Evaluating Alignment of Standards-Based Assessment Program

Overview

- Test purpose and use
- Cognitive Complexity & Depth of Knowledge Practice
- Test development and documentation
  - **Item-Level Analysis**
  - Test-Level Analysis
- Content Standard Connections to the Performance Level Descriptors (PLDs)

Assessment in Every Student Succeeds Act

"Oklahoma recognizes that a **robust assessment system** is tied closely to students' learning and teachers' instructional practices by valuing and promoting **local, classroom-based formative assessments** that help make **student learning visible**. (Oklahoma ESSA page 48)

Oklahoma School Testing Program in ESSA

At the same time, that system should provide a **strong summative assessment** program that fits as a component within a multifaceted state, district and school accountability system." (Oklahoma ESSA Plan p. 48)
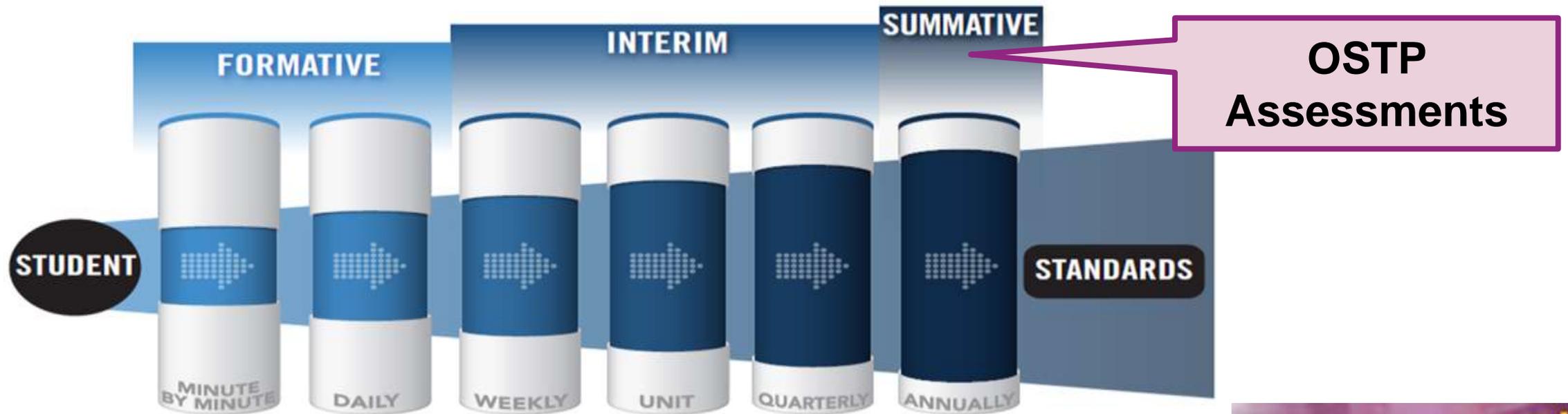
Purpose

Be judicious: An assessment purporting to serve multiple purposes serves no purpose well

- Provide information on student performance relative to some target
- Identify achievement gaps among student groups
- Provide instructional feedback
- Predict performance or track growth over time

Assessments Provide Evidence of Learning

Evidence of student learning
from classroom assessments
and other artifacts

District level
Common and
Interim Assessments

Large Scale

State tests

Who has more evidence of mastery?

