Maths

Fractions

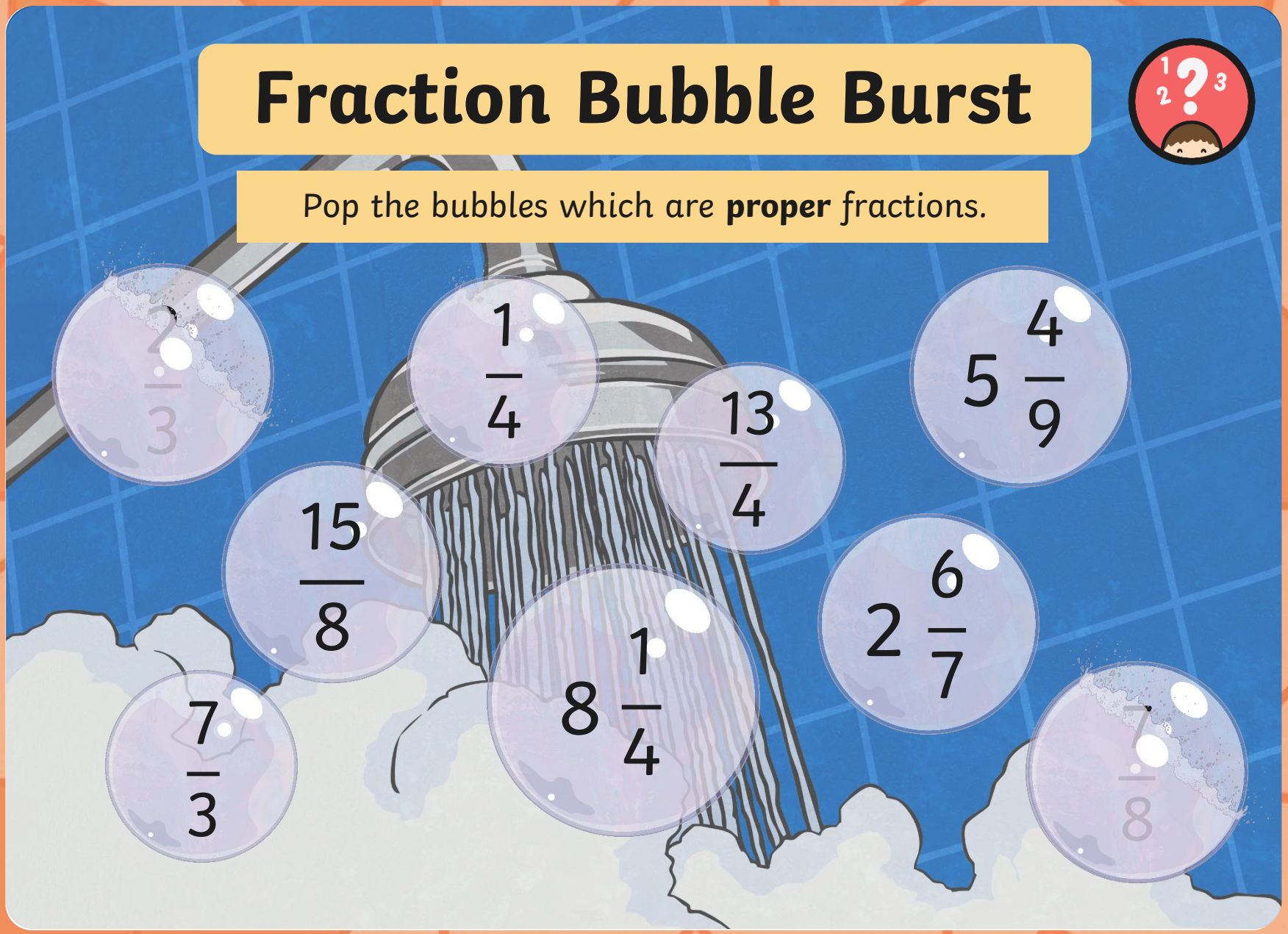
Multiplying Mixed numbers

In this lesson you will:

- understand that multiplication is the same as repeated addition.
- use fraction diagrams to multiply fractions by whole numbers.
- convert between improper fractions and mixed numbers.

