

# **DEPTH AND COMPLEXITY**

## Depth and Complexity

Teachers must respond to the diversity of their students' needs, interests, and readiness levels. With that in mind, Winebrenner (2001) in her book, *Teaching Gifted Kids in the Regular Classroom*, encourages teachers to recognize that students are at different levels in their learning and need constant opportunities to work at those various levels. Furthermore, Winebrenner stresses that gifted students require regular opportunities to become engaged with learning activities that require more depth and complexity.

To differentiate a lesson for gifted students, teachers must modify

- Content (modify according to depth and complexity)
- Process
  - Grouping (individuals, pairs, small groups, heterogeneous, homogeneous)
  - Instruction (vary teaching methods; use inductive, deductive, or hands-on strategies; alter pace; utilize compacting: for instance, in a lesson, consider pretesting, graphic organizers, demonstrating relevance, adding an intriguing twist)
- Products (many, varied, authentic, and representative of the real work of the discipline)

Sandra Kaplan (2001), associate professor of learning and instruction at the University of Southern California, suggests that teachers guide gifted students into greater depth and complexity by implementing the following dimensions of depth and complexity.

### Dimensions of Depth

For Kaplan (2001), depth is a deep understanding of the content of the field of study. It is achieved when students can understand the specialized language of the discipline; learn as many details as possible; understand the patterns; are aware of trends and rules; understand the ethics involved; know the big ideas, principles, and generalizations; and look for unanswered questions.

#### Depth

- Refers to approaching or studying something from the concrete to the abstract, from the known to the unknown.
- Requires students to examine topics by determining the facts, concepts, generalization(s), principles and theories related to them.
- Necessitates uncovering more details and new knowledge related to a topic of study.
- Encourages students to adopt perspectives and to see patterns in connections.
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Depth involves exploring a discipline by looking below the facts and investigating generalizations, principles, and universal concepts.

Depth has the following major dimensions:

- **Language of the Disciplines:** specialized vocabulary, names of skills or tasks, tools used
- **Details:** attributes, parts, factors, variables
- **Patterns:** repetition, predictability
- **Trends:** Influences, forces, direction
- **Rules:** structure, order, hierarchy, explanation
- **Ethics:** points of view, different opinions, judging
- **Big Idea:** generalizations, principles, theories
- **Unanswered Questions:** discrepancies, missing parts, unclear ideas, incomplete ideas

**Language of the Discipline**

Students identify terms or words that are specific to a subject or discipline and recognize how professionals in the field talk to one another (i.e., appropriate terminology).

**Details**

Students are instructed to note the attributes, traits, or characteristics of an idea or event.

**Patterns**

Students are instructed to identify recurring events, to recognize that patterns repeat themselves, and to use patterns to predict.

**Trends**

Students identify factors or events (social, political, economic, and geographic) that cause events to occur or happen and identify influences or forces.

**Unanswered Questions**

Students are instructed to question what is still not known or understood, to identify what is still unclear, to find discrepancies, to determine if any conclusions need further investigation, evidence or support.

**Rules**

Students are instructed to define how the topic is structured and to define the orders, laws, norms, and formulas followed.

**Ethics**

Students are instructed to identify any dilemmas or controversies of the idea or event and to determine the elements that reflect bias, prejudice, or discrimination.

**Big Ideas**

Students determine the overarching statement (e.g., generalization, principal or theory) that best summarizes what is being studied.

## Dimensions of Complexity

Kaplan (2001) defines complexity as scholarly insights into the connections across time, people and disciplines. Complexity is demonstrated in the students' ability to make connections over time, look for elements from several perspectives, and make interdisciplinary connections.

Complexity

- Includes making relationships, connecting other concepts, and layering.
- Why/how approach that connects and bridges to other disciplines to enhance the meaning of a unit of study.

Complexity encourages students to

- Relate concepts and ideas at a more sophisticated level
- See associations among diverse subjects, topics or levels
- Find multiple solutions from multiple points of view

Complexity involves the ability to see relationships between and among ideas in and within a discipline.

Complexity has three major dimensions:

- **Relationships Over Time:** relationships between the past, present and future, and within a time period

- **Relationships From Different Points of View:** multiple perspectives, opposing viewpoints, differing roles and knowledge
- **Interdisciplinary Relationships:** with, between and across the disciplines

### Over Time

Students describe how the passage of time changes the idea or event and examines the origin, the present, and the future.

### Multiple Perspectives

Students are instructed to investigate the opposing points of view, roles, status, or values and to examine the event from the perspective of different disciplinarians (e.g., anthropologist, economist, sociologist, artist) in order to gain in-depth knowledge of an issue by knowing it from both sides.

### Interdisciplinary Relationships

Students explore the topic across two or more academic disciplines by formulating questions, identifying similarities (common elements) and differences of the disciplines.

## Depth and Complexity

An essential part of differentiating the curriculum through the dimensions of depth and complexity is utilizing the key questions and thinking skills (see *Facilitating the Understanding of DEPTH and COMPLEXITY* chart on the following pages) associated with these dimensions which provide teachers with a frame of reference and encourage them to use these strategies consistently. They provide a common vocabulary for teachers and students.

