[ M A T H S   P R O B L E M ]

# FACTORS AND MULTIPLES

Students often confuse factors and multiples,
and respond with one when they mean the other

**In this lesson, students examine factors and multiples *together*, comparing and contrasting them, so as to appreciate their connections and differences.**

## THE DIFFICULTY

This task is intended to bring to the surface any confusions that students may have concerning factors and multiples.

*Find four different numbers that could go into these boxes to make the wheel statements true:*

is a multiple of

is a factor of

is a factor of

is a multiple of
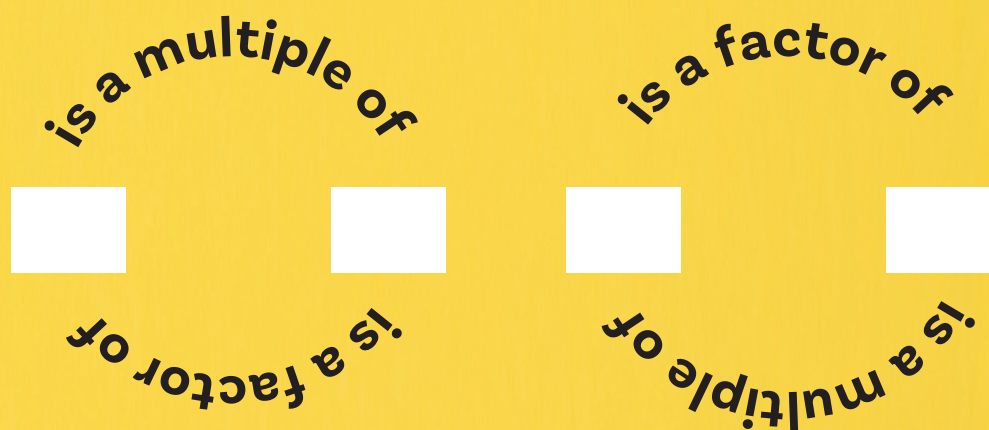
For example, students might give the numbers 10, 5, 3, 12. Look out for students putting the numbers the wrong way round, indicating that they are muddling up factor and multiple.

## THE SOLUTION

Factors 'go into' numbers, and so are (nearly) always smaller.

Multiples are made by taking 'multiple' copies of the number, so are (nearly) always bigger.

You could ask:
*Is a multiple of a number always greater than that number?*

Yes, except that any number is always a multiple of itself.

*Is a factor of a number always less than that number?*

Yes, again, except that any number is always a factor of itself.

Now ask students to make up wheel statements, with four different box numbers, like the one above. But, this time, can the four numbers:

• all end in a 3?

• all end in a 1?

• all be greater than 20 but less than 50?

• all add up to 100?

What other possible constraints can students think of?

**Checking for understanding**

*For each of these statements, say from 0 to 100% how sure you are that it's true. If you're absolutely sure it's true, write 100%. If you're absolutely sure it's false, write 0%. If it's somewhere in between, write a number between 0% and 100%.*

**a)** 3 is a factor of 6      **b)** 6 is a factor of 3

**c)** 8 is a multiple of 2    **d)** 2 is a multiple of 8

**e)** 9 is a factor of 1      **f)** 1 is a factor of 9

**g)** 1 is a multiple of 20   **h)** 20 is a multiple of 1

The answers are: a) T; b) F; c) T; d) F; e) F; f) T; g) F; h) T

You could just go through the answers, or alternatively, you could 'negative mark', so that the student's total score is the sum of the confidence percentages they gave to the true questions, *minus* the sum of the confidence percentages they gave to the false questions.

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