Twos, Fives and Tens with Arrays

Teacher		**Class**	Year 2
Subject	Maths	**Topic**	The 2, 5 and 10 times tables
Date		**Room**	
Lesson length	60 minutes	**Country**	United Kingdom

Pupils recall 2, 5 and 10 facts and link them to odd and even. They build arrays, share equally and sort numbers.

Curriculum links

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face [1]
- Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition [1]

Learning objectives

- Students will recall multiplication facts for 2, 5 and 10 using arrays and repeated addition.
- Students will use division facts for 2, 5 and 10 by sharing and grouping equally.
- Students will recognise odd and even numbers to 20 from their ones digit.

Success criteria

- I can say 2, 5 and 10 multiplications and show them with an array.
- I can share equally to find division answers for 2, 5 and 10.
- I can sort numbers to 20 into odd and even groups.

What students already know

Chant together in 2s to 20, then 5s to 30, then 10s to 50. Hold up 1 finger for odd numbers you hear and 2 fingers for even numbers.

Key words

multiplication	joining equal groups together to find how many there are altogether
division	sharing equally into groups to find how many are in each group
array	cubes lined up in neat rows and columns to show a number sentence
multiple	an answer you get when you count in twos, fives or tens [4]
even	a number you can split into pairs with nothing left over [11]
odd	a number that leaves one left over when you try to make pairs

Materials

- Slides 1-5, 7, 9-12
- Worksheet page 3 and Worksheet page 5, one copy each per student

Before the lesson

- Print Worksheet page 3 and Worksheet page 5 for each student

- squared paper, cubes and multiplication cards for 2, 5 and 10
- number cards 1 to 20 and two hoops labelled odd and even
- mini whiteboards and pens

- Set out squared paper, cubes and multiplication cards for 2, 5 and 10 on tables for pairs
- Load Slides 1-5, 7, 9-12 and check the board can be seen by all
- Place number cards 1 to 20 and odd and even hoops at the front

Lesson outline

0–10 min **Starter** 10 min · Whole class

To recall counting in 2s and odd and even numbers and hook pupils into showing facts with arrays.

YOU DO

1. Show Slide 1 and say the hook: How can we see a times table question without counting on our fingers?
2. Show Slide 2 and chant together: Pairs! 2, 4, 6, 8... to 20, clapping each pair [11].
3. Show Slide 5 and ask: How do you spot even numbers? Model 6 cubes as three towers of 2 with nothing left over, then 7 cubes with one left over.
4. Sort number cards 1 to 10 with the class into odd and even hoops, leaving one cube unpaired for odd numbers to prove it.

STUDENTS DO

1. Chant in 2s to 20 and clap each number.
2. Vote odd or even for each number card and explain about pairs.
3. Repeat the hook question to a partner and say what an array could show.

Say: How can we see a times table question without counting on our fingers? Today we will build the answer so we can see it. Even numbers can be made into pairs with nothing left over. Odd numbers always leave one left over.

Worked example: 6 cubes make 3 towers of 2, so 6 is even because there is nothing left over. 7 cubes make 3 towers of 2 with 1 left over, so 7 is odd.

Ask: Why is 8 even? (It makes 4 pairs of 2 with nothing left over.) · Why is 9 odd? (It makes 4 pairs with 1 left over.) · What pattern do you hear in 2, 4, 6, 8...? (They are all multiples of 2 [11] and go up in twos.)

Check understanding: Hold up number cards 11 to 20 and ask odd or even on whiteboards. If unsure, build the number with cubes in towers of 2 to check for a leftover.

Support: Work only with numbers to 10 first and build each number with cubes in towers of 2. **Stretch:** Ask pupils to predict if 14 and 17 are odd or even from the ones digit, then check with cubes.

Use: Slides 1-2, 5

10–20 min **Teaching** 10 min · Whole class

To model 2, 5 and 10 multiplication facts and link them to repeated addition and division.

YOU DO

1. Show Slide 3 and model doubling: Times two is just doubling! and 2 x 3 means 3 + 3 = 6, because 2 times a number is just doubling the number [12].
2. Show Slide 4 and count: Watch 5, 10, 15, 20 grow, pointing out answers end in either 0 or 5 [12].
3. Show Slide 7 and model: 10, 20, 30! Just add a zero, because multiples of 10 all have a zero in the ones column [8].
4. Model the matching division for each fact on the board, such as 15 divided by 5 is 3.

