Research

SKILLS SECTION	CROSS-CURRICULAR LINKS *Learners have opportunities to apply their knowledge and understanding of, and skills in:*	TOPICS MODELLED
Starting with	Geography: human geography • Understanding human characteristics of places Language skills: speaking and listening • Listen, reflect on what is heard and give a reasoned response with reference to at least one specific point made by the speaker Maths: statistics • Record, organise and represent categorical, discrete and continuous data • Choose and explain which representation to use in a given situation Science: thinking and working scientifically • Describe the accuracy of predictions based on results • Present and interpret results using tables, bar charts, dot plots, line graphs and scatter graphs	Moving goods and people Reduce, re-use, recycle
Developing	Language skills: reading • Explore explicit meanings in a range of texts • Explore implicit meanings in a range of texts Language skills: speaking and listening • Use language to convey ideas and opinions, with increasing clarity and detail Maths: statistics • Record, organise and represent categorical, discrete and continuous data • Choose and explain which representation to use in a given situation Science: thinking and working scientifically • Describe the accuracy of predictions based on results • Present and interpret results using tables, bar charts, dot plots, line graphs and scatter graphs	Sharing Planet Earth Moving goods and people
Getting better at	Science: thinking and working scientifically • Sort, group and classify objects, materials and living things through testing, observation and using secondary information • Describe the accuracy of predictions, based on results • Use a range of secondary information sources to research and select relevant evidence to answer questions • Collect and record observations and/or measurements in tables and diagrams appropriate to the type of scientific enquiry	Keeping healthy Moving goods and people

SKILLS SECTION	CROSS-CURRICULAR LINKS *Learners have opportunities to apply their knowledge and understanding of, and skills in:*	TOPICS MODELLED
	Maths: statistics • Plan and conduct an investigation, and make predictions for a set of related statistical questions, considering what data to collect • Record, organise and represent categorical, discrete and continuous data • Choose and explain which representation to use in a given situation Geography: human geography • Finding different solutions to environmental issues	

The cross-curricular links in this table are reproduced from Cambridge International curriculum frameworks. This Cambridge International copyright material is reproduced under licence and remains the intellectual property of Cambridge Assessment International Education.

Starting with research skills: Lesson 1

In Lesson 1, learners focus on starting to construct research questions, by considering what is meant by 'global issues' and identifying different types of question, and by starting to make their own questions about such issues.

CAMBRIDGE STAGE 6 RESEARCH LEARNING OBJECTIVES

1.1 Constructing research questions: Begin to construct research questions with support

LESSON LEARNING GOALS

To start to:

- say what a global issue is
- identify different types of question
- make my own questions to help me understand global issues.

Resources needed

Learner's Skills Book 6

Downloadables 1.1 and 1.2

Challenge topic (e.g. Moving goods and people, Reduce, re-use, recycle)

Prior learning (approx. 5–10 mins)

Good for: Building on previous knowledge.

Activity: Ask learners to discuss what 'global issues' means.

Ways of working: Give learners time to discuss global issues in pairs or small groups before staging a plenary session in which learners share and respond to each other's ideas.

Differentiation: Support learners by showing pictures of global issues and asking them to identify what the issue is from the picture. Challenge learners to come up with their own examples of global issues and to rank global issues according to which they see as being the most important.

Suggested answers: Look for and encourage responses that acknowledge 'global issues' as those which affect a large number of people around the world (e.g. technological developments, such as humans being replaced by machines in the workplace) or which impact on the planet itself (e.g. deforestation, pollution, climate change). Contrast these with issues that are specific to the learners' local community (although these too may have a global dimension).

Starter activity (approx. 10–15 mins)

Good for: Starting to understand the difference between local and global issues, and how they may be

inter-related; identifying different types of questions that can be asked about an issue.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. After looking at an example, ask learners to identify another local issue that has global dimensions and complete a table by listing some of the problems it causes.

Ways of working: Learners work in pairs or small groups to complete the table. In a plenary session, encourage learners to share and respond to each other's ideas.

