Teacher Guide Section 2

8 Fuel and energy

General

This chapter is part of a new phase of learning for students. It will help students to become more independent, to take early steps for themselves and to develop their skills without the pressures of assessment. In this section, the emphasis is on independence in remembering and attempting to use skills, and on students beginning to be independent in setting up work.

For the teacher this means starting to move into a mentoring and guidance role, controlling the environment rather than the students. It means focusing on praising attempts at independence, asking questions to develop thinking and an almost terrifying move away from “getting it right”. If you are setting targets, these could relate to independence, motivation and trying to think of the next step or to the next level. Try not to worry about performance yet. It will come with practice, and with that willingness to think to the next level.

For the students this transition can be terrifying, but also liberating. As in Section 1, students will need:

- reassurance that it is ok not to be perfect – failure, mistakes and partial attempts are all acceptable, and indeed, essential parts of the learning process
- encouragement to try thinking and acting for themselves
- reminders that the content is important and interesting, but that the ability to find, think about and use information is much more important than the actual information
- support as they learn to direct and manage their own learning – it is particularly important to give students time to make this step, rather than giving up in frustration and telling them what to do.

Guidance to activities

Activity 8.1

As in Section 1, encourage students to choose in line with their interests, but also to keep their minds open to change as they gain new information.

Consider how well it can work for your class to have groups of students working on different topics or different aspects of the topic. Students do not need to come out of the course with the same knowledge, but rather with the same skills and the same ability to think about their knowledge. As students gain independence, it should be possible, for example, for one group of students to work on how their country can ensure its food security, while another group works on political agreements regarding climate change, another works on the possibilities for producing...
renewable energy, and a fourth group works on how local communities can reduce fuel use. Being able to make some choices in their learning can inspire and motivate even quite challenging students. This kind of organisation with groups working on different content can also help teachers to avoid the trap of delivering content rather than encouraging skills development.

**Activity 8.2**

Encourage students to think about the issues, consequences and perspectives rather than about the answers to the questions. Encourage students to find a way of working which helps them to clearly separates issues, consequences and perspectives (but acknowledge an overlap if necessary). This might include: use of colours; internet searches; skim reading; note taking; use of diagrams; reference to Skills Section 2, figures 2, 3 and 4; reference back to Skills Section 1, figures 3a, 3b and 4.

Do all students need to work on all of these? Are they better off choosing two to consider? Could students use their diagrams, posters and so on to present their thinking to the class or to make attractive displays which focus on the Global Perspectives skills?

Examples of possible student responses to statement (a) are:

<table>
<thead>
<tr>
<th>The issues: Should we have a biomass power station at all? Should we have a biomass power station here</th>
<th>The student has clearly identified two relevant and separate issues. Encourage the student to move on by asking questions such as: Would people who currently oppose the biomass power station oppose it if it were somewhere else? What are the reasons for the opposition? Will the consequences be positive for the environment or not?</th>
</tr>
</thead>
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<tr>
<td>Issue: Is biomass burning better for the environment?</td>
<td></td>
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<td>Consequences: Will it mean deforestation? Will it lead to air pollution? What other effects will it have on the city?</td>
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<td>Perspectives: Personal – not wanting to look at an ugly power station or breathe nasty fumes. National – we need to produce more environmentally friendly energy, is this the best way? Global – what would happen if every country did this?</td>
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| The student has clearly separated the issue from possible consequences and perspectives. The issue is relevant. Encourage the student to look at the consequences in more depth, using some research. What about economic consequences? |

**Activity 8.3**

Encourage independence here – help students to refer back to the relevant skills from Skills Sections 1 and 2, and to set up their own procedures. They could, for example, ask, “Where are you going to look to remind yourself about identifying key issues?”

As students are working, interact with them by asking questions to prompt deeper thinking and independent recognition of areas that need attention. For example: What is it that’s causing problems? You can’t think of any global perspectives? Well, are there any international consequences? Are there any international actions that could be taken?
Does this matter at all to people in other countries? Why?
Some students may be ready to consider that there may be multiple national perspectives on an issue. Be ready to discuss this with these students.

