Multiplying and Dividing Word Problems

National Curriculum Objectives:

Mathematics Year 1: Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. More resources with this objective.
Mathematics Year 2: Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. More resources with this objective.
Mathematics Year 3: Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. More resources with this objective.
Mathematics Year 4: Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. More resources with this objective.
Mathematics Year 5: Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes. More resources with this objective.
Mathematics Year 5: Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. More resources with this objective.
Mathematics Year 6: Solve problems involving addition, subtraction, multiplication and division. More resources with this objective.

Differentiation:

Beginner Multiplication and division problems using knowledge of doubles and halves, and 2, 5 and 10 times tables. Aimed at Year 1 Mastery.
Easy Multiplication and division problems using knowledge of commutative law, doubles and halves, and 2, 5 and 10 times tables. Aimed at Year 2 Mastery.
Tricky Multiplication and division problems using knowledge of multiplication and place value, commutative law, doubles and halves, and 2, 5, 10, 3, 4 and 8 times tables. Aimed at Year 3 Mastery.
Expert Multiplication and division problems using knowledge of multiplication and place value, commutative law, doubles and halves, times tables up to 12x and multiplication and division of 2-digits or 3-digits by 1-digit. Aimed at Year 4 Mastery.
Brainbox Multiplication and division problems using knowledge of square numbers, multiplication and place value, commutative law, doubles and halves, times tables up to 12x and multiplication and division of 2-digits, 3-digits or 4-digits by 1-digit. Aimed at Year 5 Mastery.
Genius Multiplication and division problems using knowledge of area, conversion of unit measures, square numbers, multiplication and place value, commutative law, doubles and halves, times tables up to 12x and multiplication and division of 2-digits, 3-digits or 4-digits by 1-digit. Aimed at Year 6 Mastery.

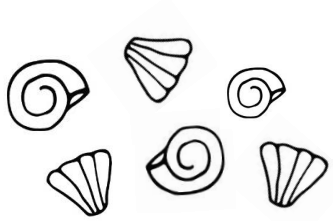
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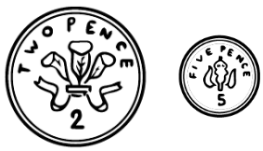
Multiplying and Dividing Word Problems

1. Ben starts at 4 and counts up in twos. Will he say 23? How do you know?

2. Nate has 20 shells. He shares them between his friends. How many friends can Nate share the shells with so that they get the same amount each?



3. Sam has 2p and 5p coins. How many different ways can he buy an ice cream for 27p?



4. Daniel says, 'half of 24 is more than double 6.'
Is Daniel correct? How do you know?

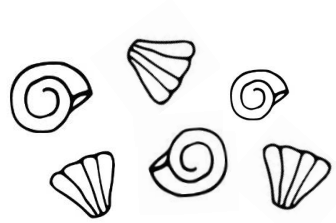
5. How many 5-a-side teams can be made from 30 children?

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Multiplying and Dividing Word Problems

1. Ben starts at 4 and counts up in twos. Will he say 23? How do you know? Ben will not say 23 as it not a multiple of 2.

2. Nate has 20 shells. He shares them between his friends. How many friends can Nate share the shells with so that they get the same amount each? 1, 2, 4, 5, 10 or 20 friends



3. Sam has 2p and 5p coins. How many different ways can he buy an ice cream for 27p?



- 5p + 2p + 2p + 2p + 2p + 2p + 2p + 2p + 2p + 2p + 2p + 2p
- 5p + 5p + 5p + 2p + 2p + 2p + 2p + 2p + 2p
- 5p + 5p + 5p + 5p + 5p + 2p

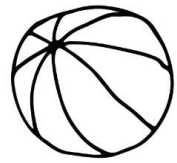
4. Daniel says, 'half of 24 is more than double 6.'
Is Daniel correct? How do you know? Daniel is not correct. Half of 24 is 12, which is equal to double 6.

5. How many 5-a-side teams can be made from 30 children?
6 teams

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Multiplying and Dividing Word Problems

6. A beach ball is on sale for 25p. Ali and Lisa want to share the cost of the beach ball equally between them. Are they able to do this? Explain your answer.



7. A rounders team needs 10 players. How many players do you need to make more teams? What do you notice about your answers?

