K – 12 Science Vertical Team Meeting Notes
March 19, 2015

Members

Katy Anich	**Hilltop**	**Penny Baker**	**Director C&I**
Sandra Clifford	Pine Bend	**Amanda Cook**	**IGHMS**
Quennel Cooper	**Hilltop**	**Mary Dillon**	**IGHMS**
Carol Ellison	**Simley**	**Lisa Ellison**	**Pine Bend**
Cindy Ford	Salem Hills	Tammy Gingerich	IGHMS
Patti Goettsch	**Pine Bend**	**Jessica Goodwin**	**Hilltop**
Jorge Guiral	**Hilltop**	**Lori Haak**	**Simley**
Michele Haedrich	Salem Hills	**Pam Hatlestad**	**Pine Bend**
Rebecca Lippert	**Pine Bend**	Rachel McLaughlin	Atheneum
Janette Melde	**Pine Bend**	Timothy Peper	Simley
Rebecca Prall	Simley	Gerald Sakala	Simley
Christina Tucker	**Hilltop**	Sally Wattrus	Hilltop
Jodi Wendel	IGHMS		

*__Bold__ – Members in Attendance

I. Vocabulary Strategies for English Language Learners

A. Leah Sedler, English Learner teacher from Simley, presented an overview for team members on strategies for helping EL learners acquire science vocabulary skills.

D. See Attachment 1: EL Presentation, Leah Sedler.

II. Review MCA III Science Benchmark Reports

A. The team reviewed the district MCA III Science Benchmark Reports.

1. Grade 5 identified a resource gap to meet a specific benchmark. Team members initiated conversations with elementary staff to supplement the resources.
2. Secondary staff researched specific benchmarks that are above and below state mean and expected school performance and will inform all department members in order to review standard alignment.

B. See Attachment 1: District Science Benchmark Reports

C. See Attachment 2: Benchmark Report Explanation

D. Penny will send the elementary principals copies of their school benchmark reports.

III. Science Inquiry Charts

A. The team reviewed the K – 12 Scientific Inquiry charts and discussed the best strategy for providing charts to all teachers. Due to the late time in the school year, it was decided that it would be best to share the charts with staff at the Back to School Workshop in the fall and pass them out at that time.

B. Team members would like to create an Inquiry video over the summer. The video would be used for training purposes at the Back to School Workshop. Penny will be inviting all team members to participate in the creation of the video.

IV. Next Steps

A. Team members discussed plans for next year's team meetings. The plan had the following expectations as set out by the Director of Curriculum and Instruction:
   1. The plan must be generated by the team.
   2. The plan must be related to state science standards and student achievement.
   3. The plan's goals must provide K – 12 benefits for students.

B. Earlier in the year, the science team had generated a list of potential ideas. They reviewed this list and made any additions or deletions as needed. The team then voted on which option they want to focus on for the 2015-2016 school year. The areas were:
   1. Fall MCA III data review, review inquiry chart status, meet only once
   2. Continue working on vocabulary charts (10/strand, power words). Apply SIOP strategies to charts (ex. Insert pictures)
   3. Conduct a deeper strand analysis and identify areas for staff development
   4. Send ISD 199 staff to training in anticipation of new state science standards (potential implementation of Next Generation Science Standards).
   5. Create common assessments

C. The team's decision was to continue working on vocabulary charts (2). At the scheduled fall meeting, the team will outline how this work will proceed for the school year. All efforts will be made to work through this process in scheduled after school sessions to have teachers out of their classrooms less frequently.

Attachment 1: EL Presentation, Leah Sedler

English Learners:

Science Vertical Team

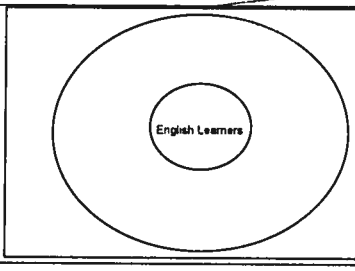
Who are English Learners?

Circle Map

Today we are going to make a circle map. This map is used to help us define and show our understanding of a topic. We use this to generate ideas, assess what we already know, and what we have learned.

Around the outside is a box. This is called the "frame of reference." Here we can write how we know what we know. Did someone teach us? Did we experience it? Did we read/see something about it? It also allows us to consider our point of view because our different experiences cause us to see the world differently from one another.

Circle Map



Think, Pair, Share

Share your circle map with a partner.

Immersion Film

Reflection

Based on the video, is there anything that you can add to your circle map?

