

# Oklahoma *PASS* Science Workshops 2008



# Who's Who

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Teachers of Grades 5 and 8

Data Recognition Corporation

*David Durette and Erica Hyland*

Oklahoma State Department of Education

*Gaile Loving*

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# Why Should You Know About Test Development?

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- ❑ Answer questions from students, parents, teachers.
- ❑ Guides development of local benchmark assessments.
- ❑ Knowledge to create your own items.



# Why Should You Know About Test Development?

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- ❑ Required to teach the *Priority Academic Student Skills (PASS)*
- ❑ Oklahoma Core Curriculum Test (OCCT) aligns with the assessed *PASS*
- ❑ Limited teaching time = focused instruction

# Goals

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- Provide educators with an overview of how science test items are developed and dually aligned to both the *PASS* content and *PASS* process standards/objectives.
- Increase understanding and use of the Item Specifications document.
- Work collaboratively with educators to create and discuss aligned test items.
- Inform educators about various resources for their classrooms.



# Overview of Test Development

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The state determines the following:

- What content areas and grade levels will be assessed?
- What is the design of the assessment?
- What are the timelines?
- How will the assessment be scored and reported?



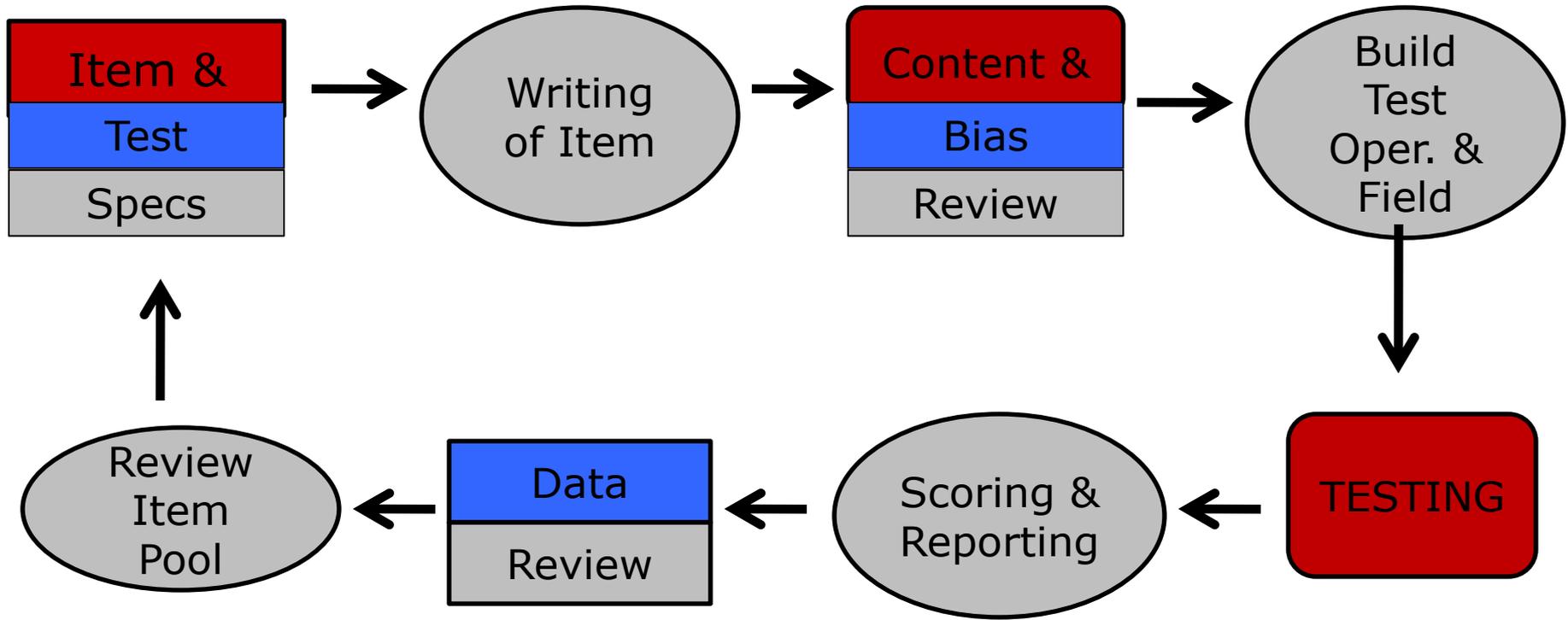
# Overview of Test Development

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- ❑ Oklahoma educators are involved.
- ❑ Committees composed of classroom teachers, curriculum specialists, administrators, and other educational stakeholders.
- ❑ Committees represent the state geographically, ethnically, by gender, and by type and size of school district.



