Using Mathematics

Suggested classroom activities to support teaching and learning using the Levels of Progression

Key Stages 1 and 2
Levels 1–5
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INTRODUCTION

This online booklet contains suggested classroom activities or example activities designed to support teachers in assessing pupil progress in the Cross-Curricular Skill of Using Mathematics (UM) and the Mathematics and Numeracy Area of Learning in the Northern Ireland Curriculum. Assessment is an integral part of the teaching and learning process and this booklet demonstrates how teachers can use the Levels of Progression for Using Mathematics more formatively to support teaching and learning. It also provides some ideas for helping pupils to progress.

We have designed the activities in line with our guidance on assessing Using Mathematics (see below).

The Levels of Progression in Using Mathematics across the curriculum: Primary (Levels 1–5)

Expansion of the Levels of Progression in Using Mathematics across the curriculum: Primary (Levels 1–5)

Non-Statutory Guidance for Assessing Using Mathematics: Key Stages 1 and 2

The suggested classroom activities are linked to The World Around Us (TWAU) and other primary themes and topics. While many of the activities will already be familiar to you and reflect typical classroom practices, they have been designed to align with the standards for Using Mathematics, with a focus on progression. You may find these activities useful in assessing your pupils’ Using Mathematics skills, but they have not been designed as formal assessment tasks.

The activities in this booklet:
• identify planning considerations, learning objectives and how content links to the requirements for Using Mathematics and the Knowledge and Understanding for Mathematics and Numeracy;
• identify connections across other Areas of Learning and to Using ICT, Communication and the Thinking Skills and Personal Capabilities;
• recommend teaching approaches and resources;
• suggest ways to capture evidence of learning through observation, assessment and evaluation; and
• include teaching and learning ideas on how you could differentiate between levels, identify progression routes and develop the activities further.
Suggested Classroom Activities
My Dinner Party

OVERVIEW

Topic or Theme: **Food, Healthy Eating and Cooking**

Pupils work together to hold a dinner party. They select and pay for ingredients for a recipe, decorate a cake and set a table for a number of guests.

**Knowledge and Understanding of Number**

Pupils can:
- use, estimate, add and subtract numbers up to at least 10;
- understand conservation of number;
- create and describe repeating patterns using objects, numbers or pictures; and
- recognise and use coins.

**Requirements for Using Mathematics**

Pupils can:
- talk about and use the materials and equipment provided to carry out an activity;
- show some organisation in their practical work;
- talk about ways to solve simple everyday problems;
- use counting strategies when carrying out activities;
- look for and talk about patterns; and
- use appropriate mathematical language to respond to questions about their work.

**Connected Learning**

Pupils:
- **Managing Information**
  - select a recipe, select the correct ingredients, recognise prices and recognise coins;
- **Working with Others**
  - fulfil the roles of shopkeeper and customer;
- **Thinking, Problem-Solving and Decision-Making**
  - set the table correctly for a given number of guests;
- **Communication: Talking and Listening**
  - take on the role of someone else, and speak audibly to be heard and understood;
- **Communication: Reading**
  - show understanding of the meaning carried by print, pictures and images from the recipe; and
- **Using ICT: Desktop Publishing**
  - use an art software package or app to create an invitation to a dinner party.
PLANNING

Prior Knowledge, Understanding and/or Experience

In this activity, pupils apply and use the knowledge, understanding and/or experience described below.

- Pupils can add 0, 1 and 2 to numbers up to and including 10.
- Pupils know, understand and can use number bonds up to and including 10.
- Pupils can engage in shopping activities and know how to pay for goods.
- Pupils can create repeating patterns using objects, numbers or pictures.

Learning Objectives

Pupils:
- choose a recipe from a given selection;
- pick the ingredients they need from a given selection of items;
- use mental calculation strategies to calculate the coins they need to buy the items (up to a value of 10p);
- create a repeating pattern using objects; and
- understand conservation of number by setting a table for a specific number of guests.

What You Need

- selection of basic recipes (see Resource 1: Recipe for an example)
- cake template (see Resource 2: Cake Template for an example)
- toy till
- selection of coins – 1p, 2p, 5p and 10p
- variety of ingredients to display (see Resource 1 for an example)
- tools and objects for decorating the cake, for example crayons, pencils and stickies
- plastic cups, plates, knives and forks
ACTIVITY

Process

**Part 1**
- Set out a selection of recipes on the table and also set up a supermarket scene with all ingredients displayed and priced (all prices are 10p and under).
- Invite one pupil to play the shopkeeper and operate the till in the role-play scenario.
- Give each pupil a selection of coins consisting of 1p, 2p, 5p and 10p coins.
- Invite pupils to look at the recipes and select one.
- Ask them to identify the ingredients needed for their chosen recipe.
- Instruct pupils to enter the shop and select the required ingredients.
- Encourage them to engage in a role play with the shopkeeper and purchase the required items.
- Advise the shopkeeper to ask for the total cost of the items, for example if tomatoes cost 5p and carrots 2p, the shopkeeper asks the customer for 7p.

Evidence of Learning (Observation, Assessment and Evaluation Opportunities)

- Observe pupils’ interactions with each other, including their routines of listening, turn taking, sharing and co-operating
- Observe pupils’ ability to select the correct ingredients for a recipe from a given selection
- Record your pupils’ correct use of mathematical terms when they are totalling up the cost of the ingredients
- **Pupil Evaluation.** Pupils recall and recount the activity. They state the total price of the items they bought and the coins they used to pay for them.
My Dinner Party

ACTIVITY (Continued)

Process

Evidence of Learning
(Observation, Assessment and Evaluation Opportunities)

Part 2
• Set out a selection of blank cake templates and a selection of materials and/or objects for decorating the cake.
• Demonstrate different arrangements of objects on the cakes and ask pupils if you have made a repeating pattern; if you have, ask a pupil to explain how you made it.
• Next, ask the pupils, as cooks, to decorate their own cakes, and tell them that the decorations must form a pattern.

• Use effective questioning, for example ‘Why is it a pattern?’, ‘Why is it not a pattern?’ and/or ‘Can it be rearranged to make a pattern?’
• Pupil Evaluation: Pupils recognise a pattern and also create a pattern using materials and/or objects.

Part 3
• Set out a selection of plastic cups, plates, knives and forks.
• Discuss with pupils what we need to use at the dinner table.
• Demonstrate how to set the table.
• Then ask pupils to set the table for a specific number of guests (guests could be other pupils or soft toys).

• Pupil Evaluation: Pupils set the table for the given number of guests with the correct cutlery, plates and cups.
My Dinner Party

PROGRESSION

Within Level 1

Requirements for Using Mathematics

Pupils can:
• talk about and use the materials and equipment provided to carry out an activity;
• show some organisation in their practical work;
• talk about ways to solve simple everyday problems;
• use counting strategies when carrying out activities;
• look for and talk about patterns; and
• use appropriate mathematical language to respond to questions about their work.

