Fractions, Decimals and Percentages

Fractions 3

Go deeper investigations

Hilary Koll and Steve Mills

Schofield&Sims

Dinosaur dig investigation

Objectives

- Understand fractions with the numerator 1.
- Compare fractions with the numerator 1.

Introduction

Show the map on the fact sheet to the pupils. Tell them that six different types of dinosaur fossils are buried on the islands. Read out the names of the dinosaurs, pointing out that they begin with the letters A to F, which will make recording the answers simpler. Look at the five different islands on the map and explain that the fraction of each type of dinosaur fossil found on each island has been recorded below the map. Give the pupils the question sheet and ask them to work in pairs to answer the questions.

The maths

Questions **a)** to **e)** require the pupils to compare unit fractions from $\frac{1}{2}$ to $\frac{1}{6}$ and to answer questions about them. They are then told the total number of fossils on each island. Questions **f)** to **j)** require the pupils to calculate numbers of fossils on different islands using the given unit fractions.

Ask:

- *What do you notice about the numerator of each of the fractions?*
- *If the numerators are both 1 how can we tell by looking at the denominator which fraction is larger?*
- *Which is the smaller fraction?*
- *How can you work out how many of each type of dinosaur is on each island? What number will you divide by?*

Solutions

a) A **b)** A **c)** C **d)** Icy Green
e) Mouseville **f)** Pickle Desert **g)** 4 **h)** Icy Green
i) Mouseville **j)** Icy Green

Support

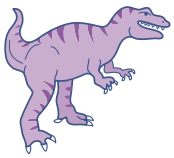
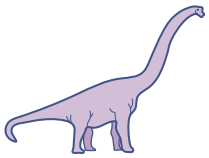
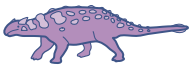
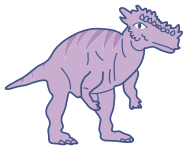
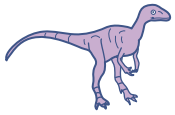
Some pupils might benefit from answering more questions similar to questions **a)** to **e)**, rather than moving on to questions **f)** to **j)**. This will allow them to reinforce their understanding of unit fractions further and ensure that they appreciate the role of the denominator in comparing unit fractions.

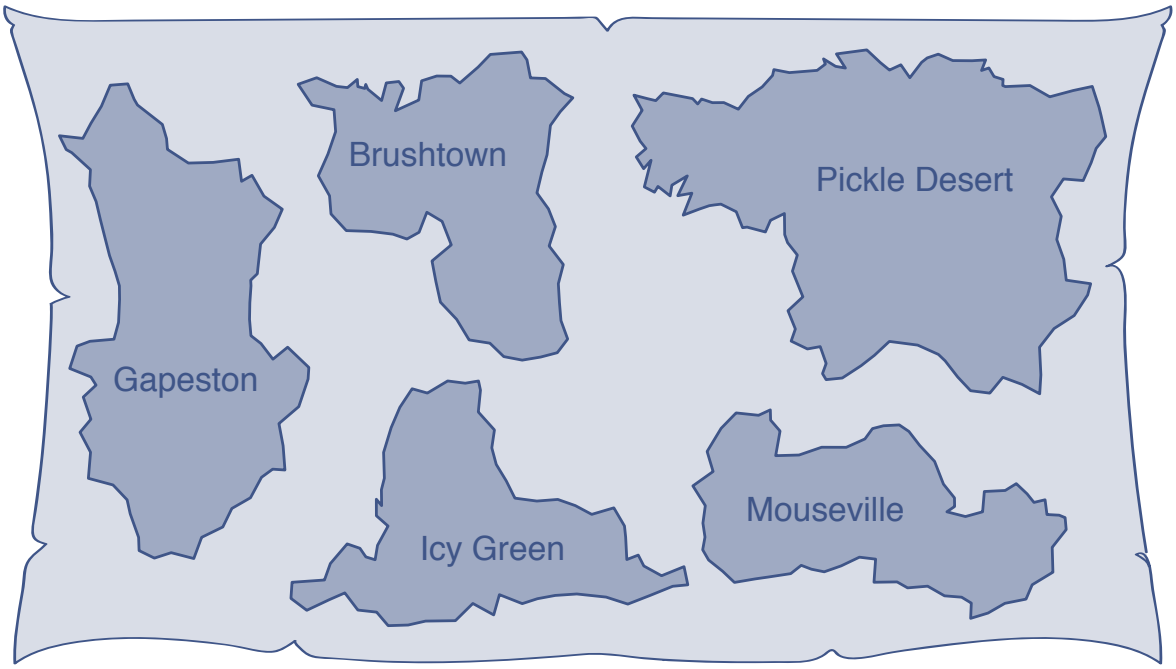
Extension

Encourage pupils to write statements about the numbers of different fossils on each island using the information given on both sheets. Draw attention to the fact that if two sets are different sizes, one-quarter of one set is a different number from one-quarter of the other.

