

# Gifted Education

## Program Guide

### Section II: Services

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# Section II: Services



## Overview of Gifted Education Services

Students found eligible by the Gifted Review Committee for gifted education services have demonstrated areas of unusual strength. Services are provided because the identified students have a documented need for differentiation in their instructional program. This differentiation provides daily academic challenges and social-emotional support to ensure continued intellectual growth and development.

DoDEA schools determine the most effective methods to meet the needs of students identified for gifted education services. Selecting from a list of gifted education service options, schools consider their current educational resources and make choices based upon the anticipated needs of their gifted learners. No matter which choices for service delivery are made, each school has in place several different ways eligible students may receive support. Each school's Gifted Review Committee considers individual strengths in matching students to services because each student has a unique profile of strengths. Some students require more intensive services than others.

DoDEA Gifted Education Standards guide school personnel in making decisions that support the continuous growth and development of gifted learners. Standards for the identification process can be found in the Identification Guide (Gifted Education Program Guide 2590.2, Section 1, Identification). Standards for service delivery, along with curriculum and instruction, are presented in the Services Guide (Gifted Education Program Guide 2590.2, Section 2, Services) with accompanying guidance on implementation. Curriculum and content standards can be found at (<http://www.dodea.edu> ) under the heading Standards and Curriculum.

## **GIFTED EDUCATION SERVICES**

### **2.1**

DoDEA Gifted Education Standards guide the decisions to be made for identified students. A provision for the delivery of services is the first step in the decision process. More important is the differentiation of curriculum and instruction that occurs within the service setting. Educators should guide students in learning and provide educational activities that keep students well connected to the DoDEA curriculum standards while offering differentiation that moves students into greater depth of content, advanced inquiry, and more challenging explorations of issues and themes. Differentiation should be understood to mean different kinds of work, not just a greater quantity of the same type of work. Daily activities should be carefully planned with these extensions in mind.

### **PROGRAM STANDARDS FOR SERVICE DELIVERY**

1. A continuum of gifted education services, matched to the needs of gifted learners, is available at each school.
2. Different instructional arrangements are considered in determining each school's options for services.
3. Several service delivery options are available at each school to meet the needs of students identified for gifted education services.
4. Differentiated learning experiences for gifted students are designed to supplement and build upon the DoDEA curriculum content standards.
5. Gifted learners are included in flexible grouping arrangements that ensure the availability of intellectual peers.
6. Gifted learners have access to social/emotional guidance and counseling appropriate to their unique development.

### **SELECTION OF SERVICES FOR IDENTIFIED STUDENTS**

Students identified for gifted education services should be provided with services that appropriately match their areas of strength and needs. The local school Gifted Review Committee makes recommendations for services for each eligible student. Each school provides several service delivery options. The range of program services available is defined by the options selected for each school.

Students may participate in more than one service option, depending on their individual needs. When the Gifted Review Committee has completed recommendations for an eligible student, the recommendations are presented for the approval of the principal. With principal approval, the parents/guardians of the student receive a letter indicating which services are available to the student. With parent permission, the services are begun for the eligible student. Services are provided on an ongoing basis unless the parent withdraws permission or the Gifted Review Committee seeks a reevaluation. A notation of the services provided is made on the student's Eligibility Status Record and data entry in the student information system is completed.

The following is a summary of the steps in the process of determining services for a particular student:

1. Gifted Review Committee makes service recommendations, selecting from the school's available program options.
2. The school principal reviews the recommendations of the Gifted Review Committee.
3. Parents are informed of available services and are requested to give permission for services.
4. With parent permission, services begin for an eligible student.
5. Services are documented on the student's Profile of Strengths and Eligibility Status Record.
6. Data entry of services is completed in the DoDEA student information system.

## **Identification Procedures and Support for Middle and High School Students**

Students in secondary grades present areas of strength that are more content specific. Thus, the emphasis on the use of the identification procedures at the secondary level becomes lessened. Educators use the tools of the identification process to facilitate discussion of individual students for whom services are less evident. For most students, the match to services is within content area offerings (honors courses, AP courses) and is automatic upon course enrollment. When students seem to require more or different services, the Gifted Review Committee should use the Identification Procedures to guide discussion and recommendations for services for individual students as well as for the gifted program.

At the high school level, the Gifted Review Committee serves students more effectively when members of the committee represent different content areas and have an awareness of opportunities in the community. Discussions of a specific student should also focus on effectively matching student strengths to opportunities that may include interning, job shadowing, mentoring, participation in academic contests, competitions, and serving as school representative in community events and opportunities.

## SERVICE OPTIONS

Figure 1 outlines the program service options for identified students. A description of each of the options is included following the chart. Schools select program services from the options shown in Figure 1.

**Figure 1. DoDEA Gifted Education Services**

<b>Elementary School</b>	<b>Middle School</b>	<b>High School</b>
Regular classroom with differentiation of instruction	Regular course with differentiation of instruction	Regular course with differentiation of instruction
Regular classroom with cluster grouping and differentiation	Regular course with cluster grouping and differentiation	Regular course with cluster grouping and differentiation
Regular classroom with grade acceleration of specific content	Interdisciplinary course	Interdisciplinary course
Resource sessions outside the classroom	Grade acceleration for specific content	Advanced Placement and honors courses
Grade acceleration for specific content	Grade acceleration	Individualized services
Grade acceleration	Individualized services	Additional opportunities
Individualized services	Additional opportunities	
Additional opportunities		

### Elementary School Options

#### **Regular classroom with differentiation of instruction**

The student receives additional academic challenges within the regular classroom and through supplemental experiences available in the school and in the community. Content, process, and products are expanded in alignment with DoDEA curriculum content standards being taught in the classroom.

The gifted education resource teacher collaborates with the regular classroom teacher to facilitate differentiation. This may include working directly with identified students and/or collaborative teaching. The resource teacher assists the regular classroom teacher with ways to differentiate academic work, including activities, resources, and assessment. This arrangement provides the opportunity for the student to experience differentiated activities directly related to the daily learning in the classroom.

### **Regular Classroom with Cluster Grouping and Differentiation**

The student is placed in a regular classroom with one or more other students identified for gifted education services. Along with the other identified students, the student receives additional challenges within the regular classroom. Content, process, and product are expanded in alignment with the DoDEA curriculum content standards being taught in the classroom.

Clustering students facilitates teacher planning for differentiation and provides academic peers for the student. Clustering also makes scheduling any out-of-class activities for identified students easier. The gifted resource teacher collaborates with the classroom teacher in selecting ways to differentiate academic work, including activities, resources, and assessment. This may include working directly with identified students and/or cooperative teaching to ensure ongoing rigor and challenge.

### **Regular Classroom with Grade Acceleration of Specific Content**

The student who has unusual strengths in a particular content area receives advanced instruction in the specified area(s) at another grade level. Generally such instruction occurs in a classroom at the next grade level. The student is expected to meet standards for the grade level of instruction. Differentiated instruction is provided as appropriate. The gifted education resource teacher works to assist both teachers and the student with the arrangement. This arrangement facilitates consistency in the presentation of advanced content and requires minimal additional teacher planning.

### **Resource Sessions outside the Classroom**

The student participates in a resource class focused on interdisciplinary curriculum in support of DoDEA content standards or in instruction targeted to a specific academic area and aligned with DoDEA content standards.

The student leaves the regular classroom at a scheduled time and is taught by the gifted resource teacher. The gifted resource teacher aligns instruction in the resource setting with the individual strengths of the students and with the DoDEA curriculum standards. This arrangement provides students with extended rigorous learning experiences with academic peers and does not replace differentiated instruction in the general classroom.

### **Grade Acceleration**

The student is advanced to and instructed at the next grade level. Instruction occurs as usual in the grade-advanced classroom. Differentiation is provided as appropriate. The gifted resource teacher monitors the progress of students who have been grade-accelerated and provides support as appropriate. Grade acceleration facilitates consistency in the presentation of advanced content and minimizes additional teacher planning.

## **Individualized Services**

Options for all identified students include mentorships, independent study, individual guidance and counseling, and/or individualized academic challenges. The gifted resource teacher provides the service or serves as an advocate and liaison between the student and those providing service to the student, articulating the student's needs and coordinating the provision of services. Individualized services offer changes in the academic program and support specifically designed to meet the needs of an individual student.

## **Additional Opportunities**

Curricular and cocurricular activities provide additional support for gifted learners. Such activities are often part of the enrichment opportunities offered to all students. The gifted resource teacher provides identified students with information and encouragement to facilitate their participation in activities that offer challenges beyond the standard instructional program. Such activities may include the following:

- Academic contests/competitions
- E-learning
- Interest groups and clubs
- Leadership activities
- Seminars
- Special events and opportunities
- Study groups

## **Middle School Options**

### **Regular Course with Differentiation of Instruction**

The student receives additional challenges within a regular academic course and through supplemental experiences available in the school and in the community. Content, process, and products are expanded in alignment with the DoDEA content curriculum standards being taught in the classroom. The gifted resource teacher collaborates with the regular classroom teacher to facilitate differentiation. This may include work with identified students and/or cooperative teaching. The resource teacher assists with ways to differentiate academic work including activities, resources, and assessment. This arrangement provides the opportunity for the student to experience differentiated activities directly related to the daily learning in the classroom.

### **Regular Course with Cluster Grouping and Differentiation**

The student is placed in a regular class with one or more other students identified for gifted education services. Along with the other identified students, the student receives additional challenges within the regular class. Content, process, and product are expanded in alignment with the DoDEA curriculum content standards being taught in the classroom. The gifted resource teacher assists the classroom teacher in selecting ways to differentiate academic work

including activities, resources, and assessment. Clustering students facilitates teacher planning for differentiation and provides academic peers for the student.

### **Interdisciplinary Course**

The student participates in an interdisciplinary course that supports and extends DoDEA curriculum content standards. The program of studies for the course incorporates problem-based learning, advanced content, and self-assessment. The gifted resource teacher instructs the class. This arrangement provides students with supplemental learning experiences that focus on critical and creative thinking, advanced research skills, and in-depth presentations of original findings to peers.

### **Grade Acceleration for Specific Content**

The student is enrolled in one or more courses generally not offered at his/her particular grade level, to support highly unusual ability and achievement. The gifted resource teacher monitors the progress of students who have been accelerated and provides support as appropriate.

### **Grade Acceleration**

The student is advanced to and instructed at the next grade level. Instruction occurs as usual for that grade with differentiation provided in specific content areas as appropriate. The gifted resource teacher monitors the progress of students who have been grade-accelerated and provides support as appropriate.

### **Individualized Services**

Options for all identified students may include mentorships, independent study, individual guidance and counseling, and/or individualized academic challenges. The gifted resource teacher provides the service or serves as an advocate and liaison between the student and those providing service to the student, articulating the student's needs and coordinating the provision of services. Individualized services offer changes in the academic program and support specifically designed to meet the needs of an individual student.

### **Additional Opportunities**

Curricular and cocurricular activities provide additional support for gifted learners. Such activities are often part of the enrichment opportunities offered to all students. The gifted resource teacher should provide identified students with information and encouragement to facilitate their participation in activities that may offer challenges beyond the standard instructional program. Such activities may include the following:

- Academic contests/competitions
- E-learning
- Interest groups and clubs
- Leadership activities
- Seminars
- Special events and opportunities
- Study groups

## **High School Options**

### **Regular Course with Differentiation of Instruction**

The student receives additional challenges within a regular academic course and through supplemental experiences available in the school and in the community. Content, process, and products are expanded in alignment with the general curriculum being taught in the classroom.

### **Regular Course with Cluster Grouping and Differentiation**

In addition to differentiation of instruction, the student is placed in a regular course with one or more other students identified for gifted education services. Clustering students facilitates teacher planning for differentiation and provides academic peers for the student.

### **Interdisciplinary Course**

The student is enrolled in an interdisciplinary course that supports and extends DoDEA content standards. The program of studies for the course incorporates problem-based learning, advanced content, and self-assessment. Some examples are Humanities, Model UN, and Contemporary Issues.

### **Advanced Placement and Honors Courses**

The student is enrolled in one or more Advanced Placement and honors courses as offered. Instruction is guided by the course outlines and is differentiated in content, process, and product to meet the needs of advanced learners.

### **Individualized Services**

Options for all identified students may include mentorships, independent study, individual guidance and counseling, and/or individualized academic challenges. Each gifted resource teacher/designated gifted educator provides the service or serves as an advocate and liaison between the student and those providing service to the student, articulating the student's needs and coordinating the provision of services. Individualized services offer changes in the academic program and support that is specifically designed to meet the needs of an individual student.

## **Additional Opportunities**

Curricular and cocurricular activities provide additional support for gifted learners. Such activities are often part of the enrichment opportunities offered to all students. The gifted resource teacher/designated gifted educator at the school should provide identified students with information and encouragement to facilitate their participation in activities that offer challenges beyond the standard instructional program. Such activities may include the following:

- Academic contests/competitions
- Correspondence courses
- Dual enrollment
- E-learning
- Interest groups and clubs
- Leadership activities
- Seminars
- Special events and opportunities
- Study groups

# **GIFTED EDUCATION CURRICULUM AND INSTRUCTION**

## **2.2**

### **DoDEA Gifted Education Program Standards for Curriculum and Instruction**

1. Teachers differentiate, supplement, or modify instruction based upon DoDEA curriculum content standards (<http://www.dodea.edu>) to ensure advanced content and process goals.
2. Instructional strategies facilitate the integration of content by key ideas, issues, and themes.
3. Students are provided opportunities for inquiry, project-based learning, problem solving, and research.
4. Process goals, including critical thinking, creative problem solving, ethical decision making, moral judgment, and leadership, are incorporated into curriculum differentiation.
5. Instructional pacing is flexible, allowing for acceleration and compression of content, as appropriate.
6. Gifted learners are provided alternative, challenging educational opportunities when they demonstrate proficiency in essential core curriculum concepts and skills.
7. Specific instructional arrangements are used to facilitate optimal learning experiences for identified students.
8. The unique social and emotional needs of gifted learners are strongly considered in planning for instruction.

