Determining What Makes Assessment Items or Tasks (More or Less) "Complex"

Karin Hess

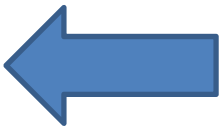
I frequently hear comments from educators and test developers about why some assessment tasks or test items seem more challenging for students than others, even though the DOK levels are the same for both. This short paper attempts to explain how I think about content versus task complexity, and how strategic scaffolding can be used to reduce the cognitive demand of complex content or complex tasks.

First, let's start with some definitions (Appendix I, *A Local Assessment Toolkit to Promote Deeper Learning: Transforming Research into Practice,* Hess, 2018).

Cognitive Rigor: Cognitive rigor encompasses the complexity of the content, the cognitive engagement with that content, and the scope of the planned learning activity (Hess, Carlock, Jones, & Walkup, 2009). Module 1 provides an in-depth discussion of what makes learning and assessment tasks more or less complex.

Three Key Components of Cognitive Rigor

- Content (less complex versus more complex texts, concepts, contexts)
- Cognitive engagement with the content (doing - Task demands and DOK)
- Scope or breadth of planned (learning or assessment) activity



Cognitive Demand: Cognitive demand describes the potential range of mental processing required to complete a given task, within a given context or scenario. Determining the intended cognitive demand of a test item or task requires more than simply identifying the "verbs" and the "nouns" describing the learning outcomes. Task developers must consider the reasoning and decision making required to complete a task successfully. *"Tasks that ask students to perform a memorized procedure in a routine manner lead to one type of opportunity for student thinking; tasks that require students to think conceptually and that stimulate students to make connections lead to a different set of opportunities for student thinking"* (Stein & Smith, 1998, p. 269). During instruction, the cognitive demand of highly complex tasks can be lessened using strategic scaffolding strategies without significantly changing the constructs being assessed. This might include strategies such as chunking texts for a reading assessment, group data collection for a science investigation, and facilitated discussions as a prewriting activity. Module 1 provides an in-depth discussion of common misconceptions about rigor, depth-of-knowledge (DOK), and cognitive demand.

A Suggested 3-Step Analysis Process for Assignments & Assessment Tasks

1. DETERMINE CONTENT "DIFFICULTY": Question #1: How complex is the content?

Easier to learn/do/read/understand ---- OR ---- Harder to learn/do/read/understand?

- ***The Hess Text Complexity Tools #7 & #8 can be used to consistently identify text complexity features.***

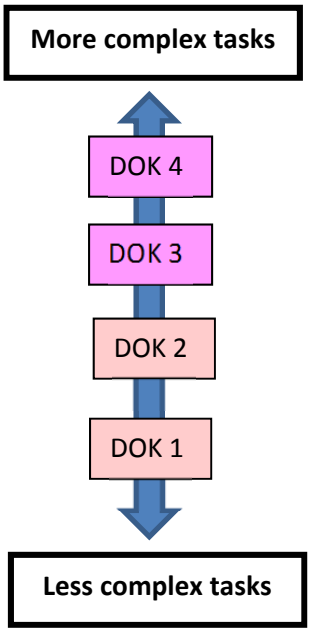
(Easier) Less complex content…
texts, concepts, contexts

(Harder) More complex content …
texts, concepts, contexts

2. ESTABLISH TASK COMPLEXITY & DEPTH (DOK): Question #2: How complex is the task?

Less complex Processes/Procedures ---- OR ---- More complex Processes/Procedures?