8. Postcards cost 5p each or 26p for a pack of 6. Tom wants to buy 6. How much will he save by buying the pack of 6, rather than buying the single postcards?



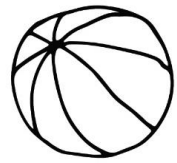
9. 10 sunflower seeds are planted in each flower bed. If there are 8 flower beds, how many seeds have been planted altogether?

10. Mikey can see 22 flip-flops. How many pairs of flip-flops is this?



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Multiplying and Dividing Word Problems

6. A beach ball is on sale for 25p. Ali and Lisa want to share the cost of the beach ball equally between them. Are they able to do this? Explain your answer.

No, 25 is not divisible by 2.

7. A rounders team needs 10 players. How many players do you need to make more teams? What do you notice about your answers? 1 team needs 10 players, 2 teams need 20, 3 teams need 30 etc. Number of players are multiples of 10.

8. Postcards cost 5p each or 26p for a pack of 6. Tom wants to buy 6. How much will he save by buying the pack of 6, rather than buying the single postcards? 4p



9. 10 sunflower seeds are planted in each flower bed. If there are 8 flower beds, how many seeds have been planted altogether?
80 seeds

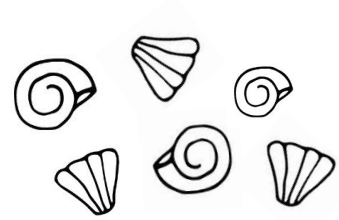
10. Mikey can see 22 flip-flops. How many pairs of flip-flops is this? 11 pairs of flip-flops



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Multiplying and Dividing Word Problems

1. Sally and Jack are collecting shells on the beach. Sally has twice as many as Jack. In total, they have 24 shells. How many does Jack have?



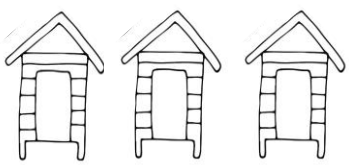
2. Jill buys 7 ice creams at £2 each. She pays with a £20 note. How many more ice creams can she buy with the money that she has left over?



3. Tom thinks of a number. He doubles the number and adds 1 to get 23. What is Tom's number?

4. Lisa organises 20 pebbles in rows of 5. How else could she organise the pebbles so that she still has full rows?

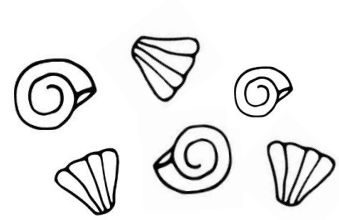
5. At the beach, the first 3 summer huts are numbered 10, 20 and 30. What will be the number of the ninth hut? Explain how you know.



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Multiplying and Dividing Word Problems

1. Sally and Jack are collecting shells on the beach. Sally has twice as many as Jack. In total, they have 24 shells. How many does Jack have? 8 shells



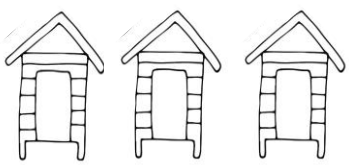
2. Jill buys 7 ice creams at £2 each. She pays with a £20 note. How many more ice creams can she buy with the money that she has left over? 3 ice creams



3. Tom thinks of a number. He doubles the number and adds 1 to get 23. What is Tom's number? 11

4. Lisa organises 20 pebbles in rows of 5. How else could she organise the pebbles so that she still has full rows? In rows of 1, 2, 4, 10 or 20

5. At the beach, the first 3 summer huts are numbered 10, 20 and 30. What will be the number of the ninth hut? Explain how you know. The hut numbers increase in multiples of 10, therefore the ninth hut will be 90.



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Multiplying and Dividing Word Problems

6. It costs £40 to enter a team competition at the local fayre. Seven children each pay £5. Do they have enough money to enter as a team? Show how you know.

7. Rob buys 3 buckets at £5 each and Tim buys 5 spades at £3 each. Who, if anybody, spends the most money? Explain how you know.



8. Jack finds four ways of making 12 using the number 6 and 2.

   6 x 2 2 x 6 6 + 6 2 + 2 + 2 + 2 + 2 + 2

   Find four ways of making 15 using the numbers 5 and 3.