National standards established for curriculum and instruction and program design are outlined in Figures 2 and 3.

**Figure 2. Gifted Education Programming Criterion: Curriculum and Instruction**

1. Differentiated curriculum for the gifted learner must span grades K–12.
2. Regular classroom curricula and instruction must be adapted, modified, or replaced to meet the unique needs of gifted learners.
3. Instructional pace must be flexible to allow for the accelerated learning of gifted learners as appropriate.
4. Educational opportunities for subject and grade skipping must be provided to gifted learners.
5. Learning opportunities for gifted learners must consist of continuum of differentiated curricular options, instructional approaches, and resource materials.

(National Association for Gifted Children, 1998)

**Figure 3. Gifted Education Programming Criterion: Socio-Emotional Guidance and Counseling**

1. Gifted learners must be provided with differentiated guidance efforts to meet their unique socio-emotional development.
2. Gifted learners must be provided with career guidance services especially designed for their unique needs.
3. Gifted at-risk students must be provided with guidance and counseling to help them reach their potential.
4. Gifted learners must be provided with affective curriculum in addition to differentiated guidance and counseling services.
5. Underachieving gifted learners must be served rather than omitted from differentiated services.

(National Association for Gifted Children, 1998)

## Matching Differentiation to the Needs of Gifted Learners

Differentiation refers to a variety of instructional strategies used to meet the needs of students with diverse academic strengths and learning styles. Students identified for gifted education have revealed specific learning characteristics and patterns of accomplishment that should guide instructional planning. Gifted learners differ in four broad areas:

- **Precocity** — Gifted learners give evidence of unusual advancement in particular areas. The learning is rapid and is often independent of formal instruction.
- **Intensity** — Gifted learners show deep personal interest in some area(s). They are often motivated to pursue such interests with urgency.
- **Complexity** — Gifted learners see multiple possibilities. The students grasp big ideas and see connections to other areas of study. They are particularly interested in how things connect to the real world.
- **Social Factors** — Gifted learners are often “out of sync” with their age peers. Classmates may see them as over-controlling or manipulative. Gifted learners may demonstrate frustrations with their own uneven learning patterns as well as with the readiness of their age peers for some intellectual activities.

Strategies for differentiation matched to gifted learner differences are presented in Figure 4. Within these broad areas many options exist for modifying content, process, and product. The most important factor is the essential purpose of differentiation: to make curriculum and instruction a more effective fit for gifted learners.

**Figure 4. Matching Differentiated Instruction to Student Differences**

<b>GIFTED LEARNERS</b>	<b>DIFFERENTIATED INSTRUCTION</b>
<b>Readiness (Precocity)</b> Predisposition Competencies Connectors Developmental age/stage	Assessment Specific learning goals Advanced content, process, product Rapid pacing
<b>Motivation (Intensity)</b> Interest Expectations for self Relevance	Expanded resources Problem-based activities In-depth experiences Independent study Use of discussion
<b>Learning Patterns (Complexity)</b> Skills Style	Issues, concepts/themes Choices Multiple perspectives
<b>Social Factors (Intellectual vs. Age/Developmental Stage)</b> Peers School Home	Community Flexible grouping Appropriate audiences Supportive peers and adults

VanTassel-Baska, 1994. Reprinted with permission. Center for Gifted Education, The College of William & Mary

Wherever and whenever differentiation occurs in the school setting, the Gifted Differentiation Checklist shown in Figure 5 can be used to determine whether planned activities are an effective match to the overall needs of advanced learners. For any given learning activity, the educator should select the features of differentiation to be employed. When using this checklist, educators should not attempt to cover all areas.

**Figure 5. Gifted Differentiation Checklist**

1. Acceleration
  - a. Fewer tasks assigned to master standards
  - b. Assessed earlier or prior to teaching
  - c. Clustered by higher order thinking skills
  
2. Complexity
  - a. Used multiple higher level skills
  - b. Added more variables to study
  - c. Required multiple resources
  
3. Depth
  - a. Studied a concept in multiple applications
  - b. Conducted original research
  - c. Developed a product
  
4. Challenge
  - a. Advanced resources employed
  - b. Sophisticated content stimuli used
  - c. Cross-disciplinary applications made
  - d. Reasoning made explicit
  
5. Creativity
  - a. Designed/constructed a model based on principles or criteria
  - b. Provided alternatives for tasks, products, and assessments
  - c. Emphasized oral and written communication to a real world audience

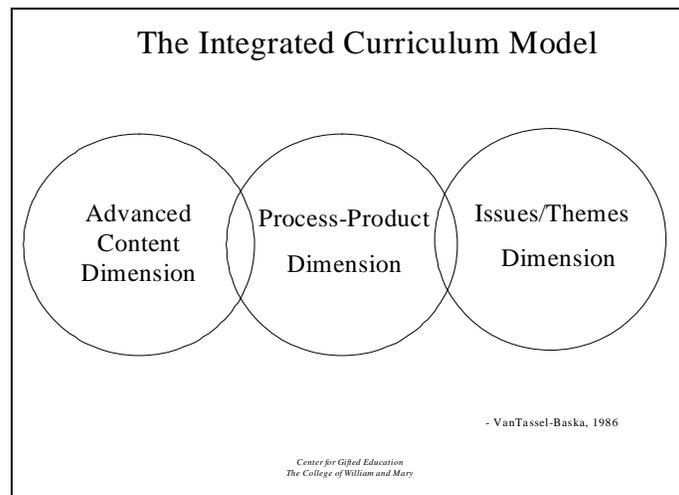
VanTassel-Baska, 1994. Reprinted with permission.  
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## The Integrated Curriculum Model

Appropriate curricula for gifted learners have three equally important and integrated dimensions, as indicated in Figure 6 (VanTassel-Baska, et al., 1988):

- An **advanced content-based mastery** dimension allows gifted learners to move more rapidly through the curriculum. This dimension suggests that advanced curriculum should be made available to gifted learners when they demonstrate readiness to engage in it. Mastery of basic knowledge and skills in curriculum should allow students to move on to higher levels through the study of progressively more complex and sophisticated principles.
- A balanced **process/product/research** dimension encourages in-depth small-group and independent learning opportunities. This dimension calls for the engagement of gifted learners in the pursuit of real and meaningful investigations, both collaboratively and independently. Problem solving, research, and experimental design provide strong avenues for investigations that mirror real life.
- An emphasis is placed on the **exploration of issues, themes, and ideas** within and across curriculum areas. This dimension features concepts and ideas as the organizers for educational experiences developed for gifted learners. These ideas, such as systems and change, allow students to see the integrated nature of the disciplines.

**Figure 6. Integrated Curriculum Model**



In summary, gifted learners need a curriculum that is targeted to their strengths and needs, one that is advanced and challenging. They need a curriculum that provides opportunities for original work and investigation. Students need to study important concepts that allow connections within and across areas of study.

## **Differentiation in the Content Areas**

Differentiation within the content areas should be guided by educational research that specifies effective methods in each discipline to challenge gifted learners. Although the disciplines have many elements of differentiation in common, research results highlight the need for gifted students to learn to think and work like writers, scientists, mathematicians, and social scientists. The “habits of mind” within each of these disciplines are critical elements of study for gifted learners.

### **Language Arts/Reading**

#### **Indicators of Verbal/Linguistic Giftedness:**

- Early and extensive reading;
- Excellent memory for poems, lyrics, verse, tongue twisters;
- Metaphorical thinking;
- Love of words, word patterns;
- Use of language to express and appreciate complex meanings; and
- Ability to learn through verbalization.

#### **Best Practices in Language Arts/Reading and Writing:**

- Encourage extensive reading.
- Use interactive learning.
- Develop sensitivity and understanding of complex concepts and language.
- Provide instruction in strategic reading and writing.
- Inter-relate language arts tasks through use of broad themes or concepts.
- Teach critical reading and writing.
- Emphasize discussion and analysis.
- Expose students to multicultural literature.
- Provide balanced forms of discourse in the reading program.
- Provide assessment based on instructional purposes and modes.
- Encourage students to find real purposes to write.
- Promote student ownership and responsibility in writing.
- Emphasize all steps in the writing process.
- Promote writing for real audiences.
- Connect writing to all areas of the curriculum.
- Use evaluation constructively and efficiently.

(Squire, 1995; Zemelman, Daniels, & Hyde, 1998)

## **Mathematics**

### **Indicators of Mathematical Giftedness:**

- Unusual curiosity about numbers and mathematical information;
- Ability to understand and apply ideas quickly;
- Strong ability to see patterns and think abstractly;
- Use of flexible and creative strategies and solutions;
- Ability to transfer a mathematical concept to an unfamiliar situation;
- Use of analytical, deductive, and inductive reasoning; and
- Persistence in solving difficult and complex problems.

(Holton & Gaffney, 1994; Miller, 1990)

### **Best Practices in Mathematics:**

- Organize content around major mathematical ideas.
- Ensure mathematical concepts are covered in depth.
- Include history of mathematical ideas, concepts, and study of mathematicians.
- Sequence materials from concrete to abstract.
- Make problem solving an integral part of the curriculum.
- Require students to communicate ideas.
- Integrate reasoning into mathematics lessons.
- Connect mathematical concepts to the real world and other areas of mathematics.
- Ask students to make conjectures and attempt to prove them.
- Illustrate “habits of mind” of mathematicians.
- Encourage divergent thinking.
- Provide students opportunities to work together and alone in solving problems.

(Johnson & Sher, 1997)

## **Science**

### **Indicators of Scientific Giftedness:**

- Strong curiosity about objects and environments;
- High interest in investigating scientific phenomena;
- Tendency to make observations and ask questions;
- Ability to make connections between scientific concepts and observed phenomena;
- Unusual ability to generate creative and valid explanations; and
- Interest in collecting, sorting, and classifying objects.

(Yager, 1989)

### **Best Practices in Science:**

- Focus and support inquiries while interacting with students.
- Orchestrate discourse among students about scientific ideas.
- Challenge students to accept and share responsibility for their own learning.
- Recognize and respond to student diversity and encourage all students to participate fully in science learning.
- Encourage and model the skills of scientific inquiry, as well as the curiosity, openness to new ideas and data, and skepticism that characterize science.

(National Research Council, 1996, p. 32)

Ensure that inquiry activities involve students in

- Pondering and posing questions,
- Using tools to make and classify observations,
- Examining sources of information,
- Investigating, analyzing, forming answers, and explanations, and
- Communicating outcomes and conclusions.

(Martin, Sexton, & Gerlovich, 2002, p-8)

### **Social Studies**

The research literature does not suggest specific “giftedness” in social studies. Students who may benefit from differentiation in social studies are those who indicate a keen interest and deep involvement in thinking about history, geography, civics, law, economics, political science, and other social studies areas. Changes in the instructional program for students identified for gifted education services should focus on developing skills that enable a person to resolve genuine problems encountered in life and to support personal contributions to our society.

### **Best Practices in Social Studies:**

- Analyze documents of all sorts to detect bias, weigh evidence, and evaluate arguments.
- Distinguish between fact and conjecture and between the trivial and the consequential.
- View human subjects nonjudgmentally and with empathy instead of present-mindedness.
- Recognize and analyze the interplay of change and continuity.
- Recognize the complexity of causality and avoid easy generalizations and stereotypes while analyzing how change occurs.
- Recognize that not all problems have solutions.
- Understand how people and cultures differ and what they share.
- Analyze how the actions of others, past and present, influence our own lives and society.

(Sandling, M. M., 2003, p. 221)

## **PLANNING INSTRUCTION FOR GIFTED LEARNERS**

### **2.3**

The following considerations, related to the integrated curriculum as well as to the social and emotional support needs of gifted learners, are important in planning differentiation for gifted learners.

#### **Curriculum Based on DoDEA Content Standards**

Academic experiences should build upon the DoDEA curriculum content standards. In this way, students maintain close connections to general education instructional opportunities while being provided with challenges that ensure new learning for them every day. Close connections with the general education program also ensure that identified students will not experience gaps in their knowledge and skill development.

#### **Assessment**

Identified students should have appropriate and frequent opportunities to document their proficiency in essential curriculum concepts and skills. When they exhibit proficiency before instruction, these students should be provided with alternative learning experiences that extend their learning rather than repeat or review demonstrated knowledge or skills. Classroom assessments before instruction facilitate the process.

#### **Fast Pace**

Students identified for gifted education services should have opportunities for more rapid pace of instruction. These students usually do not require repetitious activities for deep understanding. Consequently, they are ready for faster movement through learning sequences. Compressed presentations of new learning allow time for other experiences to extend knowledge and skills rather than repetitions of the same content.

