

# Changes in Science Education

Testing, Standards, Curriculum, and Instruction



**ARKANSAS**  
K-12 SCIENCE STANDARDS

EDUCATION FOR A NEW GENERATION

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## Goals

- Become familiar with science section of ACT Aspire.
- Become more aware of and equipped to meet shifts needed in curriculum and instruction to support high achievement in science

# ACT Aspire

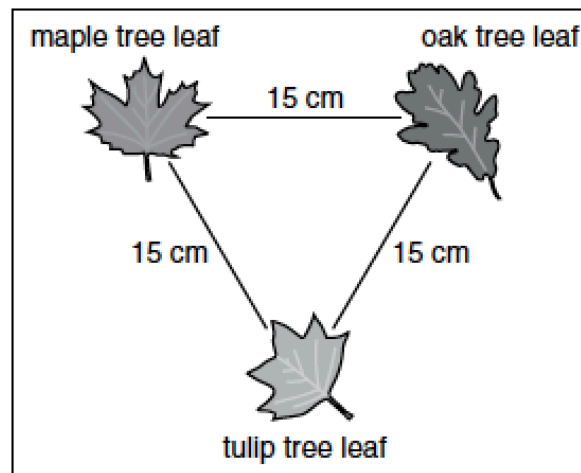
[Plickers.com](http://Plickers.com)

What do you know  
about the ACT  
Aspire?



# Dipping our Toes into the ACT Aspire

- Let's take a few minutes to look at an exemplar ACT Aspire question.
- What are your initial thoughts? Reactions?



## Online Exemplar Questions

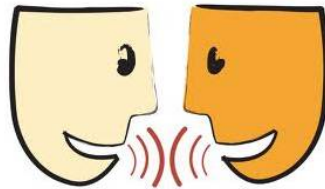
- <http://tn.actaspire.org>
- Username:
  - Science3
  - Science4
  - Science5
  - Science6
  - Science7
  - Science8
  - ScienceEHS
- Password: actaspire

Do your grade, the grade above, and the grade below.

Be warned: Test Navigator might not work in your browser.

# Sample Test Items

What did you notice with the sample test items?



# ACT Aspire - Science

Let's dig a little deeper...

- Technical Bulletin handout pg 5-7
  - As you read, what sticks out to you? Is there a line, phrase, and/or word?
  - Annotate and jot down thoughts in margin
  - Share with your group



# ACT Aspire - Science

Let's dig a little deeper...

- Is this a content test?
- What domains are tested?
- What types of questions will be used?





# ACT Aspire - Science

## Let's dig a little deeper...

## What do you notice?

*Table 16. Points and Proportion of Points by Domain for the ACT Aspire Science Assessments*

	Grade Level						
	3	4	5	6	7	8	EHS
<b>Total</b>	36	36	36	40	40	40	40
<b>IOD</b>	18–22	18–22	18–22	20–22	20–22	18–20	16–18
	.50–.60	.50–.60	.50–.60	.50–.55	.50–.55	.45–.50	.40–.45
<b>SIN</b>	7–9	7–9	7–9	6–10	6–10	8–10	10–12
	.20–.25	.20–.25	.20–.25	.15–.25	.15–.25	.20–.25	.25–.30
<b>EMI</b>	7–9	7–9	7–9	10–12	10–12	12–14	12–14
	.20–.25	.20–.25	.20–.25	.25–.30	.25–.30	.30–.35	.30–.35

*Note.* IOD: Interpretation of Data; SIN: Scientific Investigation; EMI: Evaluation of Models, Inferences, and Experimental Results. Scores in Mathematics and Science will be used to provide a *STEM* score.



# ACT Aspire - Science

Let's dig a little deeper...

What do you notice?

*Table 15. Points and Proportion of Points by Item Type for ACT Aspire Science Assessments*

	Grade Level						
	3	4	5	6	7	8	EHS
<b>Total</b>	36	36	36	40	40	40	40
<b>MC</b>	18–19	18–19	18–19	22–23	22–23	23–24	23–24
	.50–.53	.50–.53	.50–.53	.55–.58	.55–.58	.58–.60	.58–.60
<b>TE</b>	3–4	3–4	3–4	3–4	3–4	3–4	3–4
	.08–.11	.08–.11	.08–.11	.08–.10	.08–.10	.08–.10	.08–.10
<b>CR</b>	14	14	14	14	14	13	13
	0.39	0.39	0.39	0.35	0.35	0.33	0.33

*Note.* EHS = Early High School (Grades 9 and 10); MC = Multiple-Choice; TE = Technology-Enhanced; CR = Constructed-Response. Paper tests do not have TE items. MC items are used in their place.



# ACT Aspire - Science

Let's dig a little deeper...

What do you notice?

*Table 17. Percentage of Points by DOK for the ACT Aspire Science Assessments*

	Grade Level						EHS
	3	4	5	6	7	8	
<b>DOK 1</b>	10–20%	10–20%	10–20%	5–15%	5–15%	5–15%	5–15%
<b>DOK 2</b>	45–65%	45–65%	45–65%	45–65%	45–65%	45–65%	45–65%
<b>DOK 3</b>	25–35%	25–35%	25–35%	30–40%	30–40%	30–40%	30–40%

*Note.* In addition to operational questions that contribute to student scores, each Science form also contains pretest questions and associated passage. These questions do not contribute to student scores.