Activity 8.4
Encourage independence and use questions to prompt development. Assist students in setting up their own procedures and in referring back to the relevant parts of Skills Sections 1 and 2. Try to help students to spot changes or improvements they need to make, but emphasise independence and interest over performance at this stage.

Activity 8.5
There are suggested answers here, but at this stage it is more important for students to begin to set up strategies they can use to help them to answer these questions independently than it is for them to achieve a specific level in their answers. Encourage students always to move one level deeper or further by asking questions.

Note also that the sample answers are not “expected” answers in terms of level. They are examples of ways that students can be encouraged to develop their thinking. For some students, identifying the consequences at all will be success for them. Others will be able to say that the consequences are reasonable (or not) but struggle to identify why. Some will be ready to push their thinking much deeper.

(a) ‘Red Pepper’ is a UK based magazine which says it is ‘spicing up’ politics. It claims to be independent and left wing, to care about local actions with global consequences, to want welfare not warfare, and to want a new internationalism that is not dominated by multinationals. It is subject to UK laws, which say that the media must be accurate in their facts. So it is likely that the facts are accurate (and we can check these). It is also likely that Red Pepper will have a left wing perspective, and may select facts to support their view - just like all newspapers.

(b) If the five power stations mentioned will burn five times the UK’s wood production, it seems likely that a significant proportion of the wood will need to be imported. The figure of 80 per cent seems realistic but you would have to find out more about how much wood is needed, and whether the UK could produce more wood rather than importing it. Trees do take quite a while to grow, so a fast change is unlikely.

(c) (i) It seems likely on the basis of this article that biomass energy will have negative effects regarding deforestation and air pollution. It’s not at all clear that it will make climate change worse than burning coal, or mining uranium. Biomass energy is also only one part of the government’s strategy, so it might be unfair to say that the whole strategy will make things worse. You would need to read more about it.

(ii) Encourage students to think carefully about what they read. Does this look like it refers to a list of proper scientific studies? Is it a representative sample or have they just picked those which support their view and
ignored others which would oppose them? The reasons and evidence do seem to give us good reasons to oppose biomass power plants, in particular the idea that biomass means cutting down trees in vulnerable areas. If it were leftover wood from other businesses or pine trees grown locally it would be a different matter.

(d) Some options are solar energy, wind energy, and tidal energy. Encourage students to think carefully about the possible consequences.

**Activity 8.6**
Encourage students to attempt to set up their own procedures and to work independently (in groups, pairs or individually). Ask questions to prompt thinking to the next level.

**Activity 8.7**
Encourage students to really think about the issues, to spend time pondering in structured and unstructured ways. This activity is not about finding an answer but about finding your own place and perspective.

As in Skills Section 2, spend some time thinking about the difference between well thought through, supported opinions and prejudices. Encourage students to empathise but not to be governed by emotional responses.

Students might like to share plays, poems, film clips, and songs that are relevant to the issues, and talk about what they mean.

**Activity 8.8**
Encourage students to look back at the mini project plan from Section 1. They should remember how they approached the task, and think of ways to improve on that. What didn’t work last time? What can be made to work better this time?

Encourage students to think of one positive thing about the last attempt, and one area that needs improvement which they can focus on this time.

Encourage students to cooperate to find strategies to deal with classmates who didn’t pull their weight in the project last time. Can those students be made to feel more engaged? How? Can they be given a more personal stake in the project? Can they be made to feel that their contribution matters? Encourage students to consider that the attitudes of those who are hard-working and conscientious might contribute to the attitudes (and low self-esteem) of those who are not.

Once again, encourage students to focus on task planning rather than content at this stage.