9. Bobby and Lola want to play a game that involves sharing lollypop sticks equally between them. Lollypop sticks come in packs of 15, 18 or 21. Which size pack do you think they should get? Explain your choice.

10. A bag of tennis balls are shared out equally between 5 children. Each child gets the same amount. How many tennis balls could there have been? Could there be more than 1 possible answer?



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Multiplying and Dividing Word Problems

6. It costs £40 to enter a team competition at the local fayre. Seven children each pay £5. Do they have enough money to enter as a team? Show how you know. 7 x £5 = £35
They do not have enough money to enter as a team. They need an additional £5.

7. Rob buys 3 buckets at £5 each and Tim buys 5 spades at £3 each. Who, if anybody, spends the most money? Explain how you know. 5 x 3 = 3 x 5
Both Rob and Tim spend £15.



8. Jack finds four ways of making 12 using the number 6 and 2.
6 x 2 2 x 6 6 + 6 2 + 2 + 2 + 2 + 2 + 2

Find four ways of making 15 using the numbers 5 and 3.
5 x 3; 5 + 5 + 5; 3 x 5; 3 + 3 + 3 + 3 + 3

9. Bobby and Lola want to play a game that involves sharing lollypop sticks equally between them. Lollypop sticks come in packs of 15, 18 or 21. Which size pack do you think they should get? Explain your choice. 18, because it can be divided equally between the 2 players.

10. A bag of tennis balls are shared out equally between 5 children. Each child gets the same amount. How many tennis balls could there have been? Could there be more than 1 possible answer?
Any multiple of 5, e.g. 5, 10, 15, 20 etc.



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Multiplying and Dividing Word Problems

1. 8 times a number is 72, what is four times the number. How do you know?

2. Sarah is arranging the seats for the school's summer fate. At first, she arranges them in rows of 3 and has 1 left over. She then arranges them in rows of 4 and has none left over. How many chairs could she have started with?

3. Thomas is going away on holiday. He takes 4 t-shirts and 3 pairs of shorts. How many different outfits can he make? Show all answers. How do you know that you have all possible solutions?

4. Consider the calculation: ☐ x ☐ ☐
   Cassie fills the empty boxes with the digits 3, 4 and 5. Prove that the difference between the largest and smallest possible answers is 80.

5. Ruby visits a gift shop where she buys 3 badges for 17p each. She spends the rest of her money on bookmarks costing 7p each. How many bookmarks can she buy if she had £1 to start?

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Multiplying and Dividing Word Problems

1. 8 times a number is 72, what is four times the number. How do you know? 36 – four times a number will be half of 8 times the same number.

2. Sarah is arranging the seats for the school's summer fate. At first, she arranges them in rows of 3 and has 1 left over. She then arranges them in rows of 4 and has none left over. How many chairs could she have started with? 4, 16, 28, 40, 52, 64… etc. (any value within the sequence 12n – 8)

3. Thomas is going away on holiday. He takes 4 t-shirts and 3 pairs of shorts. How many different outfits can he make? Show all answers. How do you know that you have all possible solutions? 12 outfits

4. Consider the calculation: ☐ x ☐ ☐
   Cassie fills the empty boxes with the digits 3, 4 and 5. Prove that the difference between the largest and smallest possible answers is 80.
   Largest product: 5 x 43 = 215
   Smallest product: 3 x 45 = 135
   Difference: 215 – 135 = 80

5. Ruby visits a gift shop where she buys 3 badges for 17p each. She spends the rest of her money on bookmarks costing 7p each. How many bookmarks can she buy if she had £1 to start? 7 bookmarks

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Multiplying and Dividing Word Problems

6. Robert, Simon and Joe have each built a sandcastle. Robert's sandcastle is 4 times as tall as Simon's and 3 times as tall as Joe's. All castles are less than 1m in height. What could the heights of the 3 sandcastles be?

7. 3 boxes of lolly-pops are shared between 7 friends. If everyone gets 2 lolly-pops each and there is 1 left over, how many lolly-pops are there in each box?



8. In year 3, there are 50 children going on a school trip. If a mini bus can carry up to eight children. How many buses are needed altogether?

9. Rhian is arranging 48 pots of flowers in a rectangular patterns. Show that there are 10 different ways of arranging the pots of flowers.

