

TABLE 1

## Tools for sensemaking.

3D Elements	Affordances
<p><b>Performance Expectations (PEs), Storyline, and Anchor Phenomenon</b></p> <p>We situated the experience within a larger storyline, or learning sequence, designed to support particular Performance Expectations (PEs). In addition, we grounded the storyline with an anchor phenomenon.</p>	<p>It is important to note that no single activity is meant to fully carry a PE or address the anchor phenomenon. Rather several activities within a storyline build on one another to tell a coherent story about the content included in the DCIs/PEs so that students can make sense of phenomenon. This activity in particular supports learners as they begin developing an understanding related to balanced and unbalanced forces.</p>
<p><b>Equity</b></p> <p>We embedded several strategies that support science learning for all, such as (1) distinguishing between and attending to procedural vocabulary (introduced at the beginning of the investigation to provide common language) and conceptual vocabulary (introduced once students have had experiences with the terms), (2) having participants work in collaborative, heterogeneous groups; (3) posting environmental print (charts showing ideas and vocabulary related to investigations); and (4) incorporating science talk.</p>	<p>Including multiple <i>intentional</i> language supports ensures that all students can access the experience and content. These techniques help all learners, but English Language Learners (ELLs) in particular.</p>
<p><b>Science Practices: Modeling</b></p> <p>Learners constructed initial models after the inquiry starter, but prior to their focused investigations and revisited these models after their investigations and science talk to continue making sense of the question, how do parachutes work?</p>	<p>Adding a modeling component provides learners the opportunity to make sense of their ideas following their initial test, as well as an opportunity to further develop their ideas as they continue to refine their model. In this way, modeling was used as a sense-making tool rather than simply for illustrative or communicative purposes.</p>
<p><b>Crosscutting Concept: Cause and Effect</b></p> <p>A mini-lesson was incorporated prior to the investigation to articulate how a focus on cause and effect can help learners as they begin understanding how parachutes work.</p>	<p>Explicitly focusing on cause and effect enables learners to make sense of the relationship between variables. Learners can use this understanding to help them begin developing explanations about the causal mechanism between events.</p>
<p><b>Discourse</b></p> <p>Learners engaged in a science talk in which learners used their investigative results, as well as the crosscutting concept, cause and effect, to help make sense of the relationships at play during the parachute investigation. During the science talk, participants were able to engage in discourse-intensive practices such as <i>Engaging in Argument from Evidence</i>.</p>	<p>Adding a science talk enables the learners to process, synthesize, and make sense of the information shared by the group. They are able to further their understanding by hearing multiple perspectives about how parachutes work. The teacher still facilitates, but the learners lead the conversation.</p>