Concept based learning

AISA/IB

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Andrea Mwalula

Teacher Training Workshop

Run by

AISA in cooperation with IBO

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Mission Statement

The International Baccalaureate Organization aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.

To this end the IBO works with schools, governments and international organizations to develop challenging programmes of international education and rigorous assessment.

These programmes encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right.

November 2002

La Déclaration de Mission de L’IBO L’Organisation du Baccalauréat International (IBO) a pour but de développer chez les jeunes la curiosité intellectuelle, les connaissances et la sensibilité nécessaires pour contribuer à bâtir un monde meilleur et plus paisible, dans un esprit d’entente mutuelle et de respect interculturel.

À cette fin, l’IBO collabore avec des établissements scolaires, des gouvernements et des organisations internationales pour mettre au point des programmes d’éducation internationale stimulants et des méthodes d’évaluation rigoureuses.

Ces programmes encouragent les élèves de tout pays à apprendre activement tout au long de leur vie, à être empreints de compassion, et à comprendre que les autres, en étant différents, puissent aussi être dans le vrai.

Novembre 2002

Declaración de Principos de IBO

La Organización del Bachillerato Internacional tiene como meta formar jóvenes solidarios, informados y ávidos de conocimiento, capaces de contribuir a crear un mundo mejor y más pacífico, en el marco del entendimiento mutuo y el respeto intercultural.

En pos de este objetivo, la Organización del Bachillerato Internacional colabora con establecimientos escolares, gobiernos y organizaciones internacionales para crear y desarrollar programas de educación internacional exigentes y métodos de evaluación rigurosos.

Estos programas alientan a estudiantes del mundo entero a adoptar una actitud activa de aprendizaje durante toda su vida, a ser compasivos y a entender que otras personas, con sus diferencias, también pueden estar en lo cierto.

Noviembre 2002

**International Baccalaureate**

**Primary Years Programme**

**Category 3Q: Concept based learning**

**in the PYP**

**Supplementary Workbook**

**Provided by: Andrea Mwalula**

|  |  |
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**International Baccalaureate Primary Years Programme**

**Category 3:Concept Based Learning in the PYP**

***Workshop Objectives***

***This workshop is for administrators, coordinators and teachers who:***

 have been working with the programme for at least one school year

 have previously attending a PYP workshop (regional or in-school) facilitated by IB PYP workshop leaders organized by or through the regional office

***The purpose of this workshop is to develop the following understandings:***

The purpose of this workshop is to explore IB standards and practices under C3 pertaining to concept based learning.

 Concepts are integral to the inquiry process and one of the essential elements of the PYP.

 A concept driven curriculum promotes meaning and understanding and challenges

students to engage authentically with significant ideas.

 It challenges the memorization of isolated facts and the mastery of skills out of context.

 The exploration and re-exploration of concepts lead students towards an appreciation of ideas that transcend disciplinary boundaries as well as towards the

essence of each subject area.

 In addition to the key concepts, each discipline has powerful related concepts that also support inquiry.

 The IB scope and sequence documents are written as conceptual understandings to provide a platform for knowledge and skills development – concepts before

content.

 Concept based teaching and learning offers a solution to the ‘crowded curriculum‘ by linking students‘ interests to essential understandings that are transferable across disciplines.

 The concepts are explicit at all stages of curriculum planning, in the central idea, the lines of inquiry, provocations to inquire and assessment.

 Concepts presented as questions are a manageable and open- ended research tool.

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**Notable Quotations for Inquiring Minds**



―A concept is an organizing idea; a mental construct that is:

 Timeless

 Universal

 Abstract

 Represented by 1 or 2

words

 Examples share common attributes

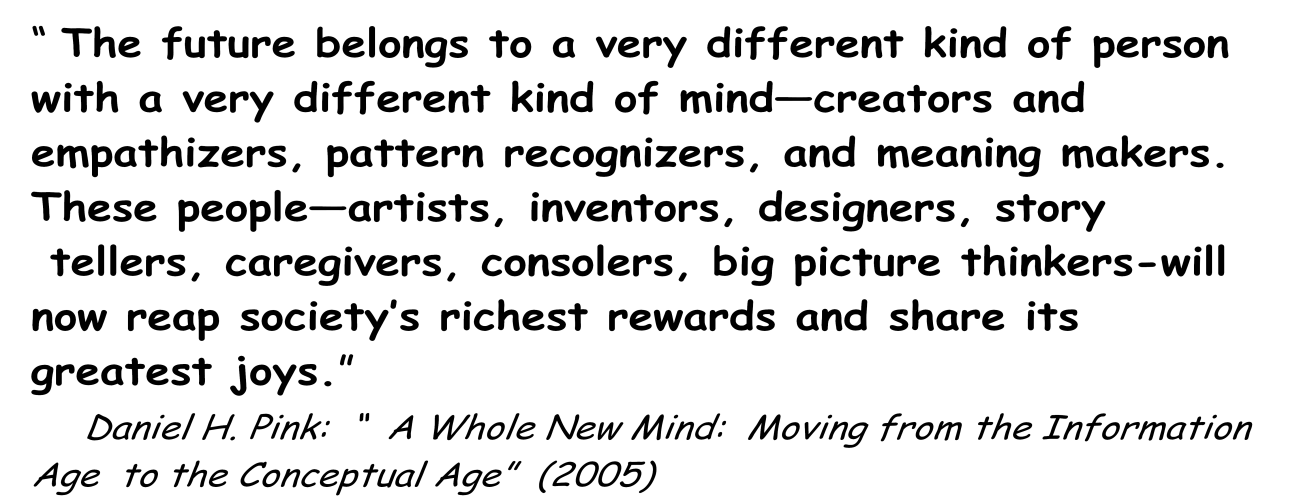
Erickson, H. L.

―In his teaching the wise man guides his students but does not pull them along; He urges them forward and does not suppress them;

He opens the way but does not take them to the place;

If his students are encouraged to think for themselves we may call the man a good teacher.

(Confucius, circa 500BC)



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**Concept Based Curriculum**

**An excerpt from the forward written by Carol Ann Tomlinson regarding Concept Based**

**Curriculum & Instruction by H. Lynn Erickson (2002).**

In a captivating story about a young girl at the turn of the 20th century, Dorothy Canfield Fisher (1917/1999) sees learning through the eyes of a child. The main character in *Understood Betsy* has, in all her three school years, been a ―good‖ student. That is, she learned what she was told and gave it back accurately when questioned. In a magical moment in her third-grade year, Betsy has an encounter with another kind of learning.

On her first day at an aunt‘s house in the country, Betsy wakes, disoriented and apprehensive

about her unfamiliar surroundings. Her aunt wisely understands the need to help the little girl

―own‖ what happens around her, so she asks Betsy to help with churning the day‘s supply of butter. As Betsy turns the paddle in the big churn, her aunt talks about the women who have turned the paddle before her – a parade of women who represent both change and stability in the world. As her aunt talks, she helps Betsy measure out ingredients with precision. ―She weighed out the salt needed on the scales, and was very much surpised to see that there is such thing as an ounce. She had never met it before outdside the pages of her history book and she didn‘t know it lived anywhere else‖ (pp. 57- 58). The work is laced with the aunt‘s stories about the churn. Once again, Betsy is caught short.

Now for a moment, she stood staring up at Aunt Abigail‘s face, and yet not seeing her at all because she was thinking so hard… Why, there were real people living with the Declaration of Independence was signed – real people, not just history people… To tell the honest truth, although she had passed a very good examination in the little book on American history they had studied in school, Betsy had never to that moment had any notion that there ever had been really and truly any Declaration of Independence at all. It had been like the ounce, living only inside her schoolbooks for little girls to be examined about. And now Aunt Abigail, talking about a butter pat, had brought it to life. (pp. 59-

60)

Educators have known for more than a hundred years what Aunt Abigail knew a hundred years ago. Facts devoid of meaning are stillborn. When we deliver information to students without breathing life into it, we have done no more than throw sand in their faces.

Now, close to a century later, Phil Schlechty (1997) reminds us again. ―Students are not products. They are people with motives, wills, capacities, needs to be satisfied, desires, longings. They are not clay to be molded or widgets on an assembly line, though sometimes

they must feel as though they are‖ (p.58). He calls us again to the one immutable job of schools:

―The business of schools is to produce work that engages students, that is so compelling that

students persist when they experience difficulties, and that is so challenging that students have a sense of accomplishment, of satisfaction – indeed, of delight, when they successfully accomplish

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the tasks assigned‖ (p. 58). The job of the teacher is, as it has always been, to make learning so compelling that young people find it more satisfying to learn that to attend to any one of a score of competing possibilities.

So what does it mean to develop curriculum that compels the young mind? Once again, we know the answers to that question. They are not new, although our depth of knowledge about them is richer and fuller than in the past. Among the characteristics of such curriculum are the following:

 It consistently fuels in-depth student understanding by guiding students in making sense of their worlds.

 It helps students organize and retain the important ideas and skills in a discipline; it provides coherence to bodies of knowledge.

 It moves beyond information to thought and to thinking about one‘s own though

processes.

 It actively involves students as doers and problem solvers.

 It calls on students to use what they learn in ways that demonstrate the efficacy of the ideas and skills.

 It is designed to support transfer of learning.

 It results in students‘ learning those things recognized by experts in a discipline, adult members of the community, and the society as having enduring value (see, e.g. National Reserch Council, 1999; Schlechty, 1997)

 It is attached to the lives and cultures of learners and to the world beyond the classroom door.

 It attracts students.

 It is based on the principles of knoweldge that support experts in problem solving and knowledge production in a discipline.