Write at least three statements based on the movie using the Say Something prompt sheet. Share your ideas with a partner.

EL Trends in Inver Grove Heights

- 573 students have languages other than English in their homes - 24 languages
- 69% of these students speak Spanish in their homes
- Next largest groups:
  - Hmong (6%)
  - Arabic (6%)
  - Somali (4%)
  - Vietnamese (2%)

WIDA: Differentiation article

- Levels 1 - 6
- Varied experiences with language, culture, and education

1. Lesson Preparation

- Connection to background knowledge
- Content (what will be learned) and language objectives (how they will learn based on the needs of students) posted, including 4 domains of speaking, listening, reading, and writing
- Content adapted (texts simplified without watering down, age appropriate concepts)
- Graphic organizers (Venn diagrams, timelines, concept maps, comparison charts, discussion webs)
- Outlines
- Highlighted text
- Marginal notes (or sticky notes)
- Adapted texts
- Jigsaw material (separate text into teams which then read aloud and discuss material, then reporting out to the larger group)
- Leveled study guides
- Cornell notes

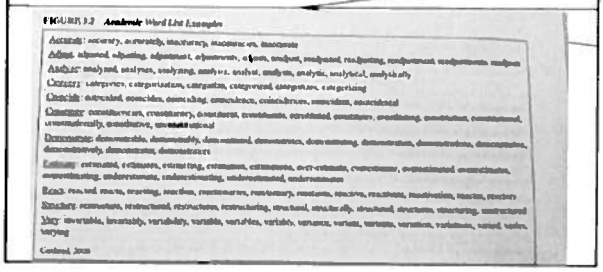
2. Building Background

- Contextualize key vocabulary (review content, introduce and define terms concretely, demonstrate how to use terms in context)
- Vocabulary linked to students' background experiences, links between past learning and new concepts
- Vocabulary self-selection (students self select vocabulary they think are essential)
- Personal dictionaries or glossaries
- Content word walls, thinking maps, vocabulary games

Academic Vocabulary

- Content Words: key vocabulary, terms and concepts related to a specific theme. For example: solubility, covalent bond, ecosystem, mitochondria, Punnett square, velocity, etc.
- Process/Function Words: functional language use. For example: how to make a hypothesis, state a conclusion, explain the effect, interpret, etc.
- Words and word parts that teach English structure.
  For example: root "photo" means light
  Words: Photosynthesis, photocopy, photograph, photogenic, photoelectron

Academic Word list



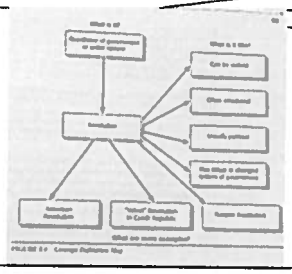
Sentence Stems

1. One thing I already know about _____ is _____.
2. "I remember learning _____ in _____."
3. "_____ reminds me of _____ because _____."

Personal Dictionaries

- Students create personal dictionaries of words from content texts or choice books.
- Words can be arranged by alphabetically, by concept, or structure.
- Teacher works with student to review words.

Concept Definition Map



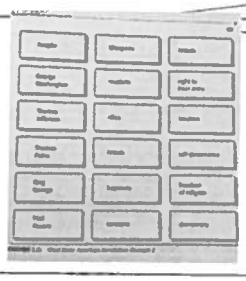
Vocabulary ratings

Have students rate their knowledge of the word.

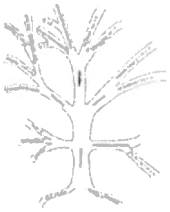
1. I know the word.
2. I have seen the word.
3. I don't know this word.

4. I use it in everyday conversation.
5. I heard it on the TV or radio.
6. I have heard or used it in school.
7. I read it in a book, magazine or online.
8. I have not read, heard, or used this word.

Word Sort



Vocabulary Tree



Word Meaning Graphic Organizer

Wordo

W	O	R	D	O
	Free Space			

Cloze Sentences

- Used to teach or practice vocabulary in context.
- Teacher selects a sentence that provides clues and class brainstorms possible words.

Ex. During a _____, which can be violent or peaceful, a group of people tries to overthrow an existing government or social system. (revolution)

Reviewing/expanding vocabulary

After teaching the highlighted words, the students answer questions using the words in context. For example:

- What would make you **speculate** that an athlete was using steroids?
- If you wanted to find out what substances are in certain **chemicals**, would you go to an operating room or a laboratory?
- Some people prefer to eat **organic** fruits and vegetables. Why would they make this choice?
- If scientists **synthesized** two hormones, how would you describe what they did?
- What could you do to prove salt is **soluble**?
- You know some steroids have negative **effects** on the human body. What are some things that have positive effects?

