YEAR 3
Mathematics
Exemplification Materials

National Centre
for Excellence in the
Teaching of Mathematics

PLACE VALUE Exemplification

count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number

a) Count on from zero in steps of 2, 3, 4, 5, 8, 50, 100; b) Give me the number 100 less than 756

recognise the place value of each digit in a three-digit number (hundreds, tens, ones)

For each of these numbers: 428, 205, 130, 25, 7, 909.

Tell me:

How many hundreds? How many tens it has? How many ones?

compare and order numbers up to 1000

Sort these numbers into ascending order: 95, 163, 8, 740, 25, 0, 400, 303

identify, represent and estimate numbers using different representations

a) Show me 642 on a number line, with Dienes apparatus, with place value cards, on a Gattegno grid; b) What number is halfway between 65 and 95? How do you know?

read and write numbers up to 1000 in numerals and words

Read these numbers 428, 205, 130, 25, 7, 909

solve number problems and practical problems involving these ideas

a) Jack walks 645 metres to school. Suzy walks 100 metres less. How far does Suzy walk?; b) What is 1 more than 485? Than 569? Than 299?; c) What number needs to go into each triangle? Explain why?

$642 = 600 + \Delta + 2$ $967 = \Delta + 60 + 7$

ADDITION & SUBTRACTION Exemplification

add and subtract numbers mentally, including a three-digit number and ones, a three-digit number and tens, three-digit number and hundreds

add and subtract numbers with up to three digits, using formal written methods of column addition and subtraction

estimate the answer to a calculation and use inverse operations to check answers

solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

Examples below, addressing combinations of the requirements above, are taken from a variety of publications.

What number is 27 more than 145? What number is 19 more than 145? Explain how you worked out these two calculations.

Work out the missing digits:

3□ + □2 = 85

Work out these subtraction calculations:

72 – 5   372 – 68   270 – 3
82 – 15   132 – 28   70 – 66

Did you use the same method for each calculation? If not, why not? Explain your methods to a friend and compare your methods with theirs.

Paul says 172 – 15 = 163. Write down an addition calculation that you could do to check this.

Paul's working is: 170 – 10 = 160 and 5 – 2 = 3 so 172 – 15 = 163

Can you identify where Paul has gone wrong?

Layla has 45p in her money bank and 28p in her purse. How much more money does she need to buy a comic that costs £1?

ADDITION & SUBTRACTION Exemplification

Ben and Jess are answering this problem:

Mary has collected 61 key rings, Jo has 45. How many more key rings does Mary have than Jo?

Ben does the calculation 61 + 45. Jess does the calculation 61 – 45. Who is correct? Explain how you know.

Josh buys one coconut and half a kilogram of bananas. What does he pay?

Coconut   Bananas
78p   £1.50 per kg

Show your working.

Explain your method to a friend.

What number is 199 more than 428?

What is the difference between 1999 and 4003?

Holly has these coins.

She wants to buy a notebook costing £1.50

How much more money does she need?

I pay for a coach trip costing £7.80 with a £10 note. How much change should I get?

Would you use a mental, written or calculator method to solve each of these? Explain your choice.

23.05 + ☐ = 176.25

What is the total cost if I buy food costing £3.86 and £8.57?

These are the start and finish times of a film.

START 14:05 FINISH 16:25

How long was the film?

MULTIPLICATION & DIVISION Exemplification

- multiply seven by three; what is four multiplied by nine? Etc.
- Circle three numbers that add to make a multiple of 411 12 13 14 15 16 17 18 19
- Leila puts 4 seeds in each of her pots. She uses 6 pots and has 1 seed left over. How many seeds did she start with?
- At Christmas, there are 49 chocolates in a tin and Tim shares them between himself and 7 other members of the family. How many chocolates will each person get?

write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

- One orange costs nineteen pence. How much will three oranges cost?
- Mark drives 19 miles to work every day and 19 miles back. He does this on Mondays, Tuesdays, Wednesdays, Thursdays and Fridays. How many miles does he travel to work and back in one week?

solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

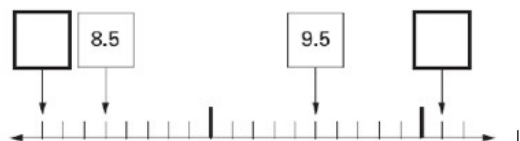Miss West needs 28 paper cups. She has to buy them in packs of 6

How many packs does she have to buy?