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***21st Century Learners MUST consider Social Change***

***Forces impacting education***

 Expanding role of technology

 Changing job demands

 Increasing global interdependence

 Changing social norms and values

 Worldwide competition and markets

 Rapid growth of knowledge

 Ecological concerns



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**Two Dimensional vs. Three Dimensional Curriculum**

**(source: Lynn Erickson (2005) www.lynnerickson.net)**

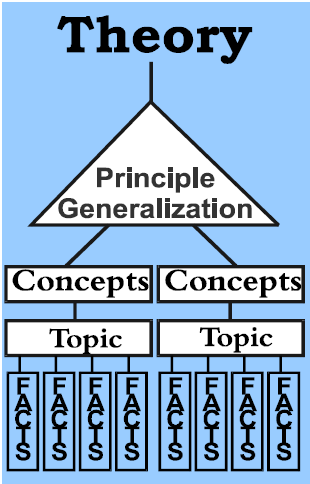
|  |  |
| --- | --- |
| **Two Dimensional Curriculum Model – *Topic Based*** | **Three Dimensional Curriculum Model – *Concept Based*** |
|  |  |
| **Coverage-centered**  ―inch deep, mile wide‖ | **Idea-centered**   Facts provide a foundation to understand conceptual, transferable ideas |
| **Intellectually shallow**   Lacks a conceptual focus to create factual/conceptual brain synergy | **Intellectual depth**   A ―conceptual lens‖ or focus, requires mental processing on the factual and conceptual levels – producing intellectual depth in thinking and understanding |
| **Inability to transfer factual knowledge**   Facts do not transfer; locked in time, place or situation | **Concepts and Generalizations Transfer**   Allows the brain to make connections and see patterns |
| **Fails to meet the intellectual demands of the**  **21st Century** | **Develops the intellect to handle a world of**  **increasing complexity and accelerating change.** |

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**The Structure of Knowledge**

Source: Lynn Erickson. (2002). Concept-Based Curriculum and Instruction: Teaching Beyond the

Facts. Corwin Press: Thousand Oaks, CA.



Theory: A conceptual idea that is yet to be proven.

Principle: A form of generalization, but is a truth that holds consistently through time.

Generalization: Connection/relatedness of two or more concepts.

Concept: An organizing idea, represented by one or two words. Examples have common attributes.

Topic: A category of study with a body of related facts to be learned.

Fact: A statement of truth.

|  |  |
| --- | --- |
| **Level** | **Example** |
| ***Theory*** | Migration is a psychologically-driven response to meet an internal need. |
| ***Principle/***  ***Generalization*** | People migrate to meet a variety of needs. Migration may lead to new  opportunities or greater freedom. |
| ***Concept*** |  Migration   Needs   Opportunity   Freedom |
| ***Topic*** | Westward Movement |
| ***Fact*** | Early American settlers migrated west. Early American settlers looked for  new opportunities. |

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**Key Points of Structure of Knowledge**

 Knowledge has an *inherent* structure from topics and facts, framed by concepts, which combine to form generalizations, principles, and theories.

 Traditional, two-dimensional curriculum/instruction models focus more on the topic and fact levels and *assume* an understanding of related concepts and principles.

 Concept-based, three-dimensional curriculum/instruction models raise the intellectual bar by teaching to ideas (generalizations/principles) and by using the topics and facts as foundational support for the deeper understandings.

 Topics and facts do not transfer. They are locked in time, place, or situation.

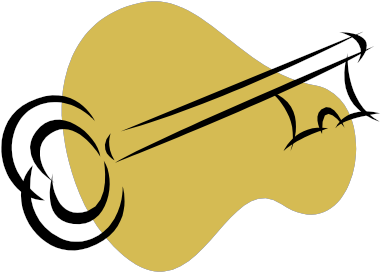
 Concepts and Generalizations transfer through time, across cultures, and across situations.

 The concepts, generalizations, and principles add the third intellectual dimension to curriculum and instruction.

 There is a Theory Level, but we need to focus our work on the Concepts, Generalization Levels at this time.

 (A Theory is an idea supported by the best evidence available, but not yet fully proven.)

Source: Lynn Erickson, Brain Presentation Summer 2005



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**Scaffolding Thinking to Complex Levels**

**Social Studies Example**



**Level 3: Traditions help to unify a people.**

**Level 2: *So what- is the significance or effect?* Celebrations express traditions of a culture.**

**Level 1: *Why do cultures have celebrations?***

**All cultures have celebrations.**

**Evaluating Scaffolding Criteria**

 Do the ideas grow in sophistication?

 Do the ideas become clearer from level to level because they are more specific (use more specific concepts)?

 Did the writers answer their question at each level?

 Are the verbs active and present tense?

 Are the ideas based in fact? Are they true?

 Are the ideas important?

 Are the ideas developmentally appropriate for students?

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**Clarifying Content Priorities**

**Worth being familiar with**

Knowledge and skills that are worth being familiar with:





**Important to know & do**

Knowledge and skills which are important to know and do:





**Enduring**

**Understandings**

Knowledge and skills essential to achieving enduring understandings:









Source: Derived from Wiggins & McTighe’s *Clarifying Content*

*Priorities* figure 3.3, Understanding by Design (2005)

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**Topic-Based and Concept-Based Curricular Designs**

|  |  |
| --- | --- |
| **Topic-Based Curricular Designs** | **Concept-Based Curricular Designs** |
| Facts and activities center around a specific  topic of study, such as the Industrial  Revolution. | Facts and activities center around a specific  topic of study, but a conceptual lens forces thinking to higher levels as students consider  ―transferable ideas from questions‖ that derive  from the topic of study. |
| Topic-based objectives drive instruction. | Essential questions thar are drawn from both  the topic and generalizable levels of knowledge drive instruction. |
| Curriculum is focused on learning and thinking  about specific facts. | Curriculum is focused on using specific facts  to understand transferable concepts and ideas. |
| Content categories and topics provide the  curricular structure for Grades K – 12. | Discipline-based concepts structure the  categories and topics of curriculum for Grades  K – 12. |
| Instructional activities focus on specific topics  and facts. | Instructional activities focus on specific topics  and facts in order to generalize understanding beyond the facts to the conceptual level. |
| Instructional activities call on a variety of  discrete skills. | Instructional activities call on complex  performances using a variety of skills. |
| Curriculum is topic centered. | Curriculum is idea centered. |

Source: Erickson, L. (2002). Concept-Based Curriculum and Instruction: Teaching Beyond the Facts.

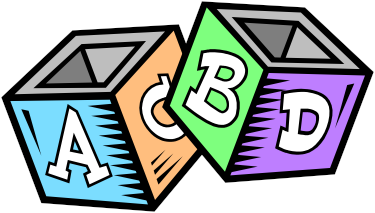
Chart 5.6 Topic-Based and Concept-Based Curricular Designs



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5 Things that Concept-Based Curriculum & Instruction Does

A ***Aligns*** curriculum, instruction and assessment



E ***Emphasizes*** and identifies what students should KNOW, UNDERSTAND and DO

I ***Identifies*** concepts in curriculum, rather than just facts

O ***Organizes*** the concepts/content into instructional units/lessons that contexutalize the standards

U ***Unites*** ―big ideas‖ for deeper understanding

(source: Public Schools of North Carolina, NCCTm Mathematics Conference, Oct 29 [http://math.ncwiseowl.org/UserFiles/Servers/Server\_4507209/File/NCCTM%20](http://math.ncwiseowl.org/UserFiles/Servers/Server_4507209/File/NCCTM)

2009/CFair.Creating%20a%20Concept-Based%20Unit.ppt.pdf)

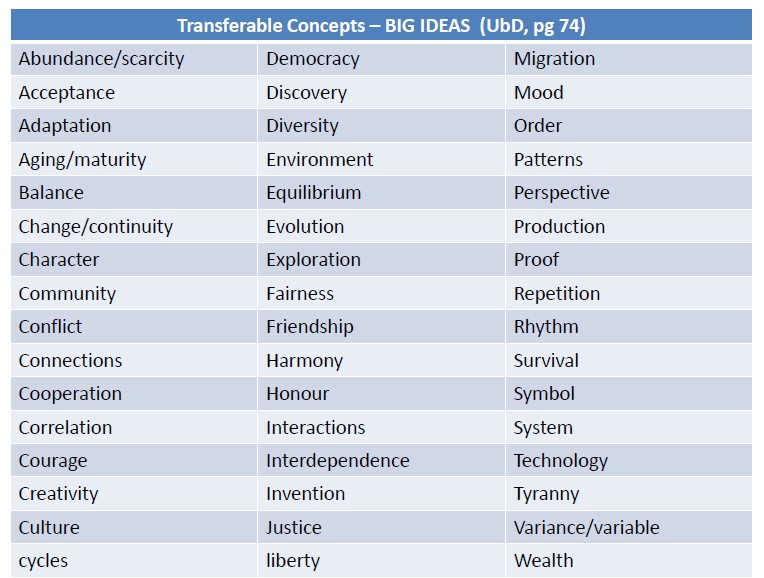
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***Subject Area Concepts***



**source: Lynn Erickson (2002)**

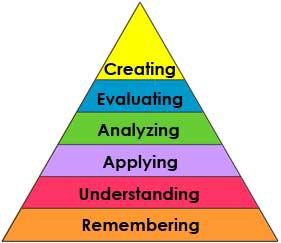
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**Recalling Bloom’s Taxonomy for Student Engagements**