Towards Level 2 or At Level 2

Requirements for Using Mathematics

Pupils can:
• talk about how to approach an activity;
• organise their practical work and check what they have done;
• use mental strategies to carry out calculations when solving problems/carrying out activities;
• recognise patterns and relationships and make predictions; and
• use appropriate mathematical language to talk about their work and respond to questions.

For pupils to progress within Level 1 towards solid achievement at Level 1, they should develop the following knowledge, understanding and skills:
• recognising and using number bonds up to and including 10;
• recognising coins up to 10p;
• revising and consolidating addition within 5, progressing to within 10 or 12, and adding two numbers using objects;
• understanding and using addition symbols and words, for example +, =, ‘add’, ‘plus’ and ‘more than’;
• carrying out calculations initially within 5, progressing to 10, including adding 0, 1 and 2 to any number, and calculating 1 more than, and 1 less than, any number;
• using a number line when counting, linking ‘counting on’ to addition;
• distinguishing patterns from non-patterns;
• creating patterns using pictures and/or objects, then progressing to creating patterns using numbers; and
• understanding one-to-one correspondence.

For pupils to progress towards Level 2, they should develop the following knowledge, understanding and skills:
• recognising and using number bonds between 10 and 20;
• using the following mental strategies: – counting forwards and backwards; and – reordering numbers;
• recognising the 50 square;
• recognising numbers up to 50;
• identifying the values that are missing from a 50 grid, and filling in the missing values;
• recognising coins up to £1;
• count on to give change within £1;
• recalling, describing and identifying the coins they used during the classroom shopping activity;
• answering questions such as: ‘How can we make different amounts using different coins?’ and ‘Can we use different sets of coins to create the same value?’; and
• creating patterns with three or more parts.
**Level 1 (to Level 2)**

**Shape and Space**

This activity is suitable for all pupils, but has been specifically designed for pupils with special educational needs (SEN). See links to Q skills in the Planning section on page 12.

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**The Wizard’s Cauldron**

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### Overview

**Topic or Theme:** *Fairy Tales*

Pupils take on the role of a wizard, using a range of shapes to create a potion, consolidating their understanding of 2-D and 3-D shapes and constructions.

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<table>
<thead>
<tr>
<th>Knowledge and Understanding of Shape and Space</th>
<th>Requirements for Using Mathematics</th>
<th>Connected Learning</th>
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</thead>
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<tr>
<td>Pupils can:</td>
<td>Pupils can:</td>
<td>Pupils:</td>
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<tr>
<td>• sort 2-D and 3-D shapes and make and describe 2-D and 3-D constructions.</td>
<td>• talk about and use the materials and equipment provided to carry out an activity;</td>
<td><strong>Managing Information</strong></td>
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<td></td>
<td>• show some organisation in their practical work;</td>
<td>• create potions using the various ingredients given;</td>
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<td></td>
<td>• talk about ways to solve simple everyday problems; and</td>
<td><strong>Working with Others</strong></td>
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<tr>
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<td>• use appropriate mathematical language to respond to questions about their work.</td>
<td>• fulfil the role of wizard, and develop routines of turn taking, sharing and co-operating;</td>
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<td><strong>Being Creative</strong></td>
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<td>• use their imagination to take on the role of a wizard, make ideas real by experimenting with potions, and seek out questions to explore;</td>
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<td><strong>Communication: Talking and Listening</strong></td>
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<td></td>
<td>• take on the role of someone else, speak audibly to be heard and understood, and talk about their experiences; and</td>
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<td><strong>Communication: Reading</strong></td>
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<td></td>
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<td>• listen to the story related to the topic, talk about what they have read, and answer questions.</td>
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The Wizard’s Cauldron

PLANNING

Prior Knowledge, Understanding and/or Experience

In this activity, pupils apply and use the knowledge, understanding and/or experience described below.

- Pupils can imitate the sorting of a range of both natural and manufactured 2-D and 3-D shapes of varying sizes, colours and textures (Q3).
- Pupils can participate in sorting activities using a range of both natural and manufactured 2-D and 3-D shapes of varying sizes, colours and textures (Q4).
- Pupils can sort a range of both natural and manufactured 2-D and 3-D shapes of varying sizes, colours and textures according to self-chosen criteria (Q5).
- Pupils can combine 2-D and 3-D shapes to make simple 2-D and 3-D constructions (Q5).

Learning Objectives

Pupils:
- use their imagination and take on the role of a wizard to create a potion;
- describe how a potion feels to touch;
- pick out 2-D and 3-D shapes; and
- sort and describe 2-D and 3-D shapes.

What You Need

- **Resource 3: How to Create Slime**
- **Resource 4: How to Create a Bubbling Cauldron**
- mixing bowl
- tablespoon
- cornflour
- water
- food colouring
- carbonated water
- vinegar
- bicarbonate of soda
- natural and manufactured 2-D and 3-D shapes of varying sizes, colours and textures
- play dough
- cauldron/tray
### ACTIVITY

#### Process

This task has been designed as an engaging multisensory activity that involves using slime. However, you could easily do the activity without the slime, picking shapes out of an empty hat or box as an alternative.

**Part 1**

- Introduce the context for the activity by reading your pupils a fairy-tale story about wizards or witches. Set out the ingredients to make the slime (see Resource 3 for the method).
- Demonstrate how to make the slime and allow pupils to attempt to make it themselves, where appropriate.
- Ask some pupils to add particular 2-D shapes to the slime, for example ‘Put the shape with four sides in the slime’.
- Invite other pupils to remove 2-D shapes from the slime and to guess what the shapes are.
- Ask pupils to suggest different ways that they could sort the 2-D shapes once they are all removed.
- Invite pupils to sort the 2-D shapes.
- Ask pupils if there are any other ways to sort the shapes, and then instruct pupils to sort the shapes using a different criterion.

#### Evidence of Learning

(Observation, Assessment and Evaluation Opportunities)

- Observe pupils’ interaction
- Ask pupils to describe how the slime and bubbling potion feel
- Observe pupils’ interaction
- Use effective questioning, for example asking pupils to select shapes according to their properties
- Observe pupils’ interaction
- Observe your pupils’ ability to sort according to a specific criterion
ACTIVITY (Continued)

Process

Part 2
- Set out the ingredients to make the bubbling cauldron (see Resource 4 for the method).
- Demonstrate how to make the bubbling cauldron and encourage pupils to attempt to make this themselves, where appropriate.
- Ask some pupils to add particular 3-D shapes to the cauldron, for example ‘Put in the shape that looks like a football’.
- Blindfold some pupils and ask them to remove the shapes from the slime and to guess what they are.
- Ask pupils how they could sort the shapes.
- Invite pupils to sort the shapes.
- Ask pupils to use play dough to create models of specific 2-D and 3-D shapes and describe what they have made.

Evidence of Learning
(Observation, Assessment and Evaluation Opportunities)

- Observe pupils’ ability to create specific 2-D and 3-D shapes using play dough
- **Pupil Evaluation**: Pupils describe and sort 2-D and 3-D shapes. They also make and describe 2-D and 3-D constructions. They use specific mathematical language to describe the properties, for example ‘four sides’, ‘straight’ and ‘curved’.
# PROGRESSION

## Within Level 1

**Requirements for Using Mathematics**

Pupils can:
- talk about and use the materials and equipment provided to carry out an activity;
- show some organisation in their practical work;
- talk about ways to solve simple everyday problems; and
- use appropriate mathematical language to respond to questions about their work.

