Phenomena are observable events that occur in the world. Serving as the context for both scientists and engineers in their work, phenomena are predicted through scientific knowledge, which is then used to create solutions to real-world problems. Centering STEM education on phenomena pushes students to move from learning about topics to figuring out why and how things happen—using the three dimensions of NGSS, students engage in inquiry, explanation, and application of phenomena to themselves become scientists and engineers in the classroom.

Best Practices with Phenomena
Using phenomena effectively in the classroom requires letting go of traditional notions of what they are. Furthermore, students should drive phenomena selection and application to real-world problems.

<table>
<thead>
<tr>
<th>Using phenomena is not...</th>
<th>Using phenomena is...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashy or purely digital</td>
<td>Authentically engaging; measured by student inquiry</td>
</tr>
<tr>
<td>Explanations using scientific terminology of a process</td>
<td>Specific examples of real-world events (experienceable)</td>
</tr>
<tr>
<td>Just used to engage</td>
<td>Used to drive lessons, connect lesson parts, unify bundles</td>
</tr>
<tr>
<td>Teacher-driven</td>
<td>Student-driven; social, culturally, and temporally engaging</td>
</tr>
<tr>
<td>Used after students develop science ideas</td>
<td>The context for the content; used before explanation</td>
</tr>
<tr>
<td>Just questions</td>
<td>Observable and applied through inquiry and engineering</td>
</tr>
</tbody>
</table>

Types of Phenomena in STEMscopes NGSS 3D

**Anchoring Phenomena**
Complex and referenced throughout the bundle; culminates in the 3D application of all the scopes’ content in the bundle

**Investigative Phenomena**
The foundation of each scope’s SE plus Intervention and Acceleration activities; provides a reference point for all student activities throughout the scope and collectively informs the solution students design for the anchoring phenomena; a bundle can contain between 2 and 5 investigative phenomena

**Everyday Phenomena**
Connect student’s everyday lives and daily observations to the investigative phenomena studied in the classroom; add context and personal meaning (engagement) to the learning and ultimately support students’ individual approaches to solving the issue presented in the anchoring phenomena

Adapted from Achieve, NGSS, nextgenstorylines.org, and STEM Teaching Tools. Learn more at https://www.nextgenscience.org/sites/default/files/Using%20Phenomena%20in%20NGSS.pdf
STEMscopes NGSS 3D is a phenomena-driven 3D STEM curriculum; constantly updated with current events and educator feedback. STEMscopes NGSS 3D’s phenomena are temporally, culturally, and personally engaging for students. Explore the types of phenomena that underpin our curriculum.

### Anchoring Phenomena
Found in each bundle, they tie all the bundle’s scopes together with a central question and coherent mission that students get to solve progressively as they learn the content through each scope activity.

- Addressed through the mission log and mission action plan in each bundle.
- Provide coherence to all the scopes under the bundle.
- Complex: require use of the knowledge and practices of all 3 dimensions, learned across the bundle’s scopes.
- Use STEMscopes lesson activities to provide observable evidence of learning across the bundle.
- Example: The Sun’s fundamental role in powering different types of renewable energy (e.g., wind).

### Investigative Phenomena
Kicking off each scope, they fuel a scope’s 5E activities and culminate in a claim-evidence-reasoning assessment. Together, the investigative phenomena inform the anchoring phenomena.

- Coherently tie the scope 5E + intervention and acceleration elements together.
- Integral to the scopes’s lab activities, literacy elements, and differentiation resources.
- Culminates in an end-of-scope claim-evidence-reasoning assessment.
- Example: How can wind energy become electricity to light your home?

### Daily Phenomena
Found in all lesson activities and enriched by your students’ real-world experiences, these tie the scope activities to your students’ everyday lives. Each of these provides context to the Investigative Phenomena.

- Connect scope content to student background knowledge, everyday observations, and personal interests.
- Solicited by the teacher and can be used to guide / modify bundles to maximize engagement.
- Example: How does current flow through a circuit when I turn on a switch?