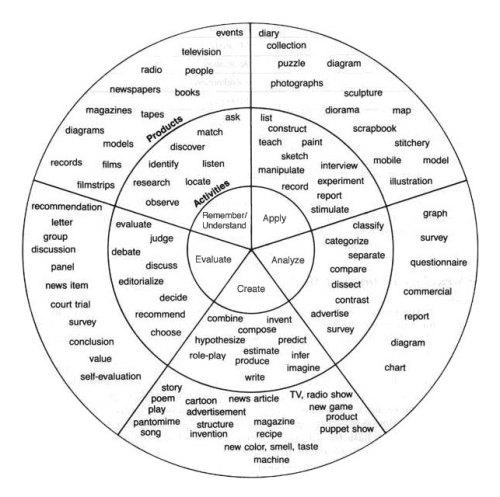
|  |  |  |
| --- | --- | --- |
| **Students will KNOW (topical, factual knowledge)** | **Students will UNDERSTAND (the conceptual, transferable understandings of the discipline** | **Students will be ABLE TO DO (the specific processes and skills of the discipline)** |
| Students **will know** the life cycle stages of a butterfly  **NO** VERB LEAD-IN | Students **will understand** that life cycles ensure the continuation of a species  **NO** VERB LEAD-IN | The students **will be able to** create models and diagrams that represent natural objects or events  VERB LEAD-IN **NEEDED** |



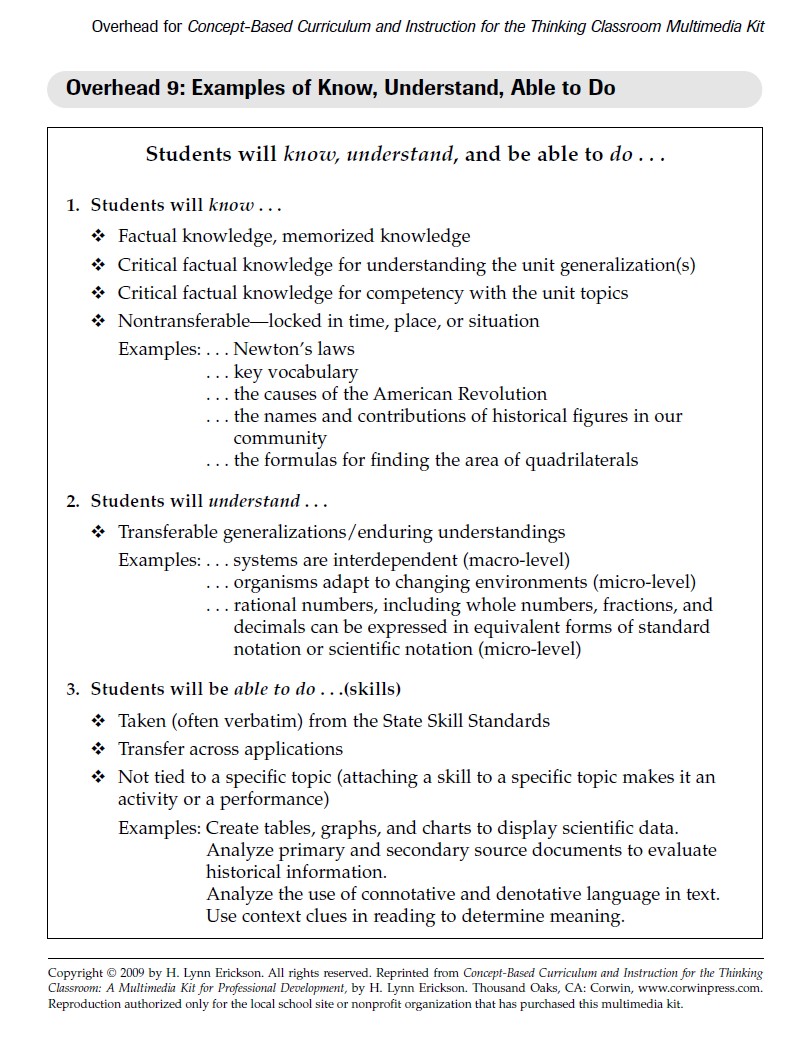
[**http://www.odu.edu/educ/roverbau/Bloom/blooms\_taxonomy.htm**](http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm)

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***Product Wheel***



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**Types of Teaching**

|  |  |
| --- | --- |
| ***What the teacher uses*** | ***What the students need to do*** |
| **Didactic or direct instruction**   Demonstration or modeling   Lecture   Questions (convergent) | **Receive, take in, respond**   Observe, attempt, practice, refine   Listen, watch, take notes, question   Answer, give responses |
| **Facilitative or Constructivist methods**   Concept attainment   Cooperative learning   Discussion   Experimental inquiry   Graphic representation   Guided inquiry   Problem-based learning   Questions (open-ended)   Reciprocal teaching   Simulation (eg. Mock trial)   Socratic seminar   Writing process | **Construct, examine, and extend meaning**   Compare, induce, define, generalize   Collaborate, support others, teach   Listen, question, consider, explain   Hypothesize, gather data, analyze   Visualize, connect, map relationship   Question, research, conclude, support   Pose or define problems, solve, evaluate   Answer and explain, reflect, rethink   Clarify, question, predict, teache   Examine, consider, challenge, debate   Consider, explain, challenge, justify   Brainstorm, organize, draft, revise |
| Coaching   Feedback and coaching   Guided practice | Refine skills, deepen understandings   Listen, consider, practice, retry, refine   Revise, reflect, refine, recycle through |

Source: Wiggins, Grant & McTighe, Jay. (2005) Understanding by Design, Figure 10.2, pg. 241

**Content of Teaching**

|  |  |
| --- | --- |
| **Column A** | **Column B** |
|  Facts   Discrete knowledge   Definitions   Obvious information   Literal information   Concrete information   Self-evident information   Predictable result   Discrete skills & techniques   Rules & recipes   Algorithm |  Concepts & principles   Systemic connections   Connotations   Subtlety, irony   Symbolism   Abstraction   Counterintuitive information   Anomaly   Strategy (using repertoire & judgement)   Invention of rules & recipes   Heuristic |

Source: Wiggins, Grant & McTighe, Jay. (2005) Understanding by Design, Figure 10.3, pg. 244

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**Central Ideas**

**Central Ideas** are the enduring understandings, the big ideas, the answer to the ―so what?‖ of a particular study.

**Conceptual understanding** requires content knowledge, but the reverse is not

true. Students knowing the science or social studies standards does not necessarily signify their deeper understanding of concepts and principles.

Central ideas are NOT topical – they are conceptual.

It is NOT about Transportation – it is about movement and/or the wheel. It is NOT about Oregon Trail or Trail of Tears – it is about migration.

It is NOT about the structure of Parliament – it is about governance.

It is NOT about the food pyramid – it is about nutritional needs changing over time.



**Continuum of Central Ideas**

The Chinese immigrants who came to San

Francisco in the 1800‘s established the *hui kuan.*

Chinese immigrants in the United States established various forms of social organizations.

All groups that have immigrated to the United

States have established social organizations.

In human societies, forms of social organizations emerge to satisfy the needs of individuals and groups.

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**Writing Generalizations**

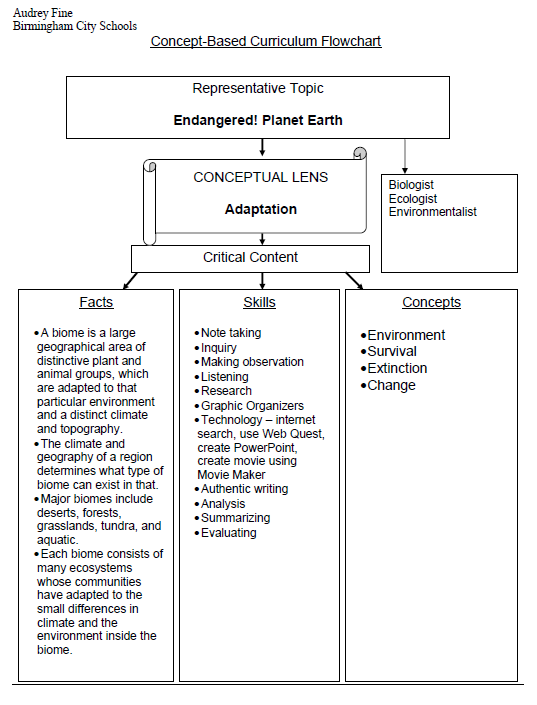
**Generalization:**

**Conceptual Lens:**

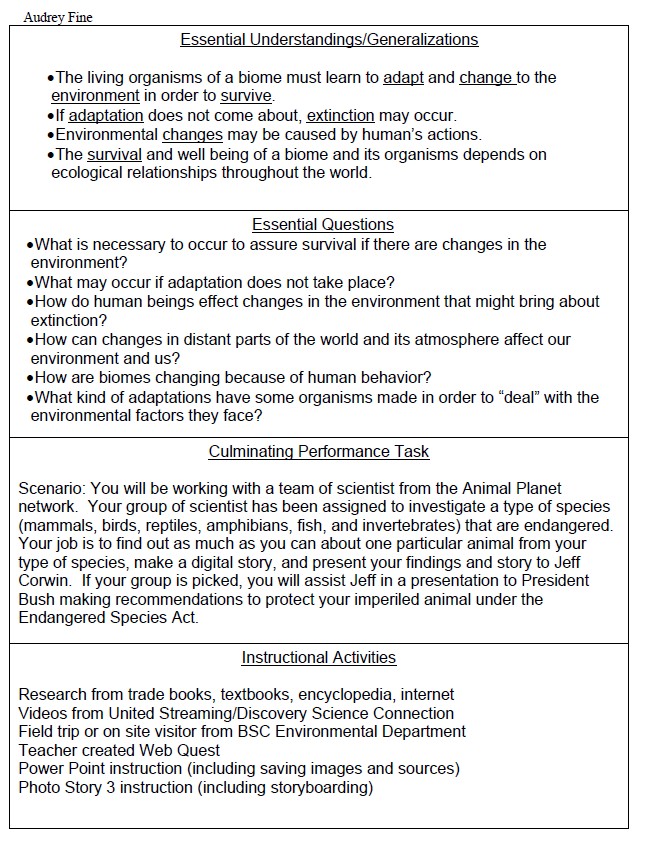
|  |  |  |  |
| --- | --- | --- | --- |
| **Checklist** | **Self** | **Peer** | **Group** |
| Is the generalization supported by topic/factual content? |  |  |  |
| Does the generalization contain at least two connecting  concepts? |  |  |  |
| Is the generalization connected to content and concepts in  the unit? |  |  |  |
| Is the generalization clear? |  |  |  |
| Is the verb tense present? |  |  |  |
| Does the generalization avoid the use of pronouns, proper  nouns, and personal nouns? |  |  |  |
| Does the generalization use an active verb choice? |  |  |  |
| Does the generalization avoid opinions or judgements? |  |  |  |
| Does the generalization require a qualifier? (may, can,  often) |  |  |  |
| Is the generalization timeless, universal, transferable, and  worth understanding? |  |  |  |

