

Lesson Plan for WJEC Metacognition Resources Project

Group: Year 9	Time: 1 hour
Lesson objectives: How can we analyse and interpret data to draw scientific conclusions which are consistent with evidence? How can we explain global warming phenomenon scientifically?	
Link to prior learning: Are able to summarise the carbon cycle and how humans may affect this. Are able to describe the composition of the atmosphere and the importance of ozone. Are able to relate carbon dioxide levels to global warming and how humans can impact carbon dioxide levels.	Resources: PISA questions and mark scheme - Greenhouse Source square Reflection Triangle
Learning activities: Starter (5 min): What do they know about CO ₂ ? Discuss. Source square (10 min): Graphs put into a source square for learners to extract as much information as possible from the graphs to draw a conclusion which links both graphs. Then compare against André's conclusion and discuss extent of agreement and evidence from the graphs (Question 5.1). 'Golden sentence' (5 min): Divide the task into sections (by paragraphs if preferred). Working in small groups, each group must present a 'golden sentence' summary of their given paragraph. Questions (10 min): From the 'golden sentence' summaries and/or source square, present questions to learners and ask them to use the information they have gathered to provide group answers to the questions. Deconstruct with learners afterwards which answers originated from the actual task/text/graphs (and how these were located) and which answers drew on previous scientific knowledge and understanding and how these are linked. Using think-pair-share, invite learners to show what clues in question stems would point towards using the information given and what requires them to draw on previous experience/knowledge. Assess answers and discuss scoring (10 min).	

Using the **reflection triangle** asking (10 min): What is this task about? How do you know? Where have you used a strategy like this before? How did you extract the information you needed? How will you identify and summarise the key ideas to answer this question?

Differentiation:

Source square - envelope with speech

Golden sentence - envelope with some of the key words that could be used.

Reflection triangle - envelope with an example of one filled in.

Opportunities for developing metacognition:

Using the **Source square**, learners could be asked to explore the links between the image and the text, or they could devise questions about the text, image and graph and set them for another group to answer. Does the image help to clarify the text? What are the axes on the graph showing? What information can we get from the graph? Are there any links between the graph, text and image which help to explain further about the topic? What inferences can we make?

Using the **'golden sentence'**, learners should be encouraged to describe how they developed their summary (e.g. use of keywords, skimming, scanning, etc.). They can then consider the effect of the overall conclusion drawn if certain pieces of evidence (certain 'golden sentence summaries') were missed out or purposely not included. This challenges learners' ideas and helps develop strategies in pulling together vast quantities of information and making decisions regarding their relevance.

Using the **'think-pair-share'**, learners are posed a question, given time to think individually, and then time to discuss ideas with a partner. Finally, the pair shares their ideas with the rest of the class (or a larger group).

Using the **reflection triangle** to promote metacognition by guiding deconstruction of the task and processes, tools and strategies used throughout the lesson. Asking: What is this task about? How do you know? Where have you used a strategy like this before? How did you extract the information you needed? How will you identify and summarise the key ideas to answer this question?