(1). $1 + 1 =$

(2). $9 + 5 =$

(3). $8.2 + 3.3 =$

(4). $\frac{1}{2} + \frac{1}{3} =$

(5). $6\frac{2}{3} + 7\frac{3}{4} =$

(6). $\sum_{n=1}^{100} \left(n - (n-1) \right)^n$

Student A: **4**/6 correct

Student B: **4**/6 correct

It's not about the number correct

Easier   Harder

$$1 + 1 = \underline{\quad}$$

$$9 + 5 = \underline{\quad}$$

$$1/2 + 1/3 = \underline{\quad}$$

$$8.2 + 3.3 = \underline{\quad}$$

$$6\ 2/3 + 7\ 3/4 = \underline{\quad}$$

$$\sum (n - (n - 1)$$
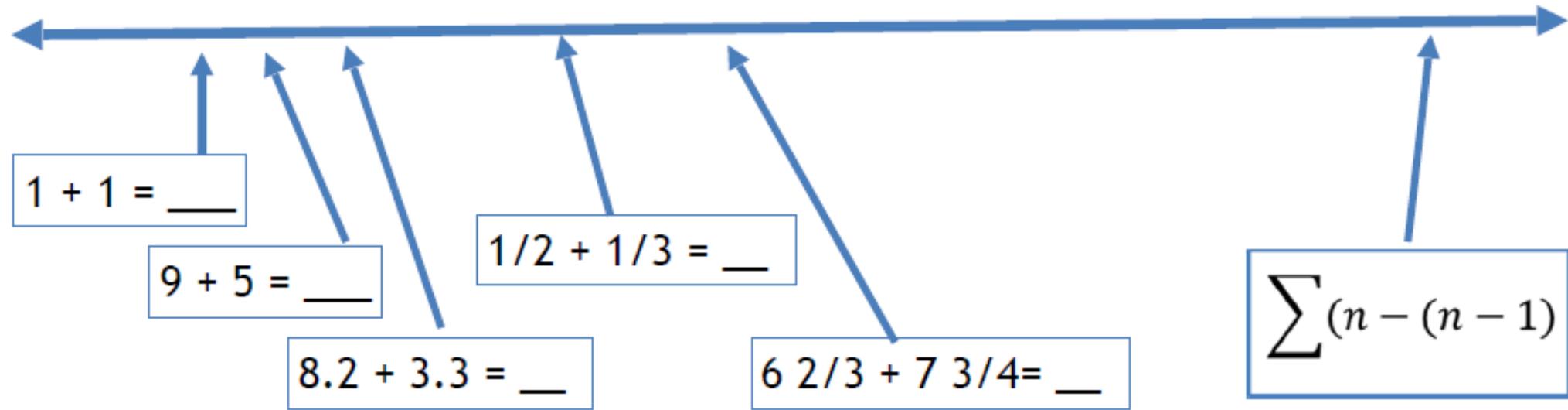
It's about Cognitive Complexity

Complexity is:
- Type of Thinking
- Intricacy of Knowledge
- Specificity of Expectations
- Nuances Between Abstract and Concrete Ideas

Depth of Knowledge (DOK) is a way to measure Cognitive Complexity

What is the knowledge?

DOK 1

Recall and Reproduction

How can the knowledge be used?

