Research

SKILLS SECTION	CROSS-CURRICULAR LINKS *Learners have opportunities to apply their knowledge and understanding of, and skills in:*	TOPICS MODELLED
Starting with	Science: biology • Describe the importance of movement in maintaining human health Physical education: healthy bodies • Demonstrate understanding of the importance of physical activity in relation to health, fitness and wellbeing • Demonstrate understanding that a varied balanced diet contributes to a healthy and active lifestyle Maths: statistics and probability • Plan and conduct an investigation to answer statistical questions, considering what data to collect (categorical and discrete data) • Record, organise and represent categorical and discrete data • Choose and explain which representation to use in a given situation • Interpret data, identifying similarities and variations, within and between data sets, to answer statistical questions; discuss conclusions, considering the sources of variation Language skills: reading • Read and explore a range of non-fiction text types • Identify key words and phrases that establish the main points in a text	Keeping healthy Sport and leisure
Developing	Language skills: speaking and listening • Listen and respond appropriately, including asking and answering questions to develop ideas • Extend a discussion by contributing relevant comments and questions • Make short notes to record information Science: thinking and working scientifically • Ask scientific questions that can be investigated • Make a prediction describing some possible outcomes of an enquiry • Identify whether results support, or do not support, a prediction • Describe simple patterns in results • Make a conclusion from results and relate it to the scientific question being investigated Geography: human geography • Understanding geographical similarities and differences, e.g. the impact of climate on human activity	Keeping healthy Living and working together

SKILLS SECTION	CROSS-CURRICULAR LINKS *Learners have opportunities to apply their knowledge and understanding of, and skills in:*	TOPICS MODELLED
Getting better at	History: developing understanding of chronology • Understand change and continuity Language skills: writing • Make short notes to record information from a text and use them to inform writing Physical education: healthy bodies • Demonstrate understanding of the importance of physical activity in relation to health, fitness and wellbeing • Demonstrate understanding that a varied balanced diet contributes to a healthy and active lifestyle	People – young and old Keeping healthy Sport and leisure

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Starting with research skills: Lesson 1

In Lesson 1, learners focus on starting to construct research questions, by coming up with their own questions to use in an investigation; and on conducting research, by carrying out an investigation using a questionnaire and interviewing each other.

CAMBRIDGE STAGE 4 RESEARCH LEARNING OBJECTIVES

1.1 Constructing research questions: Construct own questions to aid understanding of a topic

1.3 Conducting research: Conduct investigations, using interviews or questionnaires, making observations and taking appropriate measurements

LESSON LEARNING GOALS

To start to:

- make my own questions to help me find out about a topic
- carry out an investigation using my own questions.

Resources needed

Learner's Skills Book 4

Downloadable 1.1

Challenge topic (e.g. Keeping healthy, Sport and leisure)

Pictures of different aspects of keeping fit and healthy

Prior learning (approx. 5–10 mins)

Good for: Activating previous knowledge.

Activity: Ask learners to read a list of ways children can stay fit and healthy, and to rank them in order of importance.

Ways of working: Learners can work on the task individually to begin with before getting into pairs or small groups to discuss their work. Stage a plenary session so that learners can share their ideas with the whole class.

Differentiation: Support learners by checking their understanding of the items on the list by using questioning and/or pictures to illustrate their meaning. Challenge learners to explain why they have chosen one item from the list as the most important way of staying fit and healthy, and to come up with other ways.

Suggested answers: There are no definitive answers. Accept any reasonable response, especially if supported by evidence or reasoning.

Starter activity (approx. 10–15 mins)

Good for: Starting to consider how to plan an investigation into a topic based on the learners' questions.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. Ask learners to read the transcript of a discussion by a group of students as they decide on a topic to investigate. Then ask learners to think about how an investigation can be carried out using primary research (i.e. by getting information from others using their own questions) and what questions they would ask.

Ways of working: The transcript of the discussion can be presented as a role play by asking different learners to read each part. Then give learners the opportunity to discuss the questions for the class discussion in pairs or small groups before staging a whole-class discussion in which learners share their ideas and respond to others.

Differentiation: Support learners by checking their understanding of the transcript by using questioning. Challenge learners to come up with ideas about how they could carry out an investigation into how children spend their time outside school hours, and what questions they could ask to elicit information on this topic.