3. Comprehensible Input

- Appropriate speech (appropriate to students' language proficiency level)
- Explanation of academic tasks (step-by-step, paraphrase and repeat when necessary)
- Verbal scaffolding (restating a student response to model correct English usage and grammar, modeling critical thinking outloud
- Procedural scaffolding (grouping students to build skills and increase independence)
- Questioning (using a variety of questioning types including open ended questions)
- Interaction (partners, teams, student discussion and interaction)
- Wait time (up to 20 seconds for EL students)
- Clarifying key concepts in first language
- Application of content and language knowledge (discussing and doing)
- Integration of language skills with Mathematics

4. Strategies

- Thinking aloud
- Creating an "I Wonder" chart with student questions
- Previewing and predicting prior to reading material
- Establishing a purpose for reading
- Summarizing strategy
- Relating summarizing statements back to predictions
- Prompting, questioning, and elaborating (asking students to elaborate on new learning

5. Interaction

- Opportunities for interaction (exchange between teacher, students, talking with others, small groups)
- Encouraging more elaborate responses (beyond yes/no)
- Cooperative learning ideas (jigsaw, four corners, roundtable discussions, interviews, writing headlines, sending a problem from one table to another to solve)
- Wait time (allow students to express thoughts fully without interruption)
- Clarify key concepts (work with peers who speak same language, use native language dictionaries/work lists)

6. Practice and Application

- Hands on materials and manipulatives for practice (multiple opportunities to practice)
- Divide content into meaningful chunks
- Application of content and language (keeping personal learning journals, writing test questions, teach concept to another student, discussion circles, cooperative groups, partner for a project)
- Integration of language skills (reading, writing, speaking, listening)

7. Lesson Delivery

- Content and language objectives stated and delivered orally
- Pace of lesson appropriate for EL students
- Engaged students (minimized off task activities such as making announcements, passing papers)
- Strong classroom management skills
- Clear explanation of academic tasks or instruction
- Appropriate allocation of time for academic tasks

8. Review and Assessment

- Review of key vocabulary (relate new words to previously learned words, draw attention to parts of speech, repeat and reinforce language patterns
- Scaffolding student learning (paraphrasing, systematic word study, personal dictionaries)
- Review of key concepts before, during, after a lesson (summarizing, chunking of information, structured review in small groups, students asking questions to clarify own understanding)
- Providing feedback during review to correct misconceptions
- Informal assessments (on-going opportunities to determine extent of student learning)
- Authentic assessments (applied to real life contexts)
- Multiple indicators to show competency of content objectives)
- Rubrics to define the levels of learning shared with students and parent

Exit Slip

What is one thing that you can apply to your classroom?

What have you learned?

Resources

Visual Thesaurus
http://www.visuwords.com/

Visual Dictionary
http://www.visualdictionaryonline.com/science.php

Academic Word List
http://www.englishcompanion.com/pdfDocs/acvocabulary2.pdf

Vocabulary practice online
http://quizlet.com/

Sources

Echevarria, J. Vogt, *Making Content Comprehensible for Secondary English Learners*. The SIOP Model. 2010. Allyn & Bacon: Boston.

Echevarria, J. Vogt, M. Short, D. *The SIOP Model for Teaching Science to English Learners*. 2011. Pearson Education: Boston.