## Towards Level 2 or At Level 2

**Requirements for Using Mathematics**

Pupils can:
- talk about how to approach an activity;
- organise their practical work and check what they have done; and
- use appropriate mathematical language to talk about their work and respond to questions.

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For pupils to progress within Level 1 towards solid achievement at Level 1, they should develop the following knowledge, understanding and skills:

- engaging in free play with 2-D shapes and 3-D objects;
- understanding the difference between a 2-D shape and a 3-D object;
- sorting 2-D shapes and 3-D objects into two separate groups;
- describing each shape using the correct language, for example ‘corners’ or ‘edges’; and
- understanding the teacher’s real-life examples of both 2-D shapes and 3-D objects, and suggesting their own examples.

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For pupils to progress towards Level 2, they should develop the following knowledge, understanding and skills:

- learning the names of the shapes from the teacher and using methods such as rhymes to remember them;
- selecting the correct shape from a selection of shapes when the teacher calls out the name of the shape;
- recognising shapes in real-life objects, for example seeing that a fizzy drink can is a cylinder;
- matching the name of a shape with a picture of the shape; and
- sorting shapes using different criteria, for example sorting by number of sides or number of corners.
OVERVIEW

Topic or Theme: **Houses and Homes**

Pupils design and build a house using cubed blocks, and discuss materials required for building, consolidating their understanding of using non-standard units to measure length and weight.

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**Knowledge and Understanding of Measures**

Pupils can:
- identify and use non-standard units to measure length and weight.

**Requirements for Using Mathematics**

Pupils can:
- talk about how to approach an activity;
- select and use the materials, equipment and mathematics required;
- organise their practical work and check what they have done;
- use mental strategies to carry out calculations when solving problems/carrying out activities;
- present the information appropriately and talk about their findings, and
- use appropriate mathematical language to talk about their work and respond to questions.

**Connected Learning**

Pupils:

**Managing Information**
- select the correct materials, use the correct equipment, count the number of cubes, and describe dimensions;

**Working with Others**
- work in pairs to build a house, and use appropriate mathematical language to describe the house to their partner;

**Thinking, Problem-Solving and Decision-Making**
- use the balance scales to measure out the correct amount of a particular material;

**Communication: Talking and Listening**
- speak clearly to be heard and understood, listen to their partner and attempt to build the house with the dimensions that their partner provides; and

**Using ICT**
- recreate the house using suitable software for a PC or tablet.
Building a House

Level 2 (to Level 3)

Measures

PLANNING

Prior Knowledge, Understanding and/or Experience

In this activity, pupils apply and use the knowledge, understanding and/or experience described below.

• Pupils can count to at least 20.
• Pupils can identify objects according to their length, using language such as ‘long’, ‘longer’, ‘longest’, ‘short’, ‘shorter’ and ‘shortest’.
• Pupils can sort objects according to their weight, using language such as ‘heavy’, ‘heavier’, ‘heaviest’, ‘light’, ‘lighter’ and ‘lightest’.

Learning Objectives

Pupils:
• create a simple house structure using cubed blocks;
• measure the dimensions of their house using non-standard units;
• describe the dimensions of their house using non-standard units;
• use balance scales to measure out the correct amount of material using non-standard units of weight; and
• recreate the house structure using suitable software for a PC or tablet.

What You Need

• Resource 5: Recording Sheet
• Resource 6: Equivalent Measures Sheet
• cubed building blocks
• balance scales
• sand
• water
• mobile device or tablet, or computer, with block-building software
### ACTIVITY

<table>
<thead>
<tr>
<th>Process</th>
<th>Evidence of Learning (Observation, Assessment and Evaluation Opportunities)</th>
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</thead>
</table>
| **Part 1**  
- Demonstrate how to build a simple house using building blocks. Show your pupils how to measure the sides by counting the blocks, and prompt them for language such as ‘longest’, ‘shortest’ and ‘height’.  
- Ask pupils how to measure the sides of the structure.  
- Set out a selection of building blocks for pupils to use to build their own house.  
- Invite pupils to attempt to create a house using the blocks.  
- Ask them to record on a sheet (see Resource 5) the dimensions of the house they have created, discussing the dimensions, for example identifying the longest and shortest sides.  
- Invite one pupil to ask another pupil to attempt to build the same house using only the dimensions on the recording sheet. |  
- Observe pupils’ ability to measure the sides  
- Observe pupils’ interaction  
- Observe pupils’ ability to follow instructions  
- **Pupil Evaluation:** Pupils recall and recount the activity. They state the lengths of the sides and identify the shortest and longest sides. |
### Building a House

#### LEVEL 2 (TO LEVEL 3)

**Measures**

**ACTIVITY** (Continued)

<table>
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<th><strong>Evidence of Learning</strong> (Observation, Assessment and Evaluation Opportunities)</th>
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<tbody>
<tr>
<td><strong>Part 2</strong></td>
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<tr>
<td>• Discuss with your pupils the materials that are needed for building a house. Describe how to make cement and show pupils sand and water, explaining that it is important to get the amounts of sand and water correct for the cement to work.</td>
<td>• Observe pupils’ ability to measure out the correct weights using balance scales</td>
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<td>• Ask pupils to use the balance scales to measure out specific weights of sand and water that are equivalent to the weight of particular classroom items (see Resource 6).</td>
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<td></td>
<td>• Ask pupils to describe the weights of the sand and water using language such as ‘heavier’ and ‘lighter’.</td>
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<td>• Explore the topic with your pupils through discussion, asking questions such as ‘What materials are needed to build a house?’ and ‘When you compare our house structure to houses in real life, what is missing?’</td>
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<td></td>
<td>• <strong>Extension Opportunity</strong>: Demonstrate to pupils how to build block structures using suitable software for PC or tablet, for example Minecraft. Ask pupils to replicate their block house structure using the app or program. Guide them to measure the sides of the house they made earlier and then create a house with the same dimensions in the app or program.</td>
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PROGRESSION

Within Level 2

Requirements for Using Mathematics
Pupils can:
• talk about how to approach an activity;
• select and use the materials, equipment and mathematics required;
• organise their practical work and check what they have done;
• use mental strategies to carry out calculations when solving problems/carrying out activities;
• present the information appropriately and talk about their findings; and
• use appropriate mathematical language to talk about their work and respond to questions.

Towards Level 3 or At Level 3

Requirements for Using Mathematics
Pupils can:
• suggest different ways an activity might be approached;
• select and use the appropriate materials, equipment and mathematics required;
• organise their work and know how to check its accuracy;
• use a range of mental calculation strategies;
• present their findings clearly using a range of appropriate mathematical formats; and
• use appropriate mathematical language to discuss and describe their way of working and respond to questions.