Suggested answers: For the class discussion:

1 Encourage learners to come up with ideas about how they could conduct an investigation into this topic by carrying out their own primary research into how their peers spend their free time. This could be done by designing a questionnaire and then conducting interviews using the questionnaire. Accept any other reasonable responses.

2 Encourage learners to come up with questions that elicit specific data that will allow them to compare the information from different respondents (e.g. 'How much time do you spend watching TV every week?' rather than 'What do you do in your free time?').

Main activity (approx. 20–25 mins)

Good for: Starting to design a questionnaire to structure an investigation, and thinking about how to use the questionnaire in an interview.

Activity: Ask learners to look at the questionnaire template, and to work in small groups to complete it by adding more activities that they think children participate in outside of school hours. They then think of what questions they will ask when they use the questionnaire to interview others. Stage a brief plenary session to check that learners are asking appropriate questions in order to elicit the data they are looking for, and then ask them to use the questionnaire to conduct interviews with other learners – preferably from a different group – and report back on what they have found out.

Ways of working: Learners work in small groups to complete the questionnaire template. Then pair learners from different groups so that they can interview each other using their questionnaires, asking questions and recording the responses. (Use a pair to demonstrate in front of the class how to conduct the interviews, emphasising the need to adopt a polite and friendly tone – for example, 'Can I ask you some questions?', 'Thank you for your time.') Repeat the process by re-pairing learners so that they each interview at least two people. Give learners the opportunity to discuss the questions for the class discussion in their groups before holding a plenary session so that groups report back to the whole class.

Differentiation: Support learners by giving each an appropriate role within the group. For example, in a group of four, there could be a recorder (to take notes of the group's decisions), a facilitator (to check that everyone is given a chance to contribute), a timekeeper (to check that the task is completed within the time allocated) and a reporter (to report the group's findings to the whole class). It might be helpful to display posters describing each role so that learners can be reminded of what they need to do during the group activity. Challenge learners to come up with appropriate questions to ask in the interviews and to draw conclusions from their findings.

Suggested answers: Final versions of the questionnaire will vary from group to group, but should list activities that children commonly do outside of school hours (see the Worked Example in Downloadable 1.1).

For the class discussion:

1 Encourage learners to draw conclusions from their data by looking for general patterns (e.g. what activity takes up most time outside school hours? what are the most popular activities?)

2 Encourage learners to think of how they could present their findings (e.g. by using graphs, charts or diagrams).

3 Ask learners to think about what they would like to improve (e.g. would they pick different activities to list on their questionnaire, or ask different questions? Would they conduct the interviews differently, or record their findings in another way?)

Starting with research skills: Lesson 2

In Lesson 2, learners focus on starting to record findings, by recording their own findings using a pictogram, and showing what they have learnt from this.

CAMBRIDGE STAGE 4 RESEARCH LEARNING OBJECTIVES

1.4 Recording findings: Select, organise and record information from sources and findings from research in simple charts or diagrams

LESSON LEARNING GOALS

To start to:

- use a simple chart or diagram to record results of research.

Resources needed

Learner's Skills Book 4

Challenge topic (e.g. Keeping healthy, Sport and leisure)

Prior learning (approx. 5–10 mins)

Good for: Building on previous knowledge.

Activity: Ask learners to read a list of steps taken during an investigation and to order them.

Ways of working: Learners work individually on the task to begin with before getting into pairs or small groups to discuss their work. Stage a plenary session to check answers with the whole class.

Differentiation: Support learners by checking their understanding of the steps in the list by using questioning and reminding learners of the investigation they carried out in the previous lesson. Challenge learners to explain their answers, giving reasons why one step should come before or after another.

Suggested answers:

Interview some people = 4

Think of some questions we can ask = 2

Tell others what we found out = 6

Decide on a topic we can investigate = 1

Make a questionnaire = 3

Record our results = 5

Starter activity (approx. 10–15 mins)

Good for: Starting to think about how findings from an investigation can be recorded using a pictogram.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. Ask learners to look at how the results of an investigation have been recorded using a pictogram and to answer some questions about it.