Fraction Bubble Burst

Pop the bubbles which are **proper** fractions.



Fraction Bubble Burst

Pop the bubbles which are **improper** fractions.

$\frac{1}{4}$

$\frac{2}{3}$

$\frac{13}{4}$

$8\frac{1}{4}$

$\frac{15}{8}$

$5\frac{4}{9}$

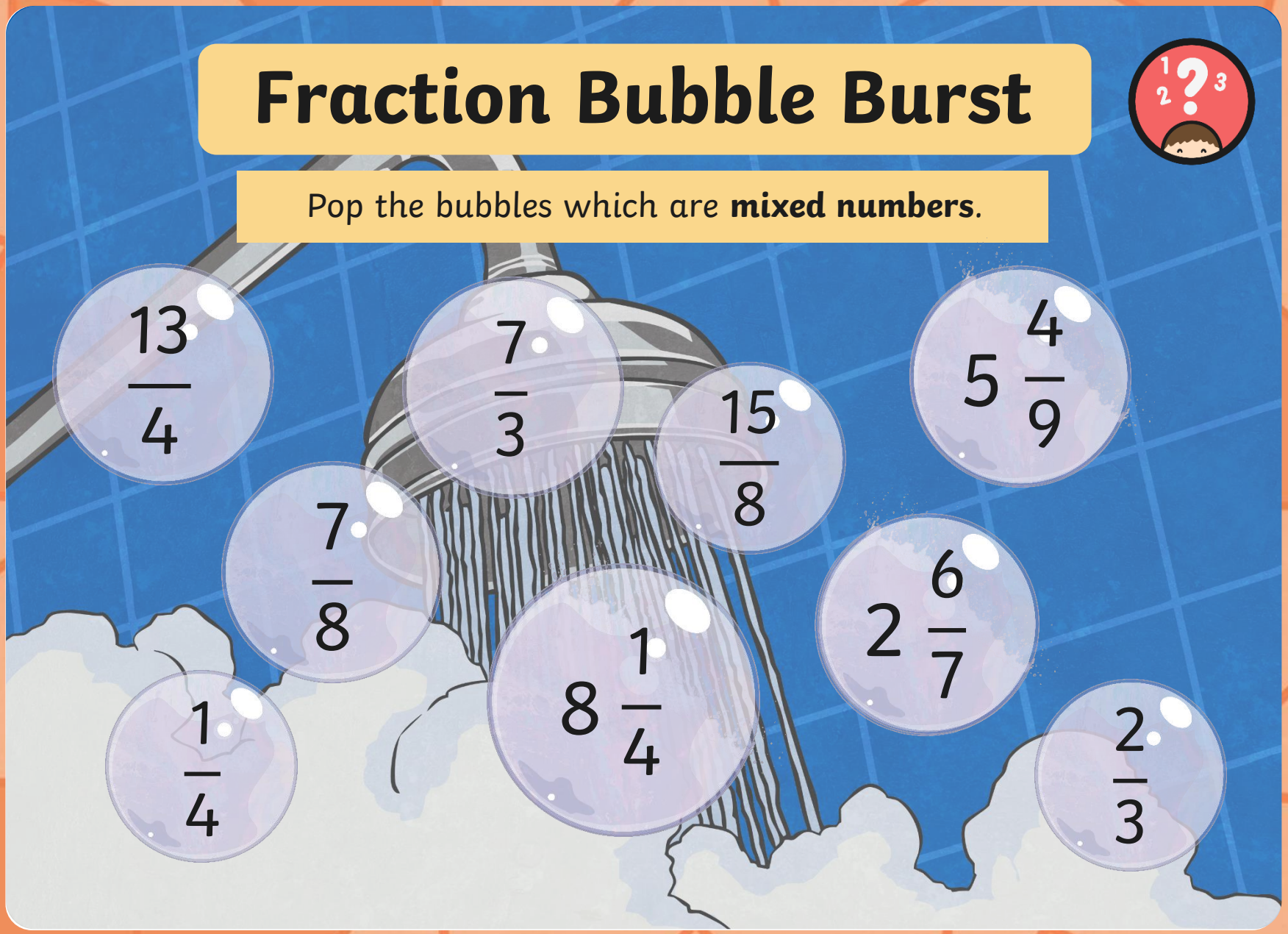
$2\frac{6}{7}$

$\frac{7}{8}$

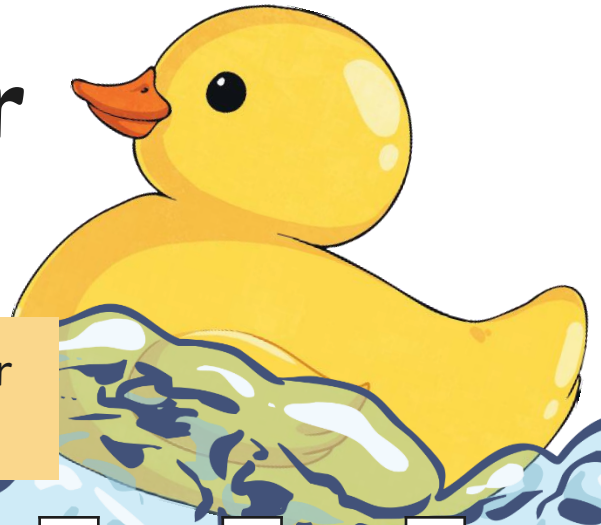
$\frac{7}{3}$

Fraction Bubble Burst

Pop the bubbles which are **mixed numbers**.



Multiplying Proper Fractions