For pupils to progress within Level 2 towards solid achievement at Level 2, they should develop the following knowledge, understanding and skills:
• comparing three or more objects and arranging them in order of length;
• comparing three or more objects and arranging them in order of weight;
• understanding and using appropriate mathematical language to discuss why objects are in a particular order, for example ‘heavier’, ‘heaviest’, ‘lightest’, ‘shortest’, ‘longest’ and ‘longer’;
• understanding and describing how to use non-standard units to measure length and weight;
• recognising standard units and understanding the need for standard units in length and weight; and
• recognising the most commonly used units in length and weight.

For pupils to progress towards Level 3, they should develop the following knowledge, understanding and skills:
• recognising devices used to measure length and weight;
• discussing standard units used to measure length and weight;
• completing matching activities, such as matching the standardised weight of an object to a picture of the object, and/or matching a measuring device with a unit of measure;
• using an appropriate measuring device to measure lengths and weights;
• discussing ways of ensuring that measuring is accurate;
• recording measures using an appropriate standard unit; and
• discussing why different devices are appropriate for different scales of measure, for example a ruler for the length of a book, and a trundle wheel for the length of a school hall.
OVERVIEW

Topic or Theme: The Romans

Part 1: Pupils use grid references to find Roman items during an archaeological dig.

Part 2: Pupils complete sorting activities with Roman tiles based on lines of symmetry and tessellation.

Part 3: Pupils navigate their way around a Roman town using directional language based on the four-point compass.

Knowledge and Understanding of Shape and Space

Pupils can:
• recognise one line of symmetry in common 2-D shapes;
• recognise tessellations through practical activities;
• recognise right angles in the environment and understand angle as a measure of turn; and
• use grid references in practical situations.

Requirements for Using Mathematics

Pupils can:
• suggest different ways an activity may be approached;
• select and use the appropriate materials, equipment and mathematics required;
• use a range of appropriate mathematical notation;
• organise their work and know how to check its accuracy;
• present their findings clearly using a range of appropriate mathematical formats;
• explain their findings; and
• use appropriate mathematical language to discuss and describe their way of working and respond to questions.

Connected Learning

Pupils:
Managing Information
• break each task into smaller parts and plan the next steps;
• record information in a variety of formats – Venn, Carroll and/or tree diagrams, and pre-prepared tables;

Working with Others
• develop further the habits of collaborative learning when working in pairs and discussing ideas and opinions with small groups and the whole class;

Thinking, Problem-Solving and Decision-Making
• explain their methods and opinions and the reasons for their choices and actions when deciding on the shortest route to the colosseum;

Self-Management
• persist with tasks until an appropriate endpoint, with teacher prompting;

Communication: Talking and Listening
• respond to questions to extend their understanding, for example ‘Based on your dig findings, where do you think the bathhouse was in this town?’; and
• explain their views or thinking.
## PLANNING

### Prior Knowledge, Understanding and/or Experience

In this activity, pupils apply and use the knowledge, understanding and/or experience described below.

- Pupils have experience of 2-D shapes, using grid references, using a four-point compass, and sorting using Venn, Carroll and tree diagrams.
- Pupils have used the internet and/or factsheets on Roman history and/or library books to acquire background knowledge of Roman objects such as a strigil, a ballista and mosaic tiles.

### Learning Objectives

<table>
<thead>
<tr>
<th>Pupils:</th>
<th>What You Need</th>
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<tr>
<td><strong>Part 1</strong>&lt;br&gt;• use simple grid references to identify a square;&lt;br&gt;<strong>Part 2</strong>&lt;br&gt;• explore and recognise one line of symmetry in a variety of 2-D shapes, designs and pictures;&lt;br&gt;• explore tessellation through practical activities;&lt;br&gt;<strong>Part 3</strong>&lt;br&gt;• investigate quarter turns, half turns and whole turns to establish relationships with right angles; and&lt;br&gt;• explore angle as a measure of turn, using the language ‘right’ and ‘left’ or ‘clockwise’ and ‘anticlockwise’ to describe turns.</td>
<td><strong>Part 1</strong>&lt;br&gt;• Resource 7: Findings Grid&lt;br&gt;• Resource 8: Findings Table&lt;br&gt;<strong>Part 2</strong>&lt;br&gt;• Resource 9: Carroll Diagram&lt;br&gt;• Resource 10: Venn Diagram&lt;br&gt;• Resource 11: Tree Diagram&lt;br&gt;• logic blocks or a range of 2-D shaped tiles&lt;br&gt;<strong>Part 3</strong>&lt;br&gt;• Resource 12: Roman Town&lt;br&gt;• Resource 13: How Do I Get to the Colosseum?</td>
</tr>
</tbody>
</table>
### ACTIVITY

#### Process

You might find it helpful to use a real sandpit and bungee cords to allow pupils to carry out a real dig.

**Part 1**
- Introduce the archaeology activity.
- Invite your pupils to use **Resource 7** to complete **Resource 8**, instructing them to work in pairs or groups of four.
- Ask pupils question such as:
  - How do you think an archaeology team of four people organise themselves to dig in this area?
  - What would be the best way to share out the digging? Why?
  
  **Support pupils in concluding that the most efficient way for the team to dig would be to share out the field equally, for example since the field contains 24 squares, each person would dig six squares. Alternatively, the team could work in two pairs – one to dig and one to record findings. Encourage pupils to consider a range of ideas before choosing the most efficient.**
  
  – Do you think that the table you have used is the best way to present the findings? Could we improve the table layout?
  
  **Support pupils in concluding that a table is the best way to present their findings. Guide them to conclude, however, that the table layout could be much improved, for example by listing the grid references in order.**

#### Evidence of Learning

(Observer, Assessment and Evaluation Opportunities)

- Observe pupils’ interaction and how they complete **Resource 8**
- Use effective questioning to fully develop pupils’ understanding of working effectively and efficiently as part of a team
- Use effective questioning to allow pupils to consider and refine ways of presenting information
ACTIVITY (Continued)

**Process**

- Explain to pupils that, in a typical Roman town, there would be an army barracks, a villa, a bathhouse, a marketplace and a temple. Ask pupils question such as:
  - Using your findings grid and table, what would you suggest each area of the Roman town was?

  **Show pupils how to take their ideas and construct them into a basic explanation, for example: ‘I think that the area covering squares D3, D4, E3 and E4 contained a Roman temple. I think this because, within this area, the archaeologists found two statues of Roman gods.’ Encourage pupils to structure their explanations in a similar way.**

**Part 2**

- Discuss images of Roman mosaic tiles, using images from the internet. Ask pupils questions such as:
  - What did you notice about the shapes used?

  **Support pupils in realising that mosaic tiles must tessellate and that many Roman mosaics were symmetrical or used symmetrical shapes.**

- Invite pupils to sort the logic blocks or 2-D shaped tiles using the blank Venn, Carroll and tree diagrams. Ask pupils question such as:
  - If we were trying to find the best tiles or shapes for a Roman mosaic, how should we sort these tiles or shapes?