Created by Maxine Bone, Amy McClellan, and Melissa Koop based on the work of H. Lynn Erickson (2010)

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**Design Process for Deep Understanding**

**Understanding of Curricula:**

Uncovering “What Matters” about and beyond the curriculum, unit or topic:

 Deconstructing, interpreting & connecting curriculum learning outcomes-

o What is important and worth knowing and doing through examining the curriculum?

 Defining Understanding –

o What transfers “beyond” the content knowledge of the curriculum and the

classroom?

o What is not obvious and requires uncoverage?

 Establishing Student Engagement –

o Why would you and your students care about the lesson/activity?

o What provokes and sustains the learning?

 Identifying Inquiry Questions-

o What questions become the climate of your classroom and guide the learning within each and every lesson?

o What questions have no obvious “right” answers and raise other questions?

o What questions help to focus the learning?

**Evidence of learning:**

Designing learning that counts as evidence of understanding and “ongoing” assessment that

measures understanding-

 Designing and connecting lessons/activities for knowledge building -

o What lessons/activities will build upon, connect and help to deepen the understandings of the curriculum?

 Designing and connecting performance tasks -

o What final products/performance tasks will invite students to demonstrate their deep understandings of curricular outcomes.

 Designing and connecting ongoing Assessment for Learning -

o What targets, rubrics, checklists, exemplars etc. will guide the learning and facilitate descriptive feedback for learning and teaching?

**Infusing Technology:**

Identifying and choosing appropriate technology for the purpose of:

 Enhancing the building of knowledge-

o What technologies enhance the building of knowledge?

 Enabling sharing -

o What technologies enable sharing of knowledge within and outside of the classroom?

 Enabling collaboration -

o What technologies enable collaboration in the building of knowledge within and outside of the classroom?

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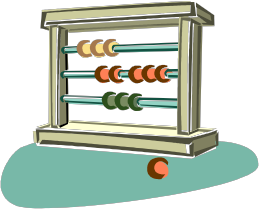
***How can a teacher promote deep understanding?***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Dimension* | *Level 1*  *Procedural*  *Focus* | *Level 2* | *Level 3* | *Level 4*  *Teaching for Deep Understanding* |
| Teacher‘s Role | Teacher is the  sole knowledge expert. Student roles focus on tasks which require minimal cognitive effort. | Although the  teacher is the sole knowledge expert, some student expertise is acknowledged. Students are assigned roles with the teacher being central to the activities. | The teacher  shares the knowledge expertise role  with the students. More teacher- directed tasks are provided for students with lower abilities, and more student centered  activities are provided for higher ability students. | The teacher is  co-learner with the students. The teacher and the entire student body are responsible for building a math community. The teacher ensures that each student is an integral part of the learning process. |

Source: Leithwood, McAdie, BAscia & Rodrigue. (2006). Teaching for Deep Understanding. Table 5.1, pg. 35

**Implications for Teaching**

Teaching for deep understanding in mathematics = Rich talk about rich tasks:



1. There is a program scope.

2. Students have access to all forms of mathematics.

3. Teachers strive to raise student self-confidence.

4. Student tasks are complex, open-ended.

5. Instruction focuses on the construction of mathematical ideas through student discovery.

6. Teacher‘s role is that of a co-learner or co-creator.

7. Mathematical problems are undertaken with the aid of manipulatives.

8. The classroom is organized so that students work together to develop and share solutions.

9. Assessment is authentic.

10. Teacher‘s conception of mathematics is that of a dynamic subject.

Source: Leithwood, McAdie, BAscia & Rodrigue. (2006). Teaching for Deep Understanding. Pg. 37

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**Designing for Student Engagement and Authentic Intellectual Work**

***Tasks, Activities and Evidence of Learning***

**Topic:**

**Evidence of Learning**

o What evidence of student learning will you gather along the way? In what ways might you document the learning of the students as they progress through this study? How might this help to guide the next steps in your students’ learning? Design assessment strategies to enable students to acquire the knowledge and competencies that have been set for them. (mutiple feedback loops)

**Task possibilities – Design learning experiences that really lead somewhere.**

o Which major ideas need to be developed, explored or investigated?

o What authentic work could students participate in?

o What could students produce that would have social, personal or aesthetic significance?

o What could students create to demonstrate deep understanding of fundamental ideas, issues or

problems?

o Where could this work go?

o Who might be potential audiences?

**Technology Possibilities – how will technology be used to support student learning?**

o Could technology be used to communicate ideas in more compelling ways? (documentaries, pod- casts, simulations, online debates)

o Can we take advantage of communication technologies to connect with others outside of the classroom? (online discussions, blogs, pod-casts)

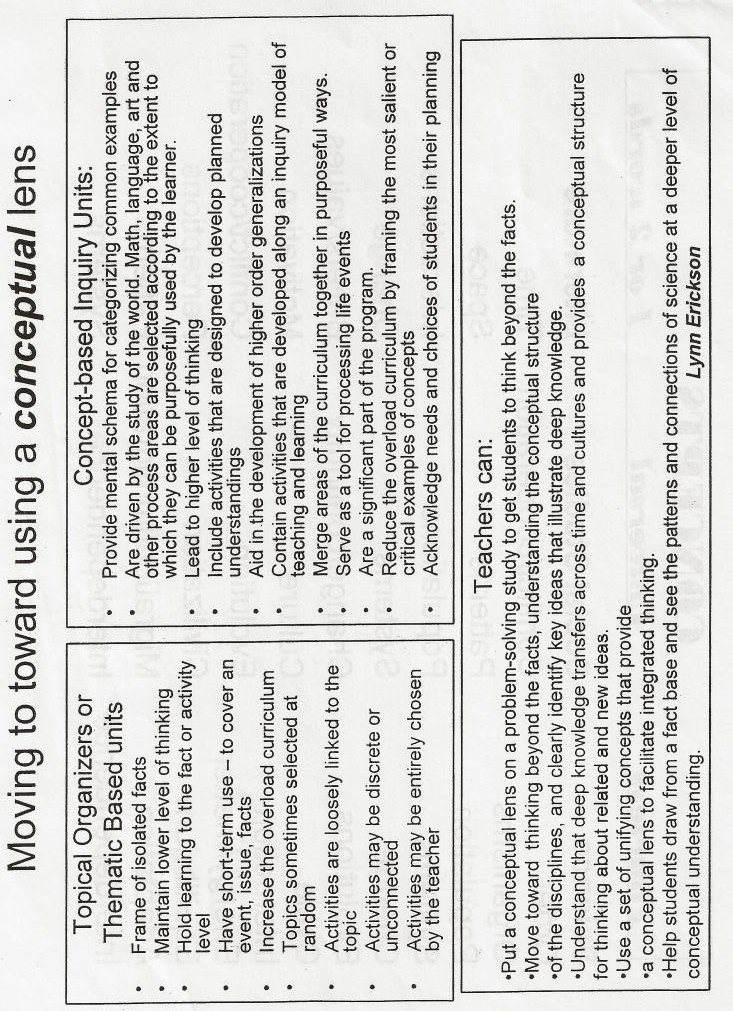
o What opportunities are available for communicating with experts or connecting with expertise online?

o Are there global databases, networks or other online places where students could collaborate with others to produce products that have personal, social and/or aesthetic significance?

o How could technology be used to document or assess student learning?

Source: Adapted from Galileo Educational Network, 2007

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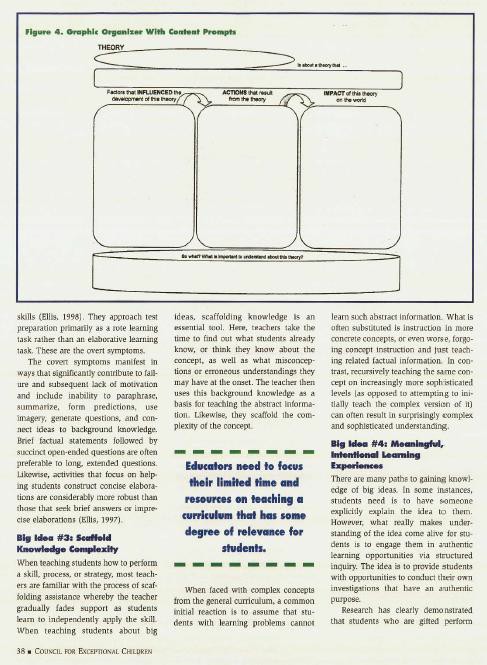
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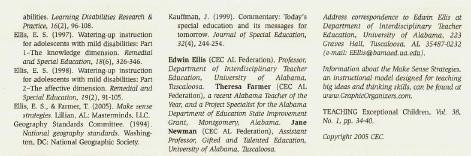
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<http://mildpdf.com/search-teaching-big-ideas.html>

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**What is a Big Idea? by Grant Wiggins Jun 10, 2010**

Source: <http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=99>

Nobody can be a good reasoner unless by constant practice he has realized the importance of getting hold of the big ideas and of hanging onto them like grim death.