DOK 2

Basic Application of Concepts and Skills

Why can the knowledge be used?
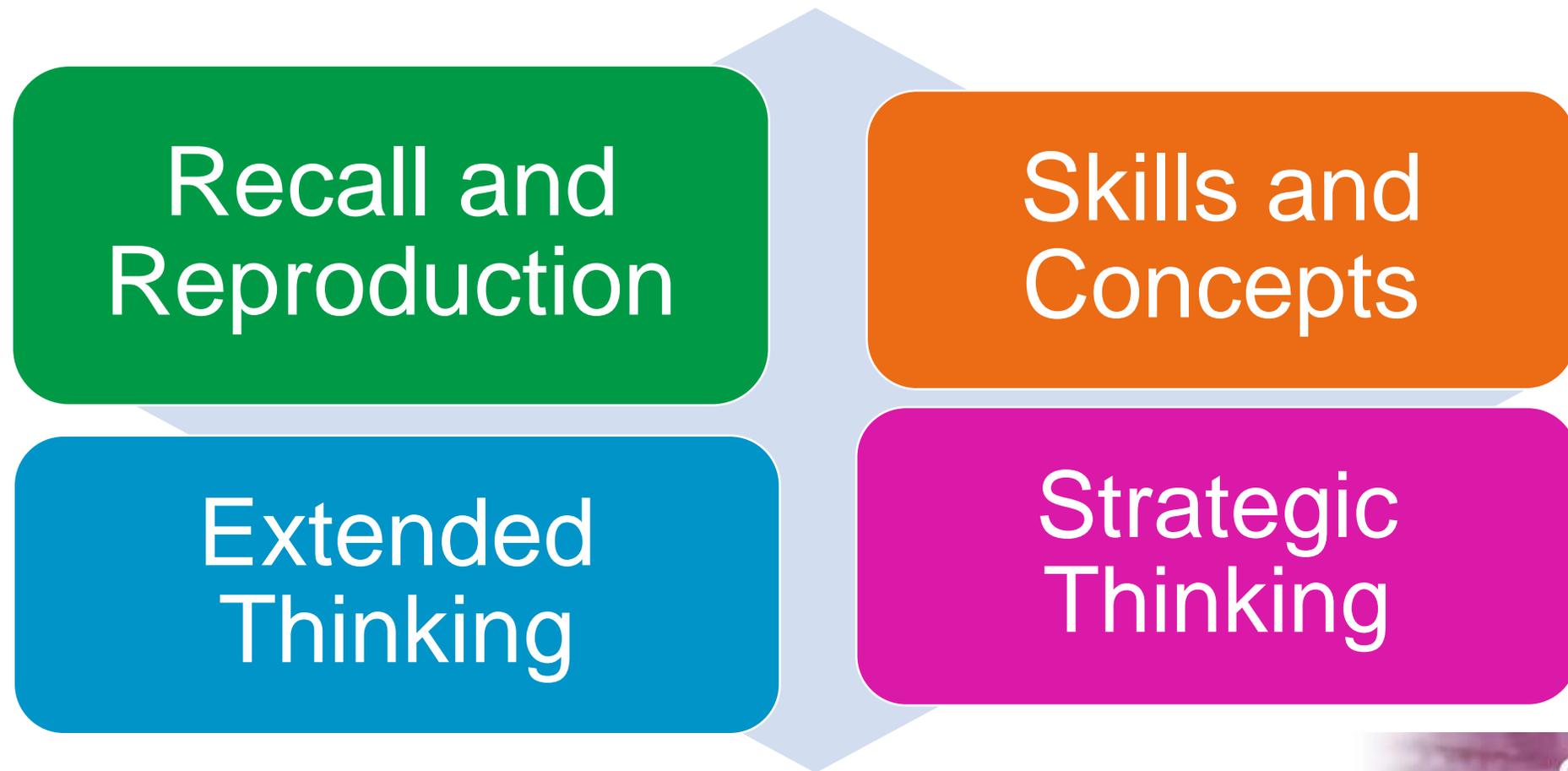
DOK 3

Strategic Thinking

What else can be done with the knowledge?

DOK 4

Extended Thinking

DOK is not sequential

Recall and Reproduction

Skills and Concepts

Extended Thinking

Strategic Thinking

engageok ON THE ROAD

DOK 1

USING SIMPLE SKILLS

Reciting facts.
Using simple skills.

Reading does not require analysis.
Focus is on basic Comprehension.

Understanding words and phrases

DOK 2

MENTAL PROCESSING

Engaging beyond recall.

Requiring both comprehension and processing.

Requiring students to:
-summarize
-interpret
-infer
-classify
-organize
-collect
-compare

DOK 3

BEYOND THE TEXT

Requiring students
To go beyond the text.

Explain, generalize, and connect ideas.

Students must be able to support their thinking.

Identify abstract themes. Infer across the entire passage. Apply prior knowledge.

DOK 1	DOK 2	DOK 3
RECALLING INFORMATION	**SKILS AND CONCEPTS**	**STRATEGIC THINKING**

DOK 1
RECALLING INFORMATION

Recalling information. Facts. Definitions. Procedures.

Following a set of procedures. (like a recipe)

Applying a formula

Performing a clearly defined set of steps.

DOK 2
SKILS AND CONCEPTS

Requiring students to make some decisions about how To approach a problem or activity

Working with problems that have more than one step.

Collecting
Classifying
Organizing
and Comparing data.

Organizing and displaying data In charts, graphs, and tables.

DOK 3
STRATEGIC THINKING

Requiring reasoning, planning, and a higher level of thinking.

Students have to explain their thinking and justify their responses.

Complexity comes from a higher demand for reasoning, not harder problems.

DOK 1

RECALLING INFORMATION

Recalling facts, terms, and concepts.

Asking students to know Who, what, and when.

Recognizing and identifying Specific information found in:
-maps
-charts
-graphs
-tables
-drawings

DOK 2

BASIC REASONING

Engaging beyond recalling or reproducing.

Asking students to know how and why.

Comparing and contrasting people, places, and events.

DOK 3

COMPLEX REASONING

Requiring evidence, reasoning, and a higher level of thinking.

Justify how and why with Application and evidence.

Propose solutions.
Make connections.
Recognize misconceptions.

DOK PRACTICE

Depth of Knowledge: Level 1 in Mathematics Recall and Reproduction

- Requires students to recall facts, terms, definitions, or simple procedures, perform simple algorithms or apply formulas.

- One-step, well-defined, or straight algorithmic procedures should be included at this level.

Examples:
- Using basic calculation tasks involving only one step (i.e. addition, subtraction, etc.), complete the following…
- Basic measurement tasks that involve one step (i.e. using a ruler to measure length)
- Use this simple formula where at least one of the unknowns are provided to…

DOK 1 Sample: Math

What is the surface area of a rectangular prism that measures 3 units by 4 units by 5 units?

This item is DOK 1 because it requires the student to complete a simple procedure to calculate the surface area of a prism.

