

Key Components and Traits of a Diagnostic Learning Environment (DLE)

Component		High-Level Teacher/Student/Instructional Traits of a DLE
1. Teacher Content Knowledge	a. Deep conceptual understanding of content taught	a. Teacher has an understanding of the subject matter at the level of <i>how we know</i> the principles and concepts in the domain.
	b. Knowledge of the learning objectives and big ideas of the unit being taught	b. Teacher has knowledge of the conceptual story behind each lesson that goes beyond the stated objective. This includes how each lesson may challenge (or not) particular facets of student thinking. This also includes knowledge of sequences of lessons beyond the curriculum that would also lead to the construction the conceptual building blocks of the big ideas of the unit.
2. Teacher Knowledge of Student Ideas and Thinking	a. Initial ideas	a. Teacher knows a variety of ways students might think about the topic and concepts prior to instruction and the strengths and weaknesses in these ideas at the beginning of the unit.
	b. Conceptual development of the ideas	b. Teacher knows that student thinking evolves during instruction and knows of problematic facets that can emerge as a result of instruction. Teacher knows of strategies to help students move from their initial ideas to the more scientific models.
3. Assessment Practices	a. Data collection strategies	a. Teacher uses coordinated assessment strategies throughout instruction to monitor the development of ideas in all students at the level of their facets of understanding. These include discussion questions, individual questions, written responses to prompts, Diagnoser assignments, concept maps, projects, portfolios, etc... The defining characteristic of the data is that it shows what students are thinking beyond if the student is answering correctly or not.
	b. Formative use of student data in instruction	b. Teacher uses knowledge of students' changing ideas to adjust instruction continuously throughout the unit. Adjustments to the curriculum include posing additional guiding questions and designing investigations that relate specifically to the models students are constructing of the concepts.
	c. Meta-cognitive strategies and growth	c. Students in the classroom are active participants in monitoring and evaluating their learning through discussions and written work (e.g., portfolios, journals, construction of rubrics, etc...). Assessment data collected early in the unit is saved, displayed and used by teachers and students to illustrate changing ideas.
4. Pedagogical Practices	Instructional strategies used in the classroom	Teacher uses a variety of instructional activities, and recognizes that each student may need different leading questions and prompts to help them make meaning even if they are using well-sequenced guided-inquiry activities from the curriculum designed to help them construct a correct model for the big ideas. The teacher has a metaphorical toolbox of instructional strategies to use in response to how students are interacting with the basic sequence of lessons.
5. Classroom Learning Culture	Expectations for learning	Students take full responsibility for their learning and gain confidence in their abilities to judge the soundness of their models. Ultimately, students may not even turn to the teacher for affirmation, instead relying on their critical thinking skills to work through inconsistencies.