



# Geographical applications and skills

Student workbook

# Introduction

This workbook is designed to be used alongside your lessons on geographical applications and skills.

The workbook can be completed at different times during your GCSE course to support or consolidate your learning in class or could be completed as a revision exercise.

**Remember that there are four assessment objectives:**

<b>A01:</b>	Demonstrate knowledge of locations, places, processes, environments and different scales.
<b>A02:</b>	Demonstrate geographical understanding of: concepts and how they are used in relation to places, environments and processes; the interrelationships between places, environments and processes.
<b>A03:</b>	Apply knowledge and understanding to interpret, analyse and evaluate geographical information and issues to make judgements.
<b>A04:</b>	Select, adapt and use a variety of skills and techniques to investigate questions and issues and communicate findings.

Most of the activities in this workbook will assess A03 and A04 which is why it is **very** important you know and understand how to interpret and analyse different forms of data presentation and are able to use a variety of geographical skills and techniques.

## Interquartile range

In your exam you could be asked to find the interquartile range (IQR) of a set of data. For each set of data find the IQR.

1. 17, 13, 14, 17, 23, 25, 17, 11, 9, 19, 23

Lower quartile: .....

Upper quartile: .....

IQR: .....

2. 4, 8, 16, 25, 23, 4, 4, 29, 31, 33, 4

Lower quartile: .....

Upper quartile: .....

IQR: .....

3. 267, 345, 132, 78, 98, 74, 345, 34, 111, 98, 33

Lower quartile: .....

Upper quartile: .....

IQR: .....

### Remember:

The IQR is the difference between the 25<sup>th</sup> (lower) and 75<sup>th</sup> (upper) quartiles. You will need to put the data in numerical order first.

## Using this skill in a geographical context

Students collected data about bedload size in the river.

	Pebble size (mm)										
Site A	40	32	45	18	55	15	28	43	16	42	38
Site B	13	12	15	13	15	12	14	13	15	14	10

4. Calculate the IQR for each site

Site A IQR: .....

Site B IQR: .....

## Drawing sketches from photographs

Using the photographs below, draw sketches. Remember you do not have to be a good artist to draw a sketch; you are also not drawing every single detail from the photograph.

### Hint:



Ensure you know the difference between a label and an annotation! A label is a simple point and an annotation is a more detailed description or explanation.

### Follow these key steps to draw your sketch:

1. Draw a box to put your sketch into and then divide this box into four. Ensure you draw the division lines lightly so that they can be rubbed out. These four boxes will help you to focus on each area of the photograph.
2. Draw in the important details such as coastal features, rivers and hills – this is anything that shapes the land.
3. Draw in the other details such as buildings and forests.
4. Annotate and label your sketch. Consider both the physical and human features. These should be labelled with geographical reasoning. Then rub out the guidelines that you put in.

Photo 1: Carding Mill Valley



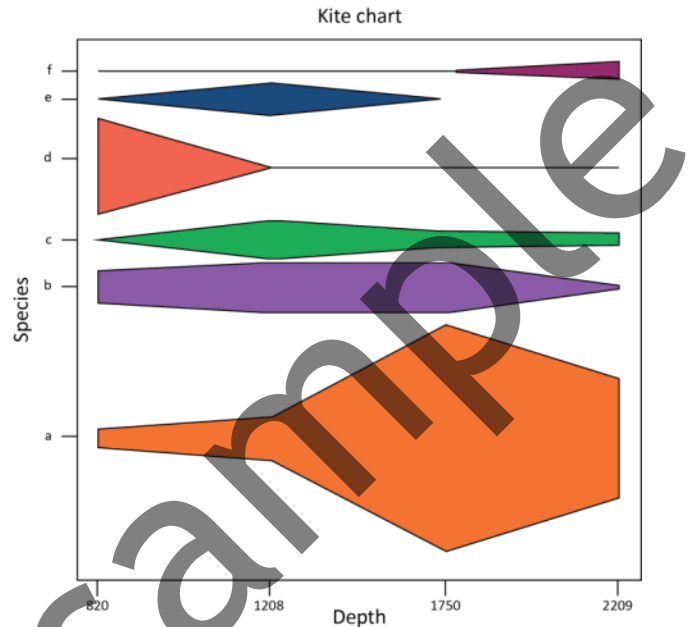
Space for extra annotations:

## Kite diagrams

For this task you will need graph paper, a ruler, a pencil and some coloured pencils.