FRACTIONS Exemplification

Children should be able to:
- Use decimal notation for tenths
- Divide single digits or whole numbers by 10
- Explain how finding 1/10 is the same as dividing by 10
  Here is part of a number line. Write in the numbers missing from the two empty boxes.

Children should be able to:
- Recognise and write unit and non-unit fractions of shapes.
  Unit Fractions. Unit means one. Here are some examples of unit fractions.

Can you spot the pattern? A unit fraction is one part of a whole that is divided into equal parts.
Non-unit fractions. Unit means one, so non-unit is any number apart from one. Here are some examples of non-unit fractions.


Many (or, rather, more than one of the) parts, of an equally divided whole, is a non-unit fraction.

Taken from: BBC skillswise different types of fraction

FRACTIONS Exemplification

- Understand that the number on the bottom of a fraction tells me how many pieces the whole is divided into
  What fraction of this shape is shaded? How do you know? Is there another way that you can describe the fraction?
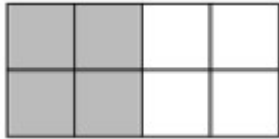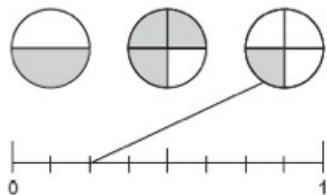

- Find fractions of amounts
  Here are 21 apples. Put a ring around one third of them.

recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators

Children should be able to:

- Position fractions on a number line; eg. mark fractions such as ½, 3 ½ and 2 3/10 on a number line marked from zero to 5.
  A fraction of each shape is shaded. Match each fraction to the correct place on the number line. One has been done for you.
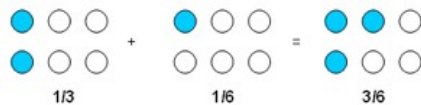
FRACTIONS Exemplification

Children should be able to:

- Identify pairs of fractions that total 1.
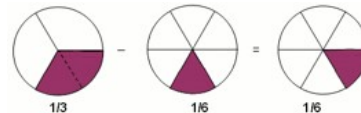- Circle two fractions that have the same value.

add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7)

This could also be done by using drawings and in the array form:
For addition:

1/3   1/6   3/6

and for subtraction:

1/3   1/6   1/6

compare and order unit fractions, and fractions with the same denominators

Children should be able to:

- Would you rather have 1/3 of 30 sweets or 1/5 of 40 sweets? Why?

solve problems that involve all of the above

Children should be able to answer questions like:

- 15 grapes are shared equally onto five plates. What fraction of the grapes is on each plate?

- Meg has 20 pet stickers to go on this page:
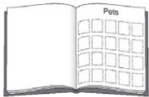
1/4 of them are dog stickers
1/2 of them are cat stickers
The rest are rabbit stickers

How many rabbit stickers does she have?
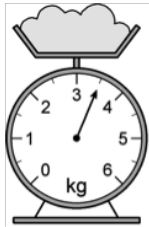
MEASURES Exemplification

Children should be able to:

Length: Show something that they think is just shorter/longer than a metre/centimetre/millimetre. They should be able to check whether they are right.

Mass: Say which object in the classroom is heavier than 100 g/kilogram/half-kilogram and know how to check if they are correct.

Read scales such as this:

Capacity: Find a container that they think would hold one litre and check to find out if they were correct.

General: Say what each division on this scale is worth and explain how they worked this out.

