#### Developing

- 1b. Esa has represented  $6 \times 6$  with the number pieces. He needs to add 3 more 6s to show nine 6s and get the same answer of 54.
- 2b. Danielle could have 6, 7, 8, 9 or 10 bags. She might have 54 ( $6 \times 9 = 54$ ); 63 ( $7 \times 9 = 63$ ); 72 ( $8 \times 9 = 72$ ); 81 ( $9 \times 9 = 81$ ) or 90 ( $10 \times 9 = 90$ ) tennis balls.
- 3b. Finlay is incorrect because  $90 \div 9 = 10$ .

#### Expected

- 4b. Liam has removed the correct number of counters but he has arranged them to represent  $3 \times 3 = 9$ . He needs one row of 9 counters to represent  $1 \times 9 = 9$ .
- 5b. Josh could have used 9, 10, 11 or 12 crates. He might have packed 81 ( $9 \times 9 = 81$ ); 90 ( $10 \times 9 = 90$ ); 99 ( $11 \times 9 = 99$ ) or 108 ( $12 \times 9 = 108$ ) bottles of pop.
- 6b. Harry is correct because he has shared out 36 strawberries.  $36 \div 9 = 4$  bowls. Maisie has prepared 3 bowls which is fewer than Harry's 4 bowls.

#### Greater Depth

- 7b. Lily's calculation would be:  
 $12 \times 9 = 108$  and  $4 \times 9 = 36$   
 $108 - 36 = 72$ ;  
Or  $12 - 4 = 8 \times 9 = 72$  which is not equal to  $7 \times 9 = 63$ .
- 8b. Emily could have 72, 81, 90 or 99 biscuits. She might have 8 ( $72 \div 9 = 8$ ), 9 ( $81 \div 9 = 9$ ), 10 ( $90 \div 9 = 10$ ) or 11 ( $99 \div 9 = 11$ ) full jars.
- 9b. Jim is correct because Kat has given out 6 packs.  $54 \div 9 = 6$ . Jim has given out 7 packs which is more than Kat.