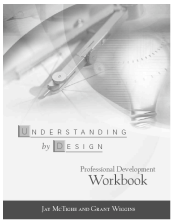
Understanding by Design

2004



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Overview

- **Introduction:**
  - What is good design?
  - What is understanding?
- **Understanding Understanding**
  - Transfer
  - Big ideas
  - The 6 facets of Understanding
- **Ubd is an embodiment of common sense, and best practice in design and what we know about learning**

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Introductory Q's

Key Questions –

- **How do you know when they "got it"? When don't they get it even though it might seem as if they do? What *is* evidence of understanding?**
- **How can we promote understanding more by design than by good fortune (and native ability)?**
- **How do we move beyond designing mere interesting activities or textbook "coverage"?**
- **What is the relation between local design work and 'audits' of achievement against the content standards?**

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Understanding by Design

An 8-year national effort in improving the design skills of educators

- **UbD is used in over 400 school districts**
- **UbD is a textbook in over 225 school of education courses**
- **The text is in the hands of over 500,000 educators**
- **Supported by a book, workbook, websites, and a cadre of veteran-educator trainers, through ASCD**

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The "big ideas" of good design

- **"Backward design" - design with clarity about the desired learnings, and on evidence of real learning (understanding/transfer)**
  - UbD takes an old idea and makes them more comprehensive and concrete
- **a sharper focus on learning *priorities*: the focus is on "big ideas" & "core tasks" of transfer, to frame curricula**
- **Focus on anticipating student misunderstandings (and learning rough spots)**
- **Making assessment central to curriculum design, not an afterthought**

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"Big ideas" of ubd: "process"

- **Based on a cycles of vision-feedback-adjust (continuous progress against models and standards)**
  - Test as you go - in designing as in teaching
  - Feedback, early & often (for us, too; not just students: peer review essential, given our egocentrism)
- **Process is messy, product is clean**
  - Many doorways in, one template

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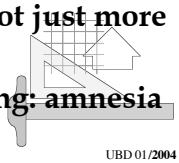
3 key understandings - about understanding:

- **Understanding is about wise use of knowledge and skill - effective "transfer"**
- **Understandings are counter-intuitive *inferences*, not just more "knowledge"**
- **Without understanding: amnesia and inert knowledge**



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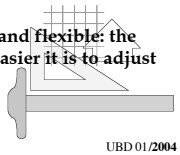
4 key understandings - about design:

- **A sound plan refers to the few key desired learnings, the desired output; not the many 'teachings' and activities, the inputs**
- **The design must be transparent to the learner; the student must understand the priorities**
- **We have to design backward from desired *performance*, not desired content mastery - content mastery is a means to ability**
- **The best plans are both purposeful and flexible: the greater the clarity of our goals, the easier it is to adjust in a timely and effective way**



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Teachers wear *many* hats:

- *Instructor*
- *Coach*
- *Friend*
- *Evaluator*
- *Disciplinarian*
- *Advisor*

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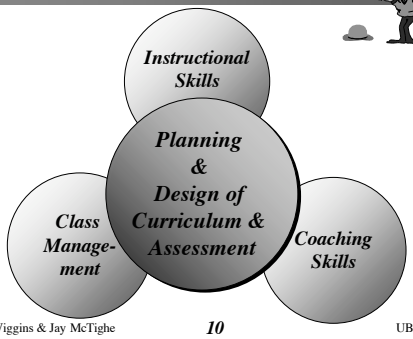
Focus here: The non-contact role