Children should be able to:

Measure the sides of regular polygons in centimetres and millimetres and find their perimeters in centimetres and millimetres?

MEASURES Exemplification

Children should be able to:

Solve problems like this:

- Jake wants to buy a comic that costs £1. He saves 25p one week and 40p the next. How much more money does he need to buy the comic?
- Add these prices: £6.73, £9.10 and £7.00 to find the total. Find out how much they need to add to get £23?

tell and write the time from an analogue clock, including Roman numerals from I to XII, and 12-hour and 24-hour clocks How would this time appear on a 12-

Children should be able to:
Read times like this in analogue and digital formats, including those with Roman numerals.

Solve problems such as: Ben's clock says 7:50 when he gets up. Place the hands on this clock to show this time.

estimate and read time with increasing accuracy to the nearest minute, record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight

Children should be able to:
Solve problems such as:

- Kevin leaves home at quarter past 8 and arrives in school at 20 to 9. How long is his journey? How did you work this out?

How long is it between the times shown on these two clocks? How did you work it out? (oral question)

MEASURES Exemplification

Children should be able to:

Solve problems such as: Milly uses a stop-watch to time her cat eating its breakfast one morning. The reading on the stop-watch, once the cat had finished eating, says 135 seconds. Can you convert this into minutes and seconds?

compare durations of events, for example to calculate the time taken by particular events or tasks

Children should be able to:

Solve problems such as:

- Estimate how long your favourite TV programme lasts. Use a television guide to work out how close your estimation was.
- It takes 35 minutes to walk from home to school. I need to be there by 8.55 am. What time do I need to leave home?

Boat Hire	
Motor boats £1.50 for 15 minutes	Rowing boats £2.50 for 1 hour

How much does it cost to hire a rowing boat for three hours?

- Sasha pays £3.00 to hire a motor boat. She goes out at 3:20 pm. By what time must she return? Explain how you solved this problem. Could you have done it in a different way?
- Sally and Maria both went to the gym on Saturday. Sally was there from 2 pm until 3.30pm. Maria was there from 12.30 pm until 3.15 pm. Who spent the longer time at the gym? How much longer was she there than her friend?

SHAPE - GEOMETRY Exemplification

draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them

recognise angles as a property of shape or a description of a turn

identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle

identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

The requirements for Year 3 in Geometry: Properties of Shapes are quite explicit and exemplars are not particularly helpful. It is helpful, however, to understand that, in Year 3, pupils should be expected to demonstrate understanding in this area by:

- using appropriate mathematical vocabulary to describe the features of common 2-D and 3-D shapes including semicircles, hemispheres and prisms
- sorting and classifying collections of 2-D shapes in different ways using a range of properties including: 'all sides are of equal length,' 'has at least one right angle' or 'has at least one line of symmetry'

STASITICS Exemplification

- Process, present and interpret data to pose and answer questions. They use all representations such as Venn and Carroll diagrams, bar charts, pictograms. They collect data quickly onto a class tally chart. Children recognise that a tally involves grouping in fives and that this helps them to count the frequencies quickly and accurately. They produce a simple pictogram and/or bar chart, where a symbol represents 2 units.
- Children sort and classify objects, numbers or shapes according to two criteria, and display this work on Venn and Carroll diagrams.

solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables

- Collect, represent and interpret data in order to answer a question that is relevant to them, for example:
- What new addition to the school play equipment would you like?
- Which class race shall we choose for sports day?
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- They decide on the information they need to collect and collect it efficiently. They collate the information on a tally chart or frequency table, then use this to make simple frequency diagrams such as bar charts, using ICT where appropriate. They discuss the outcomes, responding to questions such as:
- Which items had fewer than five votes?
- Would the table be the same if we asked Year 6?
- How might the table change if everyone had two votes?
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- Children present their conclusions to others, identifying key points that should be included. They make suggestions as to how this data could be used; for example, they may decide that they need to investigate the price of different equipment or discuss what they need to do to prepare for their chosen race.