

**PURPOSE AND
PROMPTS**

This will help children to make the link between dot arrays, counting in steps of three and multiplication facts.

UNIT 9 SUPPLEMENTARY TEACHING SEQUENCES

SEQUENCE 1

Building up 3 times table

RESOURCES:

ITP 'Multiplication Facts' (on the accompanying CD-ROM in ITPs Index)

Use the ITP 'Multiplication Facts' to build up the 3 times table as dot arrays. Set the shapes in the grid to counters and set the row button to 3. (This shows the 3s vertically).

Increase the column number and click on the rectangular array button to build up the array.

Click on the small arrow underneath each column and watch as jumps of three are made on the number line below.

Note that the multiplication fact is recorded as 3×4 , three multiplied by four or three taken four times, not three groups of four. This can cause confusion as the 3 times table is written $1 \times 3 = 3$, $2 \times 3 = 6$... and is read as 'one three is three', 'two threes are six ...' meaning 'two lots of three ...'

Discuss the fact that a three by five array can be interpreted as 'three multiplied by five' or 'five multiplied by three' (because multiplication is commutative), and that 3×5 can be read as 'three multiplied by five' or 'three lots of five'.

Click the question mark next to the calculation for the answer.

Q What is the product of 5 and 3?

Q What is 3 multiplied by 7?

Q I have nine cards with three buttons on each. How many buttons do I have?

Children could record their calculation and answer on whiteboards then use the ITP to check.

This activity could be extended to tables that are included in Year 5 objectives.

PURPOSE AND
PROMPTS

This will help children to use known facts to work out unknown facts.

$3 \times 7 / 7 \times 3$ is one of the trickier facts to remember.

UNIT 9 SUPPLEMENTARY TEACHING SEQUENCES

SEQUENCE 2

Using known facts to build up 3 times table

RESOURCES:

Counting stick or Excel spreadsheet 9.1 (on the accompanying CD-ROM) (Either the counting stick or the double number line on the spreadsheet can be used for this sequence.)

Explain that we are going to build up the 3 times table on the counting stick. Label 0 at the end and 3 on the first division.

Q If one three is three and I double three to get six, how many threes will that be?

Q If two threes are six and I double six, how many threes do I have now?

Establish that four threes are 12. Repeat doubling four threes to get eight threes.

Establish ten threes at the far end of the counting stick.

Q How can we use this to work out other facts in the 3 times table?

Q How can we use the facts already on the stick to calculate three threes?

Q How can we use this to work out six threes?

Can children use known facts to work out new facts?
e.g.

- halve ten threes to give five threes;
- subtract three from ten threes and we will have nine threes;
- add three to two threes to give three threes;
- double three threes to get six threes.

Q Have we worked out all the facts for the 3 times table?

Establish that the missing fact is seven threes.

Discuss ways of finding this fact using other facts on the stick, e.g. add three to six threes or subtract three from eight threes.

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Ask which they find easier and ask them to give a reason.

Q Which facts in the three times table are easy to remember?

Q Which are harder?

Make up rhymes and phrases to help children remember the harder statements, e.g. seven threes are twenty-one, scratch my head and suck my thumb!

Rehearse and learn using the counting stick as a visual. Remove numbers as children continue to rehearse.

This activity could be extended to tables that are included in Year 5 objectives.

SEQUENCE 3

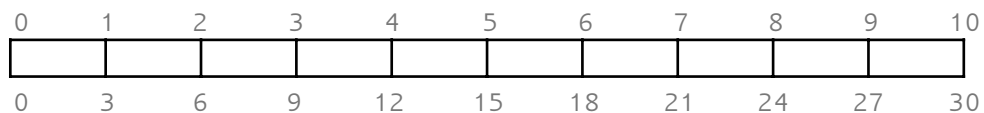
Linking multiplication and division

RESOURCES:

Counting stick or Excel spreadsheet 9.1 (on the accompanying CD-ROM) (Either the counting stick or the double number line on the spreadsheet can be used for sequence 3.)

This will help children to link multiplication and division facts.

Label a counting stick 0–10 with the multiples of three underneath.



This will help children to recall multiplication and division facts.