# ACT Aspire - Science

## Passage Stimulus Formats . . .

*Table 18. Stimulus Formats for ACT Aspire Science Assessments*

	Grade Level						
	3	4	5	6	7	8	EHS
DR				1	1	2	2
RS					1	2	2
CV						1	1
DP	2	2	2				
SI	2	2	2	2	1		
SV				1	1		

*Note.* DR = Data Representation, RS = Research Summaries, CV = Conflicting Viewpoints, DP = Data Presentation, SI = Science Investigation, SV = Student Viewpoints.



## ACT Aspire Format Types

Using the Technical Bulletin, can you identify what type of stimulus format each passage is on the online test?



# Exemplar Questions

<http://actaspire.pearson.com/exemplars.html>

click on Science tab – click grade level document name

Sample question

-includes question type, DOK level, category, answer & explanation, and improvement ideas

## ACT Aspire Compared to Benchmark and EOC

- Now that you've seen some ACT Aspire Exemplar questions,
  - What similarities do you notice?
  - What differences do you notice?
  - What implications does this have for classroom practice?

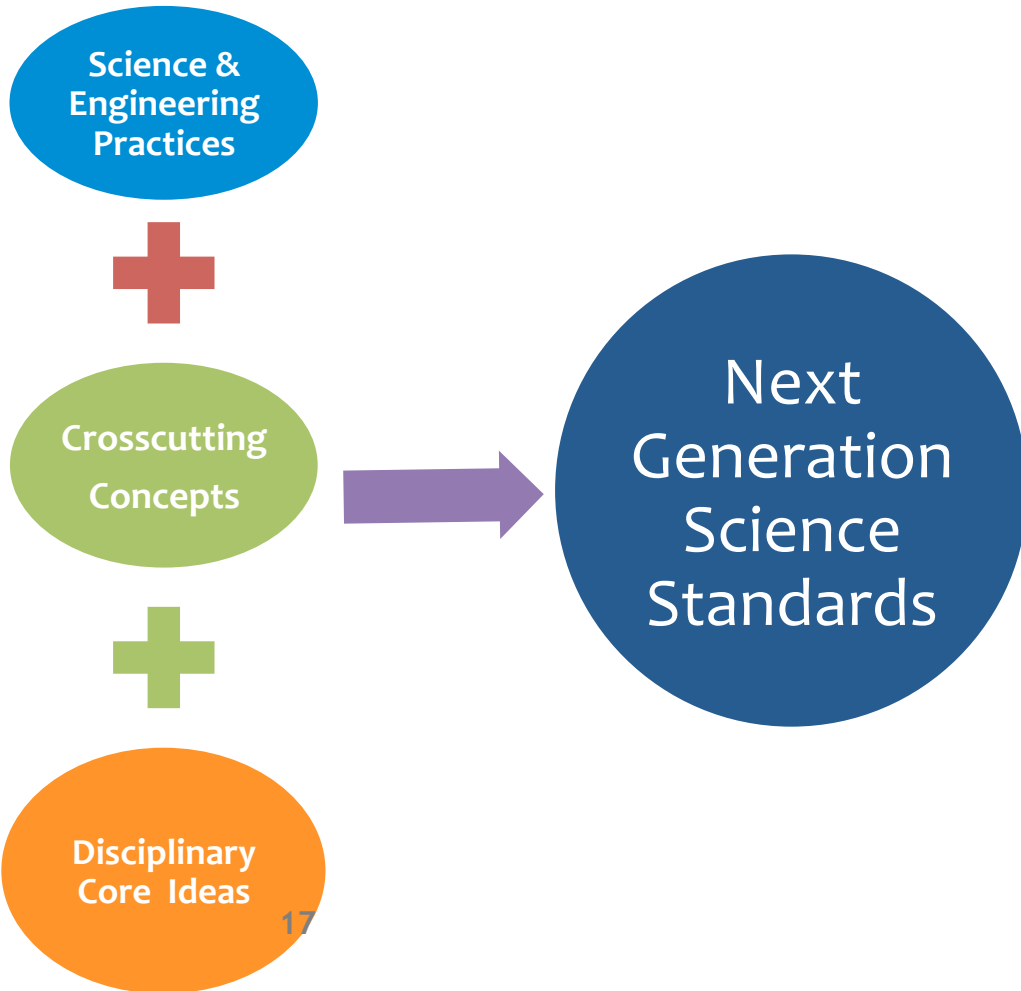
# ACT Aspire and Standards

What standards is the ACT Aspire based on?