#### **In-Depth and Interdisciplinary Explorations**

Identified students should have regular opportunities for in-depth exploration of key ideas, concepts, issues, and themes related to units of study. Such explorations are often interdisciplinary in nature.

#### **Opportunities for Advanced and Broad-Based Reading**

The curriculum readability index for gifted learners should be at least one or two grade levels beyond the given designated level. Multiple in-depth readings in the given area of study should be available.

## **Problem-Based Learning**

Identified students need opportunities to develop and practice the skills of inquiry. A focus on problem-based learning asks identified students to take risks and consider multiple possibilities for problem solutions. Problem-based learning experiences should be grounded in strong content knowledge of the problem area.

## **Multiple Resources and Multiple Options**

Teachers should determine ways to strengthen student engagement in learning through the use of multiple options. Choices in resources, learning activities, and performance tasks that give evidence of learning allow students more control over their learning and foster independence. Many students identified for gifted education services are capable of designing their own learning tasks and demonstrating evidence of learning.

## **Unique Needs of Each Student**

Each student identified for gifted education services has particular characteristics, potential, needs, and accomplishments. Services should be matched as closely as possible to an individual student's profile of strengths and needs.

## **Opportunities for Independent Learning Based on Ability and Interest**

Students should be allowed to explore extensions of content-based curriculum, including independent investigations in various settings.

## **Support from Teachers**

A common myth about gifted students is that "they can make it on their own." Students identified for gifted education services need appropriate direct instruction and support from all teachers.

## **Experiences with Intellectual Peers**

Identified students need opportunities to work with intellectual peers some of the time. Flexible grouping arrangements within and outside the classroom can provide these opportunities.

## **Reasonable and Challenging Goals**

Students identified for gifted education services should experience opportunities that stretch their minds without overburdening them with more work. Different, more challenging, and complex work should be the expectation for identified students. Students should be helped to set realistic goals for their progress and then to reflect on their personal growth.

## **Social and Emotional Support**

Students identified for gifted education services often require adult support to deal with issues related to their unusual abilities and achievements. Professionals should be available to work with these students, helping them to cope with typical issues of stress, risk taking, peer relationships, goal setting, priorities, and planning for the future.

## TEACHING STRATEGIES FOR DIFFERENTIATION OF INSTRUCTION

### 2.4

Certain teaching strategies for differentiating instruction for gifted learners are recommended. Each of these strategies is presented in greater detail following a brief overview of each one.

#### Overview of Differentiation Strategies

**Adjusted Questioning Techniques and Higher-Order Questions.** Adaptations are made to the types of questions posed to the learners based on their readiness, developmental levels, interests, and learning profiles. “Higher-order questions” are questions that require students to work out answers rather than memorize them. The teacher’s goal is to help students explore possibilities, analyze information, synthesize, and make evaluations. Students are also encouraged to generate their own questions related to areas of study.

**Agendas.** These are personalized lists of tasks that a student must complete are prepared for a specified time. Each student may have an agenda with differing tasks.

**Choice and Task Cards.** Work assignments are written on cards and placed in hanging pockets or envelopes. Each student selects a card and completes that work. The teacher targets work toward student needs yet allows student choice. Task cards are another form of choice cards. Challenging, independent activities in each content area are written on cards as opportunities for independent and small-group work.

**Concept Mapping.** This special form of a web diagram or graphic organizer is used for exploring knowledge and gathering and sharing information. Cells contain a concept, item, or question and links. The strategy stresses the importance of prior knowledge in being able to learn about new concepts.

**Curriculum Compacting.** A strategy designed to allow highly capable students the opportunity to be engaged in meaningful learning. The teacher assesses all students before beginning a unit of study or development of a skill. Those who do well on the pre-assessment are provided with a framework for alternate assignments.

**E-Learning.** Electronic learning, or e-learning, offers a range of options for differentiated instruction that must be tailored by the teacher to meet student needs.

**Entry Points.** Based on the work of Howard Gardner, this strategy encourages student exploration of a topic through different avenues to match various cognitive processing strengths: narrative (presenting a story), logical-quantitative (using numbers or deduction), foundational (examining philosophy and vocabulary), aesthetic (focusing on sensory features), and experiential (hands-on).

**Flexible Grouping.** A strategy that helps promote learning and interpersonal communication by ensuring that student groups are structured in different ways to meet varied goals. The teacher may assign small instructional groups, or the students may choose their groups according to interest. Flexibility of grouping arrangements is an important feature of a differentiated classroom.

**Graphic Organizers.** This is a cognitive map in which important aspects of a concept, topic, or unit of study are identified and arranged in a visual pattern to present information, review material, integrate prior knowledge with new information, demonstrate relationships between concepts, and retrieve information related to a given topic.

**Independent Study.** Highly motivated, self-directed students who demonstrate interest in advanced research can benefit from guided independent study experiences. The teacher and student work together to identify topics of interest and plan a method of independent investigation that culminates in a product that demonstrates learning outcomes. Topic choices are related to the general curriculum.

**Learning Centers.** Different areas in the classroom are designated as centers for learning. Centers may be assigned or chosen, and students work on various differentiated tasks.

**Pre-assessment.** The teacher assesses the students before instruction to determine what they know. The teacher uses the results of the pre-assessment to design instruction.

**Social Action Projects.** Students research important social issues related to curricular areas of study and plan a course of action to help solve related problems. By engaging in such projects, students gain the knowledge, values, leadership experience, and skills necessary to participate in social change.

**Socratic Dialogue.** This strategy uses open-ended questioning to encourage higher-level discussion. The teacher acts as a facilitator and guides students in using critical thinking, active listening, and communication skills. The strategy is discussed more fully in the Socratic Seminar Model in this program guide.

**Tiered Assignments.** This strategy provides varied levels of activities and assignments to ensure that students explore and practice concepts at a level that builds on their prior knowledge and that prompts continued growth rather than repetition of prior knowledge. Diagnostic assessment needs to be the foundation of these assignments.

**Figure 7. Suggested Grade Levels for Using Teaching Strategies**

<b>Grade</b>	<b>Suggested Strategies</b>	
<b>Kindergarten</b>	Adjusted Questions Choice/Task Cards Flexible Grouping	Learning Centers Pre-assessment Tiered Assignment
<b>Grade 1</b>	Adjusted Questions Choice/Task Cards Flexible Grouping	Learning Centers Pre-assessment Tiered Assignment
<b>Grades 2–3</b>	Adjusted Questions Choice/Task Cards Curriculum Compacting Entry Points Flexible Grouping	Graphic Organizers Independent Study Learning Centers Pre-assessment Tiered Assignment
<b>Grades 4–5</b>	Adjusted Questions Agenda Choice/Task Cards Curriculum Compacting E-Learning Entry Points	Flexible Grouping Graphic Organizers Independent Study Learning Centers Pre-assessment Tiered Assignment
<b>Grades 6–8</b>	Adjusted Questions Agenda Choice/Task Cards Curriculum Compacting E-Learning Entry Points	Flexible Grouping Graphic Organizers Independent Study Learning Centers Pre-assessment Tiered Assignment
<b>Grade 9–12</b>	Adjusted Questions Agenda Choice/Task Cards Concept Mapping Curriculum Compacting E-Learning Entry Points Flexible Grouping	Graphic Organizers Independent Study Learning Centers Pre-assessment Social Action Projects Socratic Dialogue Tiered Assignment

## Differentiation Strategies

### Adjusted Questions

Adjusted questions are targeted to the readiness level, interest, or learning profile of the student, keeping in mind that questions for quality thinking involve the following:

- Knowledge (identification and recall of information)
- Comprehension (organization and selection of facts and ideas)
- Application (use of facts, rules, principles)
- Analysis (separation of a whole into component parts)
- Synthesis (combination of ideas to form a new whole)
- Evaluation (development of opinions, judgments, or decisions)

Higher-level questions ask the student to manipulate knowledge mentally to create an answer or to support an answer logically. These questions help students clarify their thinking, examine assumptions, probe reasons and evidence, identify viewpoints or perspectives, and analyze implications and consequences. The following are some examples:

#### CLARIFICATION

- Could you give me an example?
- Could you put that another way?
- What do you think is the main issue?
- Would you summarize in your own words?

#### ASSUMPTIONS

- What are you assuming?
- Is it always the case?
- Why would someone make this assumption?

#### REASONS AND EVIDENCE

- Why do you think that is true?
- Do you have any evidence for that?
- How could we find out whether that is true?

#### VIEWPOINTS OR PERSPECTIVES

- Why have you chosen this perspective?
- How would other groups/types of people respond? Why?
- What would someone who disagrees say?
- What is an alternative?

#### IMPLICATIONS AND CONSEQUENCES

- What would happen as a result? Why?
- What is an alternative?
- If this is the case, what must also be true?

When using higher-level questioning with students, teachers should follow these guidelines:

- Avoid questions students can answer with “yes” or “no” or any other one-word answer.
- Follow information questions with a series of higher-order questions.
- Ask only one question at a time.
- Vary the techniques used to get students to process what they have learned.
- Encourage active listening; have students paraphrase what they have heard.
- Use sufficient wait time.
- Encourage students to focus, accept, and draw each other out—to answer each other, not the teacher.
- Train students to write and ask their own questions.

Figures 8 and 9 contain examples of forms of questioning and categories of thinking that will support using quality questioning when working with students. When teachers use questioning strategies that call for higher-order thinking, students are encouraged to rethink their own approach to asking quality questions. (*DoDEA Guide for Creating Conditions for Powerful Learning*)

**Figure 8. Questions Call for Different Types of Thinking:**

<p>What is the capital of Argentina? Describe how Pippi Longstocking dresses. Who is the prime minister of Canada? How do you say “chair” in German? Identify the three body parts of an insect. What happens to the fluid when we begin to heat it? List the first 10 presidents of the United States.</p>	<p>How are the two American Indian tribes alike and different? Summarize the key points of the chapter. Put the main events in sequential order. Organize the information into a descriptive graphic organizer. Categorize the buttons. What are the similarities between the two presidential candidates’ points of view? What factors in world politics might be affecting the current price of gas?</p>
<p><b>What do these examples have in common?</b></p>	<p><b>What do these examples have in common?</b></p>
<p>What do you think will happen when we combine these two substances? Using what we have learned about aerodynamics, create a flying object out of these materials. Which of these portraits is the best example of cubism? Explain your rationale. Develop a plan for recycling at our school. How well does the Scarsdale diet meet the criteria for a balanced diet? How might the earth be different if dinosaurs had not become extinct?</p>	<p>How did you know to use that strategy? What were the steps you used in solving the problem? What was hard/easy for you in this process? Where do you think you became stuck? How did you know when you were finished? What were you trying to accomplish when you used that visual? What strategy/strategies did you use when you became confused? What questions did you ask yourself as you worked on this assignment?</p>
<p><b>What do these examples have in common?</b></p>	<p><b>What do these examples have in common?</b></p>

The four categories of thinking in Figure 9 can be linked to the examples above and should be referred to when constructing quality questioning and assisting students to form their own questions.

**Figure 9. Questioning: Four Categories of Thinking**

<p style="text-align: center;"><b>Accessing Information</b></p> <p>Requires students to remember or recall information they have learned or to gather that information through a variety of resources. This information may be from prior knowledge and experiences or from knowledge gained in class.</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Define</td> <td>Match</td> </tr> <tr> <td>Select</td> <td>Recite</td> </tr> <tr> <td>Name</td> <td>Recall</td> </tr> <tr> <td>List</td> <td>Label</td> </tr> <tr> <td>Observe</td> <td>Locate</td> </tr> <tr> <td>Identify</td> <td></td> </tr> </table>	Define	Match	Select	Recite	Name	Recall	List	Label	Observe	Locate	Identify		<p style="text-align: center;"><b>Organizing Information</b></p> <p>Requires students to take data or information and process it in order to make sense of it. This thinking often asks students to put information into a new pattern or make new connections. This thinking helps shape understanding.</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Analyze</td> <td>Classify</td> </tr> <tr> <td>Compare</td> <td>Contrast</td> </tr> <tr> <td>Explain</td> <td>Categorize</td> </tr> <tr> <td>Group</td> <td>Infer</td> </tr> <tr> <td>Summarize</td> <td>Restate</td> </tr> <tr> <td>Defend</td> <td>Paraphrase</td> </tr> <tr> <td>Sequence</td> <td></td> </tr> </table>	Analyze	Classify	Compare	Contrast	Explain	Categorize	Group	Infer	Summarize	Restate	Defend	Paraphrase	Sequence	
Define	Match																										
Select	Recite																										
Name	Recall																										
List	Label																										
Observe	Locate																										
Identify																											
Analyze	Classify																										
Compare	Contrast																										
Explain	Categorize																										
Group	Infer																										
Summarize	Restate																										
Defend	Paraphrase																										
Sequence																											
<p style="text-align: center;"><b>Transforming Information</b></p> <p>Requires students to take data or information and transform it into a novel or unique form. This category often requires creative and critical thinking and asks students to demonstrate understanding.</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Predict</td> <td>Demonstrate</td> </tr> <tr> <td>Speculate</td> <td>Envision</td> </tr> <tr> <td>Evaluate</td> <td>Generalize</td> </tr> <tr> <td>Hypothesize</td> <td>Imagine</td> </tr> <tr> <td>Assess</td> <td>Criticize</td> </tr> <tr> <td>Construct</td> <td>Design</td> </tr> <tr> <td>Develop</td> <td>Create</td> </tr> </table>	Predict	Demonstrate	Speculate	Envision	Evaluate	Generalize	Hypothesize	Imagine	Assess	Criticize	Construct	Design	Develop	Create	<p style="text-align: center;"><b>Metacognition</b></p> <p>Requires students to become metacognitively aware of their thought processes. These questions, in turn, allow students to become more conscious of their strategies or steps to produce the work required and to reflect on and evaluate the productiveness of their own thinking. The goal is for them to transfer the effective steps and strategies to new situations.</p>												
Predict	Demonstrate																										
Speculate	Envision																										
Evaluate	Generalize																										
Hypothesize	Imagine																										
Assess	Criticize																										
Construct	Design																										
Develop	Create																										

*(DoDEA Guide for Creating Conditions for Powerful Learning)*

*Additional Resource for Educators*

Critical Thinking Community: <http://www.criticalthinking.org>

## Agendas, Choice, and Task Cards

Agendas allow teachers to assign tasks in several subject areas at the same time. The teacher prepares a personalized list of tasks for each individual based on readiness, interest, and/or learning profile. Each student within the class may have a different set of tasks. Assignments can be written on a sheet that goes into a student folder (agenda) or on a checklist that directs students to select specific choice cards that have been prepared ahead of time and placed in hanging pockets or envelopes in the classroom.