Rehearse multiplication facts in order. Rehearse division facts in order. (i.e. $0 \div 3 = 0$, $3 \div 3 = 1$, $6 \div 3 = 2$...)

Numbers can be removed as children continue to rehearse. You may need to remove the numbers 0–10 when practising division facts.

Ask the children multiplication and division questions.

Q What is the product of 5 and 3?

Q How many threes in 18?

Q What is 24 divided by 3?

Q What is 3 multiplied by 9?

Ask the children how they knew the answers. Repeat with similar questions and the counting stick hidden or numbers removed.

This activity could be extended to tables that are included in Year 5 objectives.

PURPOSE AND PROMPTS

This will help children link the array to a multiplication fact.

This will help children to visually see why the 6 times table is double the 3 times table.

UNIT 9 SUPPLEMENTARY TEACHING SEQUENCES

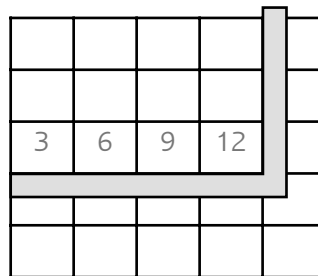
SEQUENCE 4

Building tables using arrays

RESOURCES:

Blank 10 × 10 grid
'L' shape mask

Use a blank 10 × 10 grid (part of one is shown here) and a reverse shape 'L' mask (as large as the 10 × 10 grid).



This shows four columns of three masked.

Mask off a column of three squares from the top left-hand corner. Count the squares and record in the bottom right-hand corner of the masked-off area. Repeat masking off two columns of three.

Q How many squares are in this array? How many columns of three?

Continue to mask off columns of three.

Q Do you know how many squares are in the array without counting each time? How?

Repeat the whole activity again on the same 10 × 10 grid but this time masking off columns of six. Record the total in each array in a new colour.

Q What do you notice about the two rows of numbers?

Look at the columns for the 6 times table being twice as long as those for the 3 times table.

Can children spot the patterns of doubles? e.g. can children see that the 3 times table facts can be doubled to create 6 times table facts?

This activity could be extended to tables that are included in Year 5 objectives, e.g. to the 9 times table, and repeated for the 2, 4 and 8 times tables on a new 10 × 10 grid.

**PURPOSE AND
PROMPTS**

This will help children identify the facts they need to learn.

Children need to be moving to recalling number facts.

This will provide opportunity for children to practise using multiplication facts and encourage children to use division facts alongside multiplication facts.

UNIT 9 SUPPLEMENTARY TEACHING SEQUENCES

SEQUENCE 5

Identifying facts to learn

RESOURCES:

Activity sheet 9.1 (*Springboard 5* page 107)

Ask children to complete the multiplication grid on Activity sheet 9.1. Discuss correct answers and ask children to circle incorrect answers.

Can children easily recall facts from 2, 5, and 10 times tables?

Q Which multiplication facts do you find hard to remember?

Q Can you think of ways to help you remember these?

Children may make up rhymes and phrases or create a set of flash cards to practise their target facts at home.

Extend the multiplication grid across the top to include all the numbers from 0–10, not in order, and repeat the activity above.

Note: If you want children to complete the activity sheet, Sequence 8 of this unit progresses towards the central section.

This sequence could be extended to tables that are included in Year 5 objectives.

SEQUENCE 6

Using multiplication facts

RESOURCES:

Number cards 0–10

Recap chosen table or build it on a counting stick (see Sequence 2).

Children choose six different multiples of the chosen table and write them down on a small whiteboard or paper.

Using number cards 0–10, children take it in turns to pick a card from the teacher's hand and read the number out loud. Children multiply the card number by the chosen table. If they have the answer they cross it out.

**PURPOSE AND
PROMPTS**

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Stop the group after four or five numbers have been called.

Q How many multiples have you crossed out?

Q Look at the multiples you have left. Which number would you like to be chosen next? Why?

Can children identify the factors of their chosen multiples, e.g. what number will we multiply by 3 to get 24?

The winner is the first to cross off all the six multiples. When this has happened challenge the rest of the group to tell you the number of cards left in your hand.

Q Which numbers are still in my hand? How do you know?