(Group discussion time)

Depth of Knowledge: Level 2 in Mathematics Skills and Concepts

- Requires students to make decisions on how to approach a problem.
- Requires students to compare, classify, organize, estimate, or order data. Often involves procedures with two or more steps.

Examples:

- Specify and explain relationships between facts, terms, properties, or operations
- Select procedure according to criteria and perform it
- Use concepts to solve routine multiple-step problems

DOK 2 Sample: Math

Jason had 64 football cards. He gave 12 cards to his brother. Then he divided the remaining cards equally among his four friends. How many cards did each friend receive?

Image of Football Cards

(Group discussion time)

DOK 2 Sample: Math

Jason had 64 football cards. He gave 12 cards to his brother. Then he divided the remaining cards equally among his four friends. How many cards did each friend receive?

This item is **DOK 2** because it requires students to solve a routine problem applying multiple decision points.

Depth of Knowledge: Level 3 in Mathematics Strategic Thinking

- Requires reasoning, planning, or use of evidence to solve a problem or algorithm.

- Requires conjecture or restructuring of problems.

- Involves drawing conclusions from observations, citing evidence, and developing logical arguments for concepts.

- Uses concepts to solve non-routine problems.

DOK: Level 3 Continued Strategic Thinking

Examples:

- Formulate original problem, given situation

- Formulate mathematical model for complex situation

- Produce a sound and valid mathematical argument

- Devise an original proof or critique a mathematical argument

DOK 3 Sample: Math

What is the greatest area you can make with a rectangle that has a perimeter of 24 units?

(Group discussion time)

DOK 3 Sample: Math

What is the greatest area you can make with a rectangle that has a perimeter of 24 units?

This item is **DOK 3** because it requires students to determine the possible side length measurements of the rectangle then use this information to determine which has the greatest area. Student must take a non-routine approach to answer this item.

(Group discussion time)

Remember:

DOK are levels of **cognitive complexity**, not levels of **difficulty**.

DOK of an item is **not determined by the verb**, but by the context in which the verb is used and the **depth of thinking** that is required.

Multiple Choice Math Items

What's the DOK?

Standard: **5.N.1.2** Divide multi-digit numbers, by one- and two-digit divisors, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms.

Item #1:

The art teacher had 450 sheets of construction paper on the first school day. The art students used 18 sheets during each school day. How many school days did the construction paper last?

A) 21
B) 22
C) 24
D) 25

What's the DOK?

Item #1: The art teacher had 450 sheets of construction paper on the first school day. The art students used 18 sheets during each school day. How many school days did the construction paper last?

A) 21 (The student made a computational error)

B) 22 (The student rounded 18 to 20)

C) 24 (The student made a computational error.)

D) 25 (Correct)

Depth-of-Knowledge**: 2**

DOK Rationale: This item is DOK 2 because it requires the student to determine the operation required to find the solution based on the context of the problem, then perform the calculation.

What's the DOK?

Standard: 5.N.1.4 Solve real-world and mathematical problems requiring addition, subtraction, multiplication, and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results.

Item #2: A student sorted 950 crayons into boxes that hold 36 crayons each. How many more crayons will the student need to completely fill the last box?

A) 6

B) 14

C) 22

D) 30

What's the DOK?

Item #2: A student sorted 950 crayons into boxes that hold 36 crayons each. How many more crayons will the student need to completely fill the last box?

A) 6   (The student focused on the ones place of the quotient.)

B) 14 (The student identified the remainder after dividing.)

C) 22 (Correct)

D) 30 (The student estimated the answer by dividing 900 by 30.)

