

Element	Description
<p>Phenomena Based</p> <p><i>Centered around figuring out phenomena or solving problems</i></p>	<ul style="list-style-type: none"> ● Students' work is anchored in meaningful phenomena or problems that motivate building ideas over time. ● Anchoring phenomena and problems are complex, relevant, and returned to as we figure out more. ● Students investigate related phenomena to figure out pieces of the explanation. ● Assessments ask students to make sense of specific and compelling phenomena using their understandings built during the unit.
<p>Coherent for Students</p> <p><i>Driven by students' questions and ideas</i></p>	<ul style="list-style-type: none"> ● Students' prior ideas and understandings are elicited, valued, and built upon. ● Students and teachers work together to figure out where to go next and what evidence is needed to answer their questions. ● Students understand what they are doing and how it will help them answer questions about a larger phenomenon or solve a problem. ● Students engage in science and engineering practices in meaningful ways in order to make progress on their questions.
<p>Driven by Evidence</p> <p><i>Incremental building and revision of ideas based on evidence</i></p>	<ul style="list-style-type: none"> ● Students' ideas and questions determine what evidence to collect. ● Students seek and use evidence to figure something out as they build and revise their explanations, models, and arguments. ● Investigations provide evidence to build new science ideas instead of confirming pre-taught ideas. ● Evidence can be used to problematize our current thinking and help us think about where to go next.
<p>Collaborative</p> <p><i>WE figure out ideas together</i></p>	<ul style="list-style-type: none"> ● Students have opportunities to use, build upon, and critique other's ideas. ● Students use evidence to support ideas, ask for evidence from others, and suggest ways to get additional evidence. ● Students have several opportunities to give and get feedback ● The culture of the classroom supports risk-taking and changing our minds.
<p>Equitable</p> <p><i>Requires a classroom culture that values all ideas</i></p>	<ul style="list-style-type: none"> ● Students have multiple opportunities to make sense individually and through small- and whole-group discussions. ● The class community values the diversity of resources students bring to science class, including language, gestures, metaphors, and various modes of expression. ● Norms are established and revisited to support equitable sensemaking. ● Teachers integrate a variety of assessment activities to elicit, interpret, and provide feedback to build from students' diverse ideas and experiences. ● Students understand how and why what they are learning is relevant to their own lives and their communities.

Citation: OpenSciEd. (2020 August). "OpenSciEd Key Instructional Elements," Available at https://issuu.com/opensciEd/docs/day_1.1_introduction_-_key_instructional_elements or on page 10 in Teacher Handbook: Middle School Science, version 3.0. https://www.opensciEd.org/wp-content/uploads/2019/08/Aug-2020_-_Beta-Open-SciEd-Teacher-Handbook.pdf

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