

## Unit 25 Geography and numbers

### ABOUT THE UNIT

This ‘continuous’ unit aims to show how geographical enquiry can provide a meaningful context for the teaching and reinforcement of many aspects of the framework for teaching mathematics. Links are made with the following areas across both key stages: solving problems, measures, shape and space, and handling data. The unit has been developed so that the activities link to other units in the scheme of work; for example, the work on using a compass and measuring distance can be linked to Unit 12 ‘A contrasting UK locality: Llandudno’. **The activities in this unit are therefore designed for use within other geography units.**

The mathematical demands made in geography units should be commensurate with children’s attainment in mathematics. It is helpful to use geography to reinforce particular skills of mathematics soon after they have been developed in mathematics.

<p><b>Geographical enquiry and skills</b></p> <p><i>Key stage 1</i> observe and record communicate in different ways fieldwork skills use globes, maps and plans make maps and plans</p> <p><i>Key stage 2</i> ask geographical questions collect and record evidence analyse evidence and draw conclusions communicate in different ways use fieldwork techniques and instruments use geographical vocabulary use atlas, globe, maps and plans draw maps and plans use ICT</p>	<p><b>Knowledge and understanding of places</b></p> <p><i>Key stage 1</i> describe what places are like</p> <p><i>Key stage 2</i> describe places</p>
<p><b>Knowledge and understanding of patterns and processes</b></p> <p><i>Key stage 1</i> observe features</p> <p><i>Key stage 2</i> recognise and explain patterns</p>	<p><b>Knowledge and understanding of environmental change and sustainable development</b></p> <p>–</p>

The aspects of **places** and **themes** that are taught will depend upon the geography units in which the activities are developed. Links to other areas of the curriculum will also depend upon the geographical context.

### VOCABULARY

At key stage 1, children are likely to use:

- route, length, longer, shorter, home, park, shop, road, school, thermometer, temperature, settlement, village, left, right, backward, forward, along, journey, traffic, north, south, west, east

At key stage 2, children are likely to use:

- distance, settlement, miles, kilometres, metres, centimetres, scale, public transport, tourism, compass, compass points (eg *north west*), vehicle, area, village, town, city, river and coastal features (see Units 14 and 23), population

### RESOURCES

At key stage 1:

- simple plan of local area
- thermometer
- materials for model building
- camera
- floor robot

At key stage 2:

- Ordnance Survey maps
- map of the local area
- bus timetables
- compasses
- spreadsheet software
- world time chart
- world map
- photographs of river and coastal features
- calculators

## LEARNING OBJECTIVES

## POSSIBLE TEACHING ACTIVITIES

### CHILDREN SHOULD LEARN

#### How do numbers help us in geography at key stage 1?

- to apply mathematics to work in geography
- to use geographical vocabulary
- fieldwork skills
- to use maps and plans
- to use ICT
- to investigate the locality of their school

#### Solving problems

- Ask the children to find the shortest safe route for a group of children to move between two classrooms. Children might choose to pace out different routes or use metre sticks as a standard measure. Ask the children to calculate the differences between the lengths of various routes and consider which are most suitable for the group size.

#### Measures

- When studying the locality of the school, ask the children to use simple base plans and string to mark and discuss longest and shortest routes to different places, *eg the local shops or park*. They could also begin to develop an understanding of angle as a measure of turn in this activity by using whole turns, half-turns and quarter-turns.
- When studying weather in the school grounds, ask the children to read a thermometer to the nearest labelled division.

#### Shape and space

- Ask the children to build models of ideal settlements using 3-D shapes, recording the range of shapes used and their properties. Children could investigate what the shapes look like from above using a camera.
- Ask the children to devise instructions to navigate a floor robot through a maze. Encourage children to use vocabulary such as left, right, backwards, forwards, along, clockwise, anticlockwise and right angles.
- Ask the children to talk about and draw a plan of their journey from home to school, and to estimate how far it is and how long it takes to walk it.