Choice cards might direct students to a classroom learning center, or they might contain specific instructions and an assessment rubric linked to a current unit of study. Task cards are designed to engage students in a series of discovery tasks rather than to teach a skill or content objective directly. Various challenging, independent, content area activities are recorded on cards. The cards can be stored in a card file, placed in a learning center, or arranged in hanging files in the classroom. Task cards generally describe hands-on, minds-on activities for students to perform at varying levels of sophistication.

Application-and-analysis tasks require students to use critical-thinking skills in finding out how parts of a whole are interrelated, applying their knowledge to related situations, and building deeper understanding. Some behavioral verbs in this category are *analyze, apply, assess, associate, chart, collect, compare, contrast, discover, dissect, examine, explain, graph, identify, find relationships, list attributes, paraphrase, plan, put together, take apart, and summarize.*

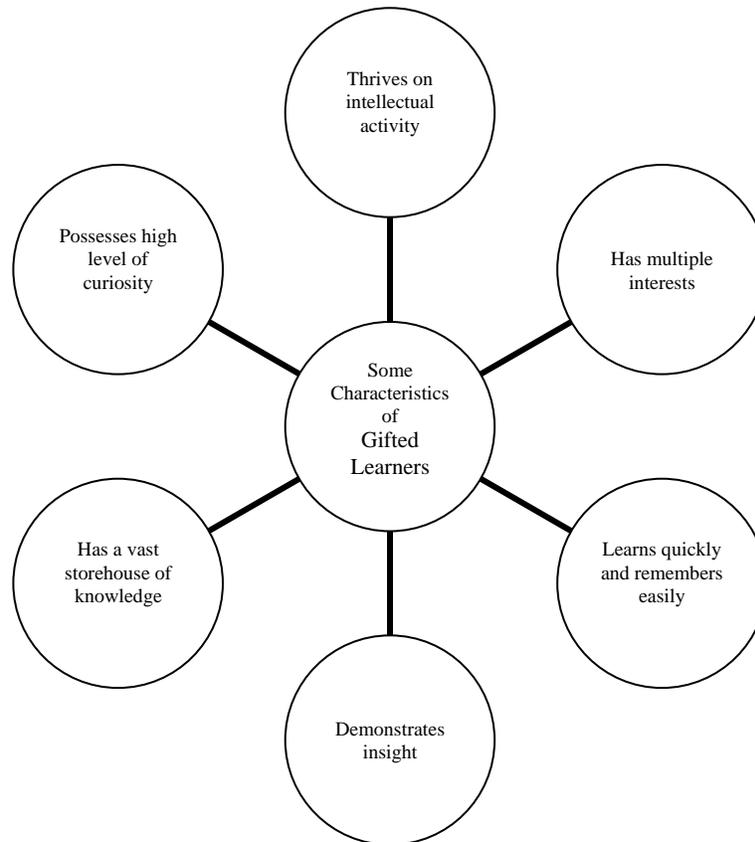
Synthesis-and-evaluation tasks require students to use divergent, dynamic thinking skills to evaluate information and respond creatively and originally to problems or scenarios. Some behavioral verbs in this category are *adapt, add to, apprise, change, combine, compare, consider, construct, create, criticize, critique, debate, defend, design, develop, elaborate, evaluate, examine, forecast, formulate, generalize, generate possibilities, give an opinion, hypothesize, identify consequences, imagine, infer, invent, judge, magnify, minify, originate, plan, pose solutions, provide alternatives, rearrange, recommend, restate, role-play, select alternatives, sketch, solve, speculate, substitute, translate, value, and weigh.*

Before implementing agendas, the teacher must allow enough planning time to make decisions about what tasks are relevant to curriculum objectives, establish procedures and routines with the class, and develop personalized lists for each student.

This strategy allows students to determine the order in which they will work on their own learning tasks. Agendas allow the teacher to be a facilitator who is monitoring progress, conferencing with students, and serving as a coach. It provides for flexible pacing of instruction and a variety of grouping options and fosters student responsibility for learning. It works best in a setting where longer blocks of time are available.

## Concept Mapping

Concept maps are visual representations of ideas, concepts, problems, and the like. (Graphic organizers are other visual forms.) Here is an example of a concept map:



Concept mapping can be done for several purposes:

- To generate ideas (brainstorming, etc.)
- To design a complex structure (long texts, hypermedia, large Web sites, etc.)
- To communicate complex ideas
- To aid learning by explicitly integrating new and old knowledge
- To assess understanding or diagnose misunderstanding

When using concept mapping, teachers should think about the central word, concept, research question, or problem from which the map will be built. They should also consider the concepts, items, descriptive words, or telling questions that can be associated with the concept, topic, research question, or problem.

## Curriculum Compacting

Compacting is a common form of instructional modification for gifted learners. It is based on the principle that students who demonstrate mastery of course content, or show that they can master course content quickly, should be given time to study material that they find more challenging and interesting (Renzulli & Reis, 1985).

The strategy requires that the teacher assess all students before beginning a unit of study or development of a skill. Students who demonstrate mastery are excused from practice activities so they can work on alternate assignments. The compacting process involves eight steps:

1. Determine the learning objectives for the material.
2. Find an appropriate way to assess those objectives.
3. Identify students who may have already mastered the objectives (or could master them more quickly).
4. Assess those students to determine their mastery level.
5. Streamline practice or instruction for students who demonstrate mastery of the objectives.
6. Provide small-group or individual instruction for students who have not yet mastered all of the objectives, but are capable of doing so more quickly than their classmates.
7. Offer more challenging academic alternatives based on student interest.
8. Maintain a record of the compacting process and instructional options provided. (Reis, Burns, & Renzulli, 1992)

Once students have selected an alternate academic focus, a written agreement or learning contract between the teacher and student can be developed that outlines what they will learn, how they will learn it, in what period of time, and how they will be evaluated.

### *Additional Resources for Educators*

Winebrenner, Susan: <http://www.ericfacility.net/ericdigests/ed372553.html>

Siegle, Del: <http://sp.uconn.edu/~nrcgt/news/fall99/fall996.html>

Reis, Burns & Renzulli: <http://www.gifted.uconn.edu/siegle/epsy373/fcompact.htm>

## Discussion Formats

Like adjusted questioning techniques, discussions can be used to help students use higher-order thinking skills. Various discussion formats include the following:

### Debates

The Lincoln-Douglas Debate format is a one-to-one debate, in which two sides of an issue are debated. It starts with a statement of purpose/policy. The debater who agrees with the statement (the *Affirmative*) begins the debate. In many Lincoln-Douglas competitive debates, debaters do not know the statement of purpose/policy in advance. The purpose is proposed, and each presenter is given three minutes to prepare for the face-off. This style of debate focuses more on persuasion and less on evidence.

Another debate style is Oregon or formal policy debate, in which teams debate positions or plans on resolutions. This is a common form of competition debate. Evidence and logical argument are hallmarks of this style.

*Additional Resource for Educators*

“Debate Central” at the University of Vermont: <http://debate.uvm.edu/>

Literature Circles

Literary circles provide a way for small groups of students to engage in critical thinking and reflection as they read and respond to books. Literary circles guide students to deeper understanding of what they read through structured discussions and written and creative responses.

*Additional Resource for Educators*

<http://www.literaturecircles.com>

Round Robin

This technique is great for brain-storming discussions. The purpose is for students to generate as many answers or ideas as possible in a given amount of time. Students are arranged in small groups, and a problem or topic is posed. Students go around their circles, quickly sharing their responses. Students may pass if they choose. Individuals can then be selected from each group to share with the whole class the ideas presented in each circle.

**E-Learning**

Technology is an engaging, highly flexible medium that supports differentiated instruction. It allows students to select content according to their interests and skill levels, process information at their own pace, access a variety of multimedia elements that enhance understanding, and publish original products summarizing their learning. Students can choose to create spreadsheets, slide shows, concept maps, cartoons, interactive presentations, Web pages, electronic music, and digital videos.

Electronic learning, or e-learning, offers a range of options for differentiated instruction that may be tailored by the teacher to meet student needs or by the students themselves at upper levels. Once standards and assessment criteria have been established, the teacher and student may select from a wide variety of e-learning activities:

Interpersonal Exchanges. Students can use e-mail, Web conferences, newsgroups, chats, real-time text, or audio/video-teleconferencing tools to communicate with peers. Online letter writing, cooperative add-a-chapter story projects, and the sharing of artwork, photographs, and messages related to specific topics are examples of interpersonal exchanges. E-pals partnerships have many similarities to “snail mail” pen-pal projects.

Global Classrooms. Two or more classrooms team up to study a common topic for a specific amount of time. This strategy can be used to extend in-class learning with

interdisciplinary investigations and thematic inquiries. Teachers can find numerous global classroom projects online, or they can initiate informal partnerships with colleagues around the world via e-mail.

Tele-mentoring. Many universities, government agencies, and businesses sponsor mentorships like *The Electronic Emissary Project*, which has been on-line since February 1993. Based at the University of Texas at Austin, in the College of Education, the project helps teachers locate Internet account holders with subject matter expertise relevant to their curricula who are willing to volunteer some of their time to share their knowledge via e-mail. Tele-mentoring projects can be a formal arrangement or an informal communication with volunteers.

Electronic Appearances. Guest experts make special appearances for specific times on many Web sites. NASA's and the JASON Project's "Ask-the-Scientist" videoconferences are examples of this type of e-learning. Many Web sites for students offer "Ask the Expert" activities that allow students to send in questions and receive an e-mail from an expert in the particular field. Another kind of electronic appearance is an "impersonation," in which individuals might take on historical roles and respond to student questions in character.

Electronic Study Trips. Virtual expeditions and interactive simulations can provide highly engaging learning opportunities that extend the curriculum. Students can take a virtual reality tour of a factory, explore the circulatory system of a frog, or go through an internal combustion engine while sitting in their classrooms. The JASON Project is one example of a multidisciplinary program in which students explore various ecosystems, complete problem-solving activities, and communicate with scientists who lead expeditions around the world.

Information Collection, Analysis, and Exchange. Projects of this type include data gathering, electronic publishing, and pooling of data for collective analysis.

Here are some examples:

Journey North - <http://www.learner.org/jnorth/index.html>

Weather Watch - <http://www.cyberbee.com/weatherwatch/>

The Global Sun Temperature Project - <http://www.k12science.org/curriculum/tempproj3/en/>

Information Searches. These problem-solving activities can take the form of scavenger hunts with clues and competitions. They can be differentiated by readiness for learning, Internet skills, and student interest.

Internet Projects. Many outstanding examples of this type of e-learning are available for teachers who want to participate in a class project with options for differentiation. Students can track the migration of the monarch butterfly, measure the coming of spring as traced by tulips blooming across the United States, and track a team's performance in the Iditarod race in Alaska. Internet projects that use "parallel problem solving" publish the same problem to students at different locations, who meet online to share data and compare findings.

Simulations. These differentiated activities are distinguished by problem-based scenarios that require students to use sophisticated thinking and leadership skills to find solutions. The University of Michigan's Interactive Communications and Simulations group is one

example. It provides extended interactions between students at different schools, thematic content in a variety of subject areas, opportunities for personal engagement through character-play or self-expression, and the involvement of university-level mentors under the supervision of project directors.

Tele-research Projects. Inquiry-based online projects are a means of differentiating instruction based on interest. One example of tele-research projects is peer feedback activities, which range from responses to writing and peer editing projects to virtual debates. Social action projects focus on real and immediate problems and call students to action.

## Entry Points

Based on the work of Howard Gardner (*Intelligence Reframed*, 1999, pp. 169–173), this strategy encourages student exploration of a topic through different avenues: narrative (presenting a story), logical-quantitative (using numbers or deduction), foundational (examining philosophy and vocabulary), aesthetic (focusing on sensory features), and experiential (hands-on). Teacher awareness of these different “entry points” can help them to introduce new information in a variety of ways that different students can easily grasp.