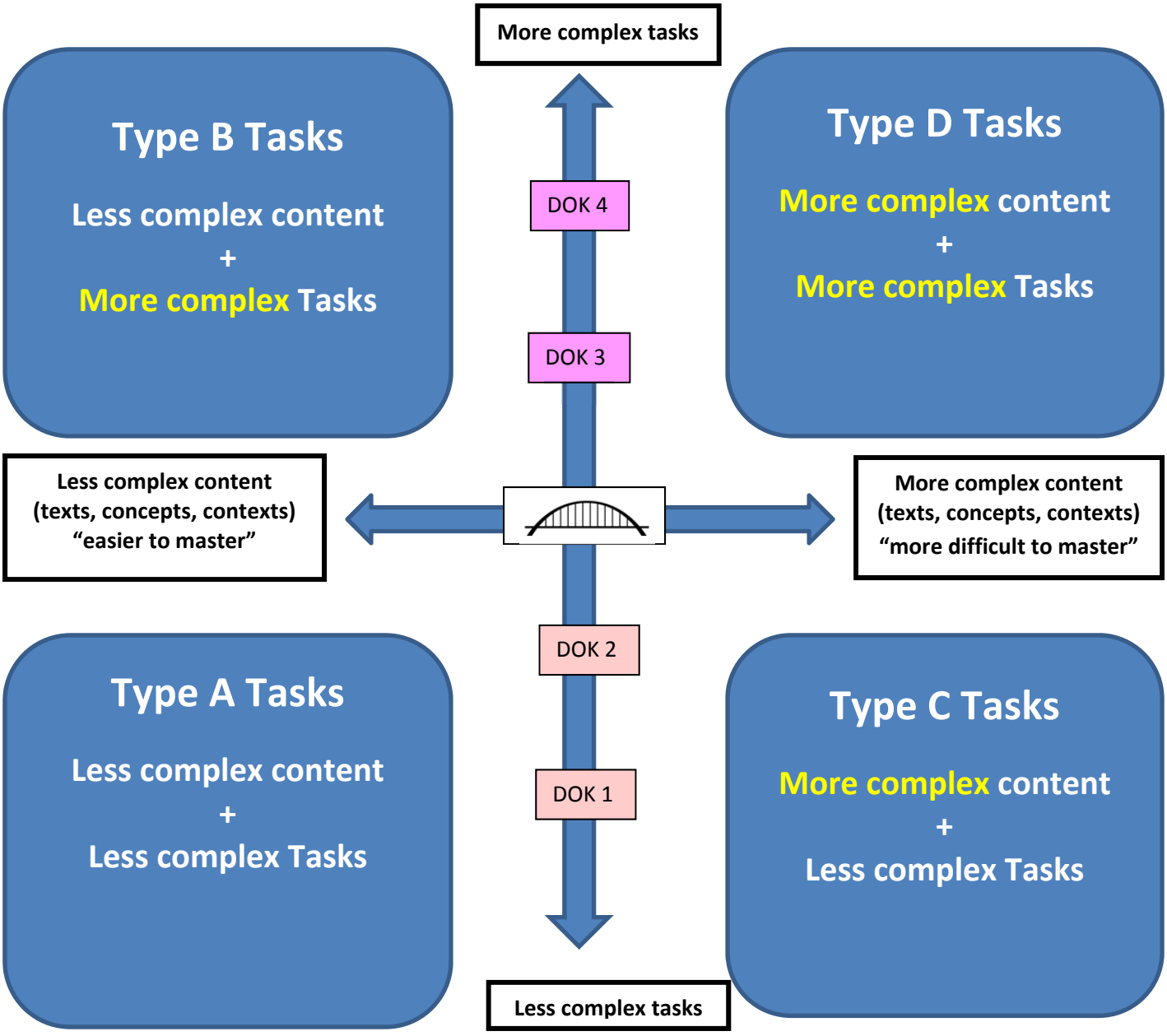
- ***The Hess CRM Tools #1-#5D can be used to consistently identify intended DOK levels (engagement and processing of content) for tasks.***



3. CONSIDER SUPPORTS: Question #3: Should I reduce the cognitive demand?

Will Strategic Scaffolding create a "bridge" for students to show what they know by (a) making content more accessible; or (b) by supporting executive function/processing of content?

Possible Combinations of Content + Task Complexity



What content is being taught or assessed? _____

1-How complex is the text/content/concepts?

2-How will students engage with the content to demonstrate their understanding?

3-How could strategic scaffolding help to reduce the cognitive demand?

What is *strategic* scaffolding?

> **Scaffolding Strategically:** Scaffolding is the purposeful use of supports to achieve a balance between cognitive complexity and student autonomy, as the overall cognitive demand of the task increases. Strategic scaffolding means the intentional steps designed into the instruction that ensure that all students can eventually complete the same complex task independently. The primary difference between scaffolding and differentiating is that differentiating means different—different assignments, different options, student choice. Differentiation is achieved by changing the content, the process skills, and/or the products of learning. Modules 1 and 2 include a variety of strategic scaffolding strategies to support deeper learning.