Multiplying a fraction by a whole number is the same as repeated addition.

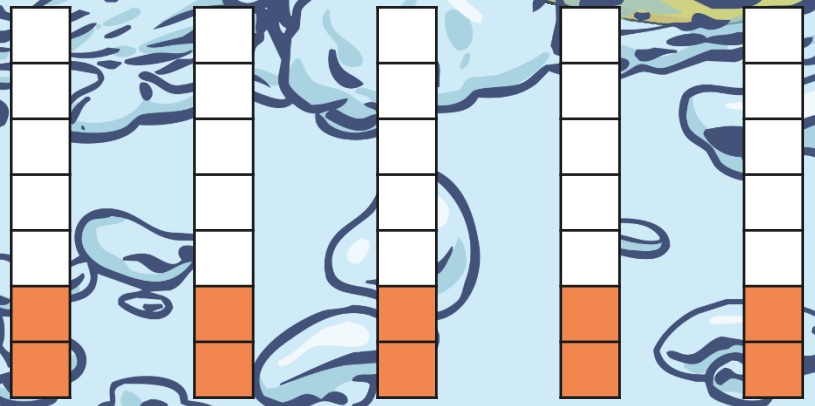
The numerator is multiplied by the whole number.

$2 \times 5 = 10$

$$\frac{2}{7} \times 5$$

The denominator is multiplied by one.

$7 \times 1 = 7$



$$\frac{2}{7} + \frac{2}{7} + \frac{2}{7} + \frac{2}{7} + \frac{2}{7} = \frac{10}{7}$$

Multiplying Proper Fractions

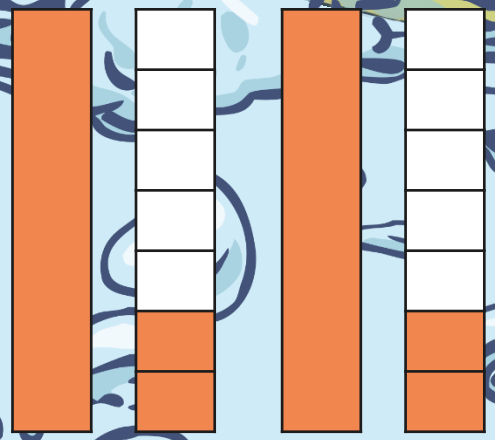
There are different strategies to multiply a mixed number by a whole number. One strategy is repeated addition.