#### Handling data

- Ask the children to undertake a pedestrian traffic count in one corridor at different times during the school day. Ask the children to present their data in a simple table or simple block graph showing time of day and number of people counted over a set period. Use a base map of the school and knowledge of the school day to discuss and interpret findings.

#### How do numbers help us in geography in years 3 and 4?

- to apply mathematics to work in geography
- to ask geographical questions
- to collect and record evidence
- to analyse evidence and draw conclusions
- to communicate in ways appropriate to the task and audience
- to use appropriate geographical vocabulary
- to use appropriate fieldwork techniques
- to use maps
- to use secondary sources of information
- to use ICT
- to investigate a locality in the United Kingdom

#### Solving problems

- Ask the children to plan a route (including calculation of distance) for a family travelling between two settlements. Ask the children to work out how much further the family would have to go if they had already travelled 'x' number of kilometres. This could be extended by asking the children to plan the stages of a longer journey so that the family does not have to travel more than a given number of kilometres in a day.
- As an alternative to planning routes, children could be asked to plan how they would travel between two settlements by public transport using public transport timetables.

#### Measures

- Ask the children to use the straight edge of a piece of paper and the scale on a large-scale Ordnance Survey map to measure distances. Discuss what the scale actually means (*eg 4cm represents 1km means that 4cm on the map represents 1km in real life*) and ask the children to use the scale to work out distances from measurements they make on the map.
- Ask the children to write an itinerary for a day out in the local area. As part of this, ask them to use local bus timetables to work out waiting times at bus stops, length of time between buses and times taken for buses to reach destinations.

#### Shape and space

- Introduce and discuss the eight points of the compass. Ask the children to use a compass to orientate themselves on a trail around the school grounds.
- Ask the children, in the role as providers of tourist information, to locate specific sites using simple coordinates, *eg a park, somewhere to have a picnic, somewhere to walk a dog*. For high-attaining children, four-figure grid references may be used.

#### Handling data

- Ask the children to undertake a survey of the journey to school, looking, for example, at where children in the school live, how they travel to school and how long their journey takes. Information can be recorded on tally charts and a map of the local area. ICT may be used to produce a data file and bar graphs to show the results. Separate charts and graphs may be produced for children coming to the school from different areas; these may be displayed on a large base map of the school area to see if any patterns emerge.

## LEARNING OUTCOMES

## POINTS TO NOTE

### CHILDREN

- work out the difference in length between two routes around the school building
- use a simple map to identify features and possible routes (longest and shortest) within the local area
- read a thermometer
- identify main features of a settlement (listing shapes used)
- use appropriate directional language
- draw a plan of their journey from home to school
- count 'traffic' and understand reasons for variation in flow

Geographical questions which may be addressed within this section include:

*Which are the longest and shortest routes between two places?*

*What are the main features of a village settlement?*

*Which way will the robot have to go to get through the maze?*

*How did we get to school today?*

*How busy is this corridor at different times during the day? Why?*

It is always worth checking the units and intervals of measurement used on fieldwork equipment.

**Ideas within this unit should be linked with other units. For example, many elements of this section could be linked with Unit 1 'Around our school – the local area'.**

- plan a route and work out the distance using the map scale
- select information on public transport from timetables to produce an itinerary
- use symbols on an Ordnance Survey map
- use simple coordinates (or four-figure grid references) to locate points (or areas) on a map
- identify the eight points of the compass and use a compass to orientate themselves/follow a route
- collect, record, present and analyse data about the journey to school, and draw conclusions

Geographical questions which may be addressed within this section include:

*How do we get to this place and how far is it?*

*What does scale mean?*

*How will we travel around this place and which places will we visit?*

*Where do tourists want to go?*

*What are the eight points of the compass and how do you use a compass?*

*How do most people travel to school? Why?*

**Ideas within this unit should be linked with other units. For example, many elements of this section could be linked with Unit 6 'Investigating our local area'.**