https://www.wida.us/

Contact

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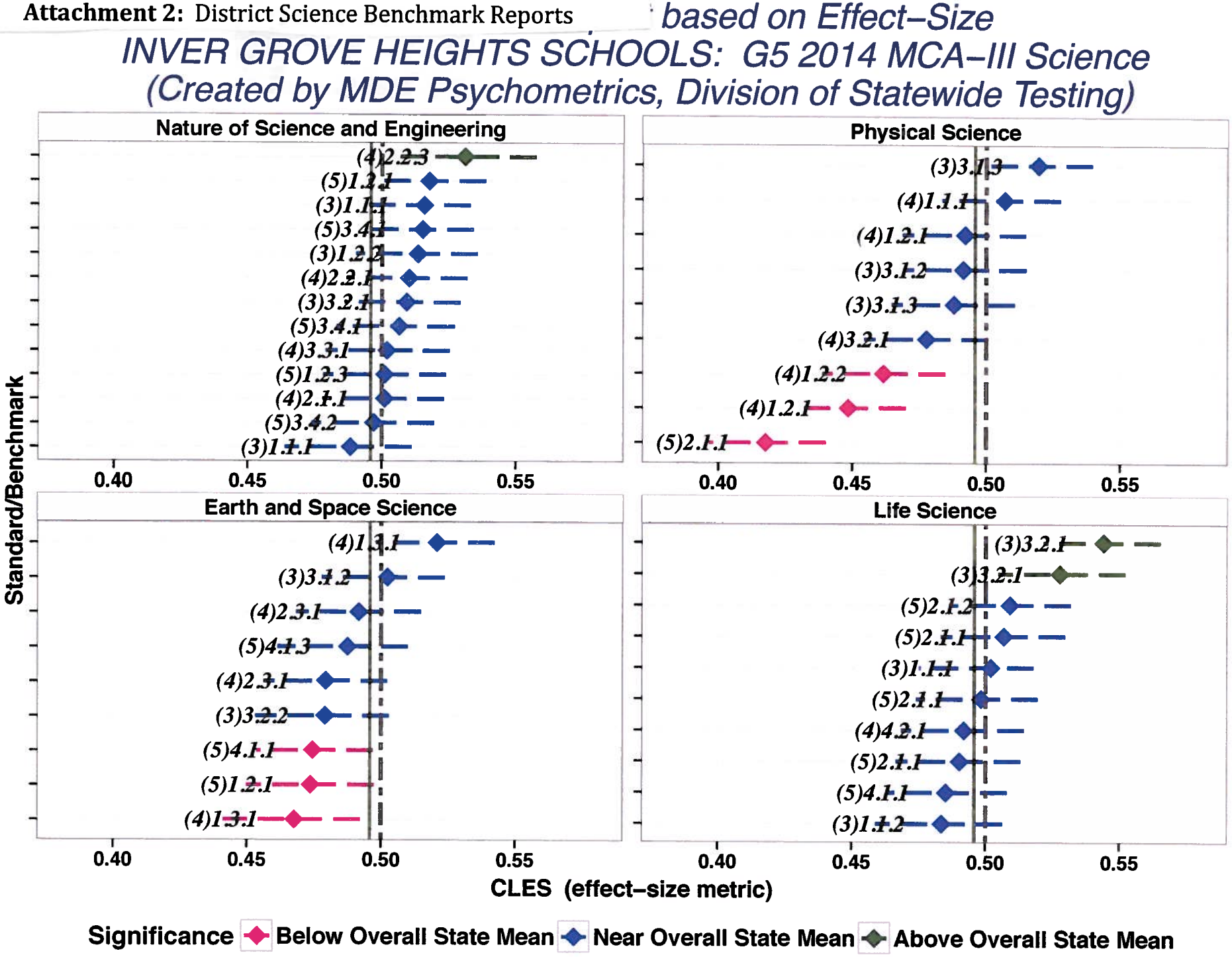
Questions?

