# Does not link counting up in equal steps to the operation of multiplication; does not use the vocabulary associated with multiplication

***Opportunity for: reasoning about numbers***

***Resources***

- Pendulum (or metronome or string with bob attached)
- Sets of 2- and 10-dot cards (Resource sheet 30)
- *Swing cards* (Resource sheet 31)
- Mini whiteboard

***Key vocabulary***

multiplied by
altogether
steps of two
steps of ten

## Teaching activity

**Time** 20 minutes

Explain to the child that this activity is going to help them to learn more about multiplying.

Show the pendulum to the child and model counting in twos. Repeat counting with the child, stopping when twelve is reached.

? **What is the size of the steps we are counting in?**

If the child recognises steps of two, confirm the answer and move on.

Place on the table a digit card with a large number 2. Next to this place a pack of 'swing' cards. Each card is labelled with a different number of swings. Place the '3 swings' card on the top of the pack.

| 2 | 3 swings |
|---|---|

Model this by counting two for each swing of the pendulum for three swings ('two and two and two').

? **How many have I counted altogether?**

'Repeat this with me: two and two and two. That is two multiplied by three.'

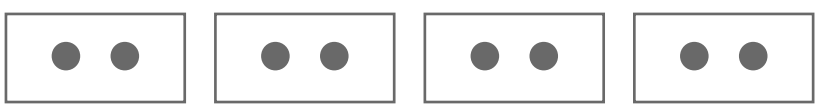
Now place the '4 swings' card on the top of the pack.

? **What's the size of step we are counting in?** *(2)*

? **Look at the swing card. How many times are you going to swing the pendulum?** *(4)*

'Now we are doing four swings: two and two and two and two. So that is two multiplied by four.'

| 2 | 4 swings |
|---|---|



Repeat using other swing cards.

If the child cannot relate cards to pendulum swings, initially reinforce the step size by modelling the counting in twos (using the 2-dot cards) while the child counts the swings.

Say, 'I counted in twos and multiplied by (number of swings).'

? **What is the step size shown on each card?** *(2)*

? **How many steps or swings will we count?**

Repeat the activity, asking the child to choose different swing cards to illustrate this.

Use a whiteboard to show how the multiplications can be recorded, relating each to the pendulum model, reinforcing the language of step size (2) and swings.

$2 \times 1 = 2$ • •

$2 \times 2 = 4$ • • • •

$2 \times 3 = 6$ • • • • • •

If the child cannot see the relationship between written multiplication and dot representation, use the 2-dot cards to make a careful match between the step size and the multiplication, for example:

• • • • • • '2 multiplied by 3', which is written as $2 \times 3$,

and demonstrate the recording to match.
Give the child other sets of 2-dot cards, and ask them to write a multiplication to match each set.

If the child is confident with the representation of step size and number of steps, repeat the activity using the pendulum and 10-dot cards.

? **What shall we write down to remember for next time?**

# Spotlight 1

Does not link counting up in equal steps to the operation of multiplication; does not use the vocabulary associated with multiplication

***Opportunity for: recognising relationships***

## Toy jumps

**Time** 15–20 minutes

***Resources***

- Digit card for the number 2 (Resource sheet 1)
- Sets of 2- and 10-dot cards (Resource sheet 30)
- Number line
- Small character toy
- Mini whiteboard

***Key vocabulary***

multiplied by
steps of two
steps of ten
altogether
jump

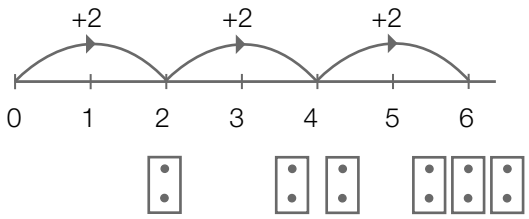
### Teaching activity

Explain to the child that this activity is going to help them to learn more about multiplying by two.

Put a digit card showing 2 on the table and ask the child to put three of the 2-dot cards together.

? **Look at the three sets of dots. How many dots are there altogether?**

Support the child counting up in twos: two, four, six …




Now use a small character toy to jump along a number line in jumps of two, counting in twos up to 6.

? **How many jumps did the toy make?**

? **How far did the toy jump altogether?**

Ask the child to jump the toy along the number line in jumps of two, stopping at 12. As the child moves the toy, reinforce the associated vocabulary by saying 'two multiplied by one', 'two multiplied by two', etc. to mirror the toy's movement along the number line.

? **How many jumps did the toy make?**

Write the associated multiplication on a whiteboard, i.e. $2 \times 6$. 'We say this as "two multiplied by six".' Ask the child to show the toy jumping along the number line again.

> If the child cannot do this, show them four jumps of two and make the connection to two multiplied by four, writing the associated multiplication as $2 \times 4 = 8$.

Now or another time you might want to repeat this with 10-dot cards.

? **Let's write down the words we said today when we had six lots of two dots.**

two multiplied by six

# Spotlight 2

Does not link counting up in equal steps to the operation of multiplication; does not use the vocabulary associated with multiplication

***Opportunity for: exploring mathematical language***

## Interlocking bricks

**Time** 15–20 minutes

***Resources***

- Set of 2- and 10-dot cards (Resource sheet 30)
- Interlocking construction bricks with pairs of prongs (e.g. Lego, Duplo)

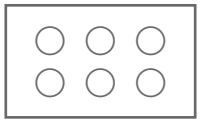
***Key vocabulary***

multiplied by
altogether
steps of two
steps of ten

## Teaching activity

Explain to the child that this activity is going to help them to learn more about multiplying by two.

Using a brick with pairs of prongs, count in twos, moving along the brick to correspond with the counting.