Differentiation: Support learners by checking their understanding of the example based on transport by using questioning. Continuing with the issue of transport, they can then consider how it affects them personally in order to complete the table. Challenge learners to come up with another global issue that has local consequences and complete the table using their answers.

Suggested answers: Look for and encourage responses that clearly identify a local issue with global dimensions. Encourage learners to talk about their personal experiences of any such issues.

Main activity (approx. 20–25 mins)

Good for: Helping learners to start identifying different types of question that can be asked about an issue and making up their own questions to develop a deeper understanding of it.

Activity: After looking at an example of how a mind-map can be used to generate questions about an issue, ask learners to identify different types of question as local, national or global. Then ask them to choose a different topic and make up their own questions about it, following this model.

Ways of working: Learners work in pairs or small groups to identify different types of question in the table. Check their answers in a plenary session using the Worked Example in Downloadable 1.1.

Learners then work in pairs or small groups to come up with a different topic and write their own questions to complete another table (a template is provided as Downloadable 1.2). Follow this with a plenary session, encouraging learners to share and respond to each other's ideas. (If time allows, ask each pair or group to read out one of their questions, getting others to identify whether it is a local, national or global question.)

Differentiation: Support learners by checking their understanding of the questions in the mind-map by using questioning. Give them a topic of local interest to focus on, and encourage them to come up with one example of each type of question (local, national and global). Challenge learners to come up with their own topic and to identify a number of local, national and global questions about it.

Suggested answers: See the Worked Example for Zara's table in Downloadable 1.1.

Starting with research skills: Lesson 2

In Lesson 2, learners focus on starting to develop information skills, by identifying different types of source relevant to a topic; conducting research, by designing questionnaires to use in an investigation and making simple predictions about the outcome of an investigation; and recording findings, by choosing an appropriate method of selecting, organising and recording research findings.

CAMBRIDGE STAGE 6 RESEARCH LEARNING OBJECTIVES

- 1.2 Information skills: Identify sources and locate relevant information and answers to questions within them
- 1.3 Conducting research: Conduct investigations, using interviews or questionnaires to test a prediction or begin to answer a research question
- 1.4 Recording findings: Select, organise and record relevant information from sources and findings from research using an appropriate method

LESSON LEARNING GOALS

To start to:

- recognise different types of sources that can help me to find out about a topic
- design a questionnaire to use in an investigation
- make simple predictions about what I think I will find out in an investigation
- choose a suitable way of selecting, organising and recording what I find out.

Resources needed

Learner's Skills Book 6

Downloadable 1.3

Challenge topic (e.g. Moving goods and people, Reduce, re-use, recycle)

Prior learning (approx. 5–10 mins)

Good for: Building on previous knowledge.

Activity: Ask learners to identify questions about local, national and global issues.

Ways of working: Give learners time to discuss and compare their answers in pairs or small groups before staging a plenary session in which a whole-class check can be carried out.

Differentiation: Support learners by asking them first to identify the question that refers to a local issue by using questioning to check their understanding of each question. Challenge learners to explain how they decided whether a question was global, national or local.

Suggested answers: 1 = national question; 2 = global question; 3 = local question.

Starter activity (approx. 10–15 mins)

Good for: Starting to think about different sources that could be used to find out about a topic and how sources about local issues might be different from sources for national or global issues.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. Ask learners to consider what sources might be useful to investigate each question and to decide the one they think the best.

Ways of working: Learners can work individually at first. They then share their ideas in pairs or small groups in order to complete each of the statements beginning 'The best way to find out would be . . . ' In a plenary session, encourage learners to share and respond to each other's ideas.

Differentiation: Support learners by checking their understanding of questions 1–3 using questioning. Ask them to focus on the question referring to a local issue and think of ways they could find out more about it. Challenge learners to come up with a variety of different sources for each question and to explain which they think is the best.

Suggested answers: Although it isn't necessary for the learners to know the terms 'primary research' and 'secondary research', look for an understanding that, in order to answer the first two questions, the learners could gather data directly themselves, for example by interviewing people, using questionnaires, to carry out a survey. For the third question, they are much more likely to suggest accessing data produced by other people's research, and that is available online or in books, newspapers, magazines, and so on.

