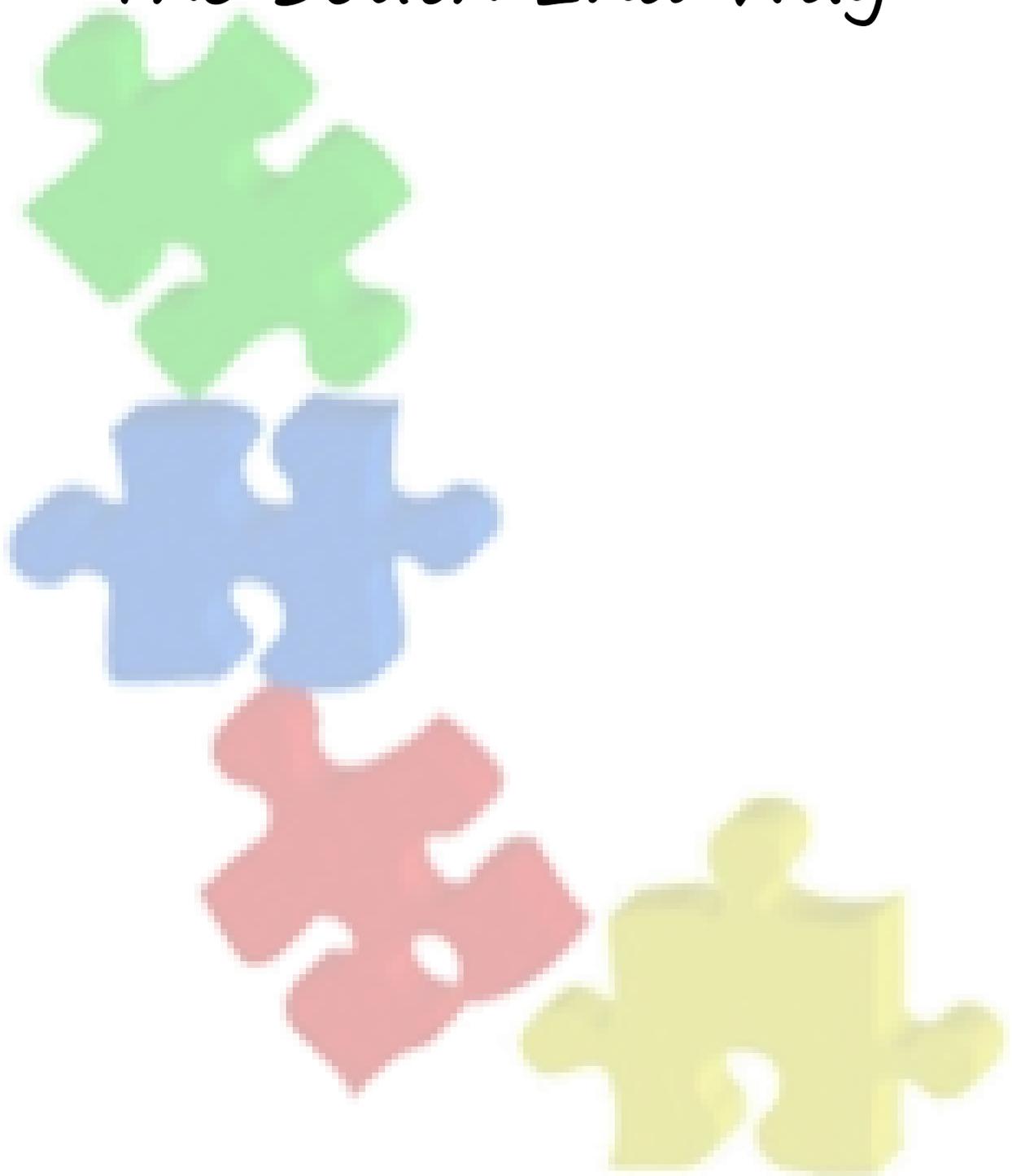


*Working with Fractions:  
The South End Way*





At Sound End Junior School all pupils, parents, support staff and teachers want every child to reach their full potential in maths. Maths is everywhere outside the classroom - in 'real life' - and this is what we are preparing our children for.

### Fractions are all around you!

Fractions are around us every day of the week. Do we know about that container of milk in the fridge? It is probably half a gallon. Drinks we buy in the shop might come in a quarter-litre bottles. When we want to buy some food at the deli counter, we might ask for a quarter or half a pound. We need to think about how much petrol we have every day. It's great to have a full tank, but we need to know how much we have left. If a pie has six pieces, we need to know if we have enough food for everyone. What about drinks? If we have a half a litre of water, will it be enough for everyone to get two glasses each? It's all about fractions.

Fractions is one of the most complex areas of the maths curriculum and this can lead to confusion for children and ultimately slow their progress and hinder their attainment. This is the reason behind 'Working with fractions' By all using the same vocabulary; teaching the same sequence of methods; in a progressive way; we can help our children progress to be the best they can be in maths.