STUDENTS DO

1. Join in counting 5, 10, 15, 20 and 10, 20, 30 and say the ones-digit pattern.
2. Repeat each fact and matching division after the teacher and show it with fingers as towers of 2.

Say: Two times a number is just doubling it. Fives always end in 5 or 0 when we count up. Tens are easy because we just write a zero after the number. Each multiplication has a matching division that undoes it.

Worked example: 3 rows of 5 cubes is 5 + 5 + 5 = 15, which is 3 lots of 5 [10]. So 3 x 5 = 15, where the row for 3 and column for 5 meet [4], and 15 divided by 5 = 3. For 10s, 10 x 3 = 30 [4] and 30 divided by 10 = 3 [4]. For 2s, 4 x 2 = 8 [4] and 8 divided by 2 = 4 [4].

Ask: What is 2 x 4 and how do you know? (8, because double 4 is 4 + 4 = 8.) · What is 5 x 3 and what division matches it? (15, and 15 divided by 5 = 3.) · Why is 30 in the 10 times table easy to spot? (Multiples of 10 all have a zero in the ones column [8].)

Check understanding: Ask all to write 5 x 2 = ? and 20 divided by 10 = ? on whiteboards. Reteach with cubes if more than a few write 12 or 10 for 5 x 2.

Support: Point to a large number line while chanting so pupils can see each jump land in 2s, 5s and 10s.
Stretch: Ask what numbers in the 10 times table are also in the 2 and 5 times tables [8], such as 20 and 30 [4].

Use: Slides 3-4, 7

20–40 min **Main activity** 20 min · Pairs

To recall 2, 5 and 10 facts by building, drawing and writing matching arrays and divisions.

YOU DO

1. Show Slide 9 and read the task: Make 4 groups of 2 cubes and Say 4 times 2 is 8.
2. Model 3 rows of 5 on squared paper, because multiplication and division relate to arrays and to repeated addition [1], counting 5 + 5 + 5 = 15.
3. Draw the array, write 3 x 5 = 15 where the facts meet in the grid [4], then write 15 divided by 5 = 3.
4. Give out multiplication cards for 2, 5 and 10 and send pairs to build, draw and write two facts per table.

STUDENTS DO

1. Pick a card, build the array with cubes on squared paper and say the fact aloud.
2. Draw the array, write the multiplication and the matching division as a fact family.
3. Swap cards with another pair and check each other's arrays and sentences.

Say: Make groups with cubes. Say the times fact. Build neat rows on the squares, then draw what you built. Write the multiplication under your drawing, then write the division that matches it.

Worked example: Pick 3 x 5. Build 3 rows of 5 cubes. Count 5 + 5 + 5 = 15. Draw 3 rows of 5 dots. Write 3 x 5 = 15 and 15 divided by 5 = 3. Pick 4 x 2. Build 4 groups of 2, say 4 times 2 is 8, write 4 x 2 = 8 and 8 divided by 2 = 4 [4]. Pick 3 x 10, write 10 x 3 = 30 [4] and 30 divided by 10 = 3 [4].

Ask: How does your array show 4 x 2 = 8? (4 rows of 2 cubes makes 8 altogether, 2 + 2 + 2 + 2 = 8.) · What division matches 3 x 5 = 15? (15 divided by 5 = 3.) · How is 5 x 2 the same as 2 x 5? (Numbers can be multiplied in any order [3], both make 10.)

Check understanding: Pairs hold up one array and read both sentences. Check the drawing matches the rows and the total. Rebuild together if the count is wrong.

Support: Start with only 2s arrays using two rows, since 2 times a number is just doubling the number [12].
Stretch: Build the same array turned sideways to show the matching fact, such as 5 rows of 3 for 15.

Use: Slide 9

40–50 min **Practice** 10 min · On their own

To practise sorting odd and even numbers and matching 2, 5 and 10 facts independently.

YOU DO

1. Give out Worksheet page 3 and explain: Colour by group: Sort the numbers into even and odd, checking the ones digit.
2. Give out Worksheet page 5 and explain: Matching: Read the sums and match the answers, writing both the multiplication and division where shown.
3. Set 4 minutes for each page, then ask pairs to compare answers and fix with cubes.

STUDENTS DO

1. Complete Worksheet page 3 by sorting numbers to 20 into odd and even groups.
2. Complete Worksheet page 5 by matching multiplications like 5 x 3 = 15 and divisions like 20 divided by 10 = 2 [4].
3. Compare with a partner and rebuild any fact with cubes if you disagree.