10. Buckets cost £8 each, spades cost £6 each and footballs cost £12 each. Six friends buy 3 buckets, 4 spades and 2 footballs. They share the cost equally between them. How much do they each pay?





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Multiplying and Dividing Word Problems

6. Robert, Simon and Joe have each built a sandcastle. Robert's sandcastle is 4 times as tall as Simon's and 3 times as tall as Joe's. All castles are less than 1m in height. What could the heights of the 3 sandcastles be? The heights of Robert's, Simon's and Joe's sandcastles must be in the ratio of 12: 3: 4, e.g. 12cm, 3cm and 4cm respectively, or 24cm, 6cm and 8cm. All values must be under 1m.

7. 3 boxes of ice-lollies are shared between 7 friends. If everyone gets 2 ice-lollies each and there is 1 left over, how many ice-lollies are there in each box? 5 ice-lollies



8. In year 3, there are 50 children going on a school trip. If a mini bus can carry up to eight children. How many buses are needed altogether? 7 mini buses

9. Rhian is arranging 48 pots of flowers in a rectangular patterns. Show that there are 10 different ways of arranging the pots of flowers.
1 by 48, 2 by 24, 3 by 16, 4 by 12, 6 by 8 and their reversals: 48 by 1 etc.

10. Buckets cost £8 each, spades cost £6 each and footballs cost £12 each. Six friends buy 3 buckets, 4 spades and 2 footballs. They share the cost equally between them. How much do they each pay? £12

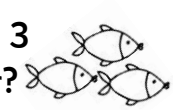




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Multiplying and Dividing Word Problems

1. Sally and Paul go on a fishing trip. Sally catches 7 fish. Paul catches 3 times as many fish as Sally. How many fish do they catch altogether?



2. 3 darts are thrown at a target board with numbers 1 to 30. Ruby throws 3 darts with a product of 24. Which 3 values did she hit with her darts? Find all possible solutions.

3. Jack is using a method to help him calculate 16 x 8.

   (1 + 6) x 8

   = (1 x 8) + (6 x 8)

   = 56

   He knows that his answer is not a sensible answer. Help Jack find the error in his work and correct the rest of his workings.

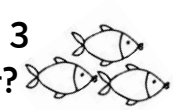
4. It costs £48 for 6 children to enter an amusement park. How much would it cost 4 children?

5. Two brothers are sent to the fairground with an equal amount of money. Ben has 25 50p coins. His brother Tommy has 5 10p coins and the remainder are all 20p coins. How many 20p coins does Tommy have?

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Multiplying and Dividing Word Problems

1. Sally and Paul go on a fishing trip. Sally catches 7 fish. Paul catches 3 times as many fish as Sally. How many fish do they catch altogether?



28 fish

2. 3 darts are thrown at a target board with numbers 1 to 30. Ruby throws 3 darts with a product of 24. Which 3 values did she hit with her darts? Find all possible solutions. 6 possible solutions: 1, 1, 24 or 1, 2, 12 or 1, 3, 8 or 1, 4, 6 or 2, 2, 6 or 2, 3, 4

3. Jack is using a method to help him calculate 16 x 8.

(1 + 6) x 8
(10 + 6) x 8
= (1 x 8) + (6 x 8)
= (10 x 8) + (6 x 8)
= 56
= 128

He knows that his answer is not a sensible answer. Help Jack find the error in his work and correct the rest of his workings.

4. It costs £48 for 6 children to enter an amusement park. How much would it cost 4 children? £32

5. Two brothers are sent to the fairground with an equal amount of money. Ben has 25 50p coins. His brother Tommy has 5 10p coins and the remainder are all 20p coins. How many 20p coins does Tommy have? 60

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6. Rupert and Ali are collecting shells at the beach. Altogether, they have collected 75 shells. Ali has collected 4 times as many shells as Rupert. How many less shells has Rupert collected than Ali?



7. A group of 13 friends rent umbrellas and deck chairs at the park. They rent 8 umbrellas at £6 each and 7 deck chairs at £8 each. They share the cost of all items equally between them. How much does each person pay?

8. 9 times a number is 153. What is 90 times the number?