  **Guide pupils to conclude that they should sort for two criteria: one line of symmetry, and tessellating shape.**

**Evidence of Learning**

(Observation, Assessment and Evaluation Opportunities)

- Assess the oral language pupils use when they explain and justify their ideas

- Observe and listen to pupils’ use of mathematical language related to shape properties

- Observe pupils’ ability to complete the sorting activity correctly
## ACTIVITY (Continued)

### Process

- Ask pupils:
  - Which sorting diagram would you use to sort the tiles or shapes? Why?
  
  *Support pupils in understanding that any of the sorting diagrams would be useful, although the Venn diagram would be the most efficient. Encourage pupils to try each of the sorting diagrams to decide on the most efficient or easiest to use.*

### Evidence of Learning

*(Observation, Assessment and Evaluation Opportunities)*

- Observe pupils’ ability to complete the sorting activity correctly

### Part 3

- Introduce **Resource 12**.
- Use the key to locate the main buildings in the town and discuss the four-point compass.

- Use parts A and B of **Resource 13** as the basis for paired or group discussion.
- Invite pupils to use part C of **Resource 13** to find all the routes from the North Gate to the colosseum and instruct them to work in pairs, independently of the teacher. Ask them to stay working in pairs and to find the shortest route and prove that it is the shortest route.
  
  *Try not to guide the pupils to using a ruler and measuring in centimetres to measure the shortest route – allow pupils to decide this for themselves.*

- Observe pupils’ interaction and how they listen to the paired or group discussion when completing **Resource 13** (parts A and B)
- Ask pupils, to choose, independent of teacher support, a ruler to measure more than one route in centimetres

- Engage the pupils in a follow-up discussion, asking questions such as:
  - How many different routes did you find from the North Gate to the colosseum?
  - What was the shortest route? How can you prove it?
  
  *When discussing the shortest route, encourage pupils to use appropriate mathematical language and to compare their shortest route with another route they measured. Discuss with pupils why they might have been tempted to find the shortest route without measuring other routes.*

- Use effective questioning to help pupils develop their ability to verify the shortest route mathematically
- Assess pupils’ appropriate use of directional language
- Ask your pupils to carry out a self-evaluation based on the Learning Objectives listed above
### ACTIVITY (Continued)

<table>
<thead>
<tr>
<th>Process</th>
<th>Evidence of Learning (Observation, Assessment and Evaluation Opportunities)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• <strong>Pupil Self-Evaluation</strong></td>
</tr>
<tr>
<td></td>
<td>Pupils use the following sentence starters to evaluate their own work in these tasks:</td>
</tr>
<tr>
<td></td>
<td>- What I enjoyed most was…</td>
</tr>
<tr>
<td></td>
<td>- What I have learned that is new is…</td>
</tr>
<tr>
<td></td>
<td>- What I need more help with is…</td>
</tr>
<tr>
<td></td>
<td>- What really made me think was…</td>
</tr>
</tbody>
</table>
# PROGRESSION

## Within Level 3

**Requirements for Using Mathematics**

Pupils can:
- suggest different ways an activity may be approached;
- select and use the appropriate materials, equipment and mathematics required;
- use a range of mathematical notation;
- organise their work and know how to check its accuracy;
- present their findings clearly using a range of appropriate mathematical formats;
- explain their findings; and
- use appropriate mathematical language to discuss and describe their way of working and respond to questions.

## Towards Level 4 or At Level 4

**Requirements for Using Mathematics**

Pupils can:
- decide how an activity might be approached and compare their approaches with others;
- identify and use appropriately the materials, equipment and mathematics required;
- use a range of appropriate mathematical techniques and notation;
- organise their own work and work systematically;
- review their work and check for accuracy;
- present information clearly;
- compare methods of presentation; and
- use appropriate mathematical language to discuss their work and explain their thinking.

## For pupils to progress within Level 3 towards solid achievement at Level 3, they should develop the following knowledge, understanding and skills:

**Part 1**
- using grid references in practical situations;
- finding the area of shapes by counting whole and half squares;

**Part 2**
- recognising tessellations in practical activities; and

**Part 3**
- using language such as ‘right’ and ‘left’ or ‘clockwise’ and ‘anti-clockwise’ to describe turns.

## For pupils to progress towards Level 4, they should develop the following knowledge, understanding and skills:

**Part 1**
- using co-ordinates in the first quadrant;

**Part 2**
- recognising and drawing lines of symmetry in a variety of 2-D shapes;
- knowing the eight points of the compass; and

**Part 3**
- understanding and using the language of line, angle and location.
OVERVIEW

Topic or Theme: Road Safety

Pupils interpret road safety data on pedestrians and cyclists. They then use the data to evaluate suggestions for improving road safety.

Knowledge and Understanding of Handling Data

Pupils can:
• present and interpret data using a range of graphs, tables, diagrams, spreadsheets and databases, for example bar charts with given class intervals, and pictograms where the key contains more than one symbol.

Requirements for Using Mathematics

Pupils can:
• decide how an activity might be approached and compare their approaches with others;
• identify and use appropriately the materials, equipment and mathematics required;
• use a range of efficient mental calculation strategies;
• investigate general statements to see if they are true;
• find, organise and interpret relevant information; and
• use appropriate mathematical language to discuss their work and explain their thinking.

Connected Learning

Pupils:
Working with Others
• work with peers (in pairs and/or small groups) to reach agreement on the data;

Thinking, Problem-Solving and Decision-Making
• make predictions, examine evidence and make links between possible causes and effects when interpreting graphical information;
• explain and justify opinions on road safety suggestions;

Being Creative
• experiment and investigate real-life issues;

Self-Management
• evaluate what they have learned from the data;

Communication: Talking and Listening
• explain information, ideas and opinions clearly, using appropriate vocabulary to explain what the data suggests and their opinions on road safety suggestions;

Communication: Writing
• express thoughts, feeling, ideas and opinions, giving reasons when appropriate; and
• express meaning clearly, using appropriate vocabulary and an appropriate level of detail.
Road Safety

Level 4 (to Level 5)
Handling Data

PLANNING

Prior Knowledge, Understanding and/or Experience

In this activity, pupils apply and use the knowledge, understanding and/or experience described below.

• Pupils have experience of interpreting data from a range of graphs and charts, including tables, bar charts (with grouped and ungrouped data) and pie charts.
• Pupils also have appropriate data handling mathematical language.

Learning Objectives

Pupils:
• discuss the need to group data; and
• interpret data in tables and bar graphs with given class intervals.

What You Need

• Resource 14: How Safe Are Our Roads for Cyclists?
• Resource 15: How Safe Are Our Roads for Pedestrians?
• Resource 16: Road Safety Planners (A)
• Resource 17: Road Safety Planners (B)
Road Safety

ACTIVITY

Process

We have created this data for the purposes of this resource; it is not based on official statistics. As an alternative to using the two data sheets provided for this activity, you might find it useful to allow pupils to research up-to-date statistics and create their own data.

• Introduce the road safety topic.