Use the dimensions within classroom lessons:

- Say “Look for (appropriate dimension) in our lesson today on (content area).”
- Use the Big Idea to summarize or end lessons.
- Label the classroom’s daily agenda and lesson plans with the dimensions reviewed.
- Have students identify and label all work with the appropriate dimensions of depth and complexity.
- Label all classroom work and charts with the dimensions.
- Post a listing of the dimensions clearly in the classroom

These ideas encourage the integration of the dimensions of depth and complexity into discussions and shows students that the teacher values the icons as learning tools. Teachers are not teaching the icons, but rather they are teaching concepts to new levels of depth and complexity using pictures to stand for the thinking strategies.

### Connecting Depth and Complexity to Higher Order Thinking Skills

The verbs below serve as **thinking keys** to activate the type of higher order thinking skill that will occur within the dimensions of depth and complexity.

Keys to Activate Deeper Learning (Depth):

- **Language of the Discipline:** *categorize, identify*
- **Details:** *describe, differentiate*
- **Patterns:** *summarize, make analogies*
- **Trends:** *prioritize, predict*
- **Rules:** *judge credibility, hypothesize*
- **Ethics:** *judge with criteria, determine bias*
- **Big Idea:** *prove with evidence, identify main idea*
- **Unanswered Questions:** *note ambiguity, distinguish fact from fiction*

Keys to Activate Complex Learning (Complexity):

- **Different Points of View:** *argue, determine bias, classify*
- **Relationships Over Time:** *relate, sequence, order*
- **Relationships Across Discipline:** *compare and contrast, show relationship*

## Resources

Conklin, Wendy and Shelly Frei. *Differentiating the Curriculum for Gifted Learners*. Huntington Beach, CA: Shell Education, 2007. Print.

Erickson, H. Lynn. *Concept-based Curriculum and Instruction for the Thinking Classroom*. Thousand Oaks, CA: Corwin, 2007. Print.

Kingore, Bertie. *Differentiation: Simplified, Realistic, and Effective – How to Challenge Advanced Potentials in Mixed-Ability Classrooms*. Austin, TX: Professional Associates Publishing, 2008. Print.

Renzulli, Joseph S. and Sally M. Reis. *Enriching Curriculum, 2<sup>nd</sup> Ed.* Thousand Oaks, CA: Corwin Press, 2008. Print.

Tomlinson, Carol A. *The Differentiated Classroom: Responding to the Needs of All Learners*. Alexandria, VA: ASCD, 1999. Print.

Tomlinson, Carol, Sandra Kaplan, Joseph Renzulli, Jeanne H. Purcell, Jann Leppien, and Deborah Burns. *The Parallel Curriculum*. Thousand Oaks, CA: Corwin Press, 2002. Print.


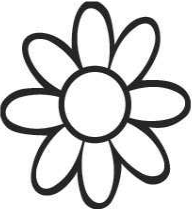
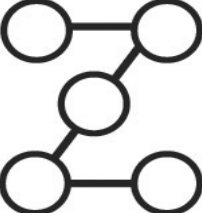
Winebrenner, Susan. *Teaching Gifted Kids in the Regular Classroom*. Minneapolis, MN: Free Spirit Publishing, 2001. Print.



## Facilitating the Understanding of DEPTH and COMPLEXITY

**Note to the teacher:**

- Key questions can be used in the context of lesson plans to probe understanding and to prompt students during discussions.
- The thinking skills can be used to initiate the type of cognitive operation or thinking that could best prompt each of the dimensions of DEPTH of COMPLEXITY.
- The resources listed are the most logical references in which to locate the type of information required by each of the dimensions of DEPTH of COMPLEXITY. Teachers may add to any of these lists as appropriate.

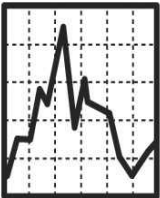

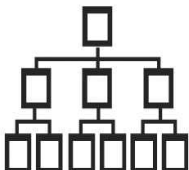

ICONS	PROMPT	KEY QUESTIONS	THINKING SKILLS	RESOURCES
	LANGUAGE OF THE DISCIPLINES	What terms or words are specific to the work of the _____? (disciplinarian)  What tools does the _____ use? (disciplinarian)	<ul style="list-style-type: none"> <li>• Categorize</li> <li>• Identify</li> </ul>	<ul style="list-style-type: none"> <li>• Texts</li> <li>• Biographies</li> </ul>
	DETAILS	What are its attributes?  What features characterize this?  What specific elements define this?  What distinguishes this from other things?	<ul style="list-style-type: none"> <li>• Identify traits</li> <li>• Describe</li> <li>• Differentiate</li> <li>• Compare/ contrast</li> <li>• Prove with evidence</li> <li>• Observe</li> </ul>	<ul style="list-style-type: none"> <li>• Pictures</li> <li>• Diaries or journals</li> <li>• Poetry</li> </ul>
	PATTERNS	What are the reoccurring events?  What elements, events, ideas, are repeated over time?  What was the order of events?  How can we predict what will come next?	<ul style="list-style-type: none"> <li>• Determine relevant vs. irrelevant</li> <li>• Summarize</li> <li>• Make analogies</li> <li>• Discriminate between same and different</li> <li>Relate</li> </ul>	<ul style="list-style-type: none"> <li>• Timelines</li> <li>• Other chronological lists</li> </ul>