Ways of working: Give learners the opportunity to discuss the questions for class discussion in pairs or small groups before holding a plenary session to share their answers with the whole class and respond to others.

Differentiation: Support learners by checking their understanding of how data is presented in the pictogram by using questioning. For example, check that learners understand that each 'face' in the pictogram represents one person, so it shows us that five people spent less than 1 hour doing sport or physical activity, while four people spent between 1 and 2 hours doing this, and only one person spent more than 3 hours. Challenge learners to find patterns in the data that allow them to draw conclusions from it, and to come up with more questions that could be asked to clarify the data.

Suggested answers: For the class discussion:

1 Encourage learners to look for patterns in the data (e.g. that apart from homework, the activity that most children spent most time on was being on their phone, computer or other devices, followed by watching TV).

2 The data suggests that this could be because they are too busy doing other things, such as homework. However, the data doesn't prove this, and more investigation is needed to see if, for example, there is a connection between the amount of time children spend doing homework (or another activity) and the amount of time they spend doing sport.

3 Encourage learners to see that the investigation could now be extended to target this information, possibly by re-interviewing those who said they played less than 1 hour of sport a week and asking them more questions about how they use their free time, or about other reasons why they don't do more sport or physical activity.

Main activity (approx. 20–25 mins)

Good for: Starting to record learners' own findings using a simple pictogram, and to consider what they can learn from the data.

Activity: Ask learners to complete a pictogram template using the results of the investigation conducted in the previous lesson.

Ways of working: Learners work in the same groups as in Lesson 1 and pool the data that they collected there in order to make a pictogram representing the findings of the whole group. They then look at the findings to find three things that their investigation has shown about what children do in their time outside school hours, and to think of another question related to this topic that they could now investigate.

Differentiation: Support learners by checking their understanding of how to represent data in the pictogram by using questioning or demonstration, and by assigning appropriate roles in the group (see Lesson 1). Challenge learners to find patterns in the data that tell them what can be learnt from it.

Suggested answers: The things that learners learn from their findings will vary according to the data collected by the groups. Encourage children to look for things such as which activities most children spent longest on, which activities showed some children choosing to spend much more time on than other children, whether activities that involve sitting down take up more time than those that involve physical activity, and so on.

For a Worked Example of how the table should look, refer back to the example of the completed pictogram in the Learner's Skills Book (Starter activity).

Responses to the follow-up questions might be:

1 **a** The activity that most children choose to spend longest on is being on their phone, computer or other device.

b Most children spend less than 3 hours a week playing a sport or doing physical activity.

c The activities that children spend most time on (e.g. homework) usually involve sitting down.

2 'If you limited the amount of time you spend on your phone, computer or other device, what would you like to do instead?'

Peer feedback (approx. 5–10 mins)

Pair each learner with a partner from a different group. Ask them to think about how clearly their partner has recorded their findings in the pictogram, whether they have shown clearly what they have learnt from it and what they would like to learn next.

Starting with research skills: Lesson 3

In Lesson 3, learners focus on starting to construct research questions, by making their own questions to help them understand a topic; and on information skills, by finding information in a source to help them answer their questions.

CAMBRIDGE STAGE 4 RESEARCH LEARNING OBJECTIVES

1.1 Constructing research questions: Construct own questions to aid understanding of a topic

1.2 Information skills: Locate relevant information and answers to questions within sources provided

LESSON LEARNING GOALS

To start to:

- make my own questions to help me find out about a topic
- find information and answers to questions in a source.

Resources needed

Learner's Skills Book 4

Downloadables 1.2 and 1.3

Challenge topic (e.g. Keeping healthy, Sport and leisure)

Laptops, tablets, mobile phones or other devices to explore locally available fitness videos, apps, etc.

Prior learning (approx. 5–10 mins)

Good for: Building on previous knowledge.

Activity: Ask learners to match some questions to the sources that are most likely to provide answers.

Ways of working: Learners can work individually on the task to begin with before getting into pairs or small groups to discuss their work. Stage a plenary session to check answers with the whole class.

Differentiation: Support learners by checking their understanding of the questions and sources by using questioning. Further support learners by pairing or grouping them and giving each pair or group a set of cut-up questions and sources to match, using Downloadable 1.2. Challenge learners to explain why they have matched a question to a particular source.