This activity could be extended to tables that are included in Year 5 objectives.

SEQUENCE 7

Using division facts

RESOURCES:

Cards displaying multiples of chosen table

This will provide opportunity for children to practise using division facts and encourage children to use multiplication facts alongside division facts.

Recap chosen table or build it on a counting stick (see Sequence 2).

Children choose six numbers from 0–10 and write them down on a small whiteboard or paper.

Using cards with multiples of the chosen table, the children take it in turns to pick a card from the teacher's hand and read the number out loud. Children divide the number by the chosen table. If they have the answer they cross it out.

Stop the group after four or five numbers have been called.

Q How many numbers have you crossed out?

Q Look at the numbers you have left. Which multiple would you like to be chosen next? Why?

PURPOSE AND PROMPTS

This will help children apply their tables knowledge to solve empty box problems.

This activity can be used with a multiplication table of your choice or with a mixed set of multiplication and division facts.

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Can children identify the multiples of their chosen factors, e.g. what number/multiple will we divide by 3 to get 8?

The winner is the first to cross off all six multiples. When this has happened challenge the rest of the group to tell you the number cards left in your hand.

Q Which multiples are still in my hand? How do you know?

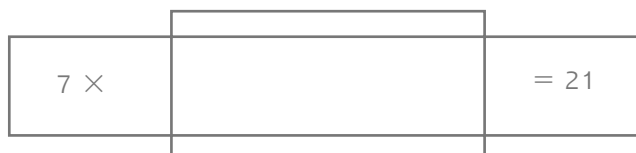
SEQUENCE 8

Empty box problems

Note: This activity would be best done prior to the central section of Activity sheet 9.1 in *Springboard 5* (page 107).

RESOURCES:

Set of multiplication and division facts on card and card sliders (as shown below) or Excel spreadsheet 9.2 (on the accompanying CD-ROM)



Create a set of prepared multiplication and division facts for your chosen table with a card slider that can be used to hide different parts of the equation. Consider creating some of them in the format $21 = 7 \times 3$.

Use the prepared cards or Excel spreadsheet to pose various problems, each time hiding part of the equation.

Q If I hide the operation sign and a number how do you know if it is multiplication or division?

Can children identify the missing number or operation by recalling multiplication or division facts?

Ask children to provide explanations for their answers.

**PURPOSE AND
PROMPTS**

This will help children apply their tables knowledge to solve problems.

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SEQUENCE 9

Word problems

Ask the children a selection of word problems involving multiplication and division. The following are examples of questions that could be used for the 3 times table.

For each problem you set ask:

Q How did you solve that problem?

Q Did you visualise anything?

Q Which multiplication or division facts helped?

You may want to ask children to work in pairs and discuss the word problems.

Q Clara is making triangles out of pipe cleaners and straws. How many pieces of pipe cleaner will she need to make six triangles?

Q Sam used 21 pieces of pipe cleaner. How many triangles did he make?

Q The perimeter of an equilateral triangle is 12cm. How long is each side?

Q Mum decorates each fairy cake with three sweets. If she uses 24 sweets how many cakes did she decorate?

Q Ben and his two friends are out playing on their tricycles. He counts the number of wheels they have between them. How many wheels does he count?

Q Chocolate bars are sold in packs of three. Myra has 18 chocolate bars in her fridge. How many packs did she buy?

Are children able to explain how they worked out answers? Can children decide whether they need to multiply or divide to solve the problem?

**PURPOSE AND
PROMPTS**

This will help children to link multiplication and division and use inverse operations.

UNIT 9 SUPPLEMENTARY TEACHING SEQUENCES

SEQUENCE 10

Using inverse operations

Ask the children a selection of 'What number am I?' type problems involving multiplication and division. The following are examples of questions that could be used:

Q If you multiply me by 3, I am 24. What number am I?

Q If you divide me by 3, I am 5. What number am I?

Ask children how they worked out (or knew) the answer. Encourage them to articulate their knowledge and use of multiplication and division facts.

Ask them to make up a problem of their own for a partner to solve.

Can children solve the problem by working backwards and using the inverse operation?

This activity could be extended to tables that are included in Year 5 objectives.