• Pair your pupils, and give each pair a copy of Resources 14 and 15. Ask questions based on the data, for example:
  – Do more children’s cycling accidents involve boys or girls?
  – What percentage of cycling accidents are caused by children ‘playing, doing tricks, cycling too fast’?

• Give pupils, in pairs, 10 minutes to look more closely at the data sheets. Instruct each pair to write, in the time given, three statements based on the data. Suggest that they do this in books or on individual whiteboards. Encourage pupils to use wording such as: ‘Most accidents on the roads are caused by car users’.

• Discuss and clarify pupils’ statements, using questions such as:
  – Which chart shows us that more accidents are caused by car users?
  – From this chart, how do you know that car users cause most accidents?

Evidence of Learning
(Observation, Assessment and Evaluation Opportunities)

• Assess pupils’ responses to questions

• Observe pupils’ interaction and how they listen to the discussion based on the data sheets

• Use effective questioning to help pupils develop their ability to use data to prove their statements
ACTIVITY (Continued)

Process

• Provide the pairs of pupils with Resource 16. Discuss the first statement: ‘It is quite clear that because there are more cars on our roads these days, there are far more accidents. All we need to do is reduce the number of cars on the roads!’, using questions such as:
  – Do you think the road safety planner is correct? Why?
  – What information can you find to prove whether he is right or wrong?
  – Is there information in more than one place?

• Use pupil responses to model an explanation of the truth of the first statement. Use an example such as: ‘I agree with the planner when he says that there are more cars on the roads these days. In 1901, there were only 101,000 cars, but in 2003 there were 31 million. However, I do not agree that, to reduce road accidents, ‘all we need to do is reduce the number of cars on the roads’. I think this because, even though there are almost 31 million more cars on the roads, accidents have only risen by 2430 accidents between 1901 and 2003. Also, not all accidents are caused by car users. Road accidents are also caused by cyclists and pedestrians, so reducing the number of cars on the roads is not the only solution’.

Evidence of Learning
( Observation, Assessment and Evaluation Opportunities)

• Assess pupil-generated success criteria
<table>
<thead>
<tr>
<th>Process</th>
<th>Evidence of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pair your pupils and give each pair a set amount of time to discuss each statement, whether they agree with the planners or not, and their reasoning. Give pupils Resource 17 when appropriate. Ask them to write, in the time given, an explanation of one statement, using the modelled explanation as support. Support pupils during this session by spending time with each pair. Pupils may require support in reading and interpreting the information, finding all the relevant data, developing their mathematical language and refining their explanations.</td>
<td>• Assess pupils’ mathematical language when they explain and justify their own ideas</td>
</tr>
<tr>
<td>• At the end of the set time, allow some pairs to share, orally, their explanation and justification of one statement. Discuss these as a whole class, using questions such as:</td>
<td>• Observe pupils’ interaction and the type of teacher support that they require</td>
</tr>
<tr>
<td>- Do you agree with this group? Why or why not?</td>
<td>• Assess how well pupils use the success criteria in their peer evaluations</td>
</tr>
<tr>
<td>- Did anyone find any other data to justify their ideas?</td>
<td>• Pupil Evaluation</td>
</tr>
<tr>
<td>- Using the success criteria, what do you think this pair did well? How could they improve their explanation?</td>
<td>Invite pairs to exchange their written explanation with another pair to carry out peer evaluation. Ask each pair to evaluate the other pair’s work using the success criteria. Instruct them to use the ‘What went well/Even better if’ or the ‘Two Stars and a Wish’ strategy in their evaluation.</td>
</tr>
</tbody>
</table>
## PROGRESSION

**Within Level 4**

Requirements for Using Mathematics

Pupils can:
- decide how an activity might be approached and compare their approaches with others;
- identify and use appropriately the materials, equipment and mathematics required;
- use a range of efficient mental calculation strategies;
- investigate general statements to see if they are true;
- find, organise and interpret relevant information; and
- use appropriate mathematical language to discuss their work and explain their thinking.

For pupils to progress within Level 4 towards solid achievement at Level 4, they should develop the following knowledge, understanding and skills:
- interpreting data using a range of graphs, tables, diagrams, spreadsheets and databases, for example a pictogram where the key contains more than one symbol.

**Towards Level 5 or At Level 5**

Requirements for Using Mathematics

Pupils can:
- plan and decide how an activity might be approached;
- identify and use efficiently the materials, equipment, mathematics and strategies required;
- use a range of problem-solving strategies, suggesting and trying out different approaches when difficulties arise;
- make general statements based on findings and test using new examples;
- summarise their findings;
- identify, obtain, process and interpret information appropriate and sufficient for the activity; and
- use appropriate mathematical language to express and communicate ideas accurately.

For pupils to progress towards Level 5, they should develop the following knowledge, understanding and skills:
- interpreting data using a range of graphs, tables, diagrams, spreadsheets and databases, for example line graphs, dual bar charts and pie charts; and
- designing and using a data collection sheet.
OVERVIEW

Topic or Theme: The Victorians

Pupils use their understanding of scale, area and perimeter to compare and contrast the furniture and layout of a Victorian labourer’s house and a Victorian landlord’s house.

Knowledge and Understanding of Measures

Pupils can:
- convert from one metric unit to another;
- calculate the areas of squares, rectangles and right angled triangles;
- calculate perimeters of a range of shapes; and
- understand and use scale in the context of simple maps and drawings.

Requirements for Using Mathematics

Pupils can:
- plan and decide how an activity might be approached;
- identify and use efficiently the materials, equipment, mathematics and strategies required;
- use a range of appropriate mathematical techniques and notation;
- plan and work systematically and efficiently;
- use a range of problem-solving strategies, suggesting and trying out different approaches when difficulties arise; and
- use appropriate mathematical language to express and communicate ideas accurately.

Connected Learning

Pupils:
- Managing Information
  - plan, set goals and select the most appropriate methods to complete Part 2 of the task;
- Thinking, Problem-Solving and Decision-Making
  - try alternative problem-solving solutions and approaches by being willing to suggest amendments and/or improvements to their original plan;
- Being Creative
  - make their ideas and solutions real by experimenting with different designs, actions and outcomes to satisfy the design brief; and
- Communication: Talking and Listening
  - communicate detailed information clearly, using precise vocabulary for measurement, scale and formulae.
PLANNING

Prior Knowledge, Understanding and/or Experience

In this activity, pupils apply and use the knowledge, understanding and/or experience described below.

• Pupils can calculate the area of a square, a rectangle and a right angled triangle.
• Pupils can calculate the perimeter of a range of shapes.
• Pupils can convert metric measurements of length and have experience of using basic scale.
• Pupils also have experience of maps drawn from a plan view.
• For the cross-curricular and historical aspects of this activity, pupils have a basic understanding of the hierarchy in a typical Victorian countryside population (for example landlord, strong farmer, small farmer, and labourer) and how each person’s role affected their living and working conditions.

Learning Objectives

Pupils:
• calculate the area of a square, rectangle and right angled triangle;
• calculate the perimeter of simple shapes, initially with all lengths given;
• record length measurements using decimal notation, and discuss how this relates to place value, for example 14 mm = 1.4 cm, 140 cm = 1.4 m; and
• solve problems and carry out investigations on length using mental calculation strategies, a pencil and paper, or a calculator.