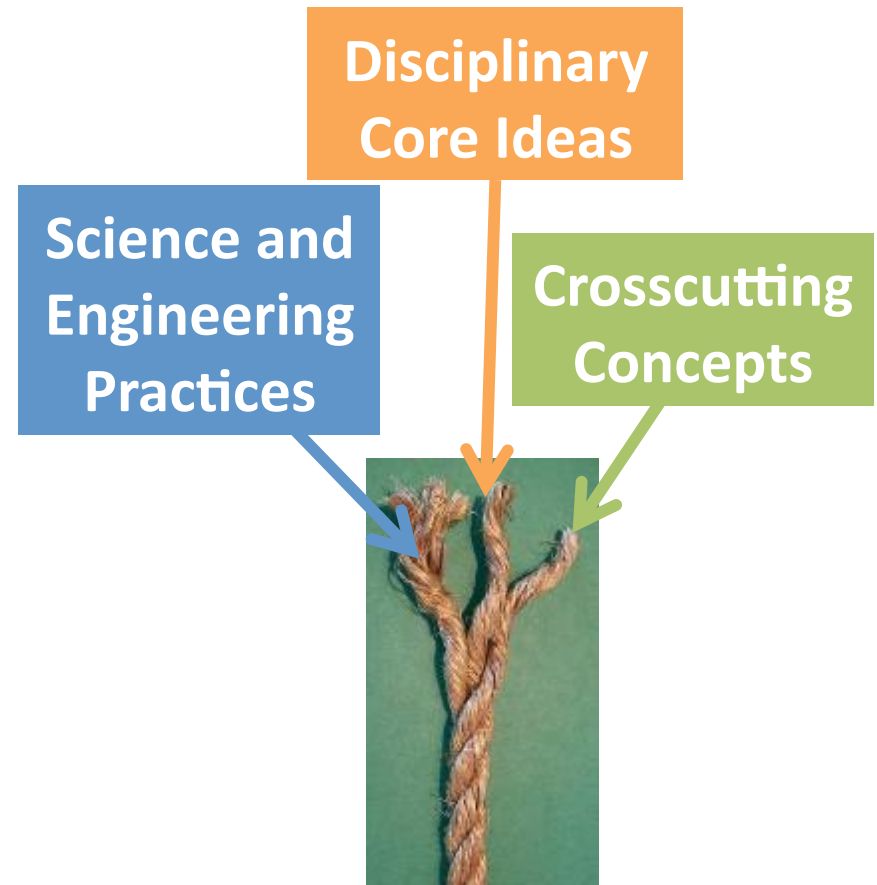


Three  
Dimensions  
of the  
Framework  
for  
K-12 Science  
Education



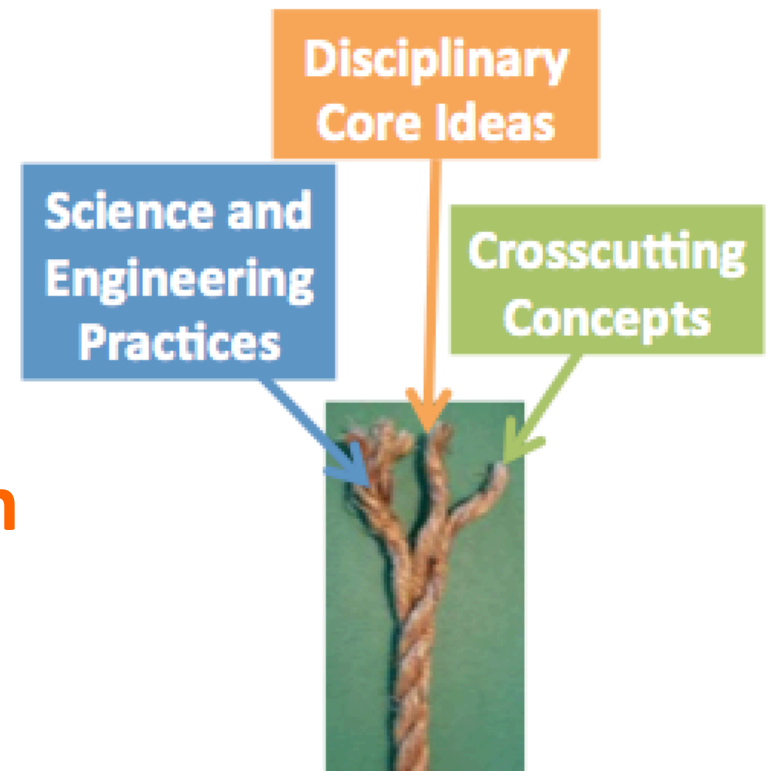
# Three-Dimensional Learning

**7-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations .**



# Three-Dimensional Learning

**7-LS2-4** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations .



## Practices Jigsaw: Identifying Common Ground

- Examine your assigned Science and Engineering Practice (SEP) Progression
- Identify areas of overlap between the ACT College and Career Readiness Standards (CCRS) and the SEP.
- Identify any gaps in the ACT CCRS that are not addressed by the SEP.

## Locating Disciplinary Text, Charts, Graphs

- Explore the materials available online.
- Consider how to craft an ACT Aspire-like series of questions/ activities that aligns with content you will be teaching this year.

Reflect...

Are there changes I need to make in my Science instruction to better prepare students?



## Other Resources Online

- Virginia's Wiki:

[Nwaescscience.pbworks.com](http://Nwaescscience.pbworks.com)

- Lesley's Google Folder

<http://tinyurl.com/ov3xwda>