For the class discussion, get feedback from pairs or groups on which sources they think would be most useful for each question and allow discussion of any differences of opinion that might arise. There is no need to insist on a 'right' or 'wrong' answer, so long as learners can justify the choice they have made.

Main activity (approx. 20–25 mins)

Good for: Starting to think about ways of designing questionnaires to make selecting, organising and recording research findings more efficient, and for making simple predictions about the outcome of an investigation.

Activity: Ask learners to look at two methods of organising research findings, deciding which is the more efficient. They apply what they have learnt in order to design their own questionnaire and make a simple prediction about what they will find out.

Ways of working: Learners work in pairs or small groups to discuss the two different methods of organising research findings before sharing their ideas and responding to others in a plenary session. They continue to work in pairs or small groups to design their own questionnaire (a template is provided in Downloadable 1.3) and make a simple prediction.

Differentiation: Support learners by checking their understanding of the questionnaire and making a tally

to record results using questioning (e.g. 'What is this questionnaire about?', 'What question did they ask?', 'How did they record people's answers?', etc.). Challenge learners to work independently or in pairs or groups to design their own questionnaire on a topic of their choice and make predictions.

Suggested answers: The first example showing how answers to the question 'How do you travel to school?' have been recorded is deliberately designed to show learners an inefficient way of doing this, and is not intended as a model for them to follow. Encourage learners to point out some of the problems with this way of recording data – for example, it's confusing because it lacks organisation, consists of a mixture of text and numerical data, lacks consistent categories or headings, contains a lot of irrelevant information (e.g. names), is unclear (how many 'friends' come with Ken in his dad's car?), and so on.

The tally chart has a number of advantages (e.g. use of headings, clear method of recording data in a tally, all data expressed as numbers, etc.). Check also that learners understand that the 'Other' heading is a way of dealing with answers that they have not predicted.

Peer feedback (approx. 5–10 mins)

Pair each learner with a partner from a different group. Ask them to think about features of each other's questionnaires, such as their choice of topic, how clear the question is, whether they have predicted the most likely answers to their question, and so on.

Starting with research skills: Lesson 3

In Lesson 3, learners focus on starting to develop information skills, by finding information in sources to answer questions; conducting research, by thinking of questions to ask when interviewing someone; and recording findings, by recognising different ways of selecting, organising and recording information from sources.

CAMBRIDGE STAGE 6 RESEARCH LEARNING OBJECTIVES

- 1.2 Information skills: Identify sources and locate relevant information and answers to questions within them
- 1.3 Conducting research: Conduct investigations, using interviews or questionnaires to test a prediction or begin to answer a research question
- 1.4 Recording findings: Select, organise and record relevant information from sources and findings from research using an appropriate method

LESSON LEARNING GOALS

To start to:

- find information in sources to answer my own questions
- think of my own questions to ask when interviewing someone
- recognise different ways of selecting, organising and recording information from sources.

Resources needed

Learner's Skills Book 6

Downloadable 1.4

Challenge topic (e.g. Moving goods and people, Reduce, re-use, recycle)

Prior learning (approx. 5–10 mins)

Good for: Building on previous knowledge.

Activity: Ask learners to recall what they already know about predictions and to make their own predictions on the topics given.

Ways of working: Learners can work individually, making their own predictions before sharing them with others in pairs or small groups. Stage a plenary session, encouraging learners to share and respond to each other's ideas.

Differentiation: Support learners by checking their understanding of the topics they are to make predictions about by using questioning. Challenge learners to explain the predictions they have made (e.g. by describing what information or knowledge was useful to them).

Suggested answers: Accept any reasonable predictions, especially where learners can give reasons to support their ideas.

Starter activity (approx. 10–15 mins)

Good for: Starting to plan an investigation by making decisions about what sources to use, what questions to ask and how to organise research findings.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. Ask learners to discuss the topic of lateness among learners arriving at school in the morning and consider how to investigate it.