Dinosaur dig investigation: fact sheet

Six different types of dinosaur fossils are buried on five islands. This sheet tells you some facts about the fossils.

A	B	C	D	E	F
					
Allosaurus	Brachiosaurus	Cederpelta	Dracorex	Eoraptor	Fabrosaurus



Brushtown	$\frac{1}{2}$ A	$\frac{1}{4}$ B	$\frac{1}{4}$ C
Pickle Desert	$\frac{1}{2}$ A	$\frac{1}{3}$ C	$\frac{1}{6}$ E
Gapeston	$\frac{1}{3}$ B	$\frac{1}{3}$ C	$\frac{1}{3}$ E
Icy Green	$\frac{1}{4}$ D	$\frac{1}{2}$ E	$\frac{1}{4}$ F
Mouseville	$\frac{1}{6}$ A	$\frac{1}{6}$ B	$\frac{1}{6}$ C	$\frac{1}{6}$ D	$\frac{1}{6}$ E	$\frac{1}{6}$ F

Dinosaur dig investigation

Use the dinosaur dig fact sheet to answer these questions.

a) In Brushtown, $\frac{1}{2}$ of the fossils are Allosaurus (A) and $\frac{1}{4}$ are Brachiosaurus (B).

Which are there more of: A or B? _____

b) In Pickle Desert, $\frac{1}{2}$ of the fossils are Allosaurus (A) and $\frac{1}{6}$ are Eoraptor (E).

Which are there more of: A or E? _____

c) In Pickle Desert, $\frac{1}{3}$ of the fossils are Cederpelta (C) and $\frac{1}{6}$ are Eoraptor (E).

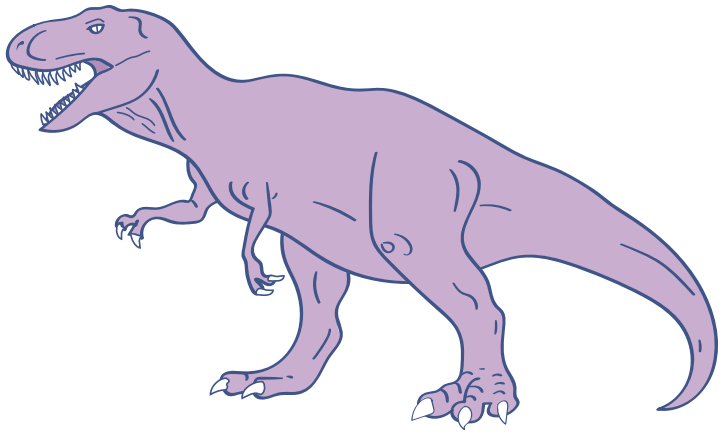
Which are there more of: C or E? _____

d) Which island has the largest fraction of Eoraptors (E)? _____

e) Which island has the smallest fraction of Cederpeltas (C)? _____

This table shows the total number of dinosaurs on each island.

Brushtown	20 dinosaurs
Pickle Desert	30 dinosaurs
Gapeston	24 dinosaurs
Icy Green	32 dinosaurs
Mouseville	24 dinosaurs



f) Which island has the most Allosaurus fossils? _____

g) How many Dracorex fossils are there on Mouseville? _____

h) Where are the most Eoraptors found? _____

i) Where will I find the fewest Brachiosaurus fossils? _____

j) Where can I find the most Fabrosaurus fossils? _____

Fractions detective investigation

Objectives

- Understand unit and non-unit fractions as areas of shapes.
- Recognise fractions of a set of objects.

Introduction

The pupils will need to identify what fractions of different shapes, or sets of shapes, are shaded in order to solve a puzzle. On the worksheet, each fraction matches a letter in an alphabet code. Pupils need to identify all the fractions correctly in order to decode the puzzle and find out who took all the biscuits from the staffroom biscuit tin!

The maths

The pupils should calculate what fraction of each shape, or set of shapes, is shaded and find the relevant fraction and its related letter. Some pupils may incorrectly think that the denominator (the number on the bottom of a fraction) stands for the number of unshaded sections of the shape or set. They might, for example, give $\frac{3}{5}$ rather than $\frac{3}{8}$ for the first shape. Remind them that the denominator shows the total number of equal parts that the shape has been split into.

