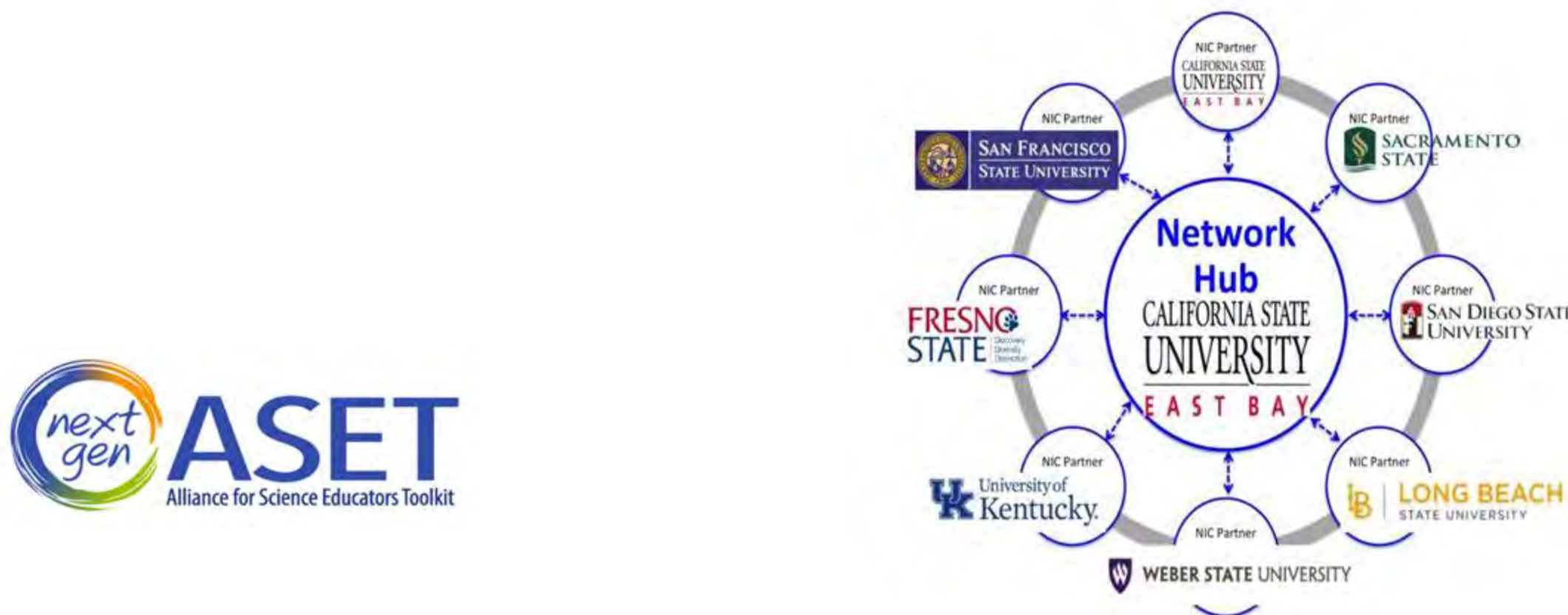


The NIC

The project, Aligning the Science Teacher Education Pathway (A-STEP): A Networked Improvement Community (NIC) was formed to address gaps in teacher training. It is an Implementation and Improvement Study proposal within the Teaching Strand of the DRK-12. **This NIC is a vehicle to bridge gaps** across four identified steps along the science teacher training and development pathways within local contexts of **8 participating universities** (NIC sites) (See “Steps in ASTEP”).



The “STEPS” in ASTEP

The **ASET Toolkit** was designed in a prior project (DRL####) to **provide a common set of scaffolds for discourse** and **implemented across 4 steps of a pathway** on which teachers are trained that we identified.

THE A-STEP PROJECT FOCUSES ON ALIGNMENT ACROSS FOUR KEY STEPS OF THE SCIENCE TEACHER EDUCATION PATHWAY.

- STEP 1: UNIVERSITY SCIENCE TEACHING METHODS COURSES**
The ASET Toolkit is used to foster discussions in the science methods courses of how to design and enact NGSS aligned lessons
- STEP 2: CREDENTIAL CANDIDATE FIELDWORK EXPERIENCES**
Collaborate with university supervisors and cooperating teachers to implement use of the ASET Toolkit to better align classroom instruction with the goals of NGSS and to facilitate post observation discussions around this alignment
- STEP 3: INDUCTION PROGRAMS**
Collaborate with district level induction programs and training within the first 3 years of entry into the profession to include use of the ASET Toolkit to bridge the lessons from these credential programs into these district level trainings
- STEP 4: DISTRICT PROFESSIONAL DEVELOPMENT**
Collaborate with local school districts to implement use of the ASET Toolkit as part of the existing professional development (PD) efforts for inservice science teachers

Our initial goals for dissemination included the following:

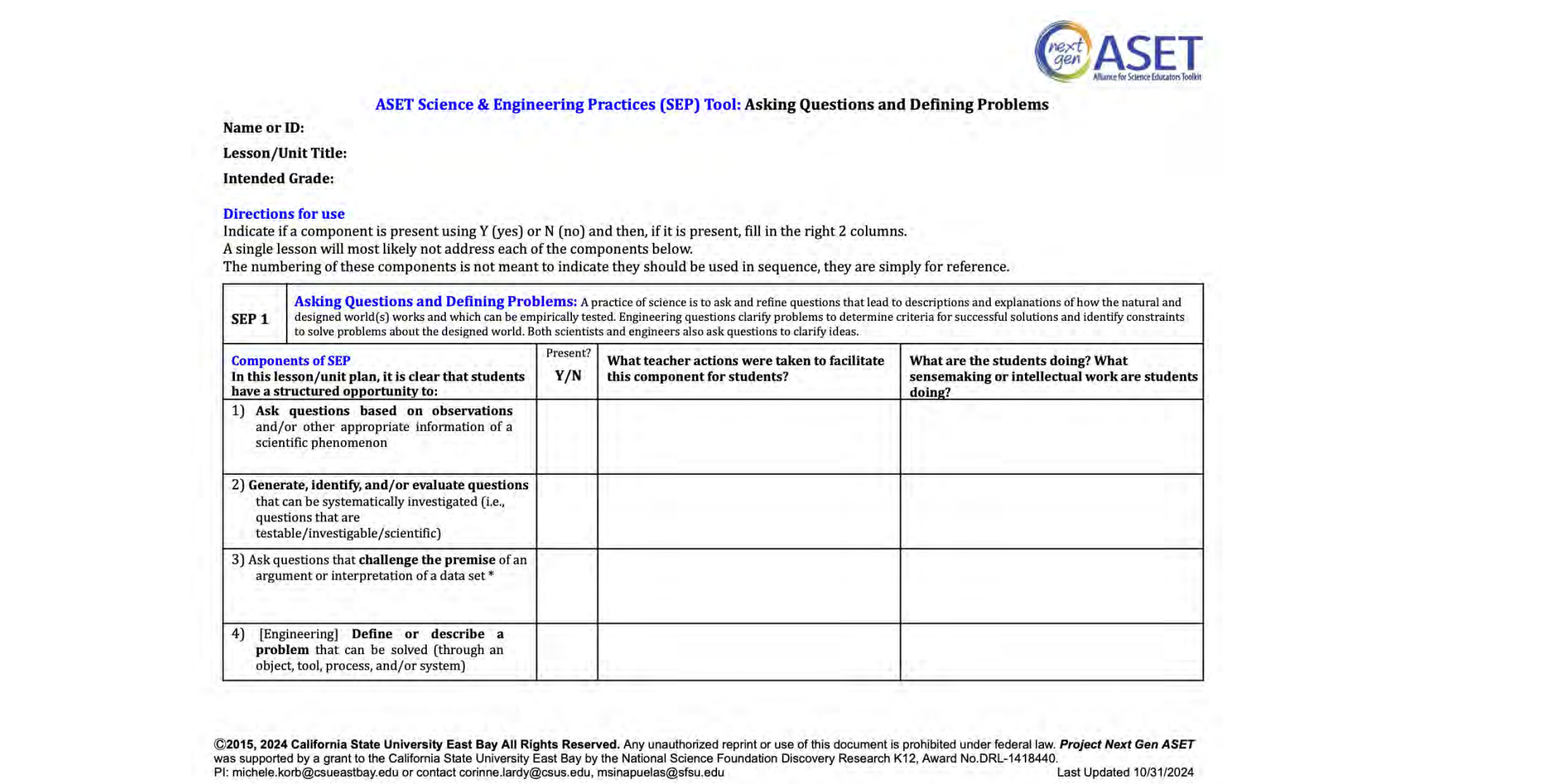
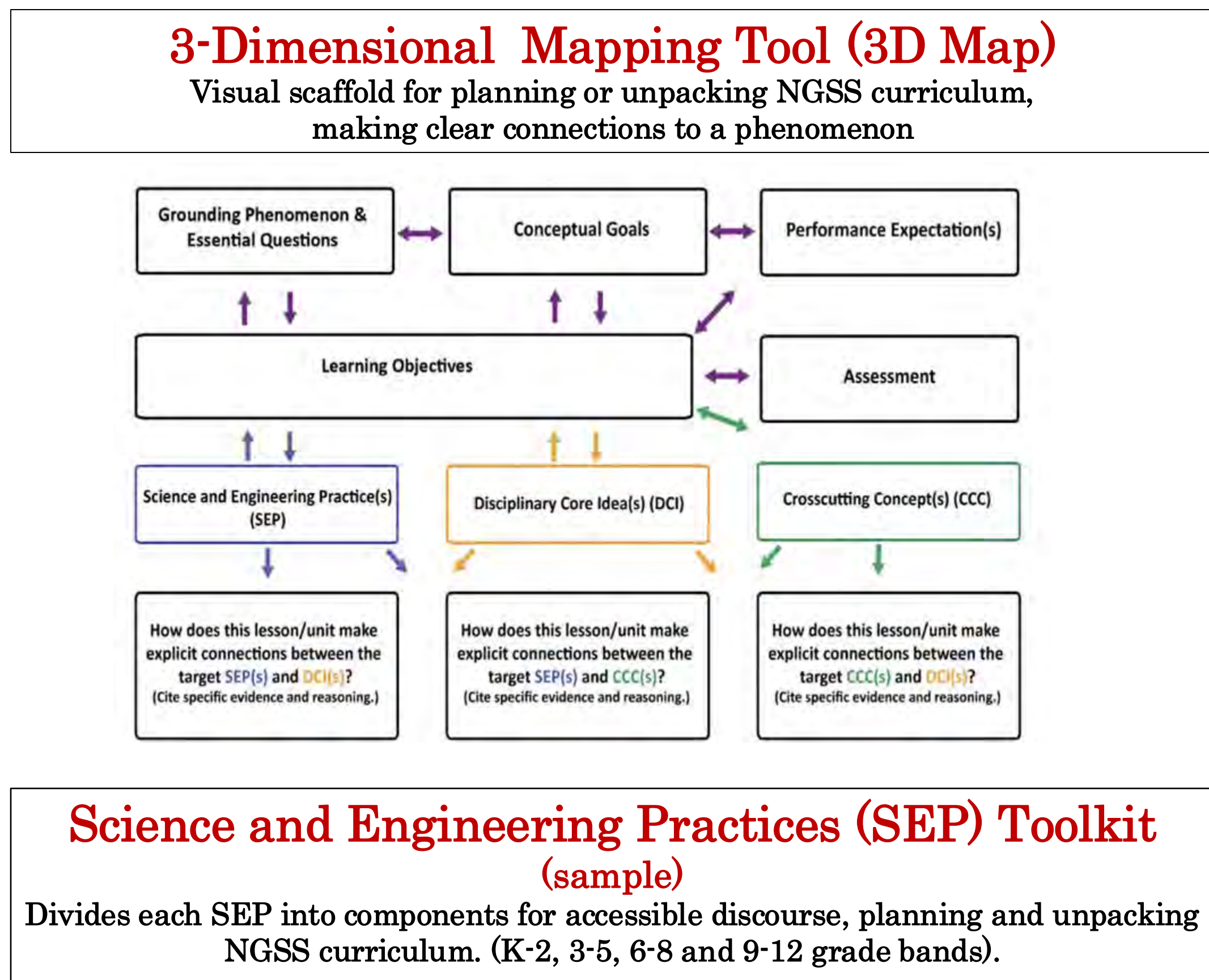
- Presentations** at state and national conferences (remotely and face to face).
- Sharing of practitioner-based tools and training to support science teacher planning during **professional development**
- Manuscripts** for science teacher educator journals or NSTA journals.

Our website lists our many accomplishments along these lines.

We realized we needed to **reach classroom practitioners** and **science teacher educators** with a variety of **visual and accessible outcomes** and examples of our Toolkit.



What is in our Toolkit?



ASET Science & Engineering Practices (SEP) Tool: Asking Questions and Defining Problems			
Name or ID:			
Lesson/Unit Title:			
Intended Grade:			
Directions for use:			
Indicators of a component is present using Y (yes) or N (no) and then, if it is present, fill in the right 2 columns. A single lesson will most likely not address each of the components below. The numbering of these components is not meant to indicate they should be used in sequence, they are simply for reference.			
SEP 1: Asking Questions and Defining Problems			
Components of SEP			
1) Ask questions that are relevant to the science and engineering practice.			
2) Generate, identify, and/or evaluate questions that can be systematically investigated (i.e., questions that are testable/falsifiable/scientific).			
3) Ask questions that challenge the premise of an argument or interpretation of a data set.			
4) (Engineering) Define or describe a problem that can be solved through an object, tool, process, and/or system.			

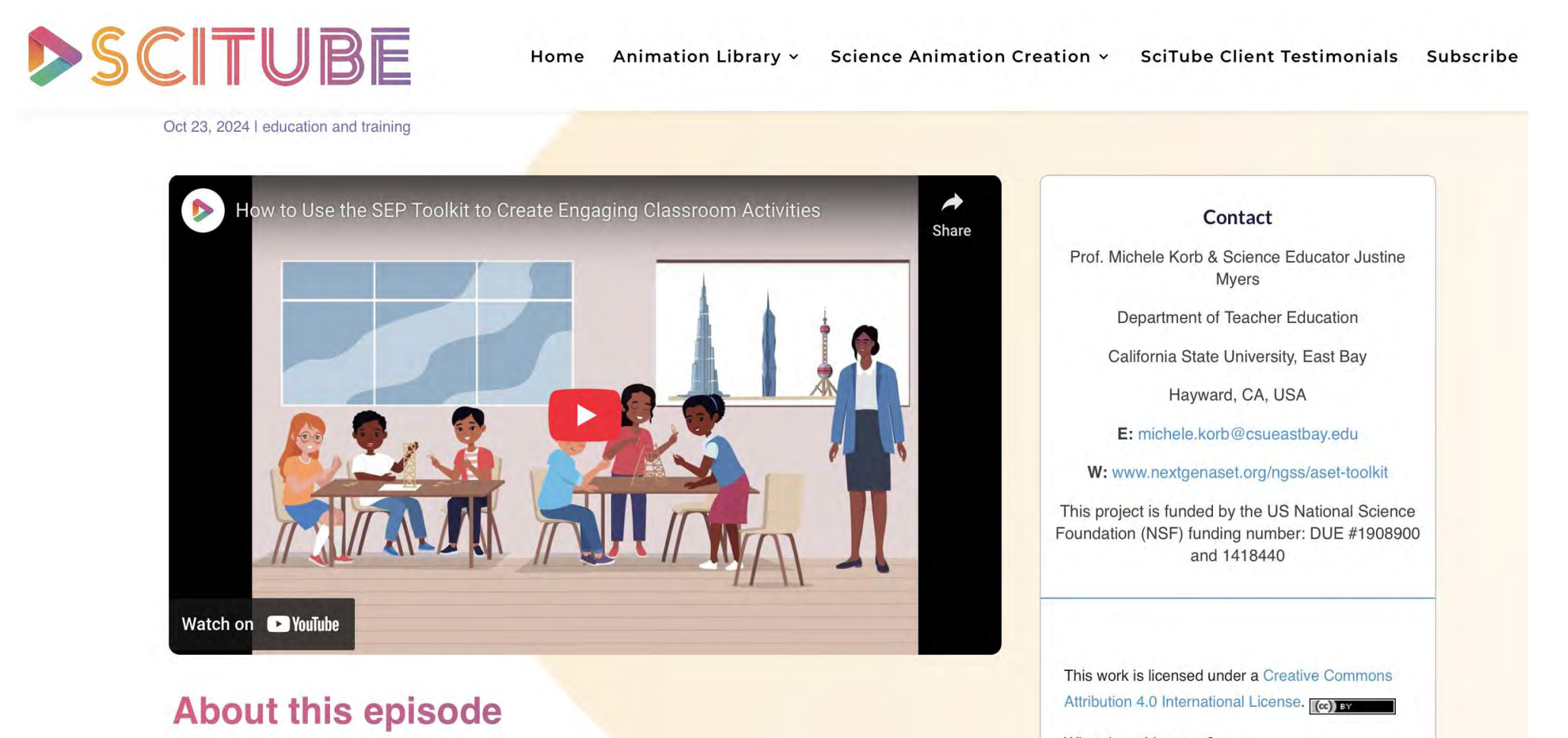
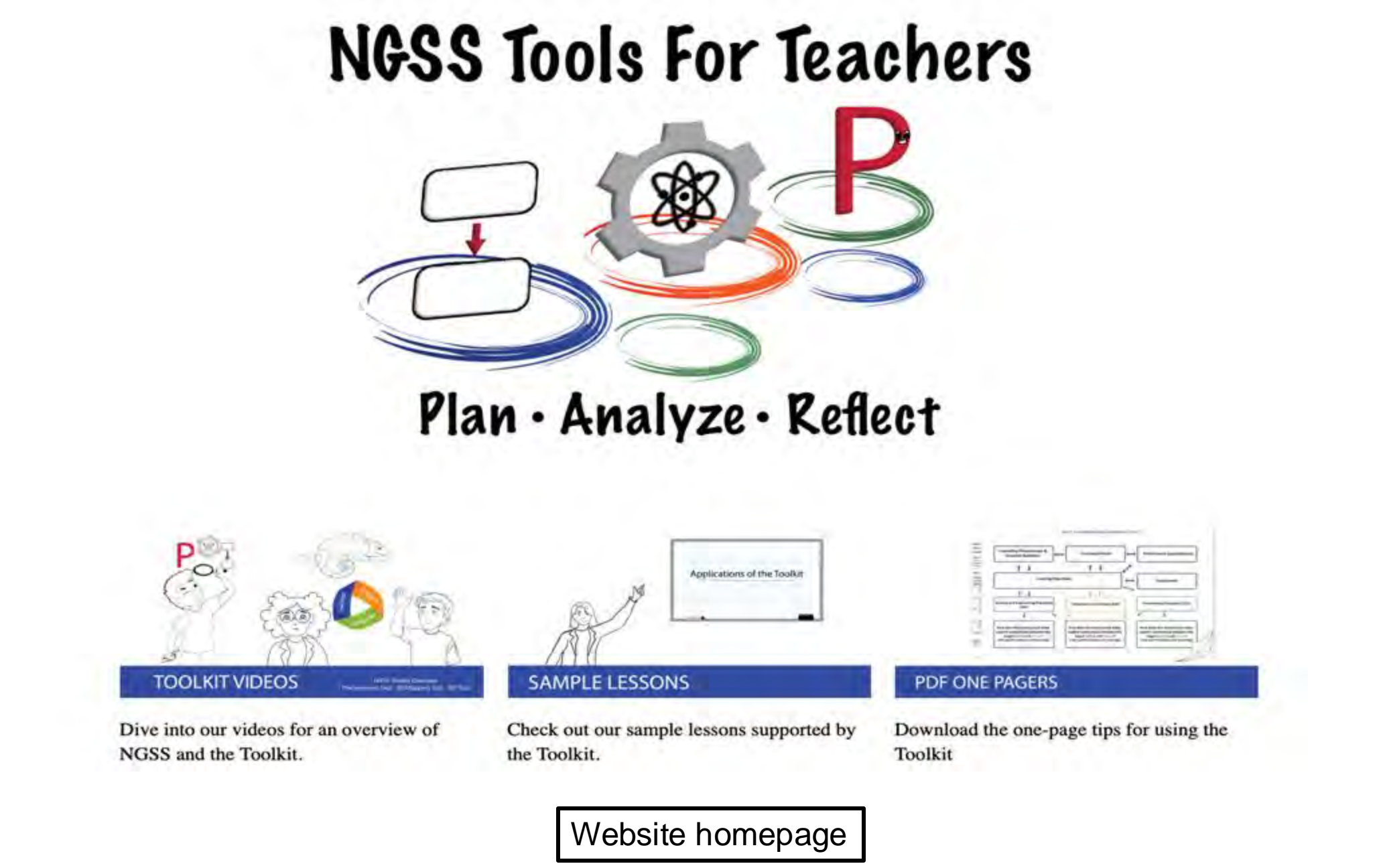
Phenomenon Tool
Scaffolds the identification of a clear and accessible phenomenon statement to anchor unit/ lesson structures

The NGSS defined phenomena as “observable events that students can use the three dimensions to explain or make sense of.” (NGSS Lead States, 2013)			
Grounding Phenomenon: Describe the real world phenomenon that you want your students to be able to explain (in part or fully) by the end of the lesson or unit:		Essential Question(s): Key essential question(s) you will pose to your students or guide your students to pose about the phenomenon:	
Criteria		Suggested questions to ask yourself in evaluating phenomena	
It is a Phenomenon if it:	Is grounded in the natural and/or human-affect world (including agriculture, engineering, medicine)	Where can it be observed in the natural world?	
	Describes an event or process that is observable directly or indirectly, through human senses or instrumentation	How will students observe it (picture, video clip, real thing, etc.)?	
It is an Anchoring Phenomenon if it:	Describes a specific or contextualized event in process so that the students’ explanation addresses a particular situation	What is the specific example of a general process?	
	Linking multiple scientific concepts is required to generate a complete explanation (significant level)	List the scientific concepts necessary for students to explain the phenomenon	
Implementation is student centered if it:	Elicits explanations that are aligned to NGSS DCI learning goals	What are the DCIs that align with this phenomenon?	
	Has an explanation that can reasonably be developed from: • a series of investigations that utilize the scientific practices (SEPs) and connecting concepts (CCCs) (one level) • an investigation that utilizes the scientific practices (SEPs) and connecting concepts (CCCs) (three levels)	How will students explore this phenomenon?	
Implementation is student centered if it:	Is relevant and interesting, building on students’ funds of knowledge	How does it build upon every day or family experiences? Why will students find it relevant and interesting?	
	Is presented in a way that clearly provides or elicits an image or model (picture or mental imagery) of an event or process that is observable, either directly or indirectly.	How will it be presented to students?	

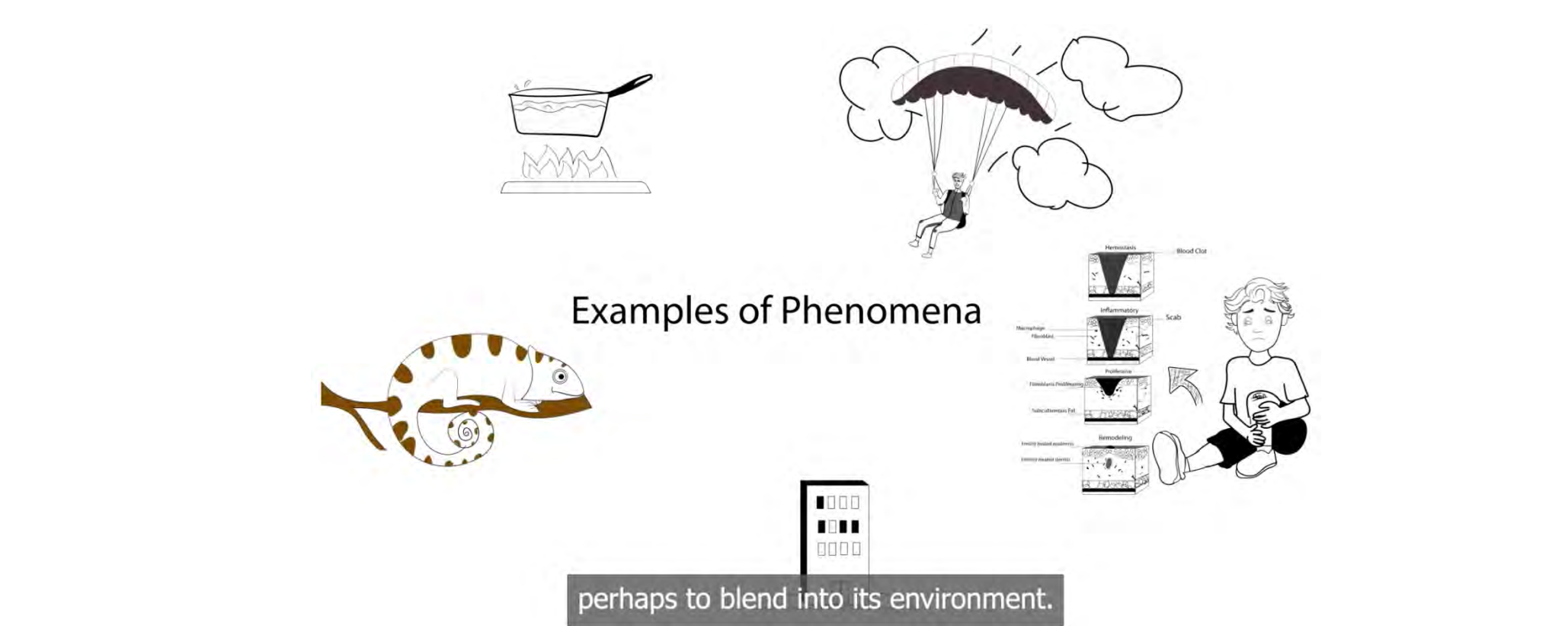
©2015 California State University East Bay All Rights Reserved. Any unauthorized reprint or use of this document is prohibited under federal law. Project Next Gen ASET was supported by a grant to the California State University East Bay by the National Science Foundation Discovery Research K-12 Award No. DUE-1418460. PI: michele.korb@csueastbay.edu or contact corinne.lardy@csueastbay.edu, michele.korb@csueastbay.edu

Beyond Pubs, Presentations and “Steps”

Website and YouTube Channel
New dissemination modalities stemming from research, work with preservice teachers, university supervisors and science classroom practitioners



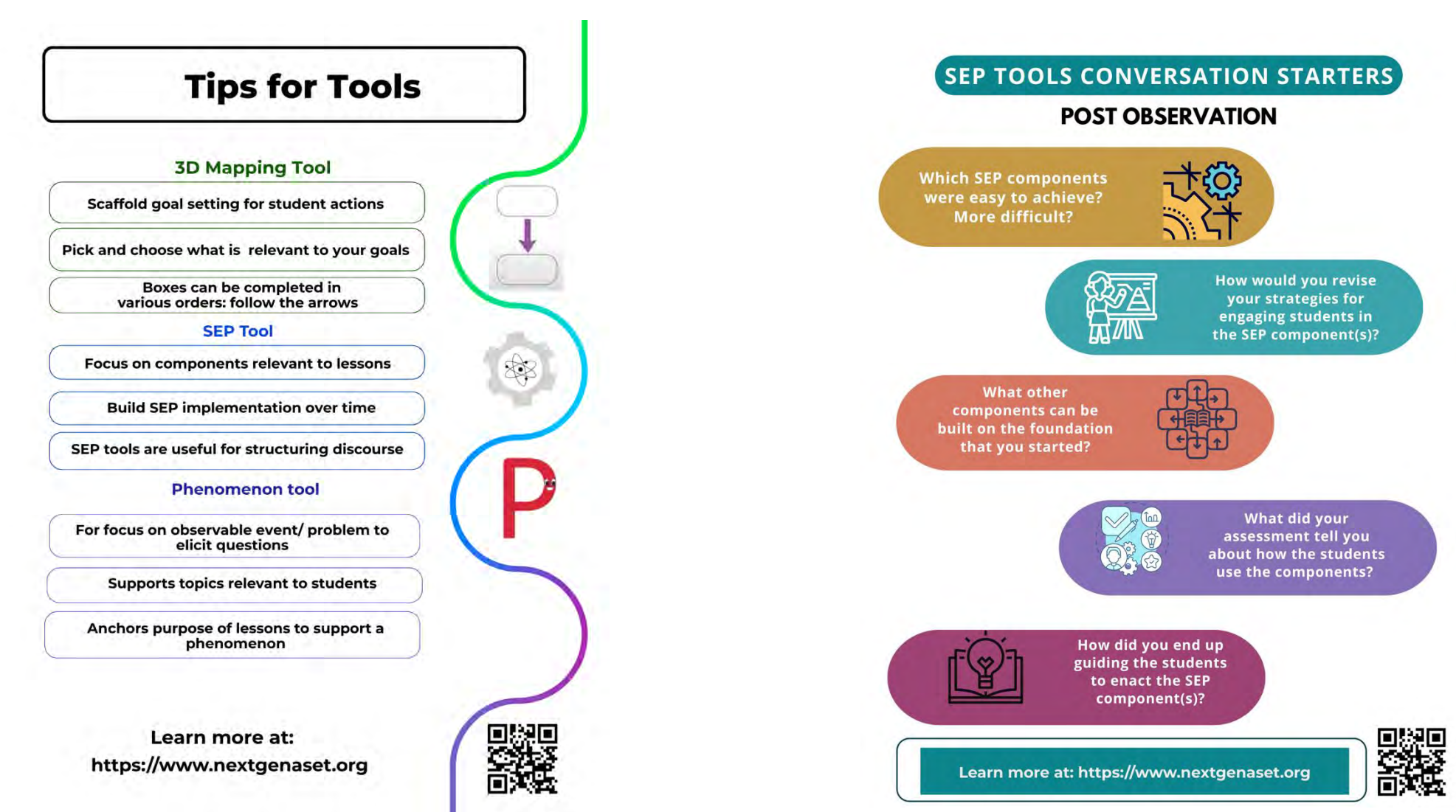
SciTube, a company from the UK, reached out to us to produce this engineering design video example based on SEP 6: Designing Solutions



Sample scene from one of our 5 videos that unpack the NGSS, the Toolkit, the 3D map, the SEP Tools and the Phenomenon Tool.

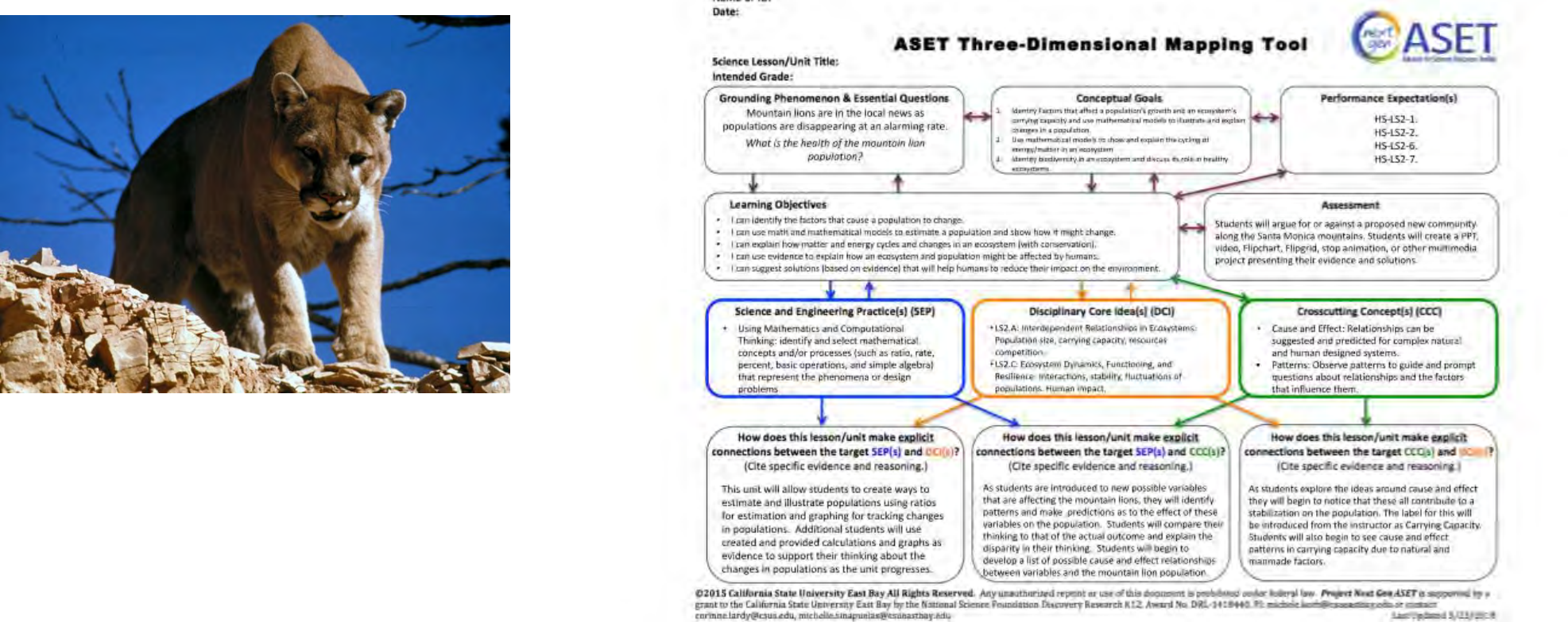
Lessons learned and next steps

ASTEP activities contribute to the **unpacking and enactment** of 3-dimensional teaching and learning as outlined in the NGSS. **Our digital product options are increasing!**



Sample one-pager overviews of how to use the Toolkit. Some are designed for university supervisors or for professional development. We have others – check out the website to find more.

Taking what we have learned from classroom teachers and teacher educators **to reach more educators**: a digital presence is part of our ongoing efforts to show how the Toolkit supports and provide **sample lessons and phenomena/storylines** to be posted on our website.



Sample lessons will include storylines or phenomena devised by preservice teachers, classroom teachers or professional development storylines. Here we feature a storyline and 3D map regarding the plight of the Santa Monica Mountain Lion.

FIND US ONLINE!

Take one of our cards or stickers!
<https://www.nextgenaset.org/>

Notable NIC Publications

<https://www.nextgenaset.org/research/>

