

Carbon TIME Classroom Discourse Routine

Carbon TIME units are designed around a classroom discourse routine that aligns with the Process Tools and the Instructional Model. This alignment, with implications for teaching *Carbon TIME* units in productive ways, is described below. Use this document to prepare for teaching *Carbon TIME* units this year.

As seen in Figure 1, across the span of each unit, classroom discourse shifts from being divergent in nature (students share and discuss diverse ideas) to being convergent in nature (students converge on the best ways to answer driving questions in the unit).

Purpose for Discussions

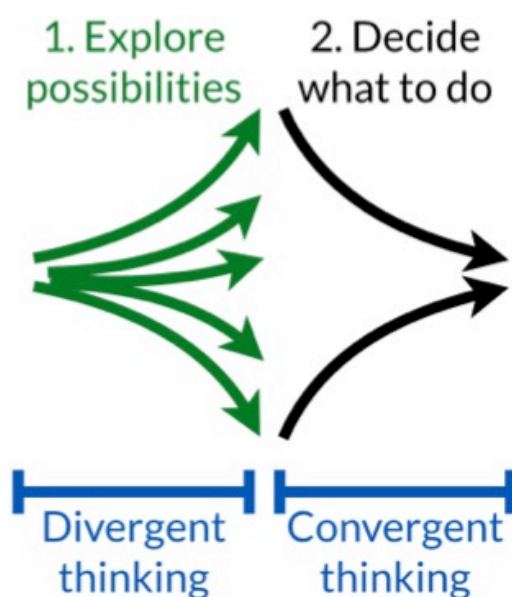


Figure 1. Divergent and convergent discussion in *Carbon TIME* classroom discourse

As seen in Figure 2, discussion is divergent in nature at the start of each unit, and shifts to being convergent when students begin constructing scientific explanations for processes toward the end of lesson 3 and in lessons 4 and 5. Supporting both divergent and convergent discourse reflects instruction that is both responsive (eliciting, valuing, and clarifying students' diverse ideas) and rigorous (using science practices to help students develop the capacity to construct accurate, canonically-aligned, model-based scientific explanations).

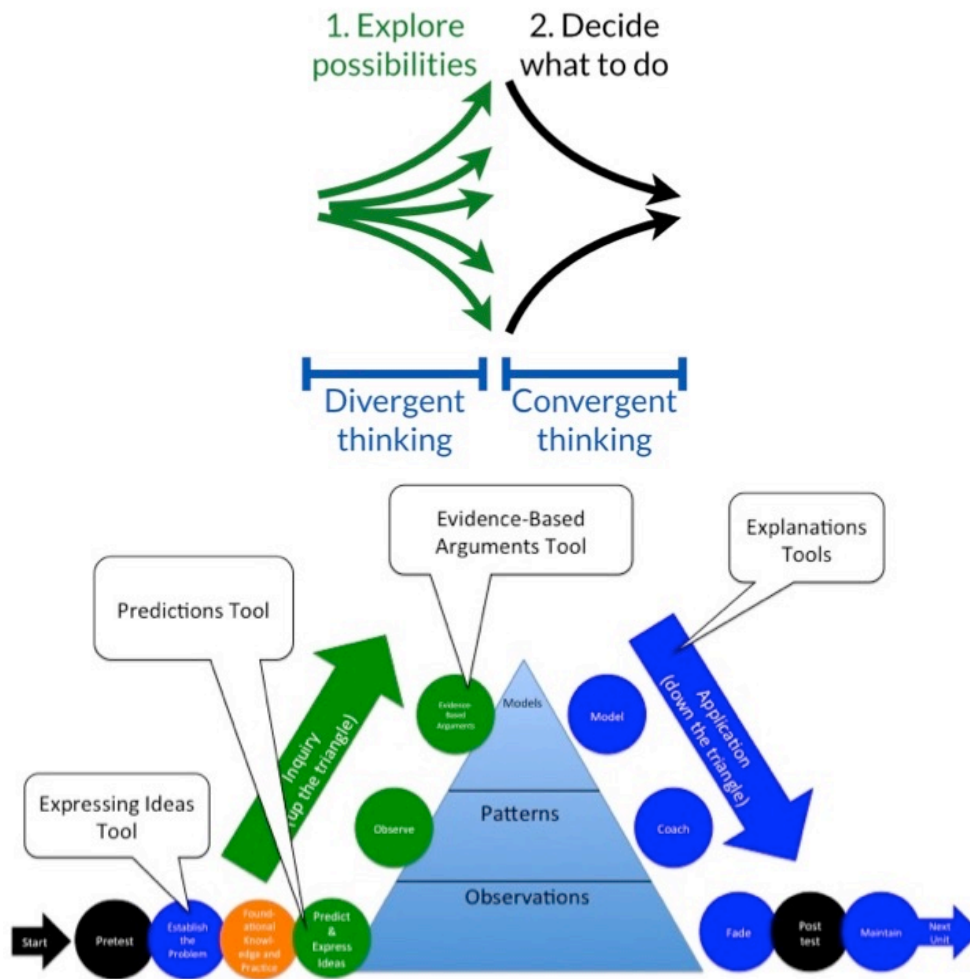


Figure 2. Divergent and convergent discussion aligns with the Instructional Model and Tools

Classroom Discourse Routine Around Process Tools

The *Carbon TIME* classroom discourse routine follows an outline in which some parts are similar across tools and some are different. The rationale for specific differences in the classroom discourse routine for each tool has to do with where the tool comes in the unit, and whether divergent or convergent thinking is called for at that point in time.

During the lesson when the Process Tool is used

- Set up and establish the problem: Discussion is aimed at activating students' prior knowledge and helping them be aware that they have ideas to write about on the process tool
- Private writing: Students use the process tool to write their ideas, conclusions, and explanations individually
- Sharing ideas: Students share and compare ideas using think-pair-share or classroom elicitation strategies
- Consensus seeking discussion accompanied by public writing: The nature of the consensus seeking is different for the different tools
 - Expressing Ideas and Predictions Tools: Class should come to consensus about:
 - Similarities and differences among students' ideas
 - Important issues and points of disagreement
 - Questions
 - Evidence-Based Arguments Tool: Class should come to consensus about:
 - Relevant patterns in data
 - Warranted conclusions
 - Unanswered questions – especially answers to the Three Questions that require cannot be answered by reference by the investigation (patterns in the data)
 - Explanations Tool (and follow-up explanation activities in the last lesson): Class should come to consensus about:
 - Coherent explanations that answer the Three Questions while following the rules (middle column) in ways that are consistent with evidence (last column)

Follow up later in the unit after the process tool was initially used

The routine for follow up after initial tool use is also different for different tools.

- Expressing Ideas, Predictions, and Evidence-Based Arguments Tools (tools that are accompanied by ASSESSMENT resources for teachers): Students' initial performances on these tools (i.e., ideas, questions, issues) should have been preserved (e.g., on a poster or a PowerPoint slide). Return to students' initial ideas in later lessons when explanations are addressed. Students and teacher can view and discuss how students' ideas have changed.
- Explanation Tool (and other worksheets and quizzes accompanied by GRADING resources for teachers): The discourse routine here is to hold students accountable for correct responses through grading, checking one another's work, etc.