## LEARNING OBJECTIVES

## POSSIBLE TEACHING ACTIVITIES

### CHILDREN SHOULD LEARN

### How do numbers help us in geography in years 5 and 6?

- to apply mathematics to work in geography
- to ask geographical questions
- to collect and record evidence
- to analyse evidence and draw conclusions
- to communicate in ways appropriate to the task and audience
- to use appropriate geographical vocabulary
- to use maps
- to draw plans and maps
- to use secondary sources of information
- to use ICT
- to investigate a locality in the United Kingdom
- to investigate the features of rivers/coasts
- to investigate how settlements differ in size

#### **Solving problems**

- Ask the children to plan a route between two specific locations (*eg from their own street to a shopping centre in a nearby settlement*) and to calculate distances travelled by car, bus, foot, etc. (This may involve the use of a range of maps at different scales.) Ask the children to calculate total distance travelled in kilometres and then in metres.

#### **Measures**

- Discuss with the children what a scale of 1:10,000 or 1:25,000 means (*eg 1:10,000 means that 1cm on the map represents 10,000cm in real life*). Ask the children to work out how many centimetres on a 1:10,000 map represent one kilometre.
- Ask the children to refer to a 1:25,000 Ordnance Survey map (or even, for some children, a 1:50,000 map) and work out how many centimetre squares on the map represent one kilometre square in real life. Children could then explore the areas of different-sized settlements.
- Ask the children to use a world time chart to work out different times around the world. The children may then transfer information to a display based on a map of the world.

#### **Shape and space**

- Ask the children to match photographs of river and coastal features to specific sites on an Ordnance Survey map using six-figure grid references.
- Revise the eight points of the compass. Ask the children to use a compass in conjunction with an Ordnance Survey map to describe a route.

#### **Handling data**

- Ask the children to study population data for two contrasting settlements and to produce frequency tables and bar charts to illustrate proportions of population within certain age groups. Ask the children to calculate simple fractions and interpret/explain results, using ICT where appropriate. Children may be asked to express some simple fractions (*eg  $\frac{1}{2}$ ,  $\frac{1}{3}$* ) as percentages.

## LEARNING OUTCOMES

## POINTS TO NOTE

### CHILDREN

- plan a route considering different modes of transport and distance travelled
- approximate the size of different settlements in kilometre squares (using an Ordnance Survey map)
- identify time differences around the world
- use six-figure grid references to identify and match coastal/river features shown on maps to photographs
- use a compass to describe a route on a map
- collect, record, present and analyse population data, using appropriate mathematical techniques, and draw conclusions

Geographical questions which may be addressed within this section include:

*How will we get to a nearby settlement?*

*Which modes of transport will we use?*

*How long will it take and how far will we travel?*

*What is the equivalent of one kilometre square on the map?*

*How and why do settlements differ in size?*

*What time is it around the world?*

*Where are features on the map?*

*How can a compass be used in conjunction with a map?*

*How do population data vary for two settlements? Why?*

**Ideas within this unit should be linked with other units. For example, many elements of this section could be linked with Unit 12 'Should the high street be closed to traffic?'**

### **PRIOR LEARNING**

For each activity, prior learning in terms of both mathematics and geography will need to be considered. For example, the teaching of six-figure grid references should be based on an understanding of, and ability to use, four-figure grid references, which, in turn, should be based on an understanding of, and ability to use, simple coordinates.

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### **EXPECTATIONS**

Expectations can be identified within other geography units and the framework for teaching mathematics.

Across the different activities within this unit, the subject focus may vary and therefore it is important to note that comparable attainments in terms of geography and mathematics cannot always be expected.

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### **FUTURE LEARNING**

As this unit has been designed to be continuous throughout key stages 1 and 2, an indication of future learning in geography and mathematics is detailed within the unit itself.