Depth of Knowledge: **3**

DOK Rationale: This item is DOK 3 because it requires the student to solve a non-routine problem. The student must first determine the remainder amount then use this to find the number of crayons needed to fill the last box.
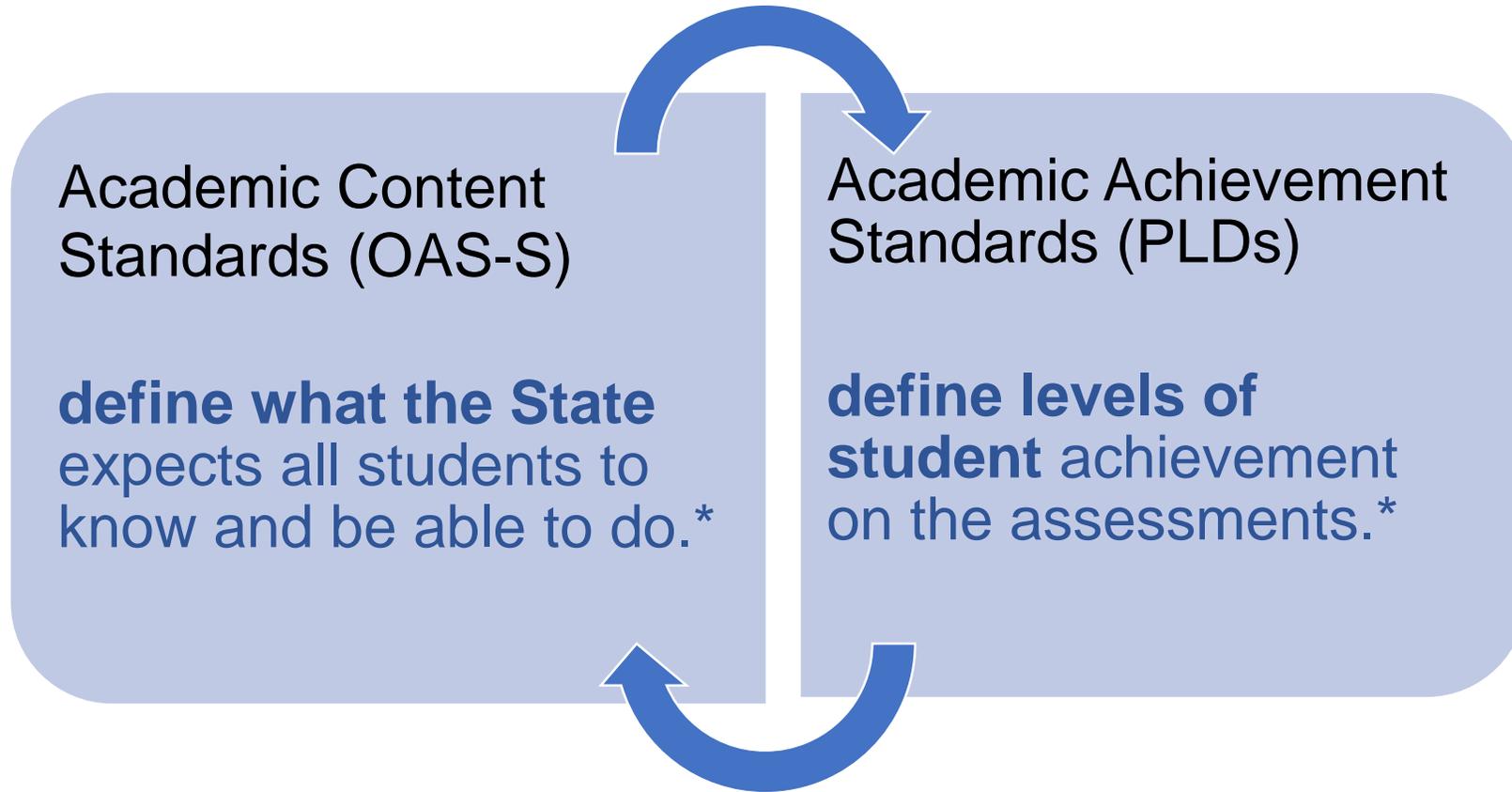
Item-Level Alignment Criteria

"A test can be no better than the items composing the test."

What evidence does the item provide about what the student knows and is able to do?

- **Content**
  - **Alignment to the Oklahoma Academic Standards (OAS)**
  - **Appropriate grade-level difficulty**
  - **Appropriate content accuracy**
  - **Range of cognitive complexity**
- Bias/sensitivity issues
- Linguistic and visual accessibility

Content Standards and PLDs

Academic Content Standards (OAS-S)

define what the State expects all students to know and be able to do.*

Academic Achievement Standards (PLDs)

define levels of student achievement on the assessments.*

U.S. Department of Education Peer Review of State Assessment Systems Non-Regulatory Guidance for States, September 25, 2015

More about PLDs

PLDs provide a narrative account of the knowledge, skills, and abilities **demonstrated by** students in each level of achievement.

PLDs describe what students *know and are able to do* based on the OAS.

PLDs inform stakeholders of how to interpret student test scores in relation to the OAS

PLDs are typically used for standard setting and score reporting.

Assessment Resources

Looking for additional information? Check out:

- https://sde.ok.gov/assessment-material
  - Test & Item Specifications: DOK rationale, distractor rationales, additional items, item-level standards alignment.
  - Performance Level Descriptors
  - Test Blueprints
  - Writing rubrics, exemplars, and checklist

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