The numerator is multiplied by the whole number.
$2 \times 2 = 4$

$1\frac{2}{7} \times 2$

The whole is multiplied by the whole number.
$1 \times 2 = 2$

The denominator is multiplied by one.
$7 \times 1 = 7$



$1\frac{2}{7} + 1\frac{2}{7} = 2\frac{4}{7}$

Multiplying Mixed Numbers

To multiply a mixed number by a whole number, you can also change the mixed number into an improper fraction.

In this mixed number, every whole is made of four parts.
$(2 \times 4) + 1 = 9$

The numerator is multiplied by the whole number.
$9 \times 2 = 18$

This answer is an improper fraction. We need to change it to a mixed number.

$$2\frac{1}{4} \times 2 = \frac{9}{4} \times 2 = \frac{18}{4} = 4\frac{2}{4}$$

The denominator is multiplied by one.
$4 \times 1 = 4$

$18 \div 4 = 4$ r 2

Multiplying Mixed Numbers

To multiply a mixed number by a whole number, you can also change the mixed number into an improper fraction.

In this mixed number, every whole is made of four parts.
$(1 \times 7) + 4 = 11$

The numerator is multiplied by the whole number.
$11 \times 3 = 33$

This answer is an improper fraction. We need to change it to a mixed number.

$$1\frac{4}{7} \times 3 = \frac{11}{7} \times 3 = \frac{33}{7} = 4\frac{5}{7}$$

The denominator is multiplied by one.
$7 \times 1 = 7$

$33 \div 7 = 4$ r 5

Multiplying Mixed Numbers

Another strategy to multiply a mixed number by a whole number is to partition the whole and the fraction.

Partition the mixed number into a whole and a fraction.

$$2\frac{5}{6} \times 4$$

Multiply the whole and then multiply the fraction.

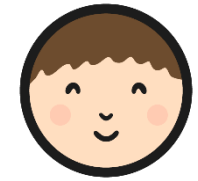
$$2 \times 4 = 8$$

$$\frac{5}{6} \times 4 = \frac{20}{6}$$

Add them back together to find the answer.

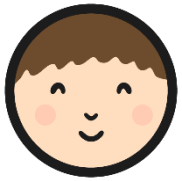
$$8 + \frac{20}{6} = 8\frac{20}{6} = 11\frac{2}{6} \text{ or } 11\frac{1}{3}$$

Lets have a go



$1\frac{1}{3} \times 4 =$	$1\frac{1}{4} \times 5 =$
$1\frac{1}{6} \times 3 =$	$1\frac{3}{8} \times 4 =$
$1\frac{1}{5} \times 2 =$	$1\frac{2}{3} \times 2 =$

Were you correct?



$1\frac{1}{3} \times 4 = \frac{4}{3} \times 4 = \frac{16}{3} = 5\frac{1}{3}$	$1\frac{1}{4} \times 5 = \frac{5}{4} \times 5 = \frac{25}{4} = 6\frac{1}{4}$
$1\frac{1}{6} \times 3 = \frac{7}{6} \times 3 = \frac{21}{6} = 3\frac{3}{6}$	$1\frac{3}{8} \times 4 = \frac{11}{8} \times 4 = \frac{44}{8} = 5\frac{4}{8}$
$1\frac{1}{5} \times 2 = \frac{6}{5} \times 2 = \frac{12}{5} = 2\frac{2}{5}$	$1\frac{2}{3} \times 2 = \frac{5}{3} \times 2 = \frac{10}{3} = 3\frac{1}{3}$

Word Up

Four friends shared a takeaway.

Each person ate $1\frac{2}{3}$ pizzas each.

How much pizza was eaten in total?

$$1\frac{2}{3} \times 4 = \frac{5}{3} \times 4 = \frac{20}{3} = 6\frac{2}{3}$$

Word Up

Six friends took part in a sponsored swim.

They each swam $1\frac{5}{8}$ km.

How many kilometres did they swim in total?

$$1\frac{5}{8} \times 6 = \frac{13}{8} \times 6 = \frac{78}{8} = 9\frac{6}{8}\text{ km}$$