### Instructions:

1. On one axis of your graph, scale out the distance for the transect from the data in the table below.
2. On the other axis write the names of the types of vegetation found along the transect.
3. Use the central line for each vegetation type and draw a cross either side of the central line for where the vegetation is found. The crosses should be symmetrical. Any data which is 0 will be on the central line.
4. Remember that the percentages won't necessarily add up to 100% as it is percentage coverage within the quadrat. Some of the quadrat could have just been sand or soil.



Distance from high-tide line	Marram grass % cover	Lichen % cover	Heather % cover	Hawthorne % cover
25m	44	0	0	0
50m	20	0	0	0
75m	6	2	0	0
100m	2	16	20	0
125m	0	54	34	2
150m	0	0	20	40

Describe the pattern shown by your kite diagram.

# Teaching notes

Within this section all the geographical applications and skills required for the GCSE programme of study are covered, including:

- a. Numerical and statistical skills
- b. Cartographic skills
- c. Graphical skills
- d. Data mapping skills
- e. Fieldwork skills

The following worksheets can be used to summarise the information from the PowerPoint presentations which will help students develop and revise all the key geographical skills required at GCSE level.

The teacher answer section provides all answers for the activities included within the student workbook.

# Geographical applications and skills personal learning checklist

Read through each statement and decide whether you feel that you are **not confident**, **sort of confident** or **confident**.

The skills which you are least confident about are the ones that you need to work on. Use the workbook to help you practise these skills.

	Geographical application or skill				Workbook
Numerical and statistical	1. I can use proportion, ratio, magnitude and frequency.				
	2. I can draw conclusions from numerical data.				
	3. I can calculate mean, mode, median and interquartile range.				
	4. I can use appropriate measures of central tendency, spread and cumulative frequency.				
	5. I can calculate percentage increases and decreases.				
	6. I can use percentiles.				
Cartographic	7. I know what latitude and longitude are.				
	8. I can identify locations using latitude and longitude.				
	9. I can describe patterns and distributions of human and physical features on a map.				
	10. I can use maps of different scales, e.g. a world map and a local OS map.				
	11. I can identify significant features on a map, e.g. settlement layouts, relief, drainage and population movement.				
	12. I can analyse the inter-relationships between physical and human features on a map, e.g. why certain locations have been selected to build settlements.				
	13. I can use and understand four- and six-figure grid references.				
	14. I can use the scale bar on a map.				
	15. I can measure distances of straight and curved lines.				
	16. I can convert the scale on a map, e.g. cm on a ruler to km on the map.				
	17. I can read contour lines and gradient on a map.				



# Teacher answers

## Page 5-6: Mean, mode, median and range

1. a	Mean: 7.54	Mode: 11	Median: 7	Range: 16
b	Mean: 17.9	Mode: 5	Median: 19	Range: 35
c	Mean: 19	Mode: 7	Median: 11	Range: 62
d	Mean: 15.7	Mode: 11.5	Median: 11.5	Range: 25
2.	Mean: 51.7	Mode: 56	Median: 51.5	Range: 22
3.	Mean: 42.8	Mode: 42	Median: 42	Range: 81
4.	<b>Site A Median:</b> 38mm	<b>Site B Median:</b> 13mm		
5.	Modal sediment size for site B is 13mm			

## Page 7: Interquartile range

1.	<b>LQ:</b> 13	<b>UQ:</b> 23	<b>IQR:</b> 10
2.	<b>LQ:</b> 4	<b>UQ:</b> 29	<b>IQR:</b> 25
3.	<b>LQ:</b> 98	<b>UQ:</b> 267	<b>IQR:</b> 169
4.	<b>Site A IQR:</b> 25mm	<b>Site B IQR:</b> 3mm	

## Page 8-9: Calculating area

Distance and scale will depend on how you have printed this workbook.

## Page 10: Atlas skills – describing patterns

### India map indicative content

There is a higher population density in the east of India around major cities such as Kolkata (above 2 000 persons per square km) and also in the north around New Delhi. In areas such as Jammu, Kashmir and Arunachal Pradesh there are lower populations. In the centre of India the population is mixed but evenly distributed. Towards the south, the population increases again around Bangalore and Kerala.