# OCCT TEST DEVELOPMENT CYCLE



SDE

DRC

OK Teachers & Students

# Walkthrough of the Guiding Documents

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- *PASS* Science Standards/Objectives
  - Alignment and validity
  
- Science Test Blueprints
  - Percent emphasis of process and content
  
- Science Item Specifications
  - Clarifies assessment limits, guides item development, and provides sample items

# Science Item Specifications

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- provide parameters and guidelines for item writers and DRC science assessment specialists to design the *PASS* Science items
- provide Oklahoma educators and SDE staff with guidance to judge whether or not items are appropriate for field testing

# ***PASS Process Standards and Objectives***

# ***PASS Content Standards and Objectives***

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## **Dual alignment:**

- ❑ Each item aligns to both a Process Standard and Objective and a Content Standard and Objective
- ❑ Dual alignment opportunities ([56/90](#))
- ❑ Indicator verbs help direct the items' alignment and likely depth of knowledge

# ***PASS Process Standards and Objectives***

# ***PASS Content Standards and Objectives***

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## **Focus on Verbs**

- Represent how students will be expected to demonstrate their knowledge, concepts and skills on the assessment
  
- Contribute to understanding the depth of knowledge and cognitive complexity expected for the assessment

# Depth of Knowledge

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- ❑ is not the same as difficulty
- ❑ complexity vs. the difficulty of a question
- ❑ is descriptive, not a taxonomy
- ❑ focuses on how deeply a student has to know the science process/content

# Depth of Knowledge

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- Recall – *Level 1*
- Skills & Concepts – *Level 2*
- Strategic Thinking – *Level 3*

# Depth of Knowledge 1

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- Requires students to demonstrate a rote response, use a well-known formula, follow a simple procedure (recipe), or perform a clearly defined series of steps
- A “simple” procedure is well defined and typically involves only one step

*Key Words: identify, recall, recognize, use, and measure*

# Sample Item      Depth of Knowledge 1

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Which tool can be used to measure an object's mass?

- A meter stick
- B Erlenmeyer flask
- C graduated cylinder
- D triple-beam balance \*

# Depth of Knowledge 2

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- It requires students to make some decisions as to how to approach the question or problem.
- Requires deeper knowledge than just giving a definition such as explaining how or why; it implies more than one step.

*Key Words: classify, organize, estimate, make observations, collect and display data, and compare data*

# Depth of Knowledge 2

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- Activities include making observations and collecting data; classifying, organizing, and comparing data; and organizing and displaying data in tables, graphs, and charts.
- Some action verbs, such as “explain,” “describe,” or “interpret,” could be classified at different depth-of-knowledge levels, depending on the complexity of the action.

# Sample Item      Depth of Knowledge 2

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**Which statement describes electron activity when magnesium oxide (MgO) forms?**

- A    Electrons are transferred from magnesium atoms to oxygen atoms.\***
- B    Electrons are shared between magnesium atoms and oxygen atoms.**
- C    Electrons leave both magnesium atoms and oxygen atoms.**
- D    Electrons travel back and forth between magnesium atoms and oxygen atoms.**

# Depth of Knowledge 3

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- ❑ Requires deep understanding as exhibited through planning, using evidence, and more demanding cognitive reasoning
- ❑ Form conclusion from experimental or observational data
- ❑ Propose and evaluate solutions
- ❑ Explain, generalize or connect natural events or ideas, using supporting evidence from a text or source