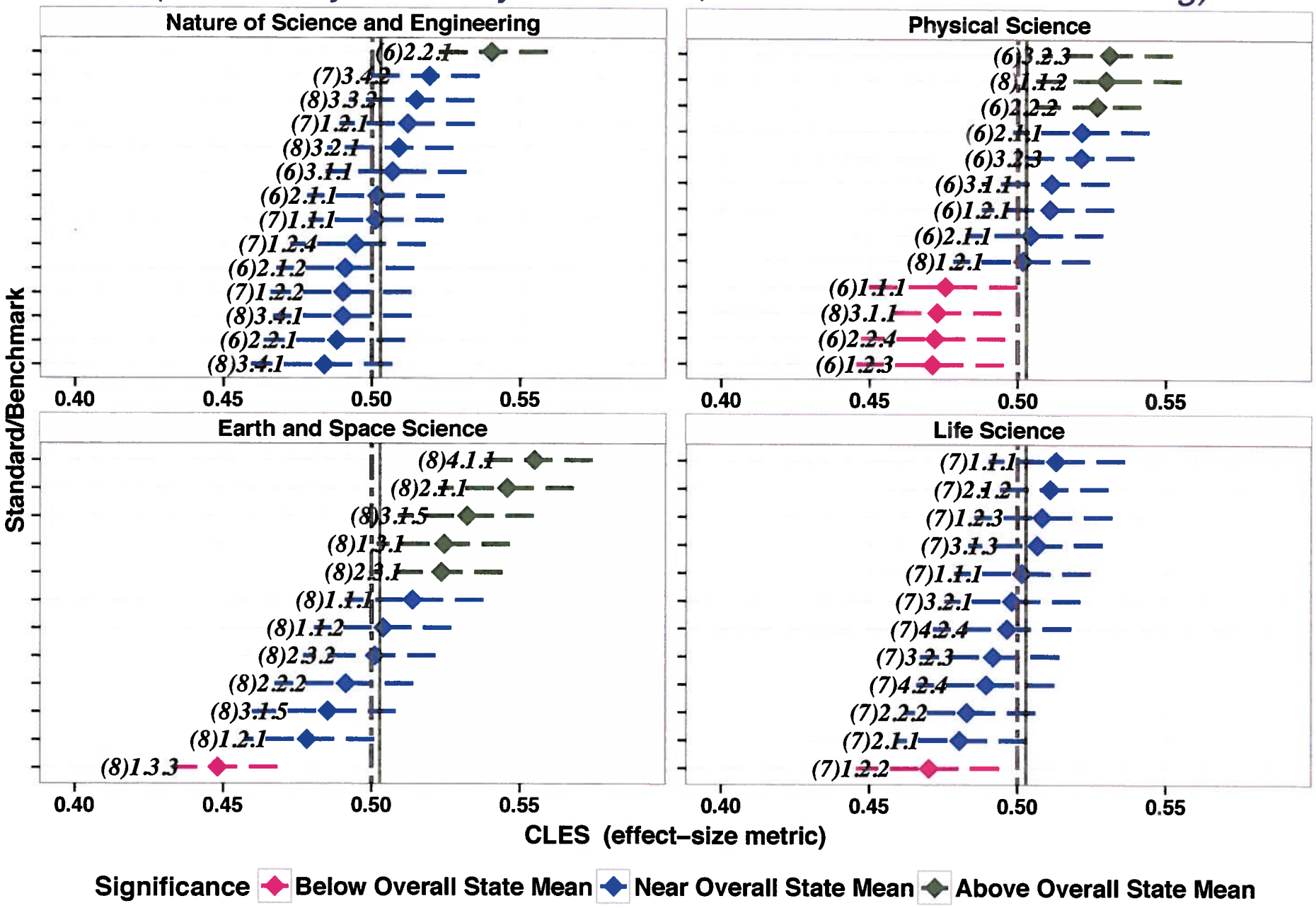
Extension

Choose a student in your class and think of what you could do for that student.

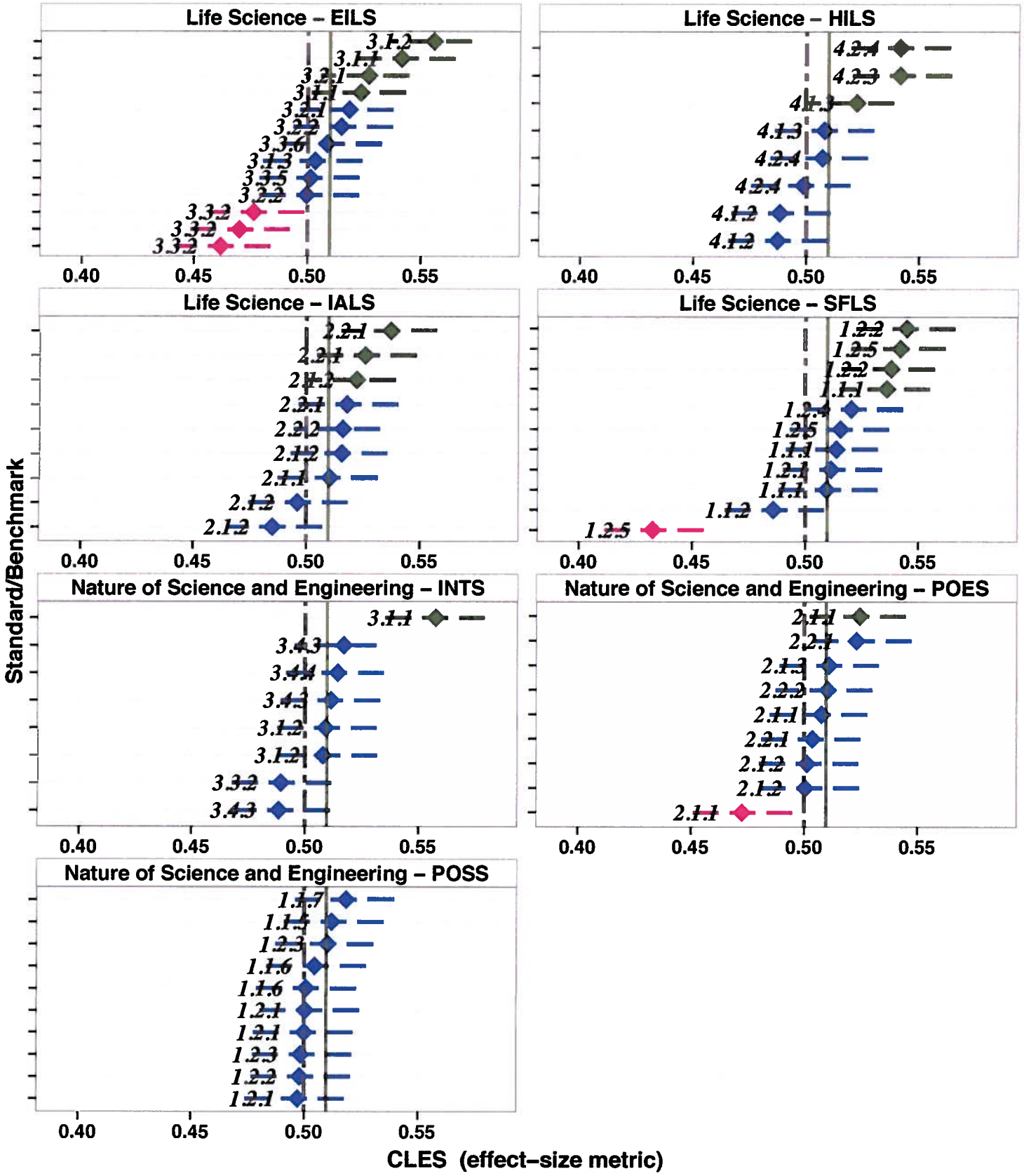
Attachment 2: District Science Benchmark Reports