Say: First sort the numbers into even and odd. Even numbers end in 0, 2, 4, 6, 8. Then read each sum carefully and match it to the right answer. Check your match in the times tables grid if you are not sure.

Ask: Is 12 odd or even and how do you know? (Even, it ends in 2 and makes pairs with nothing left.) · Which answer matches 2 x 4? (8 [4].)

Check understanding: Scan worksheets for correct odd and even groups and matched totals. Pull a small group to rebuild 5 x 3 and 10 x 3 with cubes if errors persist.

Support: Give a half-finished 10s strip with tens digits done so pupils only fill in the zero in the ones column [8].
Stretch: Ask pupils to write the matching division next to each matched multiplication, such as 40 divided by 10 = 4.

Use: Worksheet page 3, Worksheet page 5

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50–60 min **Plenary** 10 min · Whole class

To check recall of 2, 5 and 10 facts and odd and even rules against the success criteria.

YOU DO

1. Show Slide 10 and chant: Even ends 0, 2, 4, 6, 8 and Odd ends 1, 3, 5, 7, 9, noting 10s are always even.
2. Show Slide 12 and run the Quick quiz: 2 x 4 = ?, 5 x 3 = ?, 20 divided by 10 = ?, Is 7 odd or even?, taking answers on whiteboards.
3. Show Slide 11 and vote: Which table is easiest? with 2 times table, 5 times table and 10 times table, asking pupils to justify with a fact.
4. Return to the three I can statements and ask pupils to show thumbs up if they can do each.

STUDENTS DO

1. Chant the odd and even endings and sort 7, 12 and 20 aloud as odd or even.
2. Answer the four quiz questions on whiteboards: 8, 15, 2, odd [4].
3. Vote for the easiest table and say one fact from it to a partner.

Say: Even numbers end in 0, 2, 4, 6 or 8. Odd numbers end in 1, 3, 5, 7 or 9. Tens are always even because they end in zero. Show me what you can do now without cubes.

Ask: Why is 7 odd? (Odd, it ends in 7 and leaves one left over in pairs.) · What is 20 divided by 10 and which multiplication helps? (2, because 2 x 10 = 20 [4].) · Why are numbers in the 10 times table also in the 2 and 5 times tables [8]? (20 and 30 [4] can be made in twos, fives and tens.)

Check understanding: Use whiteboard answers to the quiz as the hinge: if most get 5 x 3 = 15 and 20 divided by 10 = 2, move on; if not, rebuild 5 x 3 with cubes tomorrow.

Support: Let pupils keep one built array on the desk while answering the quiz to see the total. **Stretch:** Ask pupils to give the turned-around fact too, such as 3 x 5 = 15 and 5 x 3 = 15 [12].

Use: Slides 10-12

Common mistakes

Mistake	How to spot it	How to fix it
Thinks multiples of 5 always end in 5.	Says 20 cannot be in the 5 times table.	Chant 5, 10, 15, 20 [12] and colour ones digits to show answers end in either 0 or 5 [12].
Mixes up multiplication and division signs.	Answers 15 divided by 5 with 75 or 20 divided by 10 with 200.	Return to the array: build 15 as 3 rows of 5, then cover one row to show sharing, so 15 divided by 5 = 3 [4].
Decides odd or even from the tens digit.	Says 12 is odd because 1 is odd, or 17 is even because 7 looks like 1.	Check only the ones digit, because multiples of 2 always end with an even number [11]; build towers of 2 to prove the leftover.

Support

- Start with only 2s arrays using two rows, since 2 times a number is just doubling the number [12].
- Lay real cubes in rows and count in 2s, 5s or 10s before writing anything.
- Work with numbers to 10 first when sorting odd and even, then move to 20.

Stretch

- Build the same array turned sideways to show the matching fact, such as 5 rows of 3 for 15.
- Write all four facts for an array, including two divisions, such as 6 x 2 = 12 and 12 divided by 2 = 6.
- Predict if bigger numbers like 34 or 47 are odd or even from the ones digit, then check with cubes.

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For the LSE or teaching assistant

Stay with the main activity pairs. Pre-teach multiply, share and even with cubes. Prompt pupils to say each fact aloud as they build and to point to rows when writing the division.

Check for understanding

Question	Answer
What is 5 x 3?	15
What is 20 divided by 10?	2
Is 13 odd or even? How do you know?	Odd, it ends in 3 and leaves one left over in pairs.

Homework

Count in 2s, 5s and 10s to 50 and write one multiplication fact for each table.

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