# Depth of Knowledge 3

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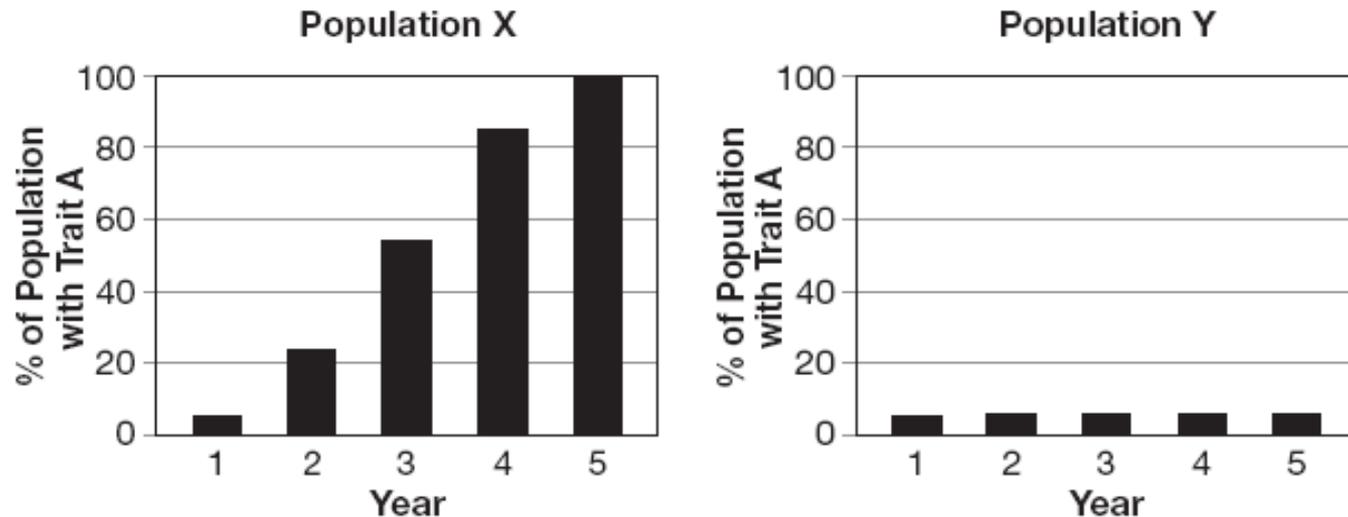
## Activities include:

- Experimental designs that involve more than one dependent variable
- Drawing conclusions from observations
- Citing evidence and developing a logical argument for concepts
- Explaining phenomena in terms of concepts
- Using concepts to solve non-routine problems

# Sample Item      Depth of Knowledge 3

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Populations X and Y are organisms of the same species that are isolated from one another.



The graphs show the percentages of a genetic trait's presence in the two populations. The changes in population X's genetic traits indicate that the population is *most likely*

- A undergoing speciation.\*
- B losing an available habitat.
- C suffering from parasitism.
- D migrating to a new habitat

# Science Item Specifications

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## Components

- Emphasis
- Assessment limits
- Format for items
- Distractor domains
- Sampling of items

# ***OCCT State Science Results***

<b>OCCT Spring 2008</b>	<b>Advanced</b>	<b>Satisfactory</b>	<b>Limited Knowledge</b>	<b>Unsatisfactory</b>
<b>Grade 8</b>	<b>12%</b>	<b>75%</b>	<b>9%</b>	<b>4%</b>
<b>Grade 5</b>	<b>27%</b>	<b>58%</b>	<b>12%</b>	<b>3%</b>



Median % Correct , FAY plus NFAY, All Students, OCCT 2008 State Results

# OCCT State Results – Grade 8

## Strengths

**P. 3.6** Safety = 100%

**P. 2.1** Classify using  
observable  
properties =  
100%

**P. 3.2** Evaluate  
experimental  
design = 80%

**C. 2** Motion and  
Forces = 88 %

## Challenges

**P. 3.3** Identify variables  
= 57%

**P. 4.2** Interpret data  
tables = 71%

**P. 2.2** Identify  
properties = 75%

**C. 5** Earth's History  
= 63%

Median % Correct , FAY plus NFAY, All  
Students, OCCT 2008 State Results



# OCCT State Results – Grade 5

## Strengths

**P. 3.4** Safety = 100%

**P. 1.2** Compare and contrast characteristics = 100%

**P. 1.1** Observe and measure = 83 %

**C. 2** Life Science = 75%

**C. 3** Earth Science = 75%

## Challenges

**P. 3.2** Evaluate experimental design = 71%

**P. 4.3** Make predictions based on experimental data = 75%

**P. 4.4** Communicate results = 75%

**C. 1** Physical Science = 72%



# *Item Review Committees*

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June 15 - 19 , 2009 OKC

≈ 15 member committee per grade

13 Teachers

1 Curriculum Specialist or  
Coordinator

1 Business stakeholder

DRC and SDE Science Representatives

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# *Item Review Committees*

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- Must be nominated or recommended  
District / Site Administrator or Curriculum Director
- Form available on the secure SDE  
site or upon request from SDE by an  
Administrator.
- Must be received by Dec 2008,  
through the secure Administrators  
site, faxed, or mailed.



# *Workshop Wrap Up*

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- What did you learn?
- How will you use what you learned?
- What do you still need to know?



# SDE Contact Information

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