MDE Benchmark Report based on Effect–Size
INVER GROVE HEIGHTS MIDDLE: G8 2014 MCA–III Science
(Created by MDE Psychometrics, Division of Statewide Testing)



MDE Benchmark Report based on Effect–Size
SIMLEY SENIOR HIGH: HS 2014 MCA–III Science
(Created by MDE Psychometrics, Division of Statewide Testing)



Attachment 3: Benchmark Report Explanation

Minnesota Department of Education

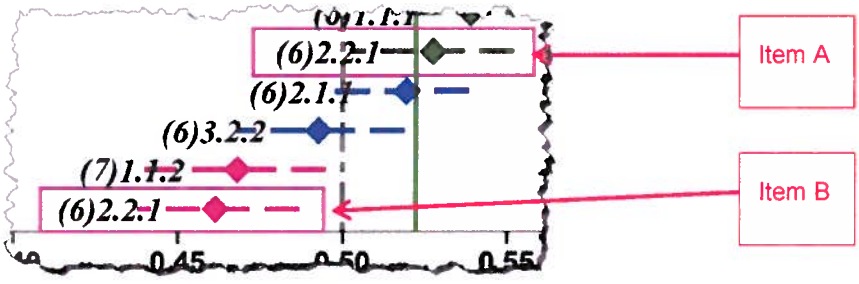
Science MCA Benchmark Reports

The Science MCA Benchmark Reports compare school-level performance with statewide performance on individual MCA items and their aligned benchmarks. The reports are a tool teachers can use to identify benchmarks and standards on which students in their school show performance above, below or at the same level ***relative to all Minnesota science students in the same grade.***

The relative performance of students in a given school compared to all Minnesota students is reported using the Common Language Effect Size (CLES). The CLES expresses the probability that a student selected at random from the school would receive a higher score on the item than a student selected at random from students statewide. For each test item, the average statewide performance—whether it be low, high or in-between—would be 0.50 on the CLES scale, meaning a student drawn at random statewide has a 50/50 chance of exceeding the performance of another student drawn at random statewide on the item. CLES values greater than 0.50 indicate that student performance on the item at the school exceeds student performance statewide on the item. CLES values less than 0.50 have the opposite implication: school performance is lower than the statewide average on the item.