### *Additional Resource for Educators*

Project Zero at the Harvard Graduate School of Education — <http://pzweb.harvard.edu/>

## Graphic Organizers and Webs

Graphic organizers are visual devices helpful in developing critical thinking skills. McTighe (1987) delineated a seven-step procedure for teaching students to use graphic organizers. The steps below modify and condense that procedure into five steps:

1. **Explanation.** The concept of a graphic organizer is explained and described with mention of the advantages and uses of the representation the teacher or student has chosen.
2. **Modeling.** The form and use of one specific graphic organizer such as the “Compare or Contrast” diagram is explained, with a demonstration of how it might be used with one specific topic or body of information that is familiar to students.
3. **Application.** Copies of the graphic organizer used in the modeling step are distributed. Working in pairs, students apply this representation first with a known topic or body of information and then with a new topic.
4. **Reflection.** Students are told to reflect on their graphic organizers by sharing with other pairs of students and evaluating the purpose of the organizers.

**5. Independent Practice.** Opportunities are provided for students to use the graphic organizers with new information studied.

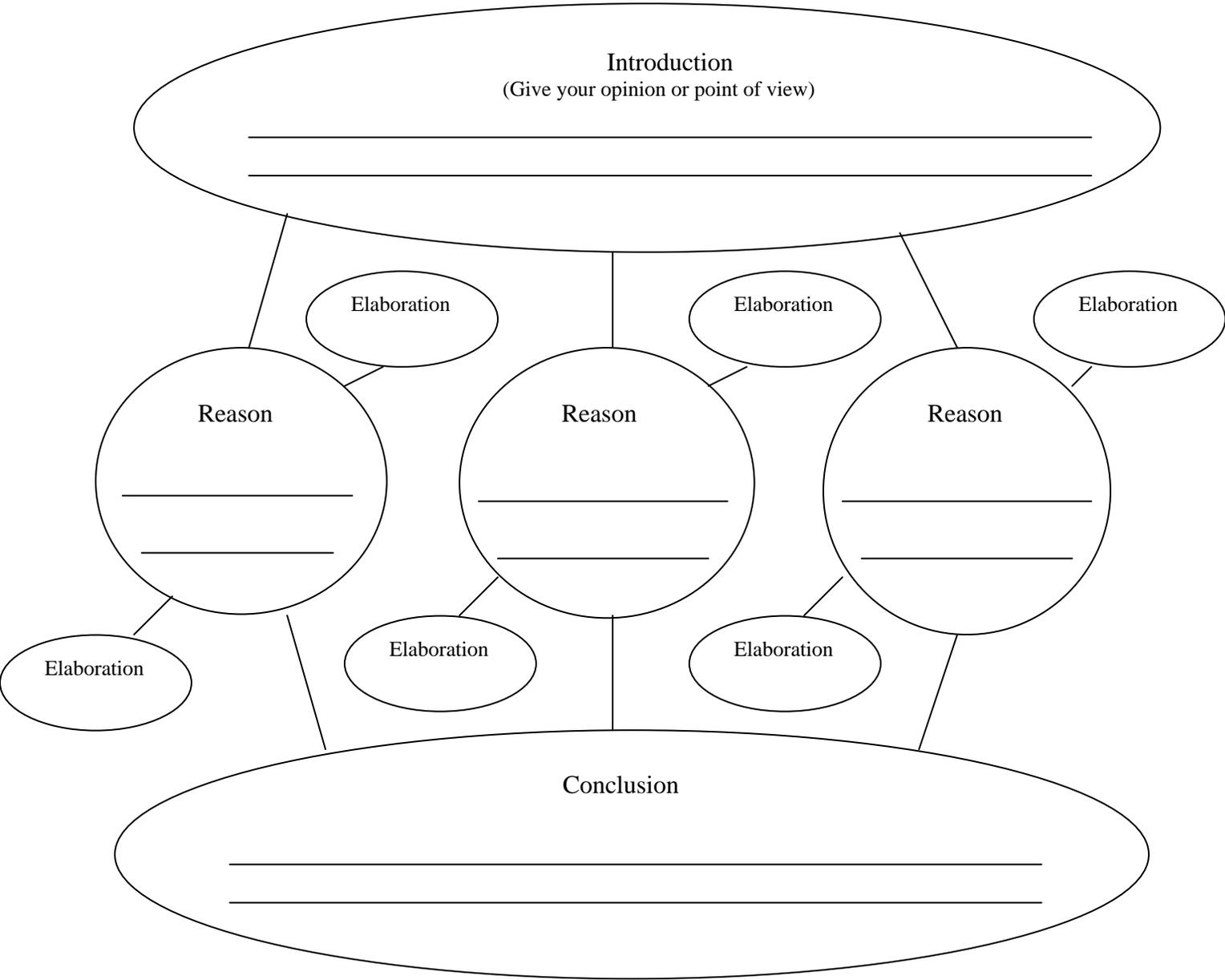
Web models are other forms of graphic organizers that are useful to the teacher as teaching strategies. Some types include the following:

Hamburger Model

The hamburger model (Figure 10) for persuasive writing provides students with a metaphor for developing a persuasive paragraph or essay. The model includes the top and bottom of the bun, representing the introduction and conclusion. The reasons written in support of the thesis statement are represented by the hamburger, the meat of the sandwich. The condiments (ketchup, mustard, and onions) are representative of the elaboration of the reasons.

The teacher should introduce the model by showing that the top bun and the bottom bun represent the introduction and conclusion of any persuasive writing piece. The teacher should note that the reasons given in support of the thesis statement are like the meat or vegetables in a burger, providing the major substance of the sandwich. Elaboration represents the condiments in a sandwich, the ketchup, mustard, and onions that hold a sandwich together, just as examples and illustrations hold a persuasive writing piece together. The teacher should then show students examples of hamburger paragraphs and essays and have students find the top bun, the bottom bun, the hamburger, and the condiments. A discussion of how “good” each sandwich is should follow. Teachers may then ask students to construct their own “hamburger” paragraphs. After students have constructed their own paragraphs, teachers may use peer and self-assessments to have students judge their own and one another’s writing. This process should be repeated.

**Figure 10. Hamburger Model for Persuasive Writing**



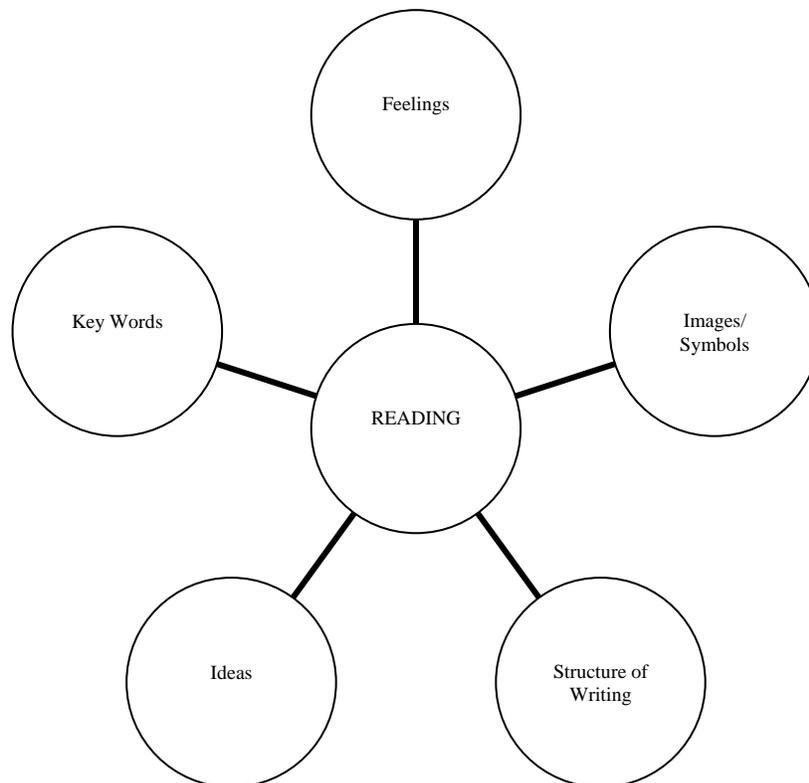
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### Literature Web Model

The literature web model (Figure 11) asks students to consider five aspects of a selection they are reading: key words, feelings, images or symbols, ideas, and structure of writing. The web helps students organize their initial responses and provides them a platform for discussing the piece in small or large groups. Whenever possible, students should be allowed to underline and to make marginal notes as they read and reread. After marking the text, they then organize their notes into the web. When students have completed their webs individually, they should compare their webs in small groups. This initial discussion will enable them to consider the ideas of others and to understand that individuals interpret literature differently. These small groups may compile a composite web that includes the ideas of all members.

Following the small-group work, teachers have several options for using the webs. For instance, they may ask each group to report to the class; they may ask groups to post their composite webs; or they may develop a new web with the class based on the small-group work. Each web serves to prepare students to consider various issues the teacher will raise in whole-group discussion.

**Figure 11. Literature Web Model**



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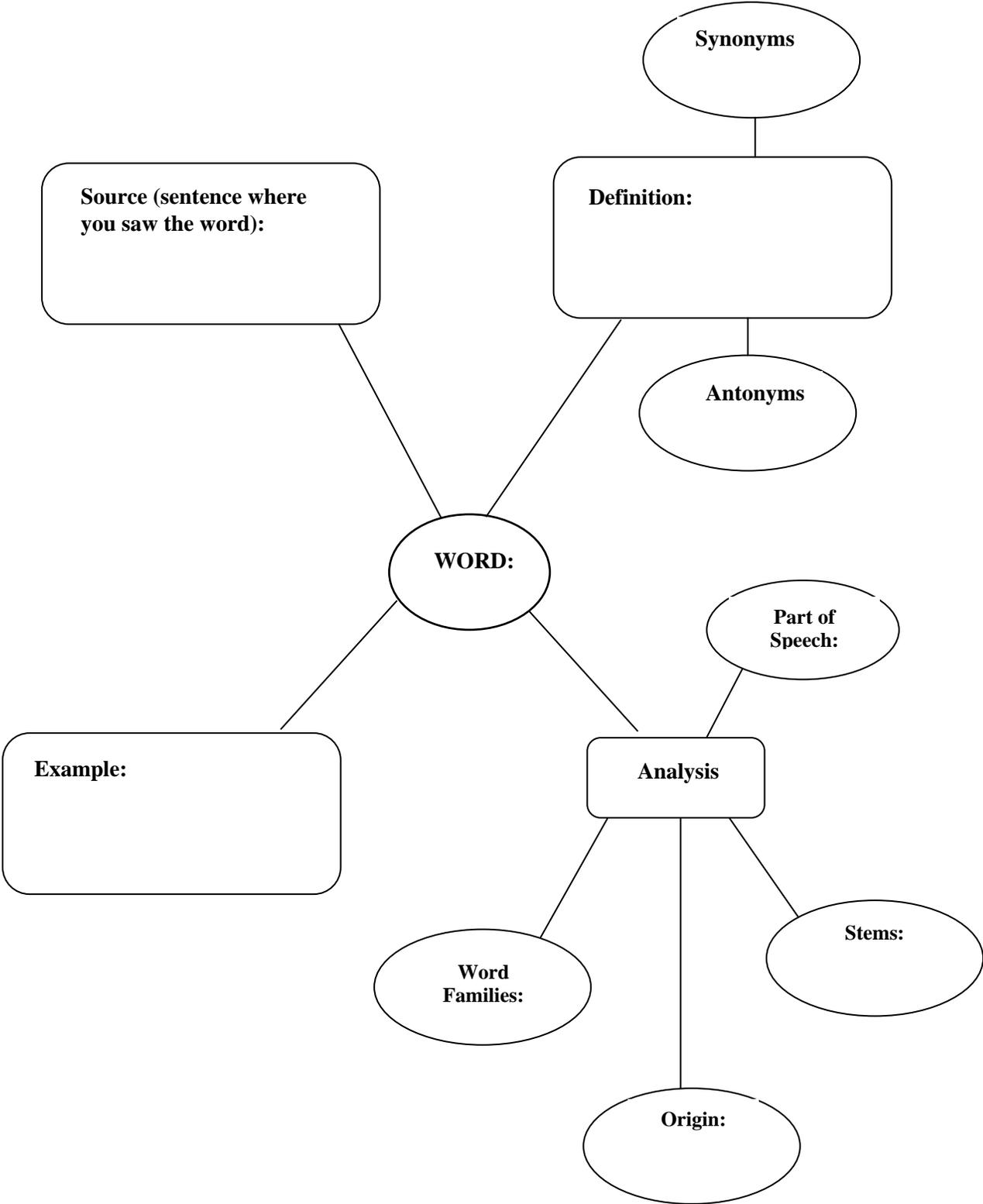
### Vocabulary Web Model

The purpose of the vocabulary web model (Figure 12) is to enable students to grasp an in-depth understanding of interesting words. Rather than promote superficial vocabulary development, the web approach allows for deep student processing of challenging and interesting words.

Figure 12 is an example of a vocabulary web. The teacher should introduce the activity by doing the first one with the whole class. Subsequently, students should work in groups to complete worksheets for other assigned words that are found in literature selections. Students may add any number of extensions to the main circles if they identify additional information about the word.

Once students become familiar with this activity they should use a streamlined version to accommodate new words that they encounter in their independent reading. A vocabulary section should be kept in a separate place in students' notebooks for this purpose. They need only list the word, definition, and sentence where the word was encountered. A college-level dictionary is useful for this activity.

Figure 12. Vocabulary Web



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## Independent Study

There are two types of independent study: one is focused on student interests and the other is focused on curricular topics (orbital studies).