 **Scaffolding can be a bridge, making complex texts/content /concepts more accessible.**

Question #1: Is the Content… Less Complex? "Easier" to learn/do/read/understand			Question #3 Reduce cognitive demand?	Question #1: Is the Content… More Complex? "Harder" to learn/do/read/understand		
Texts (Use Hess Tools 7&8)	**Concepts**	**Contexts**	**Strategic Scaffolding**	**Texts** (Use Hess Tools 7&8)	**Concepts**	**Contexts**
Single purpose **Predictable** **Supportive Layout** **Genre-typical** **Familiar vocab** **Embedded definitions** **Signal words**	**Foundational** **Concrete ideas** **Single focus** **Relational (e.g., cause-effect)**	**Familiar** **Predictable** **Follows pattern**	Mentor texts Graphic organizer Chunking text Annotate text/problem Word box, example Definition, formula Partner/team work Lessen reading load: add white space, color code, bold key terms Supportive/annotated diagrams, visuals Provide context or background	**Multipurpose** **Background needed** **Dense text, longer** **Rhetorical/ literary devices** **Few or complex visuals** **Footnotes, citations**	**Abstract** **Complex** **Multi-faceted** **Multiple or related applications** **Big/Enduring Ideas**	**Issue-based** **Problem-based** **Real-world** **References historical, literary, etc.** **Multi perspectives** **Universal**

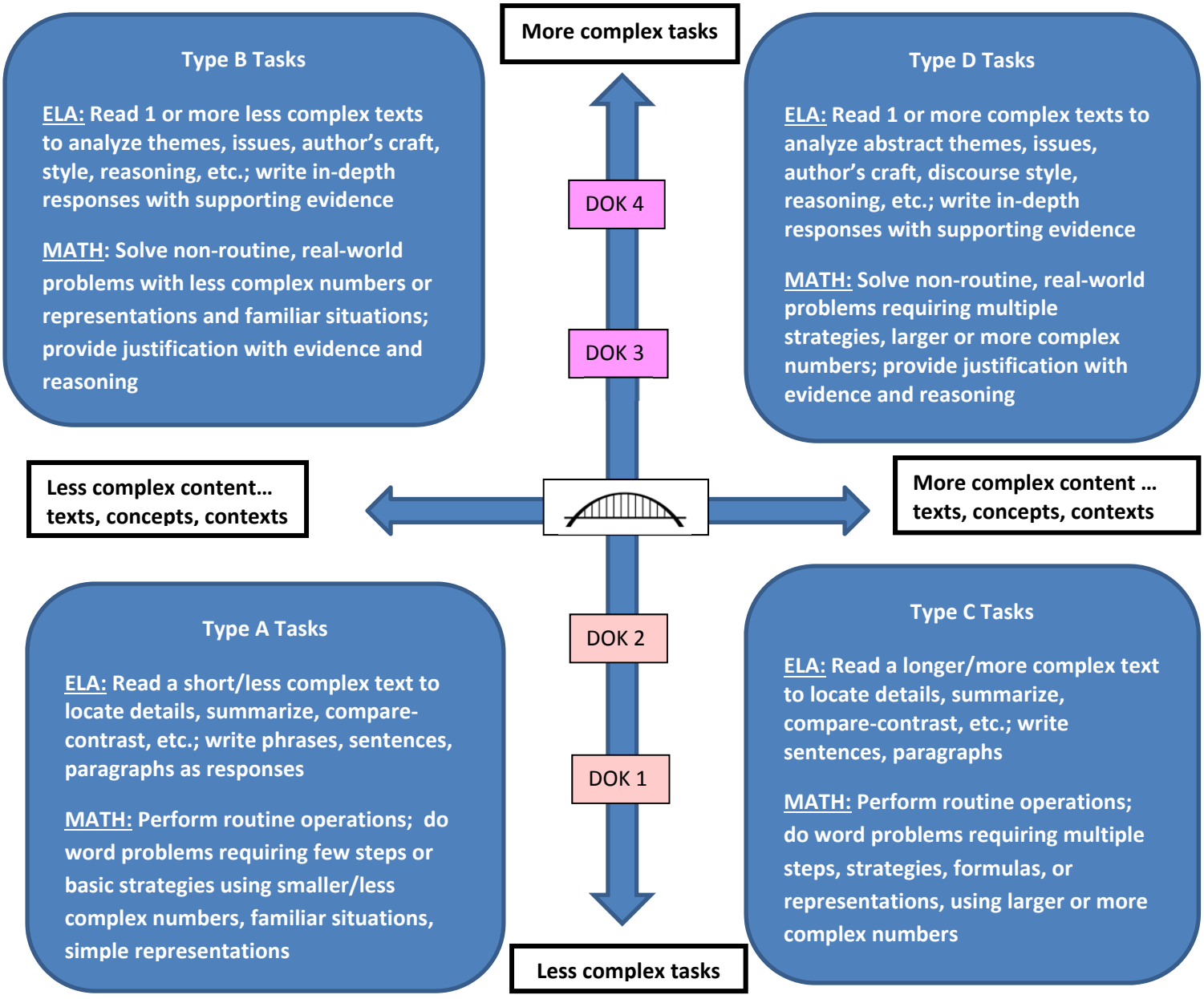
Describe Your Content & Consider Possible Scaffolding		
Least Complex	**Moderately Complex**	**Most Complex**