– A. N. Whitehead, 1929

**What is a “big idea”?**

An idea is ―big‖ if it helps us make sense of lots of confusing experiences and seemingly isolated facts. It‘s like the picture that connects the dots or a simple rule of thumb in a complex field. For example: ―the water cycle‖ is a big idea for connecting seemingly discrete and one-way events (the water seems to just disappear as it evaporates). ―The heroic cycle‖ enables us to comprehend literature from many places, cultures, and times. ―Measure twice, cut once‖ is a profound reminder about how to avoid heartache and inefficiency in building anything.

A big idea is thus a way of seeing better and working smarter, not just a vague notion or another piece of knowledge. It is more like a lens for looking than another object seen; more like a theme than the details of a narrative; more like an active strategy in your favorite sport or reading than a specific skill. It is a theory, not a detail.

If an idea is ―big‖ it helps us make sense of things. So, an idea is not ―big‖ merely because it categorizes a lot of content. ―Change,‖ ―relationships,‖ and ―number system‖ certainly encompass an enormous amount of knowledge and understanding, but these concepts don‘t contain much insight or direction beyond their definition. They aren‘t particularly powerful or illuminating on their own as concepts. On the other hand, ―For every action there is an equal reaction‖ is a powerful idea about change: we can use it to study, organize, make sense of phenomena, and predict changes in motion. So, too, is the idea that ―blood is thicker than water‖

powerful for understanding many relationships in societies and throughout history – and, perhaps for understanding a few puzzling decisions made by our family members!

A genuine idea is thus not a ―mere‖ idea. It is not abstract in the bad sense, it is concrete; it is a *useful* theory; it has real impact. For example, consider a detective trying to make sense of many puzzling clues whose meaning and relationship are unclear. Any theory as to ―whodunit‖ will relate to motive. A good detective has some big ideas about motive to bring meaning to what might otherwise seem like odd, isolated, and unique little facts to the rest of us. The ―big idea‖ (whether it is ―Look for love triangles‖ or ―Follow the money‖) is thus quite practical: it helps distinguish clues from unimportant facts, and shows the way toward more facts - and a persuasive

narrative.

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Similarly, in literacy or history teaching, the important ―themes‖ are big ideas. Why? Because – if used properly – they provide learners with mental schemas or templates that help make sense of

all the details of texts that threaten to overwhelm inexperienced readers. If I am alerted to ―the

heroic quest,‖ or ―the American Dream‖ I can read and think with more control and insight.

In science, the most illuminating hypotheses are the big ideas of science. So, the idea that we are all part of a ―food chain‖ of living and nonliving things is big because it links seemingly different (and isolated) animals and plant matter into a bigger comprehensible ―ecosystem‖ of energy exchange. We then see the role of predators, garbage, and our relationship to nature in a completely new and helpful way than before. Newton‘s laws of motion are three of the biggest ideas ever posed: suddenly, thousands of seemingly unrelated facts and phenomena – spoons dropping, the tides, the moon‘s orbit – had not only a meaningful explanation but could be seen

as part of a huge coherent system with endless predictive and connective power.

In short: think of ―big‖ as ―powerful‖ not as a large abstract category.

**A powerful idea vs. a mere abstraction**

John Dewey – as we might expect – articulated the notion of a useful idea long ago. He often

wrote to describe the difference between a ―genuine‖ idea and an idea treated as a ―fact‖:

Ideas are not then genuine ideas unless they are tools in a reflective examination which tends to solve a problem. Suppose it is a question of having the pupil grasp the idea of the sphericity of the earth. This is different from teaching him its sphericity as a fact. He may be shown (or

reminded of) a ball or a globe, and be told that the earth is round like those things; he may then be made to repeat that statement day after day till the shape of the earth and the shape of the ball are welded together in his mind. But he has not thereby acquired any idea of the earth's sphericity; at most, he has had a certain image of a sphere and has finally managed to image the earth after the analogy of his ball image. To grasp sphericity as an idea, the pupil must first have realized certain perplexities or confusing features in observed facts and have had the idea of spherical shape suggested to him as a possible way of accounting for the phenomena in question. Only by use as a method of interpreting data so as to give them fuller meaning does sphericity become a genuine idea. There may be a vivid image and no idea; or there may be a fleeting, obscure image and yet

an idea, if that image performs the function of instigating and directing the observation and

relation of facts.

- John Dewey (1910) – *How We Think*. Emphasis added.

So, we musn‘t equate ―big idea‖ with a concept taught as a fact or definition. Only when we help the learner see firsthand that an idea is an inference, and one with power to provide meaning and

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transfer, does it become a ―big idea.‖

The difference between a vital idea with power and a lifeless scientific notion was beautifully clarified by Nobel Physicist Richard Feynmann in discussing science instruction:

There is a first grade science book which, in the first lesson of the first grade, begins in an unfortunate manner to teach science, because it starts off with the wrong idea of what science is. There is a picture of a dog--a windable toy dog--and a hand comes to the winder, and then the dog is able to move. Under the last picture, it says "What makes it move?" Later on, there is a picture of a real dog and the question, "What makes it move?" Then there is a picture of a motorbike and the question, "What makes it move?" and so on.

I thought at first they were getting ready to tell what science was going to be about--physics, biology, chemistry--but that wasn't it. The answer was in the teacher's edition of the book: the answer I was trying to learn is that "energy makes it move."

That‘s only the definition of energy; it should be reversed. We might say when something can move that it has energy in it, but not what makes it move is energy. This is a very subtle [but important] difference.

Perhaps I can make the difference a little clearer this way: If you ask a child what makes the toy dog move, you should think about what an ordinary human being would answer. The answer is that you wound up the spring; it tries to unwind and pushes the gear around.

What a good way to begin a science course! Take apart the toy; see how it works. See the cleverness of the gears; see the ratchets. Learn something about the toy, the way the toy is put together, the ingenuity of people devising the ratchets and other things. [Otherwise,] suppose a student would say, "I don't think energy makes it move." Where does the discussion go from there?

I finally figured out a way to test whether you have taught an idea or you have only taught a definition.

Test it this way: you say, "Without using the new word which you have just learned, try to rephrase what you have just learned in your own language." Without using the word "energy," tell me what you know now about the dog's motion." You cannot. So you learned nothing about science.

In short, if the word is just a technical term rather than a vital approach, it isn‘t a big idea.

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**Covering facts vs. uncovering understandings: avoiding the temptation to treat all scientific ideas as facts.**

But teachers often unwittingly conflate terms with ideas. In their desire to make teaching more efficient, they often treat the theory or strategy as a fact related to a definition, as in Feynmann‘s example. They end up turning an insightful inference into a thought-ending word. We pay for this desire to cover things ever more quickly: by treating all ideas as facts to be learned instead of inferences to be validated and analyzed through use, we unwittingly end up inhibiting meaning and transfer. Students end up just trafficking in meaningless words; science gets treated as a foreign language rather than a body of knowledge and understanding.

Let‘s put this issue of efficiency vs. effectiveness in terms of the learner, the novice struggling to understand. After a few days in your room as a new student, I will likely feel overwhelmed with information; I don‘t yet see a pattern or a mental organizer by which I can begin to make sense of all that you are teaching me and that we are reading about. I need a helpful schema, a framework, a touchstone, a guidepost, a strategy for making sense of everything I am learning. In other words, I need a framework for my new content: I need a way to order, categorize and prioritize what I am learning.

Now, suppose we ask: if you could as teacher alert the student to a key recurring idea that can make sense of the learning as well as further it, what would it be? What aphorism, imperative, and/or rules of thumb would permit the student to make more and more sense of their work and how to be successful all year in your course? That‘s what we‘re calling a big idea.

Here are some possible answers, for different subjects and grade levels:

• In history class: verify the source and determine the credibility of the source. Keep asking: Who said it? Why? How credible a statement is it? How credible is the source of the statement?

• In reading: Converse with the author. Assume the text makes sense. You will likely only understand the text if you assume it is meaningful and ask questions of it – if you ‗converse‘ with the author.

• In evolution: keep remembering that the idea that mutations are random and that selection is

―natural‖ means that there is no guiding purpose to life-form change. This is the part of the theory of evolution that is most controversial, not the idea of evolution per se.

• In writing: keep asking – Who is my audience? What is it I want them to see, think, feel, or

do?

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What modern theories of human learning and understanding tell us is that the learner has to be

helped to ―construct‖ understandings, not just be told them. No meaning and no transfer occur if

―useful theory‖ is reduced to fact – even though teaching thereby becomes more efficient. The distinction between ―knowledge‖ and ―understanding‖ (or, if you like, ―facts‖ and ―genuine ideas‖) is not merely semantic. We slowly come to an understanding, as a result of using facts and ideas to make sense of things. (Facts are apprehended, ideas are comprehended, in Dewey‘s original formulation). ―Teaching‖ an understanding is as counter-productive as ―teaching‖ someone to be honest. Learners have to see the power of honesty and the unforeseen consequences of dishonesty before they can truly commit to honesty as a value.