Ways of working: Give learners the opportunity to work in pairs or small groups to discuss the questions before holding a class discussion. Encourage learners to share and respond to each other's ideas.

Differentiation: Support learners by checking their understanding of the discussion topic by using questioning. Encourage learners to speak about their own personal experience of the topic. Challenge learners to explain the possible reasons for lateness and consider how they could be investigated.

Suggested answers: Accept any reasonable responses, especially where learners can offer reasons or evidence for their ideas. Encourage learners to draw on what they have learnt in the previous lesson, reminding them of the distinction between 'primary' and 'secondary' sources and highlighting the importance of the former in an investigation of this type.

Main activity (approx. 15–20 mins)

Good for: Starting to think of what questions to ask when carrying out an interview in order to elicit relevant information, and of how to record responses to the questions.

Activity: Ask learners to look at the questionnaire form and come up with appropriate questions to ask in order to elicit all the relevant information. Learners then complete the questionnaire by using their questions to interview a partner, and recording their partner's responses.

Ways of working: Learners can work individually at first to come up with appropriate questions, then in pairs or small groups to decide which questions would be most appropriate and efficient at eliciting the relevant information. Pair learners so that they can conduct interviews using the questionnaire. Encourage learners to use polite forms of address when carrying out their interviews (e.g. 'Would you mind if I ask you some questions?', 'Thank you for your time', etc.). Having used the questionnaire to interview a partner, learners can then report back to the class in a plenary session, sharing their experience of conducting an interview and discussing how this method of research might be improved.

Differentiation: Support learners by checking their understanding of the questionnaire format by using questioning. Challenge learners by asking them to refine their questions to find the most efficient way of eliciting the relevant information in an interview.

Suggested answers: There can be some variety in the form the questions take, but learners should be encouraged to elicit the relevant information in the most efficient way – for example, by asking one question, such as 'How do you travel to school?' rather than by asking 'Do you come by car? Do you come by bus?' and so on.

The following questions could be asked:

1 How do you travel to school?

2 How long does it take?

3 Who travels to school with you?

4 How often are you late?

5 Why are you late?

Answers to the first four questions can be recorded with a tick in the appropriate box, but the fifth question requires a written response.

For a Worked Example of a completed questionnaire, see Downloadable 1.4.

Taking it further: Lessons 1–3

How do your learners travel to school? Based on their work in Lesson 2, encourage learners to think of the pros and cons of each method of travel that is used by their classmates. Stage a debate, with learners arguing in favour of their preferred method of travel, pointing out its advantages and the disadvantages of other methods.

What have your learners discovered about the reasons for lateness among their peers in Lesson 3? Encourage them to work in groups to present their findings in creative ways, for instance by producing a poster ('Don't be late!') offering advice on how to avoid lateness.

Alternatively, they could script a short dramatic sketch (e.g. a dialogue between a teacher and a learner arriving late to class) to put their message across and present this in a class assembly.

Developing research skills: Lesson 4

In Lesson 4, learners focus on developing information skills, by clarifying the difference between ways of carrying out research and ways of recording results; and constructing research questions, by investigating which of two contrasting perspectives is most supported by evidence.

CAMBRIDGE STAGE 6 RESEARCH LEARNING OBJECTIVES

1.1 Constructing research questions: Begin to construct research questions with support

1.2 Information skills: Identify sources and locate relevant information and answers to questions within them

LESSON LEARNING GOALS

To develop my knowledge and understanding about:

- making questions that help me investigate a topic
- deciding what sources will help me find out more about a topic.

Resources needed

Learner's Skills Book 6

Challenge topic (e.g. Sharing Planet Earth, Moving goods and people)

Optional:

Books from other subjects where learners have recorded results, for example science (experiments), geography (field trips)

Extracts from a local newspaper, textbooks in the school library

Extracts from the school's website or blog, and so on

Prior learning (approx. 5 mins)

Good for: Building on previous knowledge.

Activity: Learners sort ideas into a table: 'ways of carrying out research' and 'ways of recording results'.

Ways of working: Give learners time to consider this individually before discussing with a partner. Books from other subjects where learners have carried out research of any kind could be used for ideas.