In both the teacher and the student identify topics and plan a method of independent investigation with a specific product to show learning outcomes. The teacher's role is to monitor the student's progress during the independent study project and suggest appropriate resources and mentors. Community members with expertise in the topic area can volunteer to serve as mentors. Students may also locate online experts in the field to interview electronically.

Once the project begins, the teacher and the student meet regularly to discuss the student's progress and to resolve any roadblocks the student might be encountering. At the completion of the project, the teacher and the student jointly review the student's progress and final product. The evaluation is based on the goals developed before beginning the study and agreed upon by both teacher and student.

An effective independent study plan includes the following: learning outcomes, a list of proposed activities, a time line, a list of resources needed to complete the project, a description of the final product and audience, and a description of how the project will be evaluated.

The elements of the independent study should focus on developing a student's curiosity, pursuing topics of interest, investigating intriguing questions, discovering, managing time, establishing goals, setting criteria for assessing the work, and understanding the audience. Independent studies need to be individualized based on a student's talents, needs, and interests.

## Instructional Grouping

The teacher makes decisions about how to group students for instruction based on readiness, interests, developmental levels, learning styles, and social needs. Heterogeneous and homogeneous groups can both be effective, depending on the activity and the students. Sometimes gifted students benefit from the challenge and the extended possibilities of working with other students of similar abilities. Yet they also need to work in heterogeneous groups in which they learn from their classmates and have opportunities to deepen their understanding by explaining what they have learned to others. VanTassel-Baska (1992), a specialist in gifted education, makes the following recommendations about grouping students:

1. Heterogeneous groups are most appropriate when students are working on open-ended problem-solving tasks or science inquiry activities.
2. It is also appropriate for students to work in heterogeneous groups when they are discussing concepts that are new to all students.

3. Homogeneous groups are more appropriate when students are working on skill development or reviewing material that they have already learned.
4. Grouping strategies should be flexible, and students should be allowed to work independently at least occasionally according to their preferences.
5. Students should have opportunities to select their own groups based on common interests.
6. All students need to learn the skills of working together before cooperative learning activities will be successful.

(Van Tassel-Baska, 1992)

Groups can be formed and reformed to meet varied instructional purposes. All students need to participate in both homogeneous and heterogeneous grouping patterns.

“Clustering” is a grouping strategy that provides gifted students with an opportunity to engage in advanced learning activities with their intellectual peers while still providing a heterogeneous classroom experience. Clustering is the placement of a group of three to eight identified students in the same classroom. The general classroom teacher collaborates with the gifted resource teacher to provide appropriate differentiation for the cluster.

### **Learning Centers**

Learning centers are stations set up throughout the classroom where students engage in independent learning activities focused on instructional goals. Often designed to extend knowledge introduced in whole-group instruction, learning centers provide children with opportunities for hands-on active learning, problem solving, and open-ended activities. Centers are designed to meet the needs of students with diverse learning styles, interests, and ability levels.

Learning centers may contain task cards or sets of instructions that specify procedures to be followed, a variety of interesting visual aids, reference materials geared to a wide range of reading levels, and all the items students will need to accomplish the tasks. Activities should vary from simple to complex, concrete to abstract, structured to open-ended. Organization and record keeping are important. Expectations, procedures, and a method for students to record their learning need to be established so students make the most of their time.

### **Social Action Projects**

By engaging in community service and social action projects, students connect with local and national civic groups and develop leadership skills. Local, state, national, and international agencies offer opportunities for students to have a voice in decision making and to contribute to programs that make a difference in the world. These projects focus on real and immediate problems, align with the curriculum, and require planning and action by the student.

*Additional Resources for Educators*

Corporation for National and Community Service — <http://www.learnandserve.org/>

National Service-Learning Clearinghouse — <http://www.servicelearning.org/>

Youth Service America — <http://www.ysa.org/index.cfm>

Taking It Global — <http://www.takingitglobal.org>

**Tiered Assignments**

Tiered assignments are multiple versions of an assignment that allow students to build on their prior knowledge. Although all students are working to meet the same standard, the path to that standard will vary according to prior knowledge and needs. This technique is useful when all students must understand an essential topic or concept. The activities employed should ensure a high level of challenge for advanced learners, but this can be used effectively with a heterogeneous group. Tiered assignments should begin with a diagnostic assessment of the students, followed by assignment to tiers and modification of all assignments as appropriate.

On the following page is a sample for fourth grade students in a heterogeneous class. The learning task has been specified for science. The teacher can check off the appropriate differentiation adjustment being made for each group as well as the area(s) of critical thinking being addressed.

## TIERED ASSIGNMENTS PLANNING GUIDE (SAMPLE LESSON)

<b>Basic Assignment</b>	<p>Student Names: Mary, Caleb, Teshawn, Sue</p> <p>Standards/Objectives: Science (Marine Biology): Students will evaluate the factors affecting environmental quality.</p> <p>Process/Activity: Identify a minimum of five organisms that live within a coral reef and their place in the food chain. Illustrate their habitat.</p> <p>Materials: Access to computer and identified Web sites, pencils, paper, markers, software</p>	<p>Adjustments for Differentiation</p> <ul style="list-style-type: none"> <li>Acceleration</li> <li>Complexity</li> <li>Depth</li> <li>Challenge</li> <li>Creativity</li> </ul>
		<p>Thinking Levels</p> <ul style="list-style-type: none"> <li>Evaluation</li> <li>Synthesis</li> <li>Analysis</li> <li>Application</li> <li>Comprehension</li> <li>Knowledge</li> </ul>
<b>Extension Activity #1</b>	<p>Student Names: Don, Leslie, Kim, Jane</p> <p>Process/Activity: Group organisms into prey/predator categories.</p> <p>Discuss effects of over/underpopulation of one group on the other.</p> <p>Materials: Access to computer and identified Web sites, pencils, paper, markers, software</p>	<p>Adjustments for Differentiation</p> <ul style="list-style-type: none"> <li>Acceleration</li> <li>Complexity</li> <li>Depth</li> <li>Challenge</li> <li>Creativity</li> </ul>
		<p>Thinking Levels</p> <ul style="list-style-type: none"> <li>Evaluation</li> <li>Synthesis</li> <li>Analysis</li> <li>Application</li> <li>Comprehension</li> <li>Knowledge</li> </ul>
<b>Extension Activity #2</b>	<p>Student Names: Judy, Marsha, Sam, Alice, George, Ismal</p> <p>Process/Activity: Investigate current environmental endangerment of coral reefs and its effects on food chains/habitat.</p> <p>Materials: Access to computer and identified Web sites, pencils, paper, markers, software</p>	<p>Adjustments for Differentiation</p> <ul style="list-style-type: none"> <li>Acceleration</li> <li>Complexity</li> <li>Depth</li> <li>Challenge</li> <li>Creativity</li> </ul>
		<p>Thinking Levels</p> <ul style="list-style-type: none"> <li>Evaluation</li> <li>Synthesis</li> <li>Analysis</li> <li>Application</li> <li>Comprehension</li> <li>Knowledge</li> </ul>

# TEACHING MODELS FOR DIFFERENTIATION

## 2.5

Teaching models are frameworks for instruction that use organized sets of strategies to accomplish specific learning goals. Teaching models can be effective tools in planning instruction for differentiation. Several models are well matched to the principles of differentiation for gifted learners. Each of the models is presented in greater detail following the overview.

### Overview of Teaching Models

**Concept Development Model.** Based on the work of Hilda Taba (1966), the concept development model provides students with opportunities for inductive thinking and the important strengthening of their conceptual background for study. Engaging students in the development of generalizations related to key concepts is an important part of their preparation for more advanced work.

**Problem-Based Learning.** This instructional model provides a way to teach sophisticated content and high-level thinking within the context of an ill-structured problem. This problem is commonly presented by the teacher and based on teacher-selected knowledge and skills within a content area. Students work as a group toward the resolution of the problem.

**Paul Reasoning Model.** The Paul reasoning model (1992) builds upon the four aspects of reasoning: elements of reasoning, reasoning abilities, traits of a reasoning mind, and standards for reasoning. The reasoning model helps students to consider the elements of reasoning in relation to issues or problems within the context of a content area.

**Research Model.** The research model provides students with a set of steps and a framework of questions for guiding their personal research. The model guides students away from mere reporting and toward explorations that incorporate a focus on a question that can be researched. The model offers students the opportunity to ask and answer questions about things that matter.

**Socratic Seminar.** A Socratic seminar engages students in disciplined conversation about a particular reading or set of readings students have prepared. Students read to deepen their understanding of the complex ideas presented in the text. Through collaborative dialogue, students then examine big ideas logically and consider opinions through discussion with others in the seminar setting. An opening question with no right answer frames the reading of the text and the discussion.

## Teaching Models

### Concept Development Model

The concept development model, based upon the work of Hilda Taba (1966), involves both inductive and deductive reasoning processes. The model focuses on the creation of generalizations from a student-derived list of created concepts. The model has several steps and involves student participation at every step. Students begin with a broad concept, determine specific examples from that, create appropriate categorization systems, establish a generalization from those categories, and then apply the generalization to their readings and other situations.

Given the stimulus of a broad concept, such as *change*, students generate examples of the selected concept. Examples are derived from students' own understanding and experiences. Focusing questions such as "*What does this word mean to you? Can you give me any examples of this concept?*" allows open-ended responses in which students of all levels can participate. Students use their memories of events and things to determine if there is an appropriate "fit" with the concept.

1. Once an adequate number of examples has been elicited, students then group items together. Focusing questions include "*Do any of these examples have anything in common? Could you put any of these things together somehow?*" Such a process allows students to search for interrelatedness and to organize a mass of material. Students create relationships in flexible manners and perceive the world, using their personal schema. The teacher acts as a facilitator and asks the students focusing questions such as "*Why do you think that these belong together?*" Students are required to explain their reasoning and to seek clarification from each other.
2. With focusing questions such as "*What could you name this group? What title would you give this collection?*" students are asked to label their groups. Labeling also forces students to establish flexible, hierarchical concepts of relatedness: the idea that one thing or a concept could name a variety of other things. What the students mean affects the placement of particular items. The labeling process allows them to communicate the intent of their thinking. The labels should be fairly universal in nature. If labels appear to be too specific, further subsuming should occur, using the focusing questions of "*Do any of these groups have anything in common? What could we call this new group?*" Steps two and three should be repeated. New groups should then be given new labels.
3. Students are then asked to think of non-examples of the broad concept. With focusing questions such as "*What does not fit this concept? Can you name things that are not examples of the concept?*" students are required to differentiate and distinguish between examples and non-examples. In this way an understanding of what is contained and what is not contained within the definitional outlines of the concept is developed.
4. The students then determine a statement of generalization, using the concepts elicited from the labeling process. Examples for change could include "*Change may be positive or negative*" and "*Change is linked to time.*" Generalizations should be derived from

student input and may not precisely reflect the teacher's established concepts. However, they should be fairly global in nature.

5. Although the generalizations were derived from students' own experiences, they are then applied to readings and tested in specific contexts. Focusing questions such as "*How well does the generalization hold up in this piece?*" allow students to take the generalizations that they derived and evaluate how well events in stories uphold those generalizations. If any changes are needed in the language of the generalizations, students may go back and make changes. The teacher can use a focusing question such as "*Are changes in the generalization necessary?*"
6. Students are then asked to identify specific examples of the generalizations from their own readings. "*Can you name any examples of this generalization from this piece?*" Critical reading skills are reinforced as students begin to apply the generalization to books and stories. Students are asked to apply the generalization that they have created to other situations, including those found in readings, their own writings, history, and their own lives.

Here are some broad-based concepts that might be explored in various contexts:

Art	Courage	Law
Beauty	Democracy	Progress
Chance	Family	Revolution
Change	Honor	Time
Conflict	Justice	Truth
Greed	Power	Loyalty

## **Problem-Based Learning Model**

Problem-based learning is a curricular framework that, through student and community interests and motivation, provides an appropriate way to “teach” sophisticated content and high-level process . . . all while building self-efficacy, confidence, and autonomous learner behaviors (Barrows, 1986; Delisle, 1997; Stepien, Gallagher, & Workman, 1993).

### Essential Elements of Problem-Based Learning

The teacher presents an ill-structured problem.  
Students create a precise statement of the problem.  
Students find information to help them solve the problem.  
Students evaluate possible solutions to the problem (includes experimental design).  
Students create a final product relating to the problem (ex. a legislative bill, a mock town meeting, a speech, a scientific publication).  
The teacher acts as a metacognitive coach.

### **What is an “Ill-Structured” Problem?**

More information than initially presented may be necessary to

- Understand what’s going on
- Learn what caused it to be a problem
- Decide how to fix it

There’s always more than one right way to figure it out.

- Fixed formulas won’t work
- Each problem has unique components
- Each problem solver has unique *characteristics, background, and experiences*

The definition of the problem shifts or changes as new information is gathered.  
Ambiguity is a part of the environment throughout the process.  
Data are often incomplete  
...or in conflict  
...or unavailable  
...but choices must be made anyway, as time for decision-making is limited.