What You Need

Part 1
• Resource 18: Victorian Labourer’s One-Roomed Cottage

Part 2
• Resource 19: Drawing Room in the Big House
• ruler
• range of paper types – lined, blank, squared and graph paper

Part 3
• Resource 18 and Resource 19
## Level 5 Measures

### Victorian Houses

### ACTIVITY

#### Process

**Part 1**

- Using appropriate images, remind your pupils of the main features of a plan drawing, for example ‘We often use a scale and key to show the area from above’.

- Provide each pupil with a copy of **Resource 18**. Engage your pupils in a shared session to revise the following:
  - scale;
  - measuring accurately; and
  - finding the area and perimeter of shapes – plan size and actual size.

Use questions and a method such as:

- On the plan drawing, what are the dimensions of the cottage?
- On the plan drawing, what is the area of the cottage floor?
- What would be the actual dimensions of the cottage, if the scale is 4 cm = 1 m?
- What would the actual area of the cottage floor be?
- What would the actual perimeter of the cottage floor be?

**Support pupils by modelling how to present their working out for each part of the problem. Allow pupils to decide how to complete each calculation – using mental calculation strategies, a pencil and paper, or a calculator, and discuss the efficiency and effectiveness of each approach.**

#### Evidence of Learning

( Observation, Assessment and Evaluation Opportunities)

- Assess pupils’ responses and justifications of their choices
ACTIVITY (Continued)

Process

Part 2
- Arrange pupils into pairs and give each pair a copy of Resource 19. Read and discuss the activity. Use key questions to probe the pupils’ initial thinking, for example:
  - What is the activity asking you to do?
  - What information do you already know?
  - What information do you need to find out?
  - What equipment might you need to carry out this task?
  - How might you complete the activity?
  - How could you work effectively with your partner?
- Give pupils 10 minutes to start the activity. Ensure they have access to all the equipment they might require. Circulate around the class to observe, and to probe and try to refine pupils’ initial ideas.

Evidence of Learning
(Observation, Assessment and Evaluation Opportunities)

- Assess pupils’ responses and initial thinking and planning
- Observe pupils’ interaction and how they listen to the discussion
### ACTIVITY (Continued)

#### Process

- Discuss how each pair has decided to do the task. Use the key questions to help pupils assess their progress:
  - What information do you already know?
  - What information have you started to find out?
  - What equipment have you collected so far to carry out this task?
  - How are you planning to complete the activity? and/or
  - How are you going to work effectively with your partner?

Compare the different approaches pupils are using, asking questions such as:
- Have you heard any ideas that you are going to use? Are you going to change your plan in any way?
- What will be the most efficient way of carrying out this activity?

**Use questioning to scaffold pupils’ thinking and refine their approach to this task.** Advise pupils to use squared paper and a 30 cm ruler. Guide them to ensure that their scale is appropriate and easy to use, for example $2 \text{ cm} = 1 \text{ m}$ or $4 \text{ cm} = 1 \text{ m}$. Suggest that each pupil works out the dimensions, area or perimeter of half of the pieces of furniture, and then exchanges this working out with their partner’s working out, to check it.

#### Evidence of Learning

(Observer, Assessment and Evaluation Opportunities)

- Assess pupils’ approach to the task
- Use effective questioning to help pupils refine their approach to the task
ACTIVITY (Continued)

Process

• Allow pupils to work with their partners to complete the activity. Circulate around the class, supporting pupils where necessary, particularly with the scale element of the activity. However, do not give pupils the solutions, but rather use the key questions below to encourage pupils to think independently and to try to find alternative solutions to their problems.
  – What have you done so far?
  – What could you do to solve this problem?
  – What is the formula for finding the area or perimeter of...?
  – What do you already know that could help you?

• After completing the activity, allow pupils to compare their plan drawing with another pair’s drawing. Ask pupils questions such as:
  – How is the other pair’s drawing room similar or different to yours?
  – Did they draw the measurements to scale?

Part 3

• Invite pupils to compare and contrast orally each plan drawing, for example contrasting the floor area of the labourer’s cottage with the floor area of the drawing room in the big house.
• Invite your pupils to discuss how social status affected living conditions during the Victorian era.

Evidence of Learning
(Observation, Assessment and Evaluation Opportunities)

• Observe pupils’ interaction and the type of teacher support they require
• Assess pupils’ measuring skills and how they use a simple scale

• Assess how pupils use mathematical language when they compare and contrast living conditions

• Pupil Self-Evaluation
  Pupils use the following sentence starters to evaluate their own work in these tasks:
  – What I found difficult was...
  – What really made me think was...
  – What helped me when something got tricky was...
PROGRESSION

Within Level 5

Requirements for Using Mathematics

Pupils can:
• plan and decide how an activity might be approached;
• identify and use efficiently the materials, equipment, mathematics and strategies required;
• use a range of appropriate mathematical techniques and notation;
• plan and work systematically and efficiently;
• use a range of problem-solving strategies, suggesting and trying out different approaches when difficulties arise; and
• use appropriate mathematical language to express and communicate ideas accurately.

For pupils to progress within Level 5 towards solid achievement at Level 5, they should develop the following knowledge, understanding and skills:
• converting from one metric unit to another;
• understanding and using scale in the context of simple maps and drawings; and
• calculating the area of squares, rectangles and right angled triangles.

Extension Opportunities
Identify opportunities to further develop pupils’ knowledge and understanding of Measures within Level 5, or to challenge gifted and talented pupils.

For example, invite your pupils to use two maps of Belfast, one printed during the Victorian period and one modern map, to discuss how Belfast developed as a city during the Victorian period and to compare it to modern-day Belfast. Ask pupils to:
• measure distances on the map in centimetres and millimetres and convert each set of measurements to the other units;
• use the map scale to establish actual distances between major landmarks; and
• compare the land area of Belfast in the Victorian period and in modern times.
Resources
Tomato Soup
Resource 1
Recipe

- Tomatoes 4p
- Carrots 2p
- Onions 3p
- Herbs 1p
Resource 3
How to Create Slime

• You will need:
  – mixing bowl;
  – tablespoon;
  – water;
  – cornflour;
  – food colouring; and
  – cauldron.

• Pour the cornflour into a mixing bowl.

• Stir in small amounts of water until the cornflour has become a thick paste.

• To create the slime effect, add the food colouring to the paste and mix it in.

• When all the mixture looks like slime, transfer the mixture to the cauldron.
• You will need:
  – bowl or cauldron;
  – bicarbonate of soda (baking soda);
  – carbonated water;
  – vinegar; and
  – food colouring.

• Fill most of the bowl with the carbonated water.

• Add the vinegar.

• Add the food colouring.

• Add the bicarbonate of soda to create the bubbling effect and mix all the ingredients together.