Suggested answers: a = 2; b = 5; c = 1; d = 4; e = 3

Starter activity (approx. 10–15 mins)

Good for: Starting to predict what information a source might contain that could provide answers to questions about a topic.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. Ask learners to read the title of a source, and to think about what questions the source might contain the answers to.

Ways of working: Learners can work individually to begin with before getting into pairs or small groups. In their pairs or small groups, they can be given the opportunity to discuss the answers to the class discussion questions. Then hold a plenary session in which learners can share their ideas and respond to others.

Differentiation: Support learners by checking their understanding of the title of the source by using questioning. Challenge learners to explain which questions they think the source might provide answers to and why they think this.

Suggested answers:

1 Accept any reasonable responses, encouraging learners to explain why they think the source might provide the answer to a particular question. If they find this challenging, draw their attention to the part of the title referring to 'in the digital age' and ask how this might have made a difference to the way people can keep fit and healthy.

2 Accept any reasonable responses, especially any that show an awareness of how the phrase 'in the digital age' helps to define the scope of the source. (So 'What websites can help children to keep fit and healthy?' is a better question than 'How does swimming help you to stay fit and healthy?' in this context.)

Main activity (approx. 20–25 mins)

Good for: Starting to find information in a source that provides the answers to the learners' own questions about a topic.

Activity: Ask the learners to decide on three questions that they think they will find the answers to in the source provided in Downloadable 1.3. (These questions can be selected from the list in the Starter activity, questions suggested during the class discussion or questions that learners have come up with themselves.) They then read the source and discuss the outcome of their reading.

Ways of working: Learners work in pairs or small groups to decide on their questions. They should be given the opportunity to discuss in their pairs or groups the questions in the class discussion that follows.

Differentiation: Support learners by encouraging them to select three questions from the list in the Starter activity if it is challenging for them to come up with additional questions. Challenge learners to come up with questions of their own that they think they might find the answers to in the source. If time allows, encourage learners to do some online research into what health and fitness-related videos would be appropriate for children of their age, or what apps are appropriate and locally available for downloading onto their phones.

Suggested answers: Learners might come up with questions similar to the following:

a How can you use your phone or laptop to help you keep fit and healthy?

b How can you limit the amount of time you spend looking at your phone?

c How much physical exercise should you do every day?

They would tick questions a and c because the source provides answers to these.

For the class discussion:

1 Of the questions on the list in the Starter activity, the source provides answers to:

a How much physical exercise should you do every day?

d What type of physical activity helps you to keep fit and healthy?

e How can you use your phone or laptop to help you keep fit and healthy?

However, the importance of the activity lies not so much in predicting correctly what information the source contains, as in going through the process of asking questions of a source so that reading becomes more purposeful. In this respect, being able to identify what a source doesn't tell the reader is just as important a skill as identifying what it does.

2 Encourage learners to think about other information they can find in the source – for example, 'What are the advantages of watching fitness videos at home?' or 'How can an app on your phone help you to improve your fitness?'

3 Encourage learners to focus on what the source doesn't tell them about how to keep fit and healthy and to come up with questions on this topic that they could do further research into.

Taking it further: Lessons 1–3

Encourage learners to find out what fitness resources (e.g. videos of physical exercises that they could do at home) are available online in your local area. They could then create a 'menu' of exercises that are age-appropriate and practical for them to carry out in a domestic setting as a way of starting to create their own fitness regimes. These could be videoed by learners, demonstrating how to do the exercises, and shared across the school. Alternatively, learners could create an illustrated booklet of instructions for each exercise. In either case, the idea of improving physical fitness could also be promoted at school through a poster campaign, video presentation, class assembly, and so on.

This could also be an opportunity to establish links with local sports clubs. What opportunities exist in your local area for children to take part? Your class could be set the challenge of producing a brochure for someone new to the area.

Developing research skills: Lesson 4

In Lesson 4, learners focus on developing their skills in developing research skills, by developing a hypothesis about their topic; and conducting research, by using their prior understanding of a topic to help them construct research questions that could lead to comparative study.