### **Key Instructional Moments in a PBL Episode**

Introducing the problem  
Reviewing research  
Problem definition  
Research for problem resolution  
Reviewing research  
Building a resolution  
Presenting the resolution

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## Reasoning Model

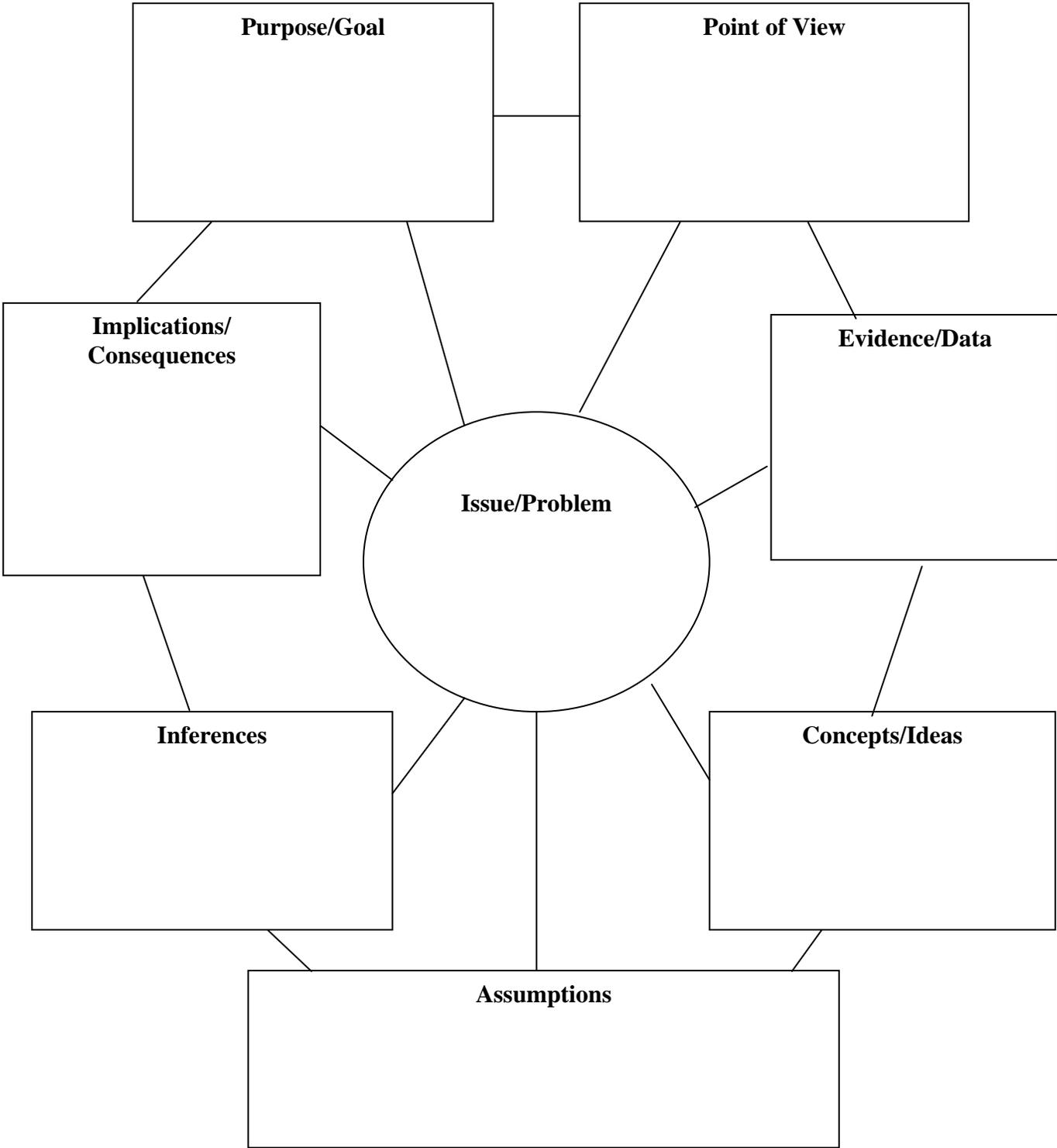
The reasoning model focuses on eight elements (Paul, 1992). It is embedded in a unit through questions, writing assignments, and research work.

1. Purpose, Goal, or End in View: Whenever we reason, we reason to some end, to achieve some purpose, to satisfy some desire, or to fulfill some need. One source of problems in reasoning is traceable to “defects” at the level of goal, purpose, or end. If our goal itself is unrealistic, contradictory to other goals we have, confusing or muddled in some way, then the reasoning we use to achieve it is problematic. The goal, purpose, or end of our thinking is something our mind must actively create.
2. Question at Issue (or Problem to Be Solved): Whenever we attempt to reason something out, there is at least one question at issue, at least one problem to be solved. One area of concern for the reasoner should therefore be the very formulation of the question to be answered or problem to be solved. If we are not clear about the question we are asking, or how the question relates to our basic purpose or goal, then it is unlikely that we will be able to find a reasonable answer to it or one that will serve our purpose. The question at issue in our thinking is something our mind must actively create.
3. Points of View or Frame of Reference: Whenever we reason, we must reason within some point of view or frame of reference. Any defect in our point of view or frame of reference is a possible source of problems in our reasoning. Our point of view may be too narrow or too parochial, may be based on false or misleading analogies or metaphors, may not be precise enough, may contain contradictions, and so forth. The point of view which shapes and organizes our thinking is something our mind must actively create.
4. The Empirical Dimension of Our Reasoning: Whenever we reason, there is some “stuff,” some phenomena, about which we are reasoning. Any defect, then, in the experiences, data, evidence, or raw material upon which our reasoning is based is a possible source of problems. We must actively decide which of a myriad of possible experiences, data, evidence, etc. we will use.
5. The Conceptual Dimension of Our Reasoning: All reasoning uses some ideas or concepts and not others. Any defect in the concepts or ideas (including the theories, principles, axioms, or rules) with which we reason is a possible source of problems. The concepts and ideas which shape and organize our thinking must be actively created by us.

6. Assumptions (the Starting Points of Reasoning): All reasoning must begin somewhere, must take some things for granted. Any defect in the starting points of our reasoning, any problem in what we have taken for granted, is a possible source of problems. Only we can create the assumptions on the basis of which we will reason.
7. Inferences: Reasoning proceeds by steps called inferences. To make an inference is to think as follows: “Because this is so, that also is so (or probably so.)” Any defect in the inferences we make while we reason is a possible problem in our reasoning. Information, data, and situations do not determine what we shall deduce from them; we create inferences through the concepts and assumptions which we bring to situations.
8. Implications and Consequences (Where Our Reasoning Takes Us): All reasoning begins somewhere and proceeds somewhere else. No reasoning is static. Reasoning is a sequence of inferences that begin somewhere and take us somewhere else. Thus all reasoning comes to an end, yet could have been taken further. All reasoning has implications or consequences beyond those the reasoner has considered. Any problem with these (implications that are false, undesirable consequences) implies a problem in the reasoning. The implications of our reasoning are an implicit creation of our reasoning.

(Paul, *Critical Thinking: What Every Person Needs to Survive in a Rapidly Changing World*, 1992)

Figure 13. The Reasoning Web (Paul, 1992)



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## The Reasoning Web with Literature

Teachers can assist students in considering a piece of literature using the reasoning web. The model can be used to probe different avenues of student reasoning about what they read. Teachers may select a few of the questions or develop the complete reasoning web through story-based questions. Some types of questions will work better with certain pieces of literature. The purpose of using the web is to enhance reasoning qualities of the mind in students as they engage in written and oral communication.

(Note: It is not always necessary to use every element listed in the graphic organizer.)

**Concept:** What concepts are central to understanding the story? What do we understand about these concepts?

**Point of View:** What point of view is the story told from?

**Inferences:** What inferences might be made about the ending of the story based on specific events?

**Purpose:** What is the purpose of the story?

**Implications:** What are the implications of character behavior at this point in the story?

**Issue:** What is the central issue in this story?

**Assumptions:** What assumptions does the author make about \_\_\_\_?

**Data/Evidence:** What evidence is presented that the central character is motivated by a given emotion?

## Research Model

The research model provides students a way to approach an issue of significance and work it through individually and in small groups. Its organization follows major elements of reasoning.

**1. Identify your issue or problem.**

What is the issue or problem?

Who are the stakeholders and what are their positions?

What is your position on this issue?

**2. Read about your issue and identify points of view or arguments through information sources.**

What are my print sources?

What are my media sources?

What are my people sources?

What are my preliminary findings based on a review of existing sources?

**3. Form a set of questions that can be answered by a specific set of data. Examples:**

What would the results be of \_\_\_\_\_?

Who would benefit and by how much?

Who would be harmed and by how much?

What other questions do I have?

**4. Gather evidence through research techniques such as surveys, interviews, or experiments.**

What survey questions should I ask?

What interview questions should I ask?

What experiments should I do?

**5. Manipulate and transform data so that they can be interpreted.**

How can I summarize what I found out?

Should I develop charts, diagrams, or graphs to represent my data?

**6. Draw conclusions and inferences.**

How can I interpret what I found out?

What conclusions and inferences can be drawn from my results?

**7. Determine implications and consequences.**

What are the implications and consequences of my results in light of the initial problem?

Do I know enough or are there now new questions to be answered?

**8. Communicate Results**

Have I used Sections 1–7 above to organize a written report?

Have I used Sections 1–7 above to organize an oral presentation?

## Choosing a Research Topic: Characteristics of an Issue

**Real world.** An issue is a controversy or problem that people are discussing or should be discussing. It is ambiguous with no clear-cut or easy solutions. As new information is obtained, the problem changes.

**Multiple points of view.** Different people or groups have different perspectives or points of view about an issue. Depending on how the issue is resolved, various groups and individuals (called stakeholders) stand to win or lose tangible things such as income and recreational areas or intangible things such as solitude and freedom of speech.

**Researchable with substantial information available.** Remember that to develop a convincing argument, you will need multiple sources of information and data. Important issues and real-world problems are informed by historical and contemporary information sources and by the collection and analysis of a variety of data.

**Worthy topic and personal involvement.** Research offers the opportunity to ask questions about things that matter. While asking questions and seeking solutions, you have the chance to consider the arguments of others and to contribute your personal perspective and original thinking. When you care about an issue, you will be willing to spend time digging for evidence, taking a stand, developing an argument, and proposing a resolution to the problem.

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## Socratic Seminar Model

A Socratic seminar is a discussion/question format in which a small group of students synthesize their thoughts and opinions on a particular reading selection using the Socratic method. Several elements are essential for a Socratic seminar:

1. **Substantive Reading Selection.** The text for the Socratic seminar may be a reading selection within any content area. The selection should be rich in ideas, issues, and values to allow students to question the text and their own thoughts as they prepare for the discussion. All participants must read the material in advance and come prepared to participate.
2. **Important Question.** The students' reading of the text and/or opening discussion is guided by an important question that has no right or wrong answer. The question should guide students to portions of the text to support their thinking as they speculate, evaluate, define, and clarify the issues.
3. **Active Participants.** Participants share the responsibility for the quality of the seminar. Preparation for the discussion is the responsibility of each participant. A circle arrangement is useful as it allows for eye contact. (Students who are not prepared should excuse themselves from the discussion and remove themselves from the primary circle. They should only observe and take notes on the inner group's discussion.)

During the seminar, participants engage in active listening, share their ideas and questions in response to the ideas and questions of others, and search for evidence in the text to support their ideas. The seminar requires rigorous attention to careful reading, thinking, listening, and speaking and should conclude with all participants having a greater understanding of the issue or reading.

The key to Socratic seminar is the open and free discussion of a topic. Participants should use agreed-upon guidelines for discussion. Generally the teacher acts as facilitator only and does not give any response, negative or positive, to the students' discussion. The facilitator's sole responsibility is to ask well-thought-out, open-ended questions that generate discussion.

Wiggins & McTighe (1998) offers the following as essentials for questions in a Socratic seminar:

- They point to the heart of the subject or topic, especially their controversies.
- They generate multiple plausible answers, perspectives, and research directions—leading to other questions.
- They cast old knowledge, ideas, texts in a new light; they make the familiar strange and the strange familiar.
- They lead to discovery and “uncoverage,” as opposed to “coverage.”
- They engender further and deepening interest in the subject.
- They are provocative, enticing, and engagingly framed.

## **Section Summary**

Each of these models provides a framework for instruction and supports students' thinking and learning in the content areas. Models may be used in any setting for gifted services. All students in the classroom could benefit from use of the models. Gifted learners will find in the models opportunities for advanced content, in-depth experiences, and problem solving critical to their growth.

When students experience the use of the models, they begin to develop facility with critical thinking and creative thinking skills. Exposure to the models over time enables students to become more effective and sophisticated users. Each model can be used in multiple content areas and, to some degree, at all grade levels. Students deepen their thinking when they are comfortable with a model and can use it as a familiar tool in various content areas.

## Glossary

**Ability Grouping** - Placing students with similar ability or achievement levels in the same class or group for purposes of instruction.

**Acceleration** - Faster presentation of content to more closely match a student's learning pace, or placement in a higher grade above a student's chronological age.

**Active Learning** - Any approach that engages learners by matching instruction to the learner's interests, understanding, and developmental level. It often includes hands-on and authentic activities.

**Advanced Placement (AP)** - A cooperative educational program between secondary schools and colleges and universities that offers highly motivated high school students the opportunity to take college-level courses at their high schools. Courses are taught by a teacher or via independent study following AP curriculum guides. The program is administered by the College Board, a national nonprofit membership association.