This 'one size fits all' handbook is designed to be used by pupils, parents, support staff and teachers alike, ensuring we are all consistent in what we teach our children. It is in line with the curriculum changes implemented in September 2014. This can be found at : [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/335158/PRIMARY\\_national\\_curriculum - Mathematics 220714.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335158/PRIMARY_national_curriculum_-_Mathematics_220714.pdf)

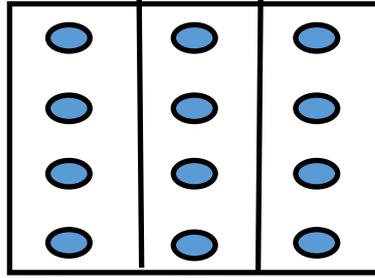
*'Mathematics gets you everywhere.'*



# Year 3

## Fractions of amounts:

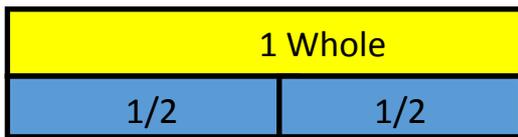
$$\frac{2}{3} \text{ of } 12 =$$



Put into 3 groups  
(denominator)

How many in 2 groups?  
(Numerator) = 8

## Equivalent fractions:



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

## Adding and subtracting fractions:

$$\frac{2}{5} - \frac{1}{5} = \frac{1}{5}$$

$$\frac{1}{6} + \frac{4}{6} = \frac{5}{6}$$

Simply add the numerators  
when the denominator are the  
same.

## Ordering fractions:

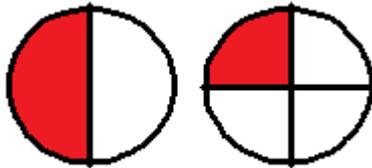
$$\frac{5}{8} \quad \frac{3}{8} \quad \frac{7}{8} \quad \frac{3}{8} \quad \frac{5}{8} \quad \frac{7}{8}$$

If the denominators are the same;  
order the numerator, which is the  
smallest number?

## Comparing fractions:

(Using pictures)

$$\frac{1}{2} \text{ and } \frac{1}{4}$$



$$\frac{1}{2} > \frac{1}{4}$$

1/2 is greater than 1/4

### **Key vocab:**

Whole, Equal parts, Half,  
Quarter, Third, equivalent,  
Numerator, Denominator, Unit  
fraction, Non-unit fraction,  
Compare, Order, Tenths

### **National Curriculum:**

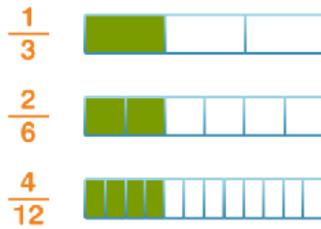
- recognise, find and write fractions of a discrete set of objects: unit fractions and non unit fractions with small denominators
- recognise and show, using diagrams, equivalent fractions with small denominators
- add and subtract fractions with the same denominator within one whole
- compare fractions with a numerator of 1 using < >
- Order a set of 4 fractions with the same denominator
- Solve problems that involve all of the above.



# Year 4

## Equivalent Fractions:

(in pictorial form)



$$\frac{2}{6} = \frac{4}{12}$$

$$2 \times 2 = 4$$

$$6 \times 2 = 12$$

$$\frac{4}{12}$$

## Adding and subtracting fractions:

$$\frac{1}{6} + \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$$

$$\frac{2}{5} - \frac{1}{5} = \frac{1}{5}$$

$$\frac{4}{5} + \frac{3}{5} = \frac{7}{5}$$

$$1\frac{2}{5}$$

We cannot have a bigger number on the top!

How many 5's in 7? = 1 whole

How many left over? = 2

## Fractions of amounts:

$$\frac{1}{5} \text{ of } 65$$

Divide the denominator by the whole number

$$65 \div 5 = 13$$

$$\frac{2}{7} \text{ of } 91$$

Divide the denominator by the whole number:

$$91 \div 7 = 13$$

Then multiply your answer by the numerator:

$$13 \times 2 = 26$$

## Converting decimals to fractions:

$$0.75 \quad 0.75 = 0.7 + 0.05$$



$$0.7 = \frac{7}{10}$$

$$0.05 = \frac{5}{100}$$

$\frac{7}{10}$  is equivalent to  $\frac{70}{100}$

$$\frac{70}{100} + \frac{5}{100} = \frac{75}{100} = \frac{3}{4}$$

### Key vocab:

Whole, Equal parts, Half, Quarter, Third, equivalent, Numerator, Denominator, Unit fraction, Non-unit fraction, Compare, Order, Tenths, Equivalent

### National Curriculum:

Pupils should be taught to:

- recognise and show, using diagrams, families of common equivalent fractions
- solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number
- add and subtract fractions with the same denominator
- Express decimals as an equivalent form of fractions to tenths and hundredths
- solve simple measure and money problems involving fractions



# Year 5

## Equivalent fractions:

$$\begin{array}{c} \xrightarrow{x5} \\ \frac{3}{5} \quad \frac{\square}{25} = 15 \\ \xleftarrow{x5} \end{array}$$

Always do the same to the numerator as to the denominator.