Ask:

- *Into how many equal parts has the shape been split/how many shapes are in this set?*
- *How many equal parts or shapes are shaded?*
- *Where does this number go in the fraction?*
- *Which number is the numerator?*
- *Which number is the denominator?*
- *How do you say the fraction in words?*

Solutions

Reading down the first column and then down the second column, the code spells: Your teacher did it.

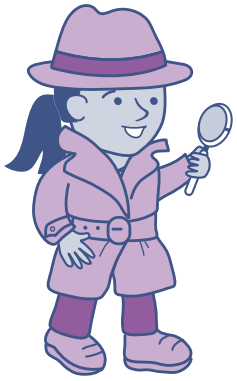
Support

Encourage the pupils to concentrate first on working out which fractions are shown by each shape or set of shapes. They should write down the total number of equal parts into which the shape has been split, or the total number of shapes in the set, and then count the number of parts or shapes that are shaded. Remind them that the former number will be the bottom number of the fraction and the latter number will be on top. To help the pupils count the parts, copy the worksheet onto A3 rather than A4 paper.

Extension

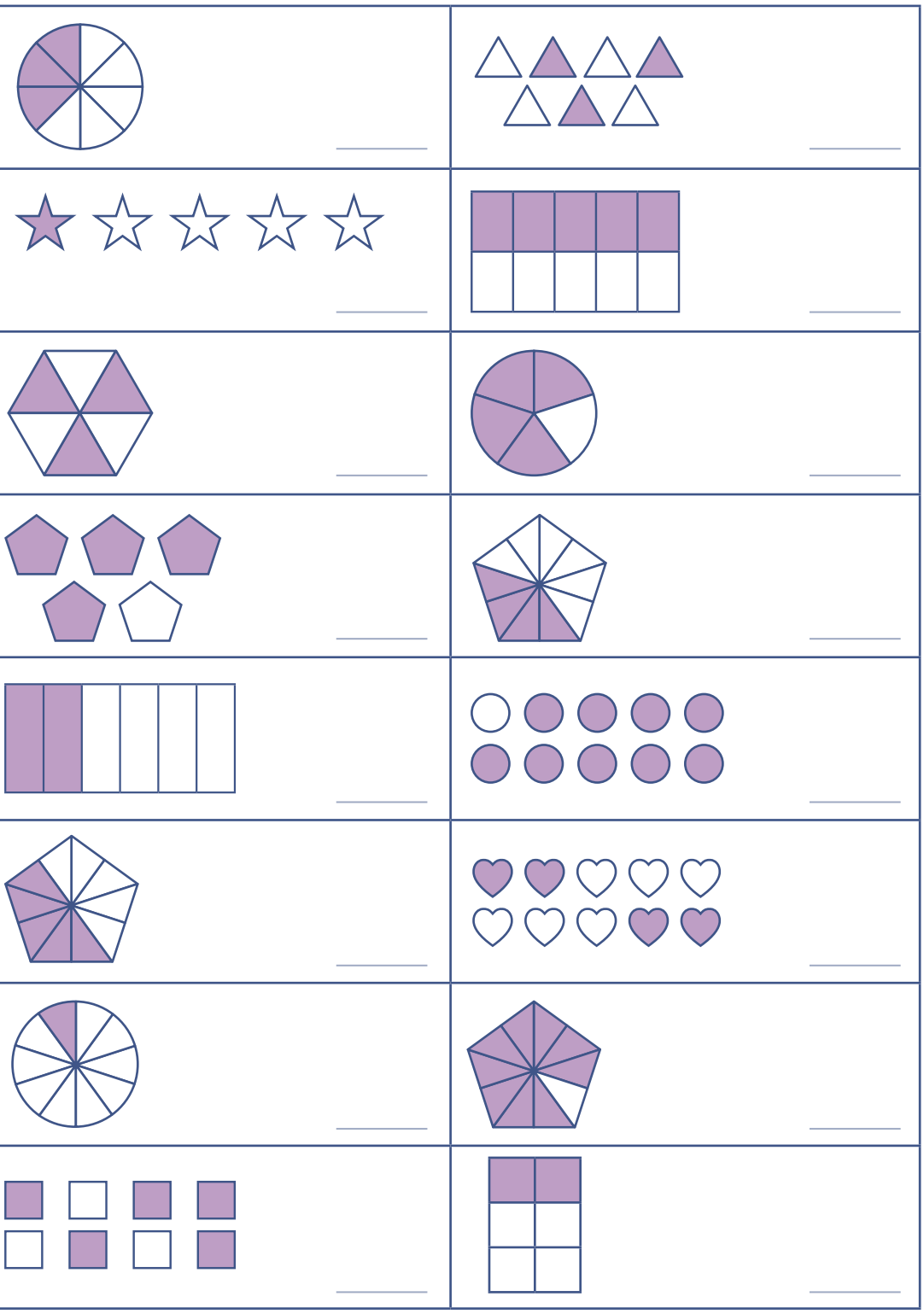
Ask the pupils to draw shapes, or sets of shapes, and to shade fractions of them in order to spell out their initials or their first name using the alphabet code. Draw attention to the fact that several shapes on the worksheet have exactly one-half shaded and encourage the children to identify these ($\frac{3}{6}$ and $\frac{5}{10}$).