**Affective Education** - Education that focuses on consideration of emotions, personal interactions, and self-concept in order to maximize self-awareness.

**Apprenticeships** - Situations in which students work in the workplace under the guidance of mentors or tutors who take responsibility for their professional development and training.

**Aptitude** - An inherent ability, as for learning; a talent.

**Asynchronous Development** - Differing rates of physical, cognitive, and/or emotional development.

**Authentic Assessment** - Assessments in the classroom that cover the material actually taught.

**Authentic Instruction** - Instruction that focuses on higher-order thinking, depth of knowledge, real-world applications, and social interactions.

**Broad-Based Reading** - Activity in which teachers provide students with additional reading material in a content area to reinforce the concepts covered. Materials may be at a higher readability index.

**Cluster Groups** - Small numbers of gifted students (commonly 3 to 6) grouped in the regular classroom, allowing the teacher to differentiate learning activities for a group rather than for one or two students.

**Collaboration** - Students working together on teams, each bringing their own strengths to work toward resolution of a problem or understanding of a topic.

**Compacting** - Situation in which students who have demonstrated mastery of skills/concepts by pre-testing work on alternate assignments or move on to the next unit/level on content within that class/subject area to avoid repetition of material already mastered.

**Computer-Assisted Instruction (CAI)** - Instruction in which students learn at their own pace with interactive computer programs.

**Concept Mapping** - A graphic organizer showing concepts and the relationships between them. Words or pictures indicate concepts. Lines are then drawn between them to show relationships. Labels indicate how the concepts are related.

**Concurrent Enrollment** - See **Dual Enrollment**.

**Continuous Progress** - Situation in which students advance at their own academic rate, progressing through curriculum according to ability and readiness rather than grade level.

**Convergent Thinking** - Focusing on one particular answer rather than multiple possible answers.

**Cooperative Learning Model** - An approach in which students share knowledge with peers through a variety of structures that allow them to explore positive group dynamics and the power of teamwork.

**Core Curriculum** - The general education content, skills, and information considered essential for every student to learn. The term is sometimes used interchangeably with *interdisciplinary*, *integrated*, or *fused curriculum*.

**Critical Thinking** - The development of logical, unbiased patterns of thinking. “Critical thinking is best understood as the ability of thinkers to take charge of their own thinking. This requires that they develop sound criteria and standards for analyzing and assessing their own thinking and routinely use those criteria and standards to improve its quality.” (Elder & Paul, 1994)

**Cross-Age Grouping** — The assignment of students to instructional groups based upon their achievement in a particular subject rather than their grade-level placement. See also **Multi-Age Grouping**.

**Deductive Thinking** - Identifying specific examples from a general rule or idea. Instruction in this area focuses on presentation of a generalization or concept, discussion of its elements, student exploration of the elements, and generation of specific examples.

**Didactic Instruction** - Teacher-centered instruction used for the delivery of factual information.

**Differentiation** - Making allowances within the classroom and developing lessons for different levels of learning and learning styles by adjusting presentation methods and outcomes/activities.

As defined in 1976 by the U.S. Office of Education, differentiated instruction includes but is not limited to the following:

1. A curriculum embodying a high level of cognitive and affective concepts and processes beyond those normally provided in the regular curriculum of the local educational agency;
2. Instructional strategies which accommodate the unique learning styles of the gifted and talented; and
3. Flexible administrative arrangements for instruction both in and out of school, such as special classes, seminars, resource rooms, independent study, student internships, mentorships, research field trips, library media research centers, and other appropriate arrangements.

**Direct Instruction** - Teacher-centered instruction that includes lecture, presentation, and recitation.

**Distance Learning** - A type of learning defined by the United States Distance Learning Association as “. . . the acquisition of knowledge and skills through mediated information and instruction. Distance learning encompasses all technologies and supports the pursuit of lifelong learning for all. Distance learning is used in all areas of education including pre-K through grade 12, higher education, home school education, continuing education, corporate training, military and government training, and telemedicine.”

**Divergent Thinking** - Thinking that results in multiple novel, unique, or creative solutions or answers.

**Dual Enrollment** - Policy that allows students at any grade level to take classes at the next school level while remaining in their original level for other classes. For example, elementary school students may take junior high classes; junior high students may take high school classes. A high school student might be excused for part of the day to take one or more courses on a college campus. The earned college credits may be used at the particular college to place the student in advanced standing when he or she actually is admitted.

**E-learning** - Instruction that uses technology, including online classes, Internet research, and other technological means of relaying and extending classroom concepts.

**Enrichment** - Broader coverage of content or subjects not usually covered in the regular grade-level curriculum. Gowan and Demos (1964) suggest that successful enrichment programs encourage students to search for new information, take part in leadership opportunities, actively pursue personal interests, engage in creative assignments, develop personal initiative, and participate in in-depth activities.

**Extension** - Deeper coverage of content or subjects.

**Facilitative Questioning** -An approach that allows the teacher or counselor to give assistance to students without contributing new ideas to the discussion. Open-ended questions are posed that allow students to explore ideas that may be complex or emotionally difficult. This strategy is used most often in situations in which there is no right answer but the solution depends on what is best for the individual.

**Flexible Pacing** - Any program option that places students at their appropriate instructional levels, creating a good match between instruction and readiness for learning. Flexible pacing allows students to move forward in the curriculum as they demonstrate mastery of content and skills. Flexible pacing may be achieved through a variety of methods.

**Gifted Resource Teacher** - A teacher whose primary goal is to ensure that the needs of identified students are met. The gifted resource teacher provides assistance in differentiated instruction to teachers who work with gifted students on a daily basis. Classroom teachers may request assistance within the classroom as new strategies are being implemented. Co-teaching activities may include demonstration lessons in higher-level thinking skills or using literature circles to implement tiered assignments. Gifted resource teachers may work with clusters of gifted students to extend and accelerate their curriculum in order to meet the students' individual needs. They may assist in various staff development activities within the school and facilitate parent and community awareness.

**Gifted Review Committee (GRC)** - Committee that reviews referred students for eligibility for a gifted program. Various data/information are used to determine if a student needs more than what is provided in the regular classroom.

**Graphic Organizer** - Visual frameworks to help the learner make connections between concepts or ideas. Graphic organizers may be used before instruction as a pre-activity, during instruction as a cue, and after instruction as review.

**Guided Discovery** - A teaching model that allows students to learn through explorations with directions from the teacher.

**Heterogeneous Grouping** - A grouping strategy often used in programs or activities in which students can learn from others even though they have wide ranges of ability and achievement.

**Higher-Level Thinking** - Abstract reasoning, critical thinking, and problem-solving abilities. Instruction emphasizes activities that require analysis, synthesis, and evaluation; encourage the study of situations from various perspectives; allow students to seek deeper understanding by using metaphors, analogies, paradoxes; and promote the discovery of many possible solutions to a problem through fluency, flexibility, originality, and elaboration of thought.

**Homogeneous Grouping** - A grouping strategy based on student ability, readiness, skills, and interests. It allows students to work with cognitive or ability peers. Examples of use include special education, gifted education, and competitive performing groups.

**Honors Classes** - Advanced DoDEA classes offered in ELA and Social Studies at the high school level only.

**Independent Study** - A form of self-directed education often based on interest. The teacher or a mentor can act as a facilitator who guides the student to appropriate resources and ways to summarize learning.

**Inductive Thinking** - Using specific, known information to construct broad general principles; proceeding from facts to the “big picture.”

**Inference** - A thinking skill that requires drawing conclusions based on prior knowledge.

**Integrated Curriculum** - Combination of content from two or more subjects to enhance meaning through interconnectedness of knowledge.

**Interactive Learning** - A strategy whereby students work together to communicate and share learned concepts. The student becomes a facilitator of his/her own learning. Also, a reciprocal exchange between technology and the learner, often referred to as “feedback.” At more sophisticated levels, an interplay and exchange in which individuals and groups influence each other person-to-person, person-to-group, and person-to-system. Examples are e-mail, listservers, bulletin boards, Web chats, telecommunication, or other technology resources that allow two-way exchanges of information.

**Interdisciplinary Course** - Instruction that combines subject matter usually taught separately into a multidisciplinary study with a unifying structure or theme.

**International Baccalaureate (IB)** - A secondary school programming option similar to Advanced Placement. The program consists of a two-year structure of courses and an international set of exams. IB prescribes the organization of the curriculum and requires mastery of certain approaches in each of the courses to be examined.

**Invention** - An open-ended problem-solving task; the process of creating something original to fill an identified need.

**Investigation** - Identifying what is known about a topic. Definitional investigations answer “What are?” questions, historical investigations answer “How?” or “Why?” questions, and projective investigations answer “What if?” questions.

**Leadership Activities** - Participation in clubs and organizations, performing duties for the school or community, or serving as a tutor or mentor.

**Mastery Learning** - An approach in which objectives for learning are established and communicated to students, and students then progress at their own speed and continue to work until their performance indicates they have mastered each set of objectives.

**Mentorship** - A program that provides an opportunity for students to work one-on-one with a teacher, parent, or community volunteer in an area of expertise or interest.

**Mini-Courses** - Short-term, high-interest courses often used in an exploratory program. Mini-courses are centered on a particular activity or topic. Examples include computers, rocketry, journalism, and video production.

**Multi-Age Grouping** - An approach in which students from more than one grade or age level are placed in the same class to facilitate continuous progress. This practice is based on research indicating that many factors may be overlooked when grouping is based solely on students' chronological age. See also **Cross-Age Grouping**.

**Multimedia** - The presentation of information using a computer and text-based, audio, and visual components.

**Outcomes-Based Education** - Teaching focused on students demonstrating a specific level of mastery.

**Pacing** - The speed at which content is presented and instruction delivered. Pacing that matches the student's rate of learning is optimal. Because gifted students are usually able to learn faster, they often prefer accelerated pacing.

**Performance Assessment** - The direct, systematic observation and rating of an actual student performance. In this type of assessment, students are asked to perform a complex performance task or to create a product. They are assessed on both the process and the end result of their work.

**Portfolio** - A collection of student work that demonstrates achievement for purposes of assessment.

**Problem-Based Learning (PBL)** - A learning model characterized by student-centered, small-group activities based on finding solutions to authentic problems. Teachers are facilitators and guides, not instructors. Problems form the focus for learning and are a vehicle for the development of problem-solving skills. Information is acquired through self-directed learning as students plan strategies, engage in research, and gather data to help them pose solutions.

**Pull-out Programming** - A program whereby gifted students leave their regular classes two or three hours per week to participate in special extension activities guided by the gifted education resource teacher or district coordinator/teacher.

**Reader's Theater** - An activity in which students adapt some of their reading to present to other students in the form of a play. These productions can be simple or elaborate and may include posters, programs, sets, and costumes.

**Reflection** - A metacognitive activity in which the learner pauses to think about, and organizes, information gathered from reading, discussions, or other activities.

**Risk Taker** - One who is not afraid of failure, is willing to take chances in order to learn new things. An important goal of many gifted programs is to provide opportunities for risk taking such as leadership activities, creative problem-solving programs, performances, and artistic presentations.

**Role-Play** - A strategy that lets children explore social-emotional issues that concern them. The teacher develops a scenario, and possible roles are discussed with the class. Students volunteer for roles, which allow them to safely offer opinions and work through their feelings and attitudes. Debriefing children after a role-play experience allows students to analyze the many sides of a topic and helps focus learning.

**Rubric** - A guideline or matrix used for rating performance that specifies characteristics on a continuum from novice to proficient performance. A rubric provides those who have been assessed with clear information about how well they performed and indicates what they need to accomplish in the future to improve. Rubrics vary depending upon their function. Holistic rubrics provide a general assessment of a performance, whereas task-specific rubrics provide feedback on specific tasks.

**Scaffolding** - A strategy that builds on students' existing knowledge to provide temporary support for new learning. Examples are explanations, organizers, concept maps, peer tutors.

**SCAMPER** - Creativity technique that reminds students to try many creative variations on an idea. SCAMPER = Substitute, Combine, Adapt, Modify (Magnify/Minify), Put to another use, Eliminate, Reverse/Rearrange.

**Self-Esteem** - A feeling about one's self-worth or self-concept. When gifted children lack confidence in their own abilities, no amount of outside motivation will turn them into high achievers. Students with high self-esteem believe in themselves.

**Service Delivery Options** - Programs and educational opportunities chosen by each school based on the needs of the students. Each school chooses which options will best serve its population.

**Socratic Method** - An instructional model that focuses on dialog and discussion to explore logic, meaning, and truth.

**Telescope** - To cover the same amount of materials or activities in less time, therefore allowing more time for extension activities and projects better suited to individual interests and needs.

**Thematic Instruction** - The organization of a curriculum around larger ideas and themes. Thematic instruction seeks to put the content areas in the context of a real-world subject that are broad enough to allow for creative exploration.

**Tiered Assignments** - Progressive assignments that are increased so that each lesson builds on skills/concepts previously learned to reinforce specific content knowledge while expanding broad-based knowledge.

**Tutoring** - One-on-one approach to teaching or reteaching concepts. This may be done by teachers, peers (other students), or professional tutors.

**Underachievement** - A significant difference between ability and performance. A gifted underachiever is often defined as having superior ability and/or strong potential yet works below grade level.

**Within-Class Regrouping** - An approach in which students are grouped together within a class for one or more subject areas based on their readiness, mastery of subject matter, or learning needs.

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