Differentiation: Support learners who are unsure, by discussing further examples from the table in 'suggested answers' below with reference to books from other subjects where learners have recorded results, for example science (experiments), geography (field trips). Challenge learners to provide further examples, especially of carrying out 'first-hand' or 'primary' research.

Suggested answers:

Ways of carrying out research	Ways of recording results
• interviewing people • making a prediction • reading articles online • using a questionnaire	• making a graph or chart • making a table • making a tally chart • taking notes

Starter activity (approx. 10 mins)

Good for: Learners to consider where they stand with regard to two contrasting perspectives on litter.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. Learners decide if they agree with Marcus's perspective (children in their school litter because they think it is normal) or Sofia's (there are not enough bins).

Ways of working: You could take a preliminary vote, for example point to the window if you agree with Marcus, point to the door if you agree with Sofia, point to the ceiling if you are unsure. Try to stimulate discussion by asking learners to talk to someone who has a different view.

Differentiation: Support learners by encouraging them to draw on their own experiences. Have they seen litter (if only on TV)? Where? What do they think caused it? Challenge learners to justify whether they agree with Marcus or Sofia (or both). On what basis do they make their judgement? Are alternative explanations possible? Is better infrastructure always the solution to a problem? Is taking personal responsibility always enough?

Suggested answers: The best responses will use their prior experience to make a general point, for example 'I agree with Sofia, because the children I know say they do care but they might both be wrong. It doesn't matter how much you care about litter or how many bins there are if the bins are all put in a windy place.' Or 'I agree with Marcus, because people are more likely to respect places that are neat and tidy in the first place.'

Main activity (approx. 20–25 mins)

Good for: Learners to consider what sources and questions would help them decide whose perspective makes most sense.

Activity: Learners rank a selection of sources according to how useful they would be to decide on the cause of the litter problem. They then decide what questions they would need to ask.

Ways of working: You could have learners working individually on both parts of the activity prior to the class discussion. Alternatively, you could come to a class agreement first about which sources would be most useful and then discuss what questions they could best help address.

Differentiation: Support learners by showing them some of the suggested resources and ask them questions. For example, show a local newspaper; does it look like it would cover stories like litter in the playground? If not, this can be ranked lower than another source that does address the topic. Challenge learners by asking them to consider what useful different perspectives could be obtained from a range of sources. Support learners by giving some initial ideas from the suggestions below – they can then follow a 'who, what, where, when, why, how' structure. Challenge them to focus their questions, targeting particular sources.

Suggested answers:

1 A possible ranking order, with reasons, might be:

1. Other children at their school – are most likely to have direct experience of the problem.
2. Teachers and parents of children at their school – will have experience over time of the issue.
3. The school's website and blog – could record appeals in the past for tidiness.
4. Textbooks in the school library – might contain information on looking after the environment in general.
5. Articles in the local newspaper – could possibly contain a success story (but very unlikely).
6. Documentaries on local TV – litter in the playground would likely be quite low on the producers' priorities.

2 Suggested questions include:

- Who thinks that the litter in the playground is normal?
- Where is the problem worst?
- How have people tried to deal with the problem in other places?

- When is the problem worst?
- Why do people drop litter?
- What has been done before to try and deal with the problem?

For the class discussion question 'What other actions could they take to get a full understanding of the problem?', possible answers might be:

- interview children
- compile a questionnaire
- conduct a survey to find out more precisely when the problem happens
- contact children in different schools to find out whether they have the same problem and if not, what they do about it.

Developing research skills: Lesson 5

In Lesson 5, learners focus on developing information skills, by using the findings of a survey and locating information in this source to answer questions. They are introduced to different ways in which findings that have been recorded can be used as part of conducting research.

CAMBRIDGE STAGE 6 RESEARCH LEARNING OBJECTIVES

1.2 Information skills: Identify sources and locate relevant information and answers to questions within them

1.3 Conducting research: Conduct investigations, using interviews or questionnaires to test a prediction or begin to answer a research question

1.4 Recording findings: Select, organise and record relevant information from sources and findings from research using an appropriate method

LESSON LEARNING GOALS

To develop my knowledge and understanding about:

- reading a tally chart
- using the results of a questionnaire
- looking at results and using them to suggest a course of action.