CAMBRIDGE STAGE 4 RESEARCH LEARNING OBJECTIVES

1.1 Constructing research questions: Construct own questions to aid understanding of a topic

1.3 Conducting research: Conduct investigations, using interviews or questionnaires, making observations and taking appropriate measurements

LESSON LEARNING GOALS

To develop my knowledge and understanding about:

- how to make my own questions to find out more about a topic
- how to carry out an investigation using a questionnaire.

Resources needed

Learner's Skills Book 4

Downloadable 1.4

Challenge topic (e.g. Keeping healthy, Living and working together)

Stimulus material (e.g. appropriate images) for the topic the learners are investigating

It would be highly advantageous to have set up links with schools in contrasting contexts for the lessons that follow.

Prior learning (approx. 5–10 mins)

Good for: Learners to activate their prior understanding of global similarities and differences.

Activity: Learners consider which of four statements on the topic of 'keeping healthy' they most agree with. These statements express different views about the extent of global diversity on the topic.

Ways of working: You could put signs up around the room with the names of each of the four characters in the Learner's Skills Book and ask learners to point to the name of the person they most agree with. You could then give learners the chance to share ideas with a person who has a similar/different view prior to opening up class discussion. You will want to emphasise an appropriate ethos of providing opportunities for prior understanding to be shared while empirically challenging the misunderstandings behind any prejudiced preconceptions that might emerge.

Differentiation: Support learners by reminding them of contrasting locations that they have studied in the past or that they may have connections with, even if that is only through representations in the media. Challenge learners to consider the extent to which their generalisations can be supported empirically – what information would they need to find out if the impressions they have developed are/are not accurate?

Suggested answers: These will depend on learners' prior learning, but this could lead them to agree with either viewpoint:

I agree with Zara that children around the world are pretty much the same. When I went to stay with my auntie in [location] I saw some children who don't like healthy food.

I agree with Sofia. It doesn't matter where they are; they will see the same brands.

I agree with Marcus. Some children are active because they like football and that is a global game.

I agree with Arun that there are massive differences around the world because there are huge differences in climate and wealth.

Starter activity (approx. 10 mins)

Good for: Developing learners' understanding of different perspectives on a topic. This can be a fruitful source of questions for further enquiry.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. Learners locate each character in the Learner's Skills Book's rationale for their opinion.

Ways of working: This activity would lend itself well to paired work.

Differentiation: Support answers by encouraging learners to identify the reasoning that suggests significant difference/similarity first. Challenge learners to compare the characters' rationale with their personal experience. Whose perspective is most similar to their own? Why is this?

Suggested answers: For a Worked Example, see Downloadable 1.4.

Main activity (approx. 20–30 mins)

Good for: Learners to develop their understanding of generating enquiry questions.

Activity: Learners suggest additional questions relevant to the Learner's Skills Book characters' 'Keeping healthy' topic, then adapt these so that they could be used in a questionnaire.

Ways of working: Learners with higher prior attainment could move to independent working sooner. Learners who are less secure in their understanding could continue to have examples modelled until they are secure enough to work independently. You may consider supportive paired work to be an appropriate approach here.

Differentiation: Support learners by showing them how statements made by the characters have been used to generate questions. Provide them with a list of suitable question stems that would yield quantifiable answers – for example, 'How many . . . ?', 'How much . . . ?', 'How often . . . ?' Challenge learners to suggest when it may or may not be appropriate to use quantifiable information. Challenge questions for class discussion could include 'Why is it a good idea to ask some open questions?', 'Why is it a good idea to ask questions that ask for a number?'

Suggested answers:

Open questions	Questions that ask for a number
Why do children in your class use mobile phones?	How many children in your class have their own mobile phone?
What is your favourite game to play and why?	How many children in your class say football is their favourite game?
What is your favourite food and why?	How many times a week do you drink sugary cola?

For the class discussion:

1 More open questions are good because you can find out about people's perspectives – why they think like they do.

2 Questions that ask for a number are good because you can make direct comparisons – for example, the proportion of children who like football in two different classes.

Developing research skills: Lesson 5

In Lesson 5, learners focus on developing their skills in conducting research, by applying skills previously developed to their own topic; and conducting research, by constructing research questions that could lead to comparative study on a global topic with relevance to their own community.