The real harm of stressing that ideas are merely words, phrases, and statements with technical meaning (instead of the power they represent) is that such teaching tends to end thought rather than further it. Rather, a big idea is alive. We develop understanding by extending and challenging understanding. A big idea reaches out, it pushes against boundaries, it asks us to possibly rethink other things we thought we knew. It raises questions and problems - and thus, generates new ideas. We see new connections and we initiate inquiries to validate or critique the idea. A big idea activates thought and permits transfer – and, thus creativity. ―Coverage‖ of an idea, by contrast, kills it: our job is not to think with ideas but just learn stuff. The best teaching does the opposite. It brings seemingly inert content to life. And in science it reminds us that today‘s Big Idea is potentially tomorrow‘s discredited notion. This is key to empowering the student: there will always be room for new ideas in any authentic teaching of science as fallible theorizing.

The article Jay McTighe and I recently wrote for *Educational Leadership* called 'Put Understanding First' makes the point in a different way: both teachers and students need to understand that there are three different educational goals always at play: Acquisition, meaning- making, and transfer or prior learning. Here is a brief excerpt from the article (which was in the May 2008 issue, on High School Reform):

To better explain what curriculum needs to be, we think it is helpful to distinguish what are in fact three different yet interrelated academic goals of high school -- students should be helped to: 1) acquire important information and skills, 2) make meaning of that content (i.e., come to understand important ideas), and 3) transfer their learning to new situations, effectively. In this

paper, we will refer to these three key learning goals as A-M-T. Acquisition is a means; meaning making and transfer are the ends.

The categories should seem intuitively sound. A fact is a fact; a skill is a skill. We acquire each in turn. To ask, however: What do these facts imply? Or: When would I use this skill (or not)? is to ask what those facts and skills mean. A third question can also be asked: How should I apply my

prior facts, skills, and ideas effectively in this particular situation? This question is about transfer.

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I must take what I have previously acquired and understood, and see how it can best be used in a particular and novel situation. Thus, when we speak of ―learning for understanding,‖ we really are referring to two different long-term aims: meaning making and transfer, utilizing previously acquired knowledge and skills – our short-term goal.

While such a classification scheme is not new or radical (see Dewey, 1933 ; Bloom, 1956 ; Marzano, et. al. 1992 ), the distinctions are real – and critical to intelligent planning, purposeful instruction, and valid assessment. Put simply: if you want understanding and transfer, you have to design backward from it.

Any understanding, essential question, or transfer task is made up of a big idea; it is built out of it, in other words. So, making a question using a big idea turns into an essential question. A food chain is a big idea. ―On what energy do we depend and how can we ensure access to it?‖ is an essential question about that big idea. While it is true that sometimes when asked to name a big idea we frame it instinctively as a question or a statement, sometimes we just express it as a phrase or word.

We first started talking about ―big ideas‖ to help those using the UbD template who did not find it easy to come up with essential questions (and understandings). People were often inappropriately trying to come up with a factual question, such as: "What is a food chain?" So, we would say,

"No, that is a factual question that is answered in the book." We would follow this up by asking them: "So, what‘s the big idea about the fact? What does the idea of 'food chain' help us to see or understand better?‖

Our hope was that this additional step might ease the transition from focusing only on ―content‖

to focusing on learning content for understanding. Alas, some people heard the phrase differently: they thought the phrase ―big idea‖ was synonymous with ―understanding‖ Or ―question.‖ Others, who had no trouble coming up with questions and understandings, then wondered if they had somehow missed something by not also coming up with big ideas. So, they would ask: ―Why is there no box in the template for big ideas?‖

"Big idea" doesn‘t have its own template box because many boxes in the template should refer directly or indirectly to big ideas. If I say ―audience and purpose‖ that‘s a phrase representing a big idea in writing and reading. If I ask: ―What is my purpose and who is my audience?‖ I am acknowledging the importance of that idea and framing it as an essential question. If I say ―Great writing, like great art, is a function of utter clarity about purpose and audience,‖ then I am proposing a specific understanding about that idea. If I ask you to write the same piece for two different audiences, I am asking you to transfer your grasp of the idea in writing. (Note, therefore, that we both may agree on the importance of ―audience and purpose‖ as an idea but propose different ―understandings‖ about it.)

So, what makes an idea *big*? An idea is *big* if it helps us make sense of lots of otherwise meaningless, isolated, inert, or confusing facts. A big idea is a way of usefully seeing connections, not just another piece of knowledge. It is more like a lens for better looking than

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something additionally seen; more like a theme than the facts of the story.

In the language of UbD, a *big idea* is a powerful intellectual tool, from which we can derive more specific and helpful understandings and facts.

*A true idea doesn’t end thought, it activates it.* It has the power to raise questions and generate learning. So, build your unit around one idea with power, an idea that helps learners make sense

of otherwise isolated content and which cannot help but bring inquiry to the fore.



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**The Educated Person by Ernest L. Boyer**

As we anticipate a new century, I am drawn back to questions that have, for generations, perplexed educators and philosophers and parents. What is an educated person? What should schools be teaching to students?

In searching for answers to these questions, we must consider first not the curriculum, but the human condition. And we must reflect especially on two essential realities of life. First, each person is unique. In defining goals, it is crucial for educators to affirm the special characteristics of each student. We

must create in schools a climate in which students are empowered, and we must find ways in the nation's classrooms to celebrate the potential of each child. But beyond the diversity of individuals, educators also must acknowledge a second reality: the deeply rooted characteristics that bind together the human community. We must show students that people around the world share a great many experiences. Attention to both these aspects of our existence is critical to any discussion of what all children should learn.

What, then, does it mean to be an educated person? It means developing one's own aptitudes and interests and discovering the diversity that makes us each unique. And it means becoming permanently empowered with language proficiency, general knowledge, social confidence, and moral awareness in order to be economically and civically successful. But becoming well educated also means discovering the connectedness of things. Educators must help students see relationships across the disciplines and learn that education is a communal act, one that affirms not only individualism, but community. And for

these goals to be accomplished, we need a new curriculum framework that is both comprehensive and coherent, one that can encompass existing subjects and integrate fragmented content while relating the curriculum to the realities of life. This curriculum must address the uniqueness of students' histories and

experiences, but it also must guide them to understand the many ways that humans are connected.

Some schools and teachers are aiming to fully educate students, but most of us have a very long way to go in reaching this goal. Today, almost all students in U.S. schools still complete

Carnegie units in exchange for a diploma. The time has come to bury the old Carnegie unit; since the Foundation I now head

created this unit of academic measure nearly a century ago, I feel authorized to declare it obsolete. Why? Because it has helped turn schooling into an exercise in trivial pursuit. Students get academic "credit," but they fail to gain a coherent view of what they study. Education is measured by seat time, not time for learning. While curious young children still ask why things are, many older children ask only, "Will this be on the test?" All students should be encouraged to ask "Why?" because "Why?" is the question that leads students to connections.

In abandoning the Carnegie unit, I do not endorse the immediate adoption of national assessment programs; indeed, I think we must postpone such programs until we are much clearer about what

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students should be learning. The goal, again, is not only to help students become well informed and prepared for lifelong learning, but also to help them put learning into the larger context of discovering the connectedness of things. Barbara McClintock, the 1983 winner of the Nobel Prize for Physiology–Medicine, asserts: "Everything is one. There is no way to draw a line between things." Contrary to McClintock's vision, the average school or college catalog dramatizes the separate academic boxes.

Frank Press, president of the National Academy of Sciences, compares scientists to artists, evoking the magnificent double helix, which broke the genetic code. He said the double helix is not only rational, but beautiful.

Similarly, when scientists and technicians watch the countdown to a space launch, they don't say, "Our formulas worked again." They respond, "Beautiful!" instinctively reaching for the aesthetic term to praise a technological achievement. When physicist Victor Weisskopf was asked, "What gives you hope in troubled times?" he replied, "Mozart and quantum mechanics." Most schools, however, separate science and art, discouraging students from seeing the connections between them.

How, then, can we help students see relationships and patterns and gain understanding beyond the separate academic subjects? How can we rethink the curriculum and use the disciplines to illuminate larger, more integrated ends?

Human Commonalities

In the 1981 book A Quest for Common Learning, I suggested that we might organize the curriculum not on the basis of disciplines or departments, but on the basis of "core commonalities." By core commonalities, I mean universal experiences that make us human, experiences shared y all cultures on the

planet. During the past decade and a half, my thinking about this thematic structure has continued to evolve. I now envision eight commonalities that bind us to one another.

I. The Life Cycle.

As life's most fundamental truth, we share, first, the experience that connects birth, growth, and death. This life cycle binds each of us to the others, and I find it sad that so many students go through life without reflecting on the mystery of their own existence. Many complete twelve or sixteen years of

formal schooling not considering the sacredness of their own bodies, not learning to sustain wellness, not pondering the imperative of death.

In reshaping the curriculum to help students see connections, I would position study of "The Life Cycle" at the core of common learning. Attention would go to nutrition, health, and all aspects of wellness. For a project, each student would undertake the care of some life form.

My wife is a certified nurse-midwife who delivers babies, including seven grandchildren of our own. Kay feels special pain when delivering the baby of a teenage girl because she knows that

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she is delivering one child into the arms of another, and that both have all too often lived for nine months on soda and

potato chips. Some young mothers first learn about the birth process between the sharp pains of labor.

Too many young women and young men pass through our process of education without learning about their own bodies. Out of ignorance, they suffer poor nutrition, addiction, and violence. "Maintaining children's good health is a shared responsibility of parents, schools, and the community at large," according to former Secretary of Education William Bennett (1986, p. 37). He urges elementary schools "to provide children with the knowledge, habits, and attitudes that will equip them for a fit and healthy life."