### Upland areas in the UK indicative content

The main upland areas are located to the west and south of the UK. Wales is predominantly an upland area, as is Scotland. Towards the east of the UK there are fewer upland areas.



# Graphical skills

## PowerPoints

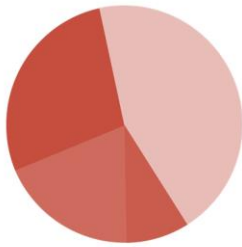
### Pie charts

Pie charts are used to show percentages and proportions.



#### Positives and negatives:

- ✓ They are easy to draw and easy to understand and interpret.
- ✗ Calculating the size of each section is more difficult than drawing a bar chart.
- ✗ If the pie chart has lots of segments it can be difficult to analyse.



© www.teachit.co.uk 2020

18

### How to draw pie charts

#### Drawing a pie chart:

1. Choose a title for your pie chart. This could be a question from a questionnaire you carried out.
2. Count up how many people chose each option.
3. Calculate what percentage of people chose each option (it should all add up to 100%).
4. Calculate how many degrees of your pie chart that equals (it should all add up to 360°). To do this, divide the percentage by 100 then multiply it by 360.
5. Draw a circle with a compass.
6. Use a protractor to draw in each segment of the pie chart.
7. Using a ruler, draw lines from each mark to the central point of the circle (the mark where your compass was).
8. Colour each segment differently.
9. Add a key and a title.

© www.teachit.co.uk 2020

19

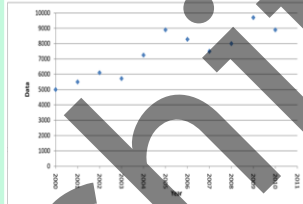
### Scatter graph

Scatter graphs are used to compare two sets of data.



#### Positives and negatives:

- ✓ Easy to construct.
- ✓ Shows the correlation between data.
- ✗ Needs a large data set.
- ✗ Almost impossible to label data points, unless you have very few.



© www.teachit.co.uk 2020

20

### How to draw a scatter graph

#### Drawing a scatter graph:

1. Decide on the appropriate title for the x and y axes. Work out the scale across each. They should be evenly spaced; make sure you include the units of measurement.
2. Plot each measurement, drawing a cross for each point.
3. Draw a line of best fit through the middle of the points and describe the correlation.
4. Ensure your graph has a title and labelled axes.

© www.teachit.co.uk 2020

21

### Bivariate data

- Bivariate data has an independent and a dependent variable. There will be two data sets.
- An example of this would be if you were plotting how river depth changes with distance from the source. The distance would be the independent variable and the depth would be the dependent variable.
- Bivariate data is usually shown on a scatter graph.
- It is important to be able to describe the correlation (relationship) between the two data sets.

© www.teachit.co.uk 2020

22

### Trend lines and lines of best fit

- Trend lines / lines of best fit will show the central tendency or course of the data that has been plotted.
- There are usually a similar number of data plots either side of the line of best fit, but generally most points will follow the pattern fairly closely.
- Data points which are away from the trend line are anomalies, data which doesn't fall inside the main pattern of the data as a whole. You could be asked to explain any anomalies.

© www.teachit.co.uk 2020

23

# Student workbook

### Example question 8

**Suggest** why **one set of data** you collected in your **human fieldwork** enquiry may **not** have been **accurate**.

**Suggest:** present a possible case.

**This question assesses A03.**

#### Hint:



This isn't a question about how much data you collected. This is about how accurate that data was. Consider the equipment that you had and the conditions that you faced.

**WAGOLL:** During our human fieldwork data collection we carried out multiple surveys of the area in order to assess the environmental quality. However different groups went to each area to carry out the surveys. As an environmental quality survey is subjective our data would not have been accurate as different groups measured each area and each group would have had their own opinion on the area.

What data did you collect in your human fieldwork enquiry?

#### Hint:



The question isn't asking how you would rectify the inaccuracy – stick to the question being asked.

In what ways could the data collection be inaccurate?

# Teaching notes

There are three fieldwork topics to choose from:

- a. River fieldwork
- b. Coastal fieldwork
- c. Urban and rural fieldwork

The following worksheets can be used to accompany the three fieldwork PowerPoint presentations which can help students learn about or revise what happens on fieldwork and apply this to examination questions.