Fractions detective investigation



Who took all the biscuits from the staffroom biscuit tin? Use the alphabet code below to find out who is guilty!

Work out the fraction of each shape, or set of shapes, that is shaded and write the correct letter next to it.



A	$\frac{1}{10}$
B	$\frac{1}{8}$
C	$\frac{5}{8}$
D	$\frac{4}{10}$
E	$\frac{5}{10}$
F	$\frac{6}{6}$
G	$\frac{7}{10}$
H	$\frac{3}{7}$
I	$\frac{9}{10}$
J	$\frac{3}{4}$
K	$\frac{5}{9}$
L	$\frac{2}{7}$
M	$\frac{1}{4}$
N	$\frac{3}{5}$
O	$\frac{1}{5}$
P	$\frac{1}{6}$
Q	$\frac{2}{3}$
R	$\frac{4}{5}$
S	$\frac{3}{10}$
T	$\frac{2}{6}$
U	$\frac{3}{6}$
V	$\frac{2}{9}$
W	$\frac{4}{6}$
X	$\frac{1}{7}$
Y	$\frac{3}{8}$
Z	$\frac{7}{8}$

Same values

Objectives

- Recognise fractions showing the same amount.
- Find equivalent fractions using a fraction wall.

Introduction

In this activity, the pupils will use a fraction wall to find fractions of the same value. Give out copies of the fraction wall and practise finding pairs of fractions with the same value. For example, show the pupils that $\frac{2}{3}$ (made from two of the $\frac{1}{3}$ sections) lines up with four of the $\frac{1}{6}$ sections – this means that the fraction $\frac{2}{3}$ is equal in value to $\frac{4}{6}$. Give out the worksheet and work through the first example, encouraging the pupils to write the fractions in words, for example, four-quarters.

The maths

This activity reinforces an understanding that several fractions can have the same value. It allows the pupils to use words to describe the fractions, helping to consolidate an appreciation of how fractions work. Note that the very last fraction on the sheet is not shown on the fraction wall, so encourage the pupils to predict what they think it might be.

When they have completed the worksheet, ask the pupils to write the words using fraction notation, put them into families and look for patterns.

Ask:

- *What fraction of the whole is each section in this row on the fraction wall?*
- *How do you write that in words? How do you write it as a fraction?*
- *If you have three of these sections, how do you write that in words or as a fraction?*
- *Can you write more statements like these?*
- *Do any of the fractions on the fraction wall line up with two-sevenths? Do you think there are any fractions that are not on the fraction wall that could be the same value?*

Solutions

a) two-halves ($\frac{2}{2}$), four-quarters ($\frac{4}{4}$), ten-tenths ($\frac{10}{10}$), six-sixths ($\frac{6}{6}$)

b) two-quarters ($\frac{2}{4}$), five-tenths ($\frac{5}{10}$), three-sixths ($\frac{3}{6}$), ten-twentieths ($\frac{10}{20}$)

c) two-eighths ($\frac{2}{8}$), three-twelfths ($\frac{3}{12}$), four-sixteenths ($\frac{4}{16}$), five-twentieths ($\frac{5}{20}$)

d) six-eighths ($\frac{6}{8}$), nine-twelfths ($\frac{9}{12}$), twelve-sixteenths ($\frac{12}{16}$), fifteen-twentieths ($\frac{15}{20}$)

e) four-sixths ($\frac{4}{6}$), eight-twelfths ($\frac{8}{12}$), twenty-thirtieths ($\frac{20}{30}$)

Support

Some pupils may find it useful to colour the sections on the fraction wall, using a different colour each time.

Extension

Ask the pupils to predict other fractions that have the same value in each family.

Same values

Fill in the missing words. Use the fraction wall to help you.

a) **one whole** is worth the same as …

two- halves four- _____ ten- _____ six- _____

b) **one-half** is worth the same as …

two- _____ five- _____ three- _____ ten- _____

c) **one-quarter** is worth the same as …

two- _____ three- _____ four- _____ five- _____

d) **three-quarters** is worth the same as …

six- _____ nine- _____ twelve- _____ fifteen- _____

e) **two-thirds** is worth the same as …

four- _____ eight- _____ twenty- _____

Same values: fraction wall