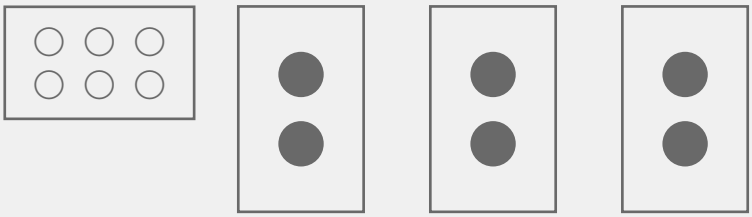


Show the number of prongs altogether on the brick by counting up in twos, for example, 'two, four, six, so there are six prongs altogether'. With the child, chant 'I've got two, one times', 'I've got two, two times', 'I've got two, three times'. Say that this is 'two multiplied by three'.

2 multiplied by 3

$2 \times 3$

If the child has difficulty with counting in twos across the brick, show the connection between the brick pattern and the 2-dot cards used in the opening teaching sequence. For example:



**two multiplied by three**

**$2 \times 3$**

Select another brick (or pair of bricks, placed end on), and repeat the activity. Explain that the child has to count across the brick(s), in twos, to find out how many prongs there are altogether. Support the child in counting in twos to find the total number of prongs on the brick(s).

? **How many twos are there on the brick(s)?**

? **How many prongs are there altogether on the brick(s)?**

? **Tell me how we said this as a multiplication. Show me how to write this.**

Repeat the activity with different sizes of brick or combinations of bricks.

? **Tell me what you know about how we say and write multiplications.**

# Spotlight 3

Does not link counting up in equal steps to the operation of multiplication; does not use the vocabulary associated with multiplication

***Opportunity for: exploring patterns***

## Tapping pattern

**Time** 10–15 minutes

***Resources***

- Small tub of paint
- Paper

***Key vocabulary***

multiplied by
altogether
steps of two
steps of ten

## Teaching activity

Explain to the child that this activity is going to help them to learn more about multiplying.

Help the child to understand two multiplied by three by tapping two fingers on the edge of the table, three times. Repeat this and explain that you are counting in twos, 'two, four, six'.

? **How many fingers did I tap each time?**

? **How many times did I tap my fingers?**

? **How many fingerprints did I leave on the table?**

Support the child in recording the tapping pattern as $2 \times 3 = 6$.

> If the child has difficulty visualising the 'fingerprints', use paint on two fingers to leave an image on paper as the finger tapping is done.

Repeat the activity varying the number of two-finger taps.

If the child is confident with two as a step size, repeat the activity using both hands to show a step size of ten.

? **Tell me something you liked doing today.**

# Spotlight 4

Does not link counting up in equal steps to the operation of multiplication; does not use the vocabulary associated with multiplication

***Opportunity for: solving real-life problems***

## Socks

**Time** 10–20 minutes

***Resources***

- Cubes or socks

***Key vocabulary***

multiplied by
steps of two
pairs
altogether
how many?

### Teaching activity

Explain to the child that this activity is going to help them to learn more about multiplying.

Tell a story explaining that Joe's mum wants to buy him enough pairs of socks so that he has a different pair for each day in the school week. She wants to know how many socks she will need to buy altogether.

? **How many socks are there in a pair?**

? **How many days are we at school in a week?**

Ask the child to draw a representation of this and find the total number of socks which Joe's mother needs to buy. Discuss the child's representation, ensuring that the drawing clearly distinguishes between pairs of socks and the number of pairs needed.

? **What multiplication can you write to match this story?**

Support the child in writing:

2 multiplied by 5

$2 \times 5$

Ask the child to think of other items that usually come in twos (or tens). Give a multiplication statement and ask the child to think of a story to match the statement, for example, $10 \times 6$.

'Seeds come in packets of ten, and I want to buy six packs. How many seeds will I have altogether?'

If the child cannot create his/her own story, provide a suitable story. Support the child in representing the story with a drawing, before linking in the associated multiplication calculation.

? **I wonder if you can you write a number sentence for two multiplied by six? Well done!**

# Spotlight 5: a learning check

Does not link counting up in equal steps to the operation of multiplication; does not use the vocabulary associated with multiplication

***Opportunity for: explaining and discussing***

## Match it

**Time** 15–20 minutes

***Resources***

- *Match it cards and game board* (Resource sheet 32)
- At least one other child
- Timer

***Check: does the child use key vocabulary?***

| | |
|---|---|
| multiplied by | steps/jumps of two |
| altogether | groups of two |

## Teaching activity

Cut out the cards from the board on Resource sheet 32 (*Match it cards and game boards*), so that each card is separate. You can cut the board into three or keep the sections together. This is a cooperative game for children to play in pairs.

'Today we are playing a game called **Match it**, and you will have to think hard about all the work we have been doing on multiplication.'

***How to play***

1. Lay all the cards face up on the table near the board.
2. Everyone looks carefully at the three sections on the board and counts how many items there are in each section.
3. Players then pick up a card that they think they can match with a picture. For example, 'I've got two, three times' goes with the number line jumps of two, so that card is put next to that part of the board.

? **Why do you think that card goes with that picture?**

4. Play continues until every card is next to a picture on the board.

***Variations***

- Set a timer and see how long it takes them to do it. Then they have to do it again and try to beat their personal best.
- Ask the players to draw three different pictures and make their own cards. Then see how long a friend takes to place all the new cards.
- The players could make some cards that don't go with the pictures and try to trick their friends.

***Learning outcomes***

By the end of this set of activities, children should be able to:

- tackle related learning tasks with increased motivation and confidence;
- use and understand connected mathematical vocabulary;
- link counting in equal steps to multiplication by the number of steps;
- record a simple multiplication using the correct vocabulary to describe the symbols recorded.

# Notes