 **Scaffolding can <u>support executive functioning, facilitate processing content,</u> and <u>bridge connections to deeper thinking/big ideas in more complex tasks</u>.**

Question #2: How complex is the task?			
More complex Processes/ Procedures			
DOK 4 Open-ended, non-routine Broad in scope Multi sources, original Justify with evidence **DOK 3** Open-ended, non-routine Deep dive into one source (text, concept, application) Justify with evidence	**TYPE B Tasks/Test Items** **Less complex content +** **More complex tasks**	**Strategic Scaffolding** Guided practice Build schema: Graphic organizer, diagram, visuals Break task in steps/ parts Hints, clear models Annotate examples & non-examples Partner/team work Anchor charts Illustrate/model rubric criteria Anticipation guide Sentence frames	**TYPE D Tasks/ Test Items** **More complex content +** **More complex tasks**
DOK 2 Routine, Conceptual Generalize, Summarize Compare, Predict, Explain Make connections, Infer **DOK 1** Routine Explicit/Surface knowledge Recall or reproduce	**TYPE A Tasks/Test Items** **Less complex content +** **Less complex tasks**		**TYPE C Tasks/ Test Items** **More complex content +** **Less complex tasks**
Less complex Tasks Processes/ Procedures			

Your Task Analysis			
More complex Processes/ Procedures			
DOK 4 Open-ended, non-routine Broad in scope Multi sources, original Justify with evidence **DOK 3** Open-ended, non-routine Deep dive into one source (text, concept, application) Justify with evidence	**TYPE B Tasks/Test Items**	**Strategic Scaffolding**	**TYPE D Tasks/ Test Items**
DOK 2 Routine, Conceptual Generalize, Summarize Compare, Predict, Explain Make connections, Infer **DOK 1** Routine Explicit/Surface knowledge Recall or reproduce	**TYPE A Tasks/Test Items**		**TYPE C Tasks/ Test Items**
Less complex Tasks Processes/ Procedures **(Use Hess CRM Tools 1-5D)**			

Possible Combinations of Content + Task Complexity in a Unit of Study



Many teachers begin a new unit of study with tasks similar to what is described in **Type A Tasks** – less complex content/texts + less complex tasks/DOK 1-2). These types of learning activities are often used to build a foundation for later (and deeper) learning. Once students can tackle less cognitively demanding tasks with "easy" content, teachers might move to **Type B Tasks** – using the same less complex content/texts + more complex tasks/DOK 3 and then perhaps DOK 4). When moving from **A** to **B**, teachers might also consider using strategic scaffolding to make the task (processing) more accessible for all learners (e.g., minimizing executive functioning with structured note-taking).

A second possible learning pathway is to move from **Type A Tasks** (less complex content/texts + less complex tasks/DOK 1-2) to **Type C Tasks** (more complex content/texts + less complex tasks/DOK 1-2). Now, strategic scaffolding is used to make the text or content more accessible.

Type D assignments increase both the complexity of the text/content ("harder to learn") and the task demands (either DOK 3 or DOK 4).