9. Harry is preparing to run a marathon. Over five days, he runs for 132 minutes per day. How many hours is this?

10. During the summer sale event, shorts are sold for £15 each or 3 for £40. What is the least that you would pay for 14 shorts?



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Multiplying and Dividing Word Problems

6. Rupert and Ali are collecting shells at the beach. Altogether, they have collected 75 shells. Ali has collected 4 times as many shells as Rupert. How many less shells has Rupert collected than Ali? 45 shells



7. A group of 13 friends rent umbrellas and deck chairs at the park. They rent 8 umbrellas at £6 each and 7 deck chairs at £8 each. They share the cost of all items equally between them. How much does each person pay? £8 each

8. 9 times a number is 153. What is 90 times the number? 1530

9. Harry is preparing to run a marathon. Over five days, he runs for 132 minutes per day. How many hours is this? 11 hours

10. During the summer sale event, shorts are sold for £15 each or 3 for £40. What is the least that you would pay for 14 shorts? £190



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Multiplying and Dividing Word Problems

1. a) 8 times a number is 200. What is 80 times the number?
   b) 6 times a number is 8.4. What is 60 times the number?
   c) 70 times a number is 56. What is 7 times the number?
   Explain your answers to all parts.

2. Lizzie and Jane share 2690 beads equally between them. They create jewellery items to sell at the school fayre. Jane needs 7 beads per item and Lizzie needs 8 beads per item. Who, if anyone, will have the most number of beads left over?

3. Daniel gets €592.50 when he exchanges £500. He decides to exchange another £300. How much is this in Euros?

4. It takes 12 weeks for a sunflower to grow 15cm. How many minutes is this?

5. 14 x ☐ x ☐ = 1694
   The same number is missing from each box. What is the missing number?

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Multiplying and Dividing Word Problems

1. a) 8 times a number is 200. What is 80 times the number? 2000
   b) 6 times a number is 8.4. What is 60 times the number? 84
   c) 70 times a number is 56. What is 7 times the number? 5.6
   Explain your answers to all parts.

2. Lizzie and Jane share 2690 beads equally between them. They create jewellery items to sell at the school fayre. Jane needs 7 beads per item and Lizzie needs 8 beads per item. Who, if anyone, will have the most number of beads left over? Both Jane and Lizzie will have 1 bead left over.

3. Daniel gets €592.50 when he exchanges £500. He decides to exchange another £300. How much is this in Euros? €355.50

4. It takes 12 weeks for a sunflower to grow 15cm. How many minutes is this? 120,960 minutes

5. 14 x ☐ x ☐ = 1694
   The same number is missing from each box. What is the missing number? 11

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6. A tennis club wants to buy 1360 new tennis balls for a competition. They are bought in packs of 3. How many packs will the tennis club need to buy?



7. When Ian shares £45 equally between himself and seven of his friends, there is 4p left over. How much did each person get?

8. This year, Robert's dad is 11 times his age. Next year, his dad will be 9 times his age. How old will Robert be next year?

9. The first square number is 1 and the product of the first 4 square numbers is 576. What is the product of the first 5 square numbers? Explain your method.

10. The new £5 note has dimensions of 12.5cm by 65mm. Donna has £155 worth in £5 notes. She lies them all flat in a rectangular arrangement on the floor. What is the area of the rectangle covered by the £5 notes?

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Multiplying and Dividing Word Problems

6. A tennis club wants to buy 1360 new tennis balls for a competition. They are bought in packs of 3. How many packs will the tennis club need to buy? 454 packs



7. When Ian shares £45 equally between himself and seven of his friends, there is 4p left over. How much did each person get? £5.62

8. This year, Robert's dad is 11 times his age. Next year, his dad will be 9 times his age. How old will Robert be next year? 5 years old

9. The first square number is 1 and the product of the first 4 square numbers is 576. What is the product of the first 5 square numbers? Explain your method.
576 x 25 = 14,400

10. The new £5 note has dimensions of 12.5cm by 65mm. Donna has £155 worth in £5 notes. She lies them all flat in a rectangular arrangement on the floor. What is the area of the rectangle covered by the £5 notes? 2518.75 cm^2

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Multiplying and Dividing Word Problems

1. The area of a basketball court is $435m^2$. A netball court measures 30.5m long by 15.25m wide. How much smaller is the area of the basketball court than the area of the netball court?