Relative Performance, NOT Item Difficulty

It is important to note that the CLES scale and the location of items on the scale **do not** provide information about the difficulty of individual test questions. It is not appropriate to make inferences about how easy or hard test questions were based on their location on the scale. An item showing high relative performance for students at the school could have a lower actual percentage of students getting the item correct than an item showing low relative performance. In a hypothetical situation, let's say that 25% of students statewide answered Item A correctly and 60% of students at Willow Middle School answered it correctly. This difficult item will be displayed on the right side of the graph, indicating that Willow's students performed very well on the item relative to the state. On Item B, 95% of students statewide answered the item correctly while 75% of the Willow Middle School students got it right. This is an easy item that will appear on the left side of the graph, showing that performance on the item at Willow Middle School is below that of the state. More Willow Middle School students answered Item B correctly (75%) than Item A (60%), but they performed less well on Item B relative to all Minnesota students. The reports show only the difference between the performance of students in a school relative to the performance of all students. Neither percent correct for students statewide nor percent correct for students at the school are provided in the Benchmark Reports. Two points that are horizontally aligned on a graph may represent items with very different levels of difficulty.



How to Read the Science MCA Benchmark Reports

The reports for Grades 5 and 8 are organized by strands in the Minnesota Academic Standards for Science. The High School reports are organized by the substrands of the Nature of Science and Engineering and Life Science strands:

Grades 5 & 8	High School
Strand 1:Nature of Science and Engineering	Strand 1, Substrand 1:Practice of Science (POSS)
	Strand 1, Substrand 2:Practice of Engineering (POES)
Strand 2:Physical Science	Strand 1, Substrand 3:Interactions among STEM and Society (INTS)
Strand 3:Earth and Space Science	Strand 4, Substrand 1:Structure and Function in Living Systems (SFLS)
	Strand 4, Substrand 2:Interdependence Among Living Systems (IALS)
Strand 4:Life Science	Strand 4, Substrand 3:Evolution in Living Systems (EILS)
	Strand 4, Substrand 4:Human Interaction with Living Systems (HILS)

Within the graph for each strand, a vertical dashed line at the 0.50 position on the horizontal axis represents average statewide performance for each test item anchored at a CLES of 0.50. A vertical solid line represents the school's overall average performance on the test.

Test items and benchmarks

Individual items within each strand are indicated by color-coded points and error bands. The items are arranged from highest performance relative to the state at the top of the graph to lowest relative performance at the bottom. Color codes[1] represent how the school's students performed on the item compared to all students in the state:

- **Green**: Students performed significantly above the state average on the item.
- **Blue**: Students performed near the state average on the item.
- **Red**: Students performed significantly below the state average on the item.

Pay close attention to the amount of overlap of error bands across items. If error bands on items overlap by more than one-half, regardless of color or position, performance on those items may be considered statistically equivalent.

Benchmarks are indicated to the left of each item. The benchmark code has been shortened by removing the strand number. In order to match the code with the Minnesota Science Standards, the strand number must be inserted. In grades 5 and 8, for example, (8) 3.3.2 in the Nature of Science and Engineering (Strand 1) section corresponds to benchmark 8.**1**.3.3.2. In the high school reports, all benchmarks begin with 9, so the grade indicator--(9)--is omitted. The Strand indicators (Strand 1 or Strand 4) are also omitted. In the Strand 4, Life Science: Evolution in Living Systems section, for example, 3.1.2 corresponds to benchmark **9.4**.3.1.2.

Interpreting the Benchmark Reports

As with any data, caution must be used in the inferences that can be made from the data. It is important to frame any interpretation in the context of the school's environment. Experience with the science curriculum, instruction and data from other classroom assessments is critical to making meaningful