Study of the Life Cycle would encourage students to reflect sensitively on the mystery of birth and growth and death, to learn about body functions and thus understand the role of choice in wellness, to carry some of their emotional and intellectual learning into their relations with others, and to observe,

understand, and respect a variety of life forms.

II. Language.

Each life on the planet turns to symbols to express feelings and ideas. After a first breath, we make sounds as a way of reaching out to others, connecting with them. We develop a variety of languages: the language of words (written and spoken), the language of symbols (mathematics, codes, sign systems),

and the language of the arts (aesthetic expressions in language, music, paint, sculpture, dance, theater, craft, and so on). A quality education develops proficiency in the written and the spoken word, as well as a useful knowledge of mathematical symbol systems and an understanding that the arts provide

countless ways to express ourselves.

Our sophisticated use of language sets human beings apart from all other forms of life. Through the created words and symbols and arts, we connect to one another. Consider the miracle of any moment. One person vibrates his or her vocal cords. Molecules shoot in the direction of listeners. They hit the

tympanic membrane; signals go scurrying up the eighth cranial nerve. From that series of events, the listener feels a response deep in the cerebrum that approximates the images in the mind of the speaker. Because of its power and scope, language is the means by which all other subjects are pursued.

The responsible use of language demands both accuracy and honesty, so students studying "Language" must also learn to consider the ethics of communication. Students live in a world where obscenities abound. They live in a world where politicians use sixty-second sound bites to destroy integrity.

They live in a world where cliches substitute for reason. To make their way in this world, students must learn to distinguish between deceit and authenticity in language.

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Writers and mathematicians have left a long and distinguished legacy for students to learn from. Through words, each child can express something personal. Through symbols, each child can increase the capacity to calculate and reason. Through the arts, each child can express a thought or a feeling. People need to write with clarity, read with comprehension, speak effectively, listen with understanding, compute accurately, and understand the communicative capabilities of the arts. Education for the next century means helping students understand that language in all its forms is a powerful and sacred trust.

III. The Arts.

All people on the planet respond to the aesthetic. Dance, music, painting, sculpture, and architecture are languages understood around the world. "Art represents a social necessity that no nation can neglect without endangering its intellectual existence," said John Ruskin (Rand 1993). We all know how art

can affect us. Salvador Dali's painting The Persistence of Memory communicates its meaning to anyone ever haunted by time passing. The gospel song "Amazing Grace" stirs people from both Appalachia and

Manhattan. "We Shall Overcome," sung in slow and solemn cadence, invokes powerful feelings regardless of the race or economic status of singer or audience.

Archaeologists examine the artifacts of ancient civilization—pottery, cave paintings, and musical instruments—to determine the attainments and quality of a culture. As J. Carter Brown (1986) observes, "The texts of man's achievements are not written exclusively in words. They are written, as well, in

architecture, paintings, sculpture, drawing, photography, and in urban, graphic, landscape, and industrial design."

Young children understand that the arts are language. Before they learn to speak, they respond intuitively to dance, music, and color. The arts also help children who are disabled. I once taught deaf children, who couldn't speak because they couldn't hear. But through painting, sculpture, movement, and rhythm, they found new ways to communicate.

Every child has the urge and capacity to be expressive. It is tragic that for most children the universal language of the arts is suppressed, then destroyed, in the early years of learning, because traditional teaching does not favor self- expression and school boards consider art a frill. This is an ironic deprivation when the role of art in developing critical thinking is becoming

more widely recognized.

Jacques d'Amboise, former principal dancer with the New York City Ballet, movie star, and founder of the National Dance Institute, offers his view on how art fits into education: "I would take the arts, science and sports, or play, and make all education involve all of them. It would be similar to what kindergarten

does, only more sophisticated, right through life. All of the disciplines would be interrelated. You dance to a poem: poetry is meter, meter is time, time is science" (Ames and Peyser 1990).

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For our most moving experiences, we turn to the arts to express feelings and ideas that words cannot convey. The arts are, as one poet has put it, "the language of the angels." To be truly educated means being sensitively responsive to the universal language of art.

IV. Time and Space.

While we are all nonuniform and often seem dramatically different from one another, all of us have the capacity to place ourselves in time and space. We explore our place through geography and astronomy. We explore our sense of time through history.

And yet, how often we squander this truly awesome capacity for exploration, neglecting even our personal roots. Looking back in my own life, my most important mentor was Grandpa Boyer,

who lived to be one hundred. Sixty years before that, Grandpa moved his little family into the slums of Dayton,

Ohio. He then spent the next forty years running a city mission, working for the poor, teaching me more by deed than by word that to be truly human, one must serve. For far too many children, the influence of such intergenerational models has diminished or totally disappeared.

Margaret Mead said that the health of any culture is sustained when three generations are vitally interacting with one another—a "vertical culture" in which the different age groups are connected. Yet in America today we've created a "horizontal culture," with each generation living alone. Infants are in

nurseries, toddlers are in day care, older children are in schools organized by age. College students are isolated on campuses. Adults are in the workplace. And older citizens are in retirement villages, living and dying all alone.

For several years, my own parents chose to live in a retirement village where the average age was eighty. But this village had a day-care center, too, and all the three- and four- year-olds had adopted grandparents to meet with every day. The two generations quickly became friends.

When I called my father, he didn't talk about his aches and pains, he talked about his little friend. And when I visited, I saw that my father, like any proud grandparent, had the child's drawings taped to the wall. As I watched the two of them

together, I was struck by the idea that there is something really special about a four-year-old seeing the difficulty and courage of growing old. And I was struck, too, by watching an eighty- year-old being informed and inspired by the energy and innocence of a child. Exposure to such an age difference surely

increases the understanding of time and personal history.

The time has come to break up the age ghettos. It is time to build intergenerational institutions that bring together the old and young. I'm impressed by the "grandteacher" programs in the schools, for example. In the new core curriculum, with a strand called "Time and Space," students should discover their own roots and complete an oral history. But beyond their own extended family, all students should also become well informed about the influence of the culture that surrounds them and learn about the traditions of

other cultures.

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A truly educated person will see connections by placing his or her life in time and space. In the days ahead, students should study Western civilization to understand our past, and they should study non-Western cultures to understand our present and our future.

V. Groups and Institutions.

All people on the planet belong to groups and institutions that shape their lives. Nearly 150 years ago, Ralph Waldo Emerson observed, "We do not make a world of our own, but rather fall into institutions already made and have to accommodate ourselves to them." Every society organizes itself and carries on its work through social interaction that varies from one culture to another.

Students must be asked to think about the groups of which they are members, how they are shaped by those groups, and how they help to shape them. Students need to learn about the social web of our existence, about family life, about how governments function, about the informal social structures that

surround us. They also must discover how life in groups varies from one culture to another.

Civic responsibility also must be taught. The school itself can be the starting point for this education, serving as a "working model" of a healthy society in microcosm that bears witness to the ideals of community. Within the school, students should feel "enfranchised." Teachers, administrators, and staff

should meet often to find their own relationship to the institution of the school. And students should study groups in their own community, finding out about local government.

One of my sons lives in a Mayan village in the jungle of Belize. When my wife and I visit Craig each year, I'm impressed that Mayans and Americans live and work in very similar ways. The jungle of Manhattan and the one of Belize are separated by a thousand miles and a thousand years, and yet the

Mayans, just like us, have their family units. They have elected leaders, village councils, law enforcement officers, jails, schools, and places to worship. Life there is both different and very much the same. Students in the United States should be introduced to institutions in our own culture and in other cultures, so they might study, for example, both Santa Cruz, California, and Santa Cruz, Belize.

We all belong to many groups. Exploring their history and functions helps students understand the privileges and the responsibilities that belong to each of us.

VI. Work.

We all participate, for much of our lives, in the commonality of work. As Thoreau reminds us, we both "live" and "get a living." Regardless of differences, all people on the planet produce and consume. A quality education will help students understand and prepare for the world of work. Unfortunately, our own culture has become too preoccupied with consuming, too little with the tools for producing. Children may see their parents leave the house carrying briefcases or lunch pails in the morning and see them come

home again in the evening, but do they know what parents actually do during the day?

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Jerome Bruner (1971) asks: "Could it be that in our stratified and segmented society, our students simply do not know about local grocers and their styles, local doctors and their styles, local taxi drivers and theirs, local political activists and theirs? . . . I would urge that we find some way of connecting the

diversity of the society to the phenomenon of school" (p. 7). A new, integrative curriculum for the schools needs to give attention to "Producing and Consuming," with each student studying simple economics, different money systems, vocational studies, career planning, how work varies from one culture to another, and with each completing a work project to gain a respect for craftsmanship.

Several years ago when Kay and I were in China, we were told about a student who had defaced the surface of his desk. As punishment, he spent three days in the factory where the desks were made, helping the woodworkers, observing the effort involved. Not surprisingly, the student never defaced another desk.

When I was Chancellor of the State University of New York, I took my youngest son, then eight, to a cabin in the Berkshires for the weekend. My goal: to build a dock. All day, instead of playing, Stephen sat by the lake, watching me work. As we drove home, he looked pensive.

After several miles, he said, "Daddy, I wish you'd grown up to be a carpenter—instead of you- know-what!"

VII. Natural World.

Though all people are different, we are all connected to the earth in many ways. David, my grandson in Belize, lives these connections as he chases birds, bathes in the river, and watches corn being picked, pounded into tortillas, and heated outdoors. But David's cousins in Boston and Princeton spend more time with appliances, asphalt roadways, and precooked food. For them, discovering connectedness to nature does not come so naturally.