2. Calculate:
$$\frac{(4 \times 5 \times 6 \times 7 \times 8)^2}{(4 \times 5 \times 6)^2}$$

3. John is thinking of a number. He says,
'My number multiplied by 23 is 1306.4. My number multiplied by 24 is 1363.2. Without using division, calculate John's number. Explain your method.

4. Adam, Catrin and Bobby make cupcakes to sell at the school fayre. The total cost of ingredients was £16. They sell the cupcakes at 75p each. How many must they sell in order to make a profit of over £25?

5. A bike has 2 chains: one small and one large. For every 7 turns of the large chain, the small chain makes 9 complete turns. On a bike ride, the large chain turns a total of 2492 times. How many full turns does the small chain make?

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Multiplying and Dividing Word Problems

1. The area of a basketball court is 435m^2. A netball court measures 30.5m long by 15.25m wide. How much smaller is the area of the basketball court than the area of the netball court? 30.125m^2

2. Calculate:

$$\frac{(4 \times 5 \times 6 \times 7 \times 8)^2}{(4 \times 5 \times 6)^2}$$

3136

3. John is thinking of a number. He says,
'My number multiplied by 23 is 1306.4. My number multiplied by 24 is 1363.2. Without using division, calculate John's number. Explain your method. 1363.2 – 1306.4 = 56.8

4. Adam, Catrin and Bobby make cupcakes to sell at the school fayre. The total cost of ingredients was £16. They sell the cupcakes at 75p each. How many must they sell in order to make a profit of over £25? 55 cupcakes

5. A bike has 2 chains: one small and one large. For every 7 turns of the large chain, the small chain makes 9 complete turns. On a bike ride, the large chain turns a total of 2492 times. How many full turns does the small chain make? 3204 turns

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6. Here are 2 different offers on tennis balls:
'Pack of 5 for £6.50' or 'pack of 8 for £12.'
A school wants 92 new tennis balls. Which deal is better and by how much?



7. James buys 8 ice-creams. All ice creams cost the same price. He pays with 1 note and gets £2.34 in change. Prove that James was not given the correct change.

8. Mark is thinking of 3 prime numbers. He multiples all 3 numbers and gets 231. What are the 3 numbers?

9. A holiday for 2 adults and 6 children costs £2434. A holiday for 4 adults and 6 children costs £3530. How much would a holiday cost for 3 adults and 5 children?

10. Kat is making a 'berry explosion' flavoured ice-lolly using a mixture of strawberry juice and raspberry juice in the ratio of 3:7. Each ice-lolly requires 150ml of the mixture. She has only 2.8 litres of raspberry juice but plenty of strawberry juice. How many ice-lollies can Kat make?

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6. Here are 2 different offers on tennis balls:
'Pack of 5 for £6.50' or 'pack of 8 for £12.'
A school wants 92 new tennis balls. Which deal is better and by how much?
Buying the tennis balls in packs of 5 is £20.50 cheaper than the alternative option.



7. James buys 8 ice-creams. All ice creams cost the same price. He pays with 1 note and gets £2.34 in change. Prove that James was not given the correct change.
If James paid with a £5 note, then the total cost, given the change, must have been £2.66.
If he paid with a £10 note, then the total cost, given the change, must have been £7.66.
If he paid with a £20 note, then the total cost, given the change, must have been £17.66.
If he paid with a £50 note, then the total cost, given the change, must have been £47.66.
None of these total costs are divisible by 8 (to give a whole pence) and therefore, James must have been given incorrect change.

8. Mark is thinking of 3 prime numbers. He multiples all 3 numbers and gets 231. What are the 3 numbers? 3, 7 and 11

9. A holiday for 2 adults and 6 children costs £2434. A holiday for 4 adults and 6 children costs £3530. How much would a holiday cost for 3 adults and 5 children? £2759

10. Kat is making a 'berry explosion' flavoured ice-lolly using a mixture of strawberry juice and raspberry juice in the ratio of 3:7. Each ice-lolly requires 150ml of the mixture. She has only 2.8 litres of raspberry juice but plenty of strawberry juice. How many ice-lollies can Kat make? 26 ice-lollies

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