## Compare and Order fractions:

Make all the fractions equivalent by finding a common multiple. Then order by size of the numerator.

$$\begin{array}{c} \xrightarrow{x4} \\ \frac{1}{2} \\ \xleftarrow{x4} \\ \frac{4}{8} \end{array} \quad \begin{array}{c} \xrightarrow{x2} \\ \frac{1}{4} \\ \xleftarrow{x2} \\ \frac{2}{8} \end{array} \quad \begin{array}{c} \xrightarrow{x1} \\ \frac{1}{8} \\ \xleftarrow{x1} \\ \frac{1}{8} \end{array}$$

Always do the same to the numerator as to the denominator. Now they can be ordered.

## Mixed and improper fractions:

$$1 \frac{1}{2} = \frac{\text{2 bars}}{2} = \frac{3}{2}$$

Multiply the whole number (1) by the denominator (2).  $1 \times 2 = 2$

Add the numerator (1)  $2 + 1 = 3$

Put this number on top of the original denominator

## Add and subtract fractions:

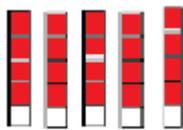
Make the fractions equivalent first

$$\begin{array}{c} \xrightarrow{x2} \\ \frac{4}{5} + \frac{1}{10} \\ \xleftarrow{x2} \\ \frac{8}{10} + \frac{1}{10} = \frac{9}{10} \end{array}$$

$$\begin{array}{c} \xrightarrow{x2} \\ \frac{3}{5} - \frac{1}{10} \\ \xleftarrow{x2} \\ \frac{6}{10} - \frac{1}{10} = \frac{5}{10} \end{array}$$

## Multiplying by a whole number:

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



$$\frac{4}{1} \times \frac{4}{5} = \frac{16}{5} \rightarrow 3 \frac{1}{5}$$

Multiply the numerators together and multiply the denominators together.

### **Key vocab:**

Whole, Equal parts, Half, Quarter, Third, equivalent, Numerator, Denominator, Unit fraction, Non-unit fraction, Compare, Order, Tenths, Equivalent, Proper fractions, Improper fractions, Mixed numbers, Percentage, Fifth, Two fifths, four fifths, Ratio, Proportion

### **National Curriculum:**

Pupils should be taught to:

- Identify, name and write equivalent fractions, finding missing values
- compare and order fractions whose denominators are all multiples of the same number
- recognise mixed numbers and improper fractions and convert from one form to the other
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams



# Year 6

## Simplifying fractions:

$$\frac{6}{48} \xrightarrow{\div 2} \frac{3}{24} \xrightarrow{\div 3} \frac{1}{8}$$

$$\frac{6}{48} \xrightarrow{\div 2} \frac{3}{24} \xrightarrow{\div 3} \frac{1}{8}$$

Find a common multiple.

Always do the same to the numerator as to the denominator.

## Adding and subtracting fractions:

$$2\frac{3}{5} + 3\frac{1}{5} =$$

$$2\frac{3}{5} = \frac{2 \times 5 + 3}{5} = \frac{13}{5}$$

$$3\frac{1}{5} = \frac{3 \times 5 + 1}{5} = \frac{16}{5}$$

$$13 + 16 = 29 / 5$$

How many 5's are in 29? = 5

How many left over = 4

$$5\frac{4}{5}$$

## Multiplying pairs of fractions:

$$\frac{5}{6} \times \frac{3}{4} = \frac{15}{24}$$

Multiply the numerators together and multiply the denominators together.

$$\frac{2}{3} \times \frac{2}{6} = \frac{4}{18}$$

This can be simplified!

$$\frac{4}{18} \xrightarrow{\div 2} \frac{2}{9}$$

## Divide fractions by a whole number:

$$\frac{2}{3} \div 4$$

Make 4 into a fraction: 4/1

$$\frac{2}{3} \div \frac{4}{1}$$

Flip the 2nd fraction and multiply

$$\frac{2}{3} \times \frac{1}{4}$$

$$\frac{2}{12} = \frac{1}{6}$$

## Decimal and percentage equivalents:

to turn  $\frac{3}{4}$  into a decimal you need to do  $3 \div 4 = 0.75$

To turn it into a percentage, work out how many times the denominator goes into 100, then multiply the numerator by the same amount.

$$\frac{3}{16} = \frac{\text{Percent}}{100}$$

X 100/1 (simplify)      ÷ 100

$$\frac{50}{100} \xrightarrow{\div 100} 0.5 \xrightarrow{\times 100} 50\%$$

### **Key vocab:**

Whole, Equal parts, Half, Quarter, Third, equivalent, Numerator, Denominator, Unit fraction, Non-unit fraction, Compare, Order, Tenths, Equivalent, Proper fractions, Improper fractions, Mixed numbers, Percentage, Fifth, Two fifths, four fifths, Ratio, Proportion, Degree of accuracy, Simplify

### **National Curriculum:**

Pupils should be taught to:

- use common factors to simplify fractions
- compare and order fractions, including fractions > 1
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form
- divide proper fractions by whole numbers
- Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts