NCESD STEM Materials Center and LASER Alliance
Choosing STCMS™ Units

The North Central Educational Service District's STEM Materials Center will be rolling out new middle school units in the Fall of 2017. The units are as follows:

Grade	STCMS™ Units
6	Energy, Waves & Info Transfer
	Weather & Climate
	Structures & Function
7	Matter & Its Interactions
	Earth's Dynamic Systems
	Ecosystems & Their Interactions
8	Space Science Explorations
	Energy Forces & Motion
	Genes & Molecular Machines

This brings about some questions about how these units were chosen and why they were placed in the arrangement outlined above.

In October of 2013, Washington State adopted the Next Generation Science Standards (NGSS), now called the Washington State 2013 K-12 Science Learning Standards. For grades K-5, performance expectations (PEs) were grade-level specific. However, at middle school, the performance expectations were grouped by grade-band, leaving districts to decide which grades should teach which PEs. The developers of the standards did offer some guidance in Appendix K: Model Course Mapping in the Middle School and High School.

California's Science Expert Panel (SEP), a group comprised of kindergarten through grade twelve teachers, scientists, educators, business industry representatives, and informal science educators, revised one of the models in the first draft of Appendix K. This model was eventually added to Appendix K (see pages 20-21).

The SEP used the following criteria to arrange the performance expectations for middle school grades six, seven, and eight:

1. Performance expectations (PEs) were placed at each grade level so that they support content articulation across grade levels (from fifth through eighth grade) and provide the opportunity for content integration within each grade level.
2. Performance expectations were aligned with the Common Core State Standards (CCSS) in English Language Arts (ELA) and Mathematics so that science learning would not be dependent upon math skills not yet acquired.
3. The final arrangement of performance expectations reflected a balance both in content complexity and number at each grade level with human impact and engineering performance expectations appropriately integrated.

North Central Educational Service District's (NCESD) materials cooperative is one small part of the Smithsonian Science Education Center's Theory of Action which

incorporates the Leadership and Assistance for Science Education Reform (LASER) model that describes the infrastructure for transforming science education. This model includes: research-based, inquiry-driven curriculum; professional development; materials support; administrative and community support; and appropriate assessment.

The North Central LASER Alliance, one of Washington State's LASER Alliances, is made up of districts that may, or may not, participate in the materials cooperative, but share the same strategic thinking of the LASER model. Teacher leaders were brought together from this alliance, after having engaged in a significant amount of professional learning around the NGSS, to form the transition team for the materials cooperative.

Being a local control state, districts can choose the model that best serves their students. The value of the thinking behind the California Course Progressions Model was clear to the transition team and it was determined that this would be the best model for students in the alliance as well as the materials cooperative.

After selecting a course progression model, the transition team was presented with materials from several publishers. In 2015, the selection was fairly limited and not completely developed (STEM Scopes, FOSS, IQWST, and STC were among those shared). The team identified STC as their preferred curriculum for some of the following reasons:

- STC developed their units around the performance expectations.
- As teachers piloted units, the connections to the Common Core standards were evident and appreciated.
- The units are built following a coherent storyline that support sense making opportunities.
- Students engage in designing solutions to problems in addition to making sense of science concepts.
- All three dimensions of the NGSS are incorporated and integrated throughout the lessons and units.
- The units are designed to engage students in hands-on experiences and can be used with, or without, online components.
- The student guides will be translated into Spanish.

Once a particular curriculum had been selected, it was necessary to place the units in an order that most closely matched the course progression model.

Each unit addresses a specific set of performance expectations. For each unit, the PEs were highlighted based on their alignment to the California Course Progressions model.

6th grade PEs
7th grade PEs
8th grade PEs
Bolded PEs appear in more than one unit

Engineering PEs were not highlighted as they are to be taught at all grades.

STCMS™ Learning Framework

Physical Science	Life Science	Earth/Space Science
Energy, Forces, and Motion MS-PS2-1, MS-PS2-2, MS-PS2-3, MS-PS2-5, MS-PS3-1, MSPS3-2, MS-PS3-5, ETS1-1, ETS1-2, ETS1-3, ETS1-4	Ecosystems and Their Interactions MS-LS1-5, **MS-LS1-6**, **MS-LS1-7**, MS-LS2-1, MS-LS2-2, MS-LS2-3, MS-LS2-4, MS-LS2-5, MS-LS4-4, MS-LS4-6, MS-ESS3-3, ETS1-1, ETS1-2	Weather and Climate Systems MS-ESS2-4, MS-ESS2-5, MS-ESS2-6, **MS-ESS3-2**, MS-ESS3-4, MS-ESS3-5, ETS1-1, ETS1-2, ETS1-3
Matter and Its Interactions MS-PS1-1, MS-PS1-2, MS-PS1-3, MS-PS1-4, MS-PS1-5, MSPS1-6, MS-PS3-4, ETS1-1, ETS1-2, ETS1-3, ETS1-4	Structure and Function **MS-LS1-1**, MS-LS1-2, MS-LS1-3, **MS-LS1-6**, **MS-LS1-7**, MS-LS1-8, MS-LS4-2, MS-LS4-3	Earth's Dynamic Systems MS-LS4-1, MS-ESS1-4, MS-ESS2-1, MS-ESS2-2, MS-ESS2-3, MS-ESS3-1, **MS-ESS3-2**, ETS1-1, ETS1-2, ETS1-3, ETS1-4
Electricity, Waves, and Information Transfer MS-LS1-8, MS-PS2-3, MS-PS3-3, MS-PS3-5, MS-PS4-1, MS-PS4-2, MS-PS4-3, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4	Genes and Molecular Machines **MS-LS1-1**, MS-LS1-4, MS-LS3-1, MS-LS3-2, MS-LS4-4, MS-LS4-5	Space Systems Exploration MS-PS2-4, MS-ESS1-1, MS-ESS1-2, MS-ESS1-3, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4

This quickly determined the placement of some of the units but left a couple that needed a second filter. The two units that did not fit the course progression model well were *Genes and Molecular Machines* and *Electricity*, *Waves, and Information Transfer*.

These two units could be placed at either 6th or 8th grade. However, 6th grade had an identified Life Science unit and 8th grade already had a Physical Science unit. Therefore, the determination was made to fill in the missing gaps. This decision also most closely aligns those to unit two, the conceptual progressions model proposed in Appendix K on page 11.

At the time of this report, the following districts in the North Central ESD region have chosen to use the STC units in this specific configuration. Those with an asterisk do not participate in the materials cooperative, but have chosen to follow the guidance of our Alliance.

- Brewster
- Bridgeport
- Cashmere
- Eastmont*
- Entiat
- Nespelem
- Orondo
- Quincy
- Tonasket*
- Warden
- Waterville

Districts currently considering this model with the use of STC as pilots in the cooperative:

- Ephrata
- Lake Chelan
- Moses Lake
- Omak