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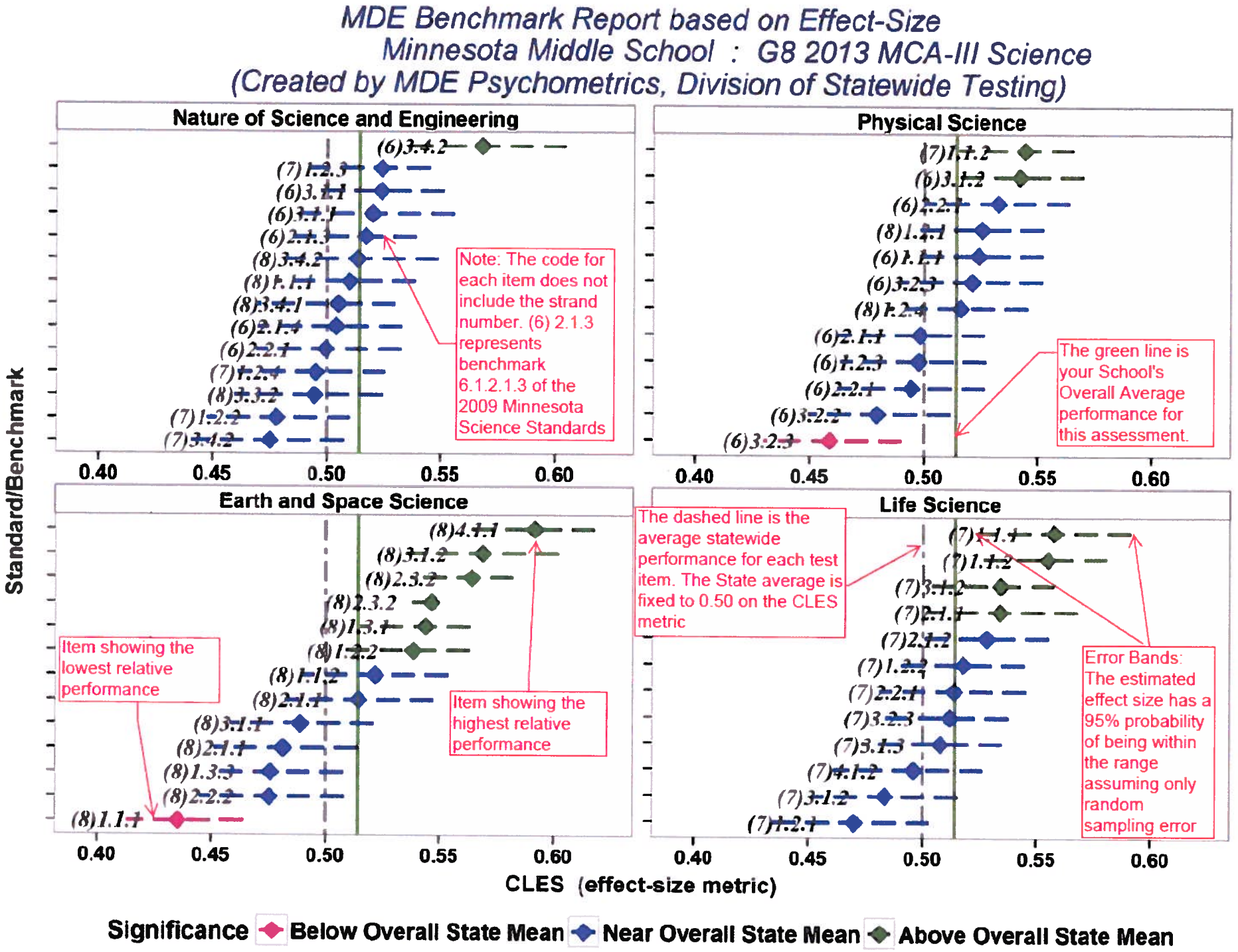
[1] It is not necessary to rely on the color codes to determine relative performance:

- Points to the right and with error bands that do not overlap the dashed vertical line indicate students performed significantly above the state average.
- Points with error bands that overlap the dashed vertical line indicate students performed near the state average.
- Points to the left and with error bands that do not overlap the dashed vertical line indicate students performed significantly below the state average.

inferences from this report. Any interpretation of these reports must take the following considerations into account:

- The number of items on each report corresponds to the number of items on the assessment, as outlined in the test specifications for each grade. This feature is specific to the Science MCA only.
- There may be more than one item assessing a particular benchmark.
- Color codes and position of items in the graphs do not correspond to item difficulty.
- Color codes and position of items in the graphs do not correspond to achievement levels (i.e., Does Not Meet, Partially Meets, Meets, or Exceeds the Standards).
- When looking at different schools within a district, be aware of any differences in the CLES scale. The horizontal axis comprising the CLES scale is adjusted to fit each individual school's data. Hence, if a school has a large outlier (very well or very poor performing item) the graph will have items placed more tightly together and more points on the horizontal axis.


MDE Benchmark Report based on Effect-Size
Minnesota Middle School : G8 2013 MCA-III Science
(Created by MDE Psychometrics, Division of Statewide Testing)
Nature of Science and Engineering
Physical Science
Earth and Space Science
Life Science
Standard/Benchmark
CLES (effect-size metric)
0.40
0.45
0.50
0.55
0.60
Note: The code for each item does not include the strand number. (6) 2.1.3 represents benchmark 6.1.2.1.3 of the 2009 Minnesota Science Standards
The green line is your School's Overall Average performance for this assessment.
The dashed line is the average statewide performance for each test item. The State average is fixed to 0.50 on the CLES metric
Item showing the lowest relative performance
Item showing the highest relative performance
Error Bands: The estimated effect size has a 95% probability of being within the range assuming only random sampling error
Significance
Below Overall State Mean
Near Overall State Mean
Above Overall State Mean