Example 1: Make a wind turbine

(a) Leader – Josh; researcher – Ben; turbine maker – Ellie

(b) | Task       | Who will do it | When should it be done |
<table>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Josh</td>
<td>All the time</td>
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</table>
These students need to develop their thinking and planning. How realistic and achievable is it to make a wind turbine? (It is possible that there are ways of making real electricity-generating devices for a school, but this would need to be carefully planned and budgeted, which these students have not done!)

The plan needs to be broken down and made more specific. Ask the students what tasks Josh will be doing as leader, what the role of the researcher might be and how he might interact with the turbine maker, what specific tasks contribute to research and turbine making. Is making a turbine a job for one person?

Example 2: Outcome—design a set of cartoons to illustrate the personal, national and global problems associated with fuel and energy. Print the cartoons on T-shirts and sell them at the school’s environment day event.

(a) Team – Josh, Ellie, Ben, Sunita, Kwami; leader – Sunita; artist – Kwami

(b)

<table>
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<th>Task</th>
<th>Who will do it</th>
<th>When should it be done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brainstorm all the tasks we are going to need to do</td>
<td>All of us</td>
<td>This lesson</td>
</tr>
<tr>
<td>Work back from the final deadline to schedule each task</td>
<td>All</td>
<td>This lesson</td>
</tr>
<tr>
<td>Discuss possible funny ideas, situations, captions</td>
<td>All of us</td>
<td>This lesson</td>
</tr>
<tr>
<td>Consider budget, how we can get T-shirts printed?</td>
<td>All</td>
<td>Bring in first ideas next lesson</td>
</tr>
</tbody>
</table>

These students have made a very good start at breaking down the tasks and have a good idea of the processes needed to list and schedule tasks. They have chosen a project from the textbook which allows them to have a SMART outcome and deal with issues and perspectives. Encourage them to think one step further. What are the consequences/implications of their decisions about what the display looks like for their research? Do they need to make a list of things to find during their research? Could they make lists of key words for a search? Encourage them also to think about the final deadline and make sure that all the tasks are scheduled, along with review meetings.

**Activity 8.9**

Encourage students to remember the procedures and processes they used in Section 1 to write their short report, and structure their work for themselves as much as possible. Talk to them about reviewing their research material, and the diagrams and thoughts they have had on the material. Discuss selecting only the most useful and relevant ideas. Students can sometimes be reluctant to discard material that they have
researched. Having a real or imaginary shelf for interesting ideas that you can come back to later can help here.

As in Section 1, encourage students to write one, two or three clear sentences for each heading, using their own words. Suggest that they use a maximum of one quotation per section, and/or refer to statistics briefly. For causes and consequences, students might be more comfortable using diagrams or charts, as used in the skills section. This is not intended to be assessment-ready work. Encourage relevance, clear summaries of the issues, use of own words and clear analysis of the issues. Discourage overly long responses, overload of information and long passages clearly taken without manipulation from sources. Some able students may find the restrictions frustrating, and may need to be reminded that selecting the right 300 words is a greater skill than producing 3,000 words with less thought.

**Activity 8.10**

Encourage students to think carefully about their project work. These questions will lead eventually to project evaluations, but at this stage students are only beginning the process. They may need assistance in considering problems and solutions without unpleasant recriminations or blame casting.

**Developing material from this section for assessment**

The tasks in this section are intended as introductory materials and not as assessment-ready work. However, the topics are on the IGCSE Global Perspectives syllabus and work in these areas can be submitted for assessment. If students choose to submit work in these areas, it is recommended that they revisit the areas after further study.

**Research questions**

The research questions suggested in the topic could be used for assessed work, with more developed, analytical answers. It might be useful to move from “how” to “what actions could we/governments take”. Remember to always consider the global perspective as well as the personal and national perspectives.

**Projects**

The first project suggested in this topic is too limited to be submitted for assessment. It could be amended as follows:

Work with a school in a different country to suggest solutions to two different problems related to fuel experienced by your countries. Make displays for an open day. Remember to consider causes, consequences and personal, national and global perspectives.

The second project needs only to include cross-cultural communication. Working with a school in another country, perhaps T-shirts could be designed and sold to each other.