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## Facilitating the Understanding of DEPTH and COMPLEXITY

ICONS	PROMPT	KEY QUESTIONS	THINKING SKILLS	RESOURCES
	TRENDS	<p>What ongoing factors have influenced this study?</p> <p>What factors have contributed to this study?</p>	<ul style="list-style-type: none"> <li>• Prioritize</li> <li>• Determine cause and effect</li> <li>• Predict</li> <li>• Relate</li> <li>• Formulate questions</li> <li>• Hypothesize</li> </ul>	<ul style="list-style-type: none"> <li>• Journals</li> <li>• Newspapers</li> <li>• Graphs</li> <li>• Charts</li> </ul>
	UNANSWERED QUESTIONS	<p>What is still not understood about this area/ topic/ study/ discipline?</p> <p>What is yet unknown about this area/ topic/ study/ disciplines?</p> <p>In what ways is the information incomplete or lacking in explanation?</p>	<ul style="list-style-type: none"> <li>• Recognize fallacies</li> <li>• Note ambiguity</li> <li>• Distinguish fact from fiction and opinion</li> <li>• Formulate questions</li> <li>• Problem solve</li> <li>• Identify missing information</li> <li>• Test assumptions</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple and varied resources</li> <li>• Comparative analyses of autobiographical and current nonfiction articles, etc.</li> </ul>
	RULES	<p>How is this structured?</p> <p>What are the stated and unstated causes related to the description or explanation of what we are studying?</p>	<ul style="list-style-type: none"> <li>• Generalize</li> <li>• Hypothesize</li> <li>• Judge credibility</li> </ul>	<ul style="list-style-type: none"> <li>• Editorials</li> <li>• Essays</li> <li>• Laws</li> <li>• Theories</li> </ul>
	ETHICS	<p>What dilemmas or controversies are involved in this area/ topic/ study/ discipline?</p> <p>What elements can be identified that reflect bias, prejudice, discrimination?</p>	<ul style="list-style-type: none"> <li>• Judge with criteria</li> <li>• Determine bias</li> </ul>	<ul style="list-style-type: none"> <li>• Editorials</li> <li>• Essays</li> <li>• Autobiographies</li> <li>• Journals</li> </ul>

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## Facilitating the Understanding of DEPTH and COMPLEXITY

ICONS	PROMPT	KEY QUESTIONS	THINKING SKILLS	RESOURCES
	<p style="text-align: center;">BIG IDEAS, GENERALIZATIONS, PRINCIPLES, THEORIES</p>	<p>What overarching statement best describes what is being studied?</p> <p>What general statement includes what is being studied?</p>	<ul style="list-style-type: none"> <li>• Prove with evidence</li> <li>• Generalize</li> <li>• Identify the main idea</li> </ul>	<ul style="list-style-type: none"> <li>• Quotations</li> <li>• Discipline-related essays</li> </ul>
	<p style="text-align: center;">OVER TIME</p>	<p>How are the ideas related between the past, present, future?</p> <p>How are these ideas related within or during a particular time period?</p> <p>How has time affected the information?</p> <p>How and why do things change or remain the same?</p>	<ul style="list-style-type: none"> <li>• Relate</li> <li>• Sequence</li> <li>• Order</li> </ul>	<ul style="list-style-type: none"> <li>• Time lines</li> <li>• Text</li> <li>• Biographies</li> <li>• Autobiographies</li> <li>• Historical documents</li> </ul>
	<p style="text-align: center;">DIFFERENT POINTS OF VIEW</p>	<p>What are the opposing viewpoints?</p> <p>How do different people and characters see this event or situation?</p>	<ul style="list-style-type: none"> <li>• Argue</li> <li>• Determine bias</li> <li>• Classify</li> </ul>	<ul style="list-style-type: none"> <li>• Biographies</li> <li>• Autobiographies</li> <li>• Mythologies, legends vs. non-fiction accounts</li> <li>• Debates</li> </ul>
	<p style="text-align: center;">ACROSS DISCIPLINES</p>	<p>What are the common elements in the subjects that come from the different disciplines?</p>	<ul style="list-style-type: none"> <li>• Relate</li> <li>• Compare &amp; Contrast</li> <li>• Differentiate</li> <li>• Synthesize</li> <li>• Evaluate</li> </ul>	<ul style="list-style-type: none"> <li>• Primary &amp; Secondary Resources (magazines, diaries, and interviews)</li> <li>• Internet searches</li> <li>• Text</li> <li>• Encyclopedias</li> </ul>

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