Resources needed

Learner's Skills Book 6 – this includes Sofia and Marcus's results

Downloadables 1.5, 1.6 and 1.7

Challenge topic (e.g. Sharing Planet Earth, Moving goods and people)

Prior learning (approx. 5 mins)

Good for: Activating prior understanding of the issue (litter) and different perspectives on its causes.

Activity: Class discussion of Sofia and Marcus's perspectives in the previous lesson – who do they agree with and why?

Ways of working: You could employ the 'quick vote' technique used in Lesson 4. Alternatively, learners could be given a set amount of time to consider their decision before you select individuals to feed back to the class. Others could be asked if they share the view that has just been expressed.

Differentiation: Support learners by encouraging them to look back and use the way Sofia and Marcus back up their opinions. Challenge learners to apply again their own understanding of the issue based on their experience. Is it an issue as far as they are concerned? What, in their view, is/are the main cause(s)? Have they any experience of a different approach to the problem?

Suggested answers:

1 Litter in the playground.

2 The lack of bins was the main cause.

3 Litter is so common that children think it is normal.

4 The character who learners agree with most will depend on their experience of the issue. A wide range of answers are possible – for example, 'Marcus is right; around my area, it is so messy that people never bother with bins.' or 'Sofia is right; I know our playground bin overflows easily.'

Starter activity (approx. 5 mins)

Good for: Starting out with facts before making inferences from a set of data.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. Learners are asked what we know for sure from these results.

Ways of working: A good way of a conducting whole-class assessment for learning would be to give a statement and ask, for example, 'Point to the window if you think we can be confident this statement is true; point to the door if you think we can't', and so on.

Differentiation: Support learners by encouraging them to use the data and state facts (e.g. 'Only one child surveyed disagreed with the statement, 'there is too much litter on the playground'). Challenge learners to use expressions of degree appropriately (e.g. 'The overwhelming majority believes that . . . ', 'A significant proportion think that . . . ').

Suggested answers:

Only one person disagreed with the statement 'There is too much litter on the school playground at break time.'

The vast majority agreed with the statement 'There is too much litter on the school playground at break time.'

A significant majority disagreed with the statement 'Children drop litter because they do not care about the environment.'

Only one person thought that there were enough litter bins on the playground for everyone's rubbish.

Main activity (approx. 30 mins)

Good for: Learners to use data and understand that conclusions can be drawn with varying degrees of certainty. It is OK to infer what data is telling us as long as we understand that is what we're doing.

Activity: Learners read statements based on questionnaire data and decide the best descriptions: 'certainly true'; 'likely to be true'; 'cannot be sure'; 'likely to be false'; 'certainly false'.

Ways of working: This would lend itself well to pair work with partners taking turns to give their opinion first before recording. If using the differentiation activity in Downloadable 1.6 (see Differentiation below), support learners by encouraging them to work with their partner to rule out the options that have least basis in the results first. Challenge learners to discuss with their partner the likely outcomes of each option based on their own experiences, the results and their perspective.

Differentiation: Support learners by working through more of the suggested answers (see Downloadable 1.5) with them. Challenge learners to suggest other possible statements that fit each of the criteria. Challenge learners further by using the activity in Downloadable 1.6, in which learners are asked to select the best action that Marcus and Sofia could take to solve the problem of litter on the playground.

Suggested answers: Downloadable 1.5 provides a Worked Example to the Main activity. See Downloadable 1.7 for a Worked Example for the differentiation activity.

Peer feedback (approx. 5 mins)

Pair each learner with a partner from a different group. Ask them to give feedback on whether the decisions 'certainly true'; 'likely to be true'; 'cannot be sure'; 'likely to be false'; 'certainly false' are supported by the results.

Alternatively, if you have used Downloadable 1.6, pair each learner with a partner from a different group. Ask them to give feedback on whether their proposed solution is in fact supported by the results.