• Continue to add the bicarbonate of soda to keep the bubbling effect.
House Measurements

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>length</td>
<td>.................. blocks</td>
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<td>width</td>
<td>.................. blocks</td>
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<tr>
<td>height</td>
<td>.................. blocks</td>
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</tbody>
</table>
Creating Cement
When the archaeology team completed their dig, this is what they found.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>medallion</td>
<td>mosaic tile</td>
<td>fragment of sculpture</td>
<td>fragment of bowl</td>
<td>statue of Mars</td>
<td>strigil</td>
<td>fragment of bowl</td>
<td>Roman coin</td>
</tr>
<tr>
<td>5</td>
<td>coke can</td>
<td>ballista</td>
<td>statue of Juno</td>
<td>fragment of oil lamp</td>
<td>bowl</td>
<td>£1 coin</td>
<td>bowl</td>
<td>shopping trolley</td>
</tr>
<tr>
<td>4</td>
<td>Celtic brooch</td>
<td>mosaic tile</td>
<td>fragment of sculpture</td>
<td>fragment of bowl</td>
<td>statue of Mars</td>
<td>strigil</td>
<td>fragment of oil lamp</td>
<td>mosaic tile</td>
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</tr>
</tbody>
</table>

When the archaeology team completed their dig, this is what they found.
Complete the table of findings from the archaeologists’ dig.

<table>
<thead>
<tr>
<th>Position</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2</td>
<td>ballista</td>
</tr>
<tr>
<td>D4</td>
<td>fragment of oil lamp</td>
</tr>
<tr>
<td>E6</td>
<td>fragment of bowl</td>
</tr>
<tr>
<td>H3</td>
<td>newspaper</td>
</tr>
<tr>
<td>E3</td>
<td>fragment of sculpture</td>
</tr>
<tr>
<td></td>
<td>ring</td>
</tr>
<tr>
<td>C2</td>
<td>fragment of oil lamp</td>
</tr>
<tr>
<td>A4</td>
<td></td>
</tr>
<tr>
<td>A6</td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>fragment of bowl</td>
</tr>
<tr>
<td>B3</td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>sword</td>
</tr>
<tr>
<td>D6</td>
<td>medallion</td>
</tr>
<tr>
<td>H5</td>
<td></td>
</tr>
</tbody>
</table>
Resource 12
Roman Town

- gate
- guest house
- army barracks
- villa
- bathhouse
- forum
- temple
- amphitheatre and colosseum
- Roman road
- town walls
A ➔ What can you see?
1. Stand in the forum facing north.
2. Stand in the temple facing west.
3. Stand in the barracks facing south.
4. Stand at the West Gate facing east.

B ➔ Where are you?
1. Stand at the North Gate and face south.
   ➔ Move forwards 4 cm. ➔ Turn one right angle to the right. ➔ Move forwards 3 cm.

Where are you now?

2. Start at the East Gate and face west.
   ➔ Move forwards 2 cm. ➔ Turn one right angle to the left. ➔ Move forwards 4 cm.
   ➔ Turn one right angle to the right. ➔ Move forwards 1 cm.

Where are you now?

3. Write your own directions for travelling from the West and South Gates to another place in the Roman town. Exchange them with a partner – can your partner follow your directions correctly?

C ➔ How do I get to the colosseum?

I have just entered the Roman town through the North Gate. I’d like to walk along a Roman road to the colosseum.

There are a number of different ways I could get there and, if I don’t hurry, I’m going to miss the chariot racing!

Help me out by finding the shortest route from the North Gate to the colosseum along a Roman road.
How Safe Are Our Roads for Cyclists?

For adults, 80% of accidents occur in the daylight and only 20% at night. For children, 90% of accidents occur in the daylight.

Most accidents involving cyclists happen in urban areas, with 2/3 of accidents at or near a road junction.

For cyclists, roundabouts can be dangerous. Also, the number of accidents involving cyclists increases as the speed limit increases.
Older people usually walk or take a bus when making a journey. Many older people suffer discomfort while walking, and this can cause road accidents.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage Suffering Discomfort</th>
</tr>
</thead>
<tbody>
<tr>
<td>65–74 years</td>
<td>29%</td>
</tr>
<tr>
<td>74–84 years</td>
<td>44%</td>
</tr>
<tr>
<td>84+ years</td>
<td>46%</td>
</tr>
</tbody>
</table>

In 1901, there were 101 000 cars on the roads and 1070 accidents occurred that year. In 2003, there were 31 million cars on the roads and 3500 accidents occurred that year.

---

### Number of Accidents by Road User

- Pedestrians
- Pedal Cyclists
- Motorcycle Users
- Car Users
- Other

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### Accidents Involving Pedestrians

- Environment (weather, road surface or road design)
- Other

---

### Number of Accidents

- Walking to school
- Walking on or near to a pedestrian crossing
- Environment (weather, road surface or road design)
- Other

---

### Age Group (years)

- <16
- 16–24
- 25–34
- 35–49
- 50–64
- 65+

---

### Age Group Percentage Suffering Discomfort

- 65–74 years: 29%
- 74–84 years: 44%
- 84+ years: 46%
These road safety planners are suggesting ideas to reduce the number of road accidents.

It is quite clear that, because there are more cars on our roads these days, there are far more accidents. All we need to do is reduce the number of cars on the roads!

To reduce the number of accidents, we should place a bus stop and a puffin crossing outside each home for the elderly.

Making cyclists complete their own version of a driving test would reduce the number of accidents involving cyclists.

What do you think?
The road safety planners have even more suggestions!

If we created a cycle lane to be used only by cyclists from 8.00 am to 9.00 am and from 3.00 pm to 6.00 pm, we would significantly reduce the number of accidents involving cyclists.

To reduce accidents, it should be compulsory for all children to wear high visibility vests when walking or cycling outdoors.

There are fewer accidents involving pedestrians under 16 years of age. I think that we could save money by removing crossing patrols from schools.

What do you think?
Resource 18
Victorian Labourer’s One-Roomed Cottage

- bed
- wooden box for cot
- stool
- basket for potatoes
- fireplace

4 cm = 1 m
I would like to rearrange the furniture in my drawing room, as my husband has brought back some new and interesting pieces from his travels.

My butler has drawn a quick outline of the room and made some notes about each piece of furniture, and I would like you to make a plan drawing to ensure that all the furniture will fit comfortably into the room.

2 sofas – These are rectangular in shape and congruent in size. Each covers a floor area of 2.5 m².

2 chairs – Each chair is a different shape. However, they both have the same perimeter of 4 m.

large table – Behind one of the sofas should be a large rectangular table measuring 2.5 m by 50 cm.

dining table – This is for afternoon tea. It is an irregular octagon shaped table, although it is still symmetrical. It has a perimeter of 6 m.

4 dining chairs – These are square in shape and are part of a set. Each chair covers a floor area of 50 cm².

2 sideboards – These are also an odd shape – I think the correct name for the shape is an isosceles right angled triangle. The sideboards are a matching pair. The side of each sideboard measures 1 m.

mirror – When viewed from above, the mirror looks rectangular in shape. It has a perimeter of 6.4 m and protrudes 20 cm from the wall.