When I was United States Commissioner of Education, Joan Cooney, the brilliant creator of Sesame Street, told me that she and her colleagues at Children's Television Workshop wanted to start a new program on science and technology for junior high school kids. They wanted young people to learn

a little more about their world and what they must understand as part of living. Funds were raised, and 3–2–1 Contact went on the air. To prepare scripts, staff surveyed junior high school kids in New York City, asking questions such as "Where does water come from?"—which brought from some students the disturbing reply, "The faucet." They asked, "Where does light come from?" and heard, "The switch." And they asked, "Where does garbage go?" "Down the chute." These students' sense of connectedness

stopped at the VCR or refrigerator door.

Canadian geneticist David Suzuki, host of The Nature of Things, says: "We ought to be greening the school yard, breaking up the asphalt and concrete. . . . We have to give children hand-held lenses, classroom aquariums and terrariums, lots of field trips, organic garden plots on the school grounds,

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butterfly gardens, trees. Then insects, squirrels—maybe even raccoons and rabbits—will show up, even in the city. We've got to reconnect those kids, and we've got to do it very early. . . . Our challenge is to reconnect children to their natural curiosity" (Baron Estes 1993).

With all our differences, each of us is inextricably connected to the natural world. During their days of formal learning, students should explore this commonality by studying the principles of science, by discovering the shaping power of technology, and, above all, by learning that survival on this planet

means respecting and preserving the earth we share. VIII. Search for Meaning.

Regardless of heritage or tradition, each person searches for some larger purpose. We all seek to give special meaning to our lives. Reinhold Niebuhr said, "Man cannot be whole unless he be committed, he cannot find himself, unless he find a purpose beyond himself." We all need to examine values and

beliefs, and develop convictions. During my study of the American high school, I became convinced ours is less a school problem and more a youth problem. Far too many teenagers feel unwanted, unneeded, and unconnected. Without guidance and direction, they soon lose their sense of purpose—even their sense of wanting purpose.

Great teachers allow their lives to express their values. They are matchless guides as they give the gift of opening truths about themselves to their students. I often think of three or four teachers, out of the many I have worked with, who changed my life. What made them truly great? They were well informed. They could relate their knowledge to students. They created an active, not passive, climate for learning. More than that, they were authentic human beings who taught their subjects and were open enough to teach

about themselves.

Service projects instill values. All students should complete a community service project, working in day-care centers and retirement villages or tutoring other students at school. The North Carolina School of Science and Math develops an ethos of responsible citizenship. To be admitted, a child must

commit to sixty hours of community service per summer and three hours per week during the school year (Beach 1992, p. 56).

Martin Luther King, Jr., preached: "Everyone can be great because everyone can serve." I'm convinced the young people of this country want inspiration from this kind of larger vision, whether they come across it in a book or in person, or whether they find it inside themselves.

Values, Beliefs, and Connections

What, then, does it mean to be an educated person? It means respecting the miracle of life, being empowered in the use of language, and responding sensitively to the aesthetic. Being truly educated means putting learning in historical perspective, understanding groups and institutions, having reverence for the natural world, and affirming the dignity of work. And, above all, being

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an educated person means being guided by values and beliefs and connecting the lessons of the classroom to the realities of life. These are the core competencies that I believe replace the old Carnegie units.

And all of this can be accomplished as schools focus not on seat time, but on students involved in true communities of learning. I realize that remarkable changes must occur for this shift in goals to take place, but I hope deeply that in the century ahead students will be judged not by their performance on a single test but by the quality of their lives. It is my hope that students in the classrooms of tomorrow will be encouraged to create more than conform, and to cooperate more than compete. Each student deserves to see the world clearly and in its entirety and to be inspired by both the beauty and the challenges that surround us all.

Above all, I pray that Julie and David, my granddaughter in Princeton and my grandson in Belize, along with all other children on the planet, will grow to understand that they belong to the same human family, the family that connects us all.

Fifty years ago, Mark Van Doren wrote, "The connectedness of things is what the educator contemplates to the limit of his capacity." The student, he says, who can begin early in life to see things as connected has begun the life of learning. This, it seems to me, is what it means to be an educated person.

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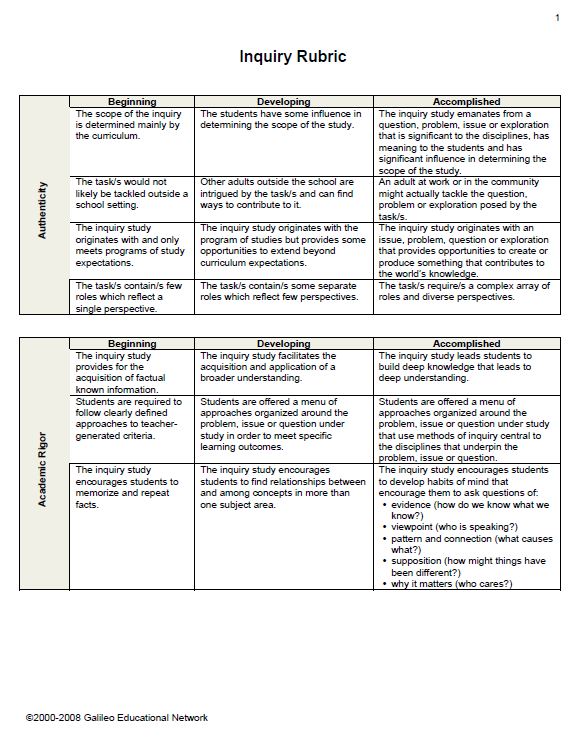
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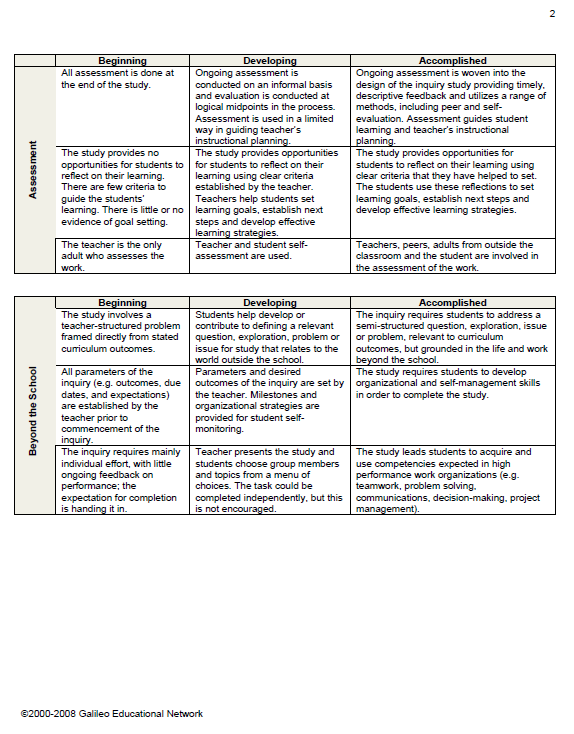
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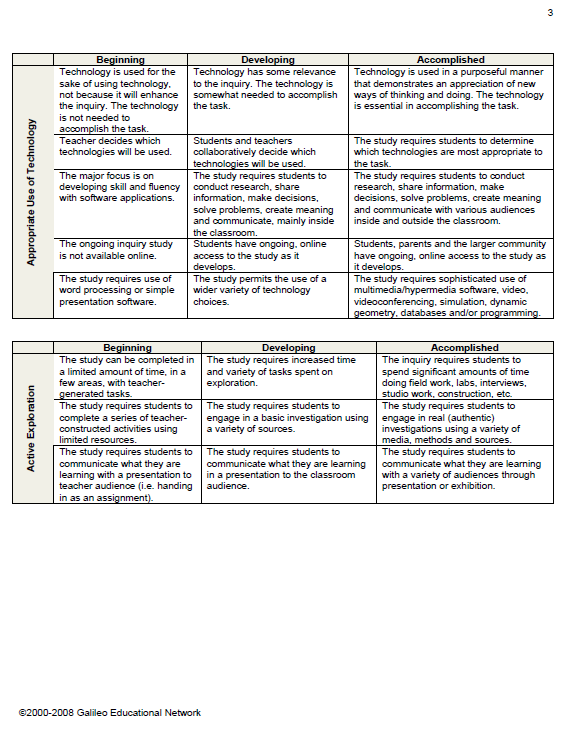
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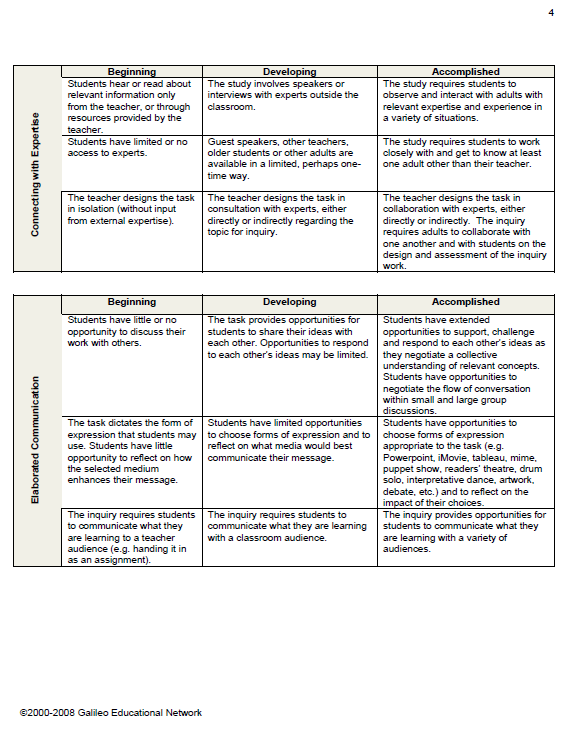
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***Good inquirers need a place to write…***

***(insert brilliant ideas here)***



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