Discipline-Specific Language Demands with CER and KLEWS

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TENNESSEE TECH UNIVERSITY

NSTA Engage: Spring 21
What is Academic Language?

- Academic Language: oral and written language used for academic purposes
  - the means by which students develop and express content understandings
  - represents the language of the discipline that students need to learn and use to participate and engage in meaningful ways in the content area
  - more than just vocabulary

- Let’s look at an example of academic language!

Example of Academic Language

- We made it to the split but I got flipped out of my lane. I knew I was holding 2. When I let go of the button I met the tree coming on so I bumped it up twice and it was green. It felt like it lost a little out in the middle but I still ran him to the first cone and turned him loose. My win light came on, and when I got the ticket he took 004 to be 6 thou under.
**Example of Academic Language**

We made it to the split but I got flipped out of my lane. I knew I was holding 2. When I let go of the button I met the tree coming on so I bumped it up twice and it was green. It felt like it lost a little out in the middle but I still ran him to the first cone and turned him loose. My win light came on, and when I got the ticket he took 004 to be 6 thou under.

**Are there any words that are brand new to you?**

**What is this passage about?**

**What is happening in this passage?**

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**Here is another example!**

*Kole Pritchett*

*July 26*

Been an up and down few weeks of racing. Managed to roll dad's car down to 5 last night before I just flat missed the tree. Had both cars in 4th round when the crank decided to give up the ghost around 300ft. Congrats to Travis-Andrea Forsythe Nelson on the win. Thanks to Travis, Keith Thomas, and Kaden Harrill for helping get my push model in the trailer.

 võ Haley Neubert, Jason Kilby and 38 others
What are Language Demands?

- **Language Demands**: skills that teachers need to consider as they plan to support student learning of content.
  - Language Functions
  - Vocabulary
  - Syntax
  - Discourse

These correlate to the EdTPA requirements for pre-service teachers.

Language Demands

- **Language Functions**:
  - Examples: Analyze, Explain, Interpret, Justify with Evidence, Predict
  - Skills, verbs from Bloom’s taxonomy, closely tied to the Science and Engineering Practices

**SEPs**:
- Analyzing questions or defining problems
- Developing and carrying out investigations
- Analysing and interpreting data
- Using mathematical/computational thinking
- Constructing explanations/designing solutions
- Engaging in argument from evidence
- Developing and evaluating complex solutions
Language Demands

- Vocabulary:
  - Tier 2
  - Tier 3
  - Words with multiple meanings
  - Words with different meanings in the field of Science

- Syntax:
  - The specific rules associated with communication in Science
  - Examples:
    - Units and mathematical formulas
    - Physics diagrams
    - Chemical formulas, equations, nomenclature
    - Electron Configuration
    - Genotypes, Punnett Squares
    - DNA, Amino Acids
    - Biological nomenclature and classification
Language Demands

- Discourse:
  - How we engage in communication as a whole
  - Written work
  - Discussion and oral communication

Student Supports

- Anything we can do to help students as they develop their academic language skills.
- We will be talking specifically about the KLEWS chart – CER framework

<table>
<thead>
<tr>
<th>Essential Question:</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
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<tr>
<td>L</td>
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<td>E</td>
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<tr>
<td>W</td>
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<td>S</td>
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Academic Language Demands as supported with these tools:

- LF: Justify with Evidence
- LF: Explain
- Vocabulary
- Discourse
- SEP: Asking Questions
- SEP: Obtaining/Evaluating/Communicating Information
- SEP: Constructing Explanations
- SEP: Engaging in Argument from Evidence

What is a KLEWS Chart?

- Graphic Organizer used over the course of a unit or lesson to allow students to organize their ideas about a topic
- KWL chart modified for Science
  - Adds “Evidence”
  - Adds “Science Concepts”
**Essential Question:**

<table>
<thead>
<tr>
<th>K</th>
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<tr>
<td>What we think we know about this phenomena</td>
<td>Evidence, Observations, Data</td>
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<td>S</td>
</tr>
<tr>
<td></td>
<td>What we are learning</td>
</tr>
</tbody>
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What is a KLEWS Chart?

**K**
What we think we know about this phenomena.
- Preassessment
  - Activating Prior Knowledge
    - Students’ Personal/Cultural/Community Assets

**L**
What we are learning.
- Complete throughout the unit/lesson
  - Readings and Videos
  - Student Investigations

**E**
Evidence Observations/Data
- Activating/Anticipation Strategy
- What questions come up as you learn more?

**W**
Wonderings
- Vocabulary and Terms
  - Laws, Theories, Principles (Accepted Science Concepts)

**S**
Scientific Concepts and Words

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KLEWS Example

What is the structure of DNA?

**K**
What we think we know about this phenomena.
- STUDENTS COMPLETE

**L**
What we are learning.
- STUDENTS COMPLETE

**E**
Evidence Observations/Data
- STUDENTS COMPLETE

**W**
Wonderings

**S**
Scientific Concepts and Words
### KLEWS Example

**What is the structure of DNA?**

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Here's where the KLEWS is different from a basic KWL!

- **STUDENTS COMPLETE** (as you review the K and W, during the E)
- **STUDENTS COMPLETE**

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### Possible Sources of Evidence and Science Concepts:

- [What is DNA?](#)
- [The Amoeba Sisters](#)
- [Biology](#)
What is the structure of DNA?

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**KLEWS Example**

**KLEWS to CER**

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CER Statements

Claim – A statement or conclusion that answers the original question/problem [KLEWS Chart – “C” column]

Evidence – Scientific data that supports the claim [KLEWS Chart – “E” column]

Reasoning – A justification that connects the evidence to the claim using scientific principles [KLEWS Chart – “R” column]
References:


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<th>Evidence/Observations/Data</th>
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<th>What we think</th>
<th>Phenomena</th>
<th>Know About This</th>
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**Essential Question:**