CAMBRIDGE STAGE 4 RESEARCH LEARNING OBJECTIVES

1.1 Constructing research questions: Construct own questions to aid understanding of a topic

1.3 Conducting research: Conduct investigations, using interviews or questionnaires, making observations and taking appropriate measurements

LESSON LEARNING GOALS

To develop my knowledge and understanding about:

- how to make my own questions to find out more about a topic
- how to carry out an investigation using a questionnaire.

Resources needed

Learner's Skills Book 4

Downloadable 1.5

Challenge topic (e.g. Keeping healthy, Living and working together)

Stimulus material (e.g. appropriate images) for the topic the learners are investigating

It is essential for this lesson that learners have some prior understanding of a global topic that has an impact in their local community.

Prior learning (approx. 5–10 mins)

Good for: Learners to consider their prior understanding of the extent of global similarities or differences with regard to their topic.

Activity: Learners consider which of four statements on their topic they most agree with. Building on the previous lesson, these statements express different views about the extent of global diversity on the topic.

Ways of working: You could put signs up around the room with the letters 'a', 'b', 'c' and 'd' corresponding to the statements in the Learner's Skills Book. Ask learners to point to the letter of the statement they most agree with. You could again give learners the chance to share ideas with a person who has a similar/different perspective prior to opening up class discussion. As in the previous lesson, you will want to emphasise

an appropriate ethos of providing opportunities for prior understanding to be shared while empirically challenging the misunderstandings behind any prejudiced preconceptions that might emerge.

Differentiation: As in the previous lesson, support learners by reminding them of contrasting locations that they have studied in the past or that they may have connections with, even if that is only through representations in the media. Discuss with them the potential impact that factors such as urban/rural or climate contrasts may have on the topic. As in the previous lesson, challenge learners to consider the extent to which their generalisations can be supported empirically – what information would they need to find out if the impressions they have developed regarding their topic are/are not accurate?

Suggested answers: As in the previous lesson, these will depend on learning that has formed the children's perspectives, and so this could potentially lead them to agree with either viewpoint. The following table explores possible responses to the topic of 'access to water':

Statements	Reasons
As far as this topic is concerned, it doesn't matter where you go; children are exactly the same.	All children must have access to water – it is a basic need.
As far as this topic is concerned, depending on where you go, there are some differences, but children are mostly the same.	When I went to visit my cousins, they have water with their meal just as we do – only they like to buy bottled water.
As far as this topic is concerned, depending on where you go, there are some similarities, but children are mostly different.	All children need water, but not all children have access to clean water.
As far as this topic is concerned, it depends entirely on where you are; children are very different.	Children's access to water depends on where they are because some parts of the world have very dry climates – in other places, it rains all the time.

Starter activity (approx. 10 mins)

Good for: Learners to apply their understanding of different perspectives, learnt in the previous lesson, to developing questions on their own topic.

Activity: Read through the learning goals for this lesson with learners at the beginning of this activity. Learners summarise the contrasting perspectives in their class/group based on the previous discussion.

Ways of working: This activity would lend itself well to paired work.

Differentiation: Support answers by focusing on one of the more outlying perspectives expressed on the similarity/difference continuum first. Challenge learners to compare the other members of the class/group's rationale with their personal experience. Whose perspective is most similar to their own? Why is this?

Suggested answers: For a Worked Example that explores possible responses to the topic of 'Rich and poor', see Downloadable 1.5.

Main activity (approx. 20–30 mins)

Good for: Learners to apply their understanding of enquiry questions to their own topic.

Activity: Learners suggest additional questions relevant to their own topic then classify these so that they could be used in a questionnaire.

Ways of working: As with the previous lesson, learners with higher prior attainment could move to independent working sooner. Learners who are less secure in their understanding could continue to have examples modelled until they are secure enough to work independently. Challenge learners to consider when/why it might be more useful to have answers in the form of numbers or when/why it might be more useful to have answers in the form of words.

Differentiation: Support learners by reminding them of how statements made by the characters were used to generate questions in the previous lesson. Provide them with a list of suitable question stems that would yield quantifiable answers – for example, 'How many . . . ?', 'How much . . . ?', 'How often . . . ?' Challenge learners to suggest why and when it may or may not be appropriate to use quantifiable information in their enquiry.