**For each type of fieldwork there are the following student worksheets:**

1. Reducing the risk:  
Can be used to create a table to look at risk assessment.
2. Fieldwork methods:  
Can be used to summarise the different fieldwork methods carried out, the reasons a particular method was chosen, the issues faced and possible solutions.
3. Data presentation methods:  
Can be used to evaluate the different data presentation methods.  
This could easily be amended to include different forms of data presentation used to represent the data collected.
4. Fieldwork summary:  
Can be used for revising or summarising the fieldwork that was carried out by students and revisiting fieldwork techniques.  
Remind students to apply their knowledge of fieldwork. They must use frequent examples of their own experiences.

It is recommended that these worksheets be enlarged to A3 size to enable students to complete them thoroughly.

## Reducing the risk: river fieldwork

What is the risk?	How likely is the risk?	How can the risk be reduced?
<b>Trips, slips and falls</b>  Tripping over rocks, slipping on wet rocks, falling down holes in riverbed.		
<b>Drowning</b>  Becoming caught in the river after losing footing.		

## Urban and rural fieldwork summary

Location	Why did we go to that location?	What is a sphere of influence?
Primary data	Secondary data	Presenting data – what are the best ways to present our data?
What we found out while conducting our fieldwork	Limitations of our fieldwork	Evaluation of our methods

# Coastal fieldwork PowerPoint

## Coastal fieldwork



© www.teachit.co.uk 2020

1

## Your fieldwork study

- It is important to apply **your knowledge** of fieldwork to the questions that you are answering.
- You must know **what** you did and **why** you did it.
- You don't need to remember all of the measurements, but you must know **what** you measured, **why** you measured it and **how** you presented it.
- You must also consider what **issues/problems** you had and how you could overcome them.

© www.teachit.co.uk 2020

2

## Hypothesis

### Key word: hypothesis

An educated prediction which can be tested. These are statements, not questions, e.g. 'The beach sediment will become rounder with distance from the beach.' They should be statements which can be investigated.

- You will need to create a hypothesis or enquiry question for your fieldwork. You will need to revisit your question frequently throughout your investigation.
- You will be asked about your hypothesis or enquiry question in your exam – so make sure you know what it is!
- You need to consider the location that you are going to, to ensure that your hypothesis is suitable for that location. For example you should not choose a hypothesis about sand dunes if there are no sand dunes at your chosen location.

### Key term: enquiry question

Turning your hypothesis into a question, e.g. 'How does the shape of the sediment change with distance from the beach?'

© www.teachit.co.uk 2020

3

## Location

Coastal fieldwork is carried out in coastal locations, e.g. at the beach or in sand dunes.

Locations are generally chosen for their proximity to school and their suitability.

If you are investigating rates of erosion or impacts of erosion you would choose a location which is known to have high levels of erosion.

### Location considerations:

- How far is it from school?
- What will the journey time be?
- Is the beach easy to access?
- Are the sand dunes accessible?
- Is the beach safe?
- Are the factors/features you are investigating present at that location?
- What are the tide times?
- How busy will that location be?

### Example questions:

Explain why your chosen fieldwork location was **suitable** for the collection of data.

Assess the **suitability** of the location chosen for your **physical** fieldwork enquiry.

© www.teachit.co.uk 2020

4

## Risks

- It is important to know the possible risks when you are carrying out fieldwork.

- What possible risks could there be when carrying out coastal fieldwork?

- Share ideas with the person next to you on what the possible risks could be.

### Risks for coastal fieldwork

- Trips, slips and falls – sometimes the ground is uneven.
- Drowning.
- Becoming cut off by the tide.
- Rockfalls from cliffs.
- Poor weather.
- Hot weather – dehydration/heatstroke/sunburn.

### Example questions:

Identify one potential risk in your physical fieldwork enquiry and explain how that risk was reduced.

© www.teachit.co.uk 2020

5

## Reducing the risks

- Before you go out on a fieldwork trip it is important to complete a risk assessment to assess what the risks are and to reduce the possible risks.

- Your safety is very important, so reducing the risks is vital.

- Complete your worksheet on how to reduce the risks during fieldwork.

Reducing the risk: coastal fieldwork

Identify the risk	How to reduce the risk	How to reduce the risk
Identify one potential risk in your physical fieldwork enquiry and explain how that risk was reduced.		

### Example questions:

Identify one potential risk in your physical fieldwork enquiry and explain how that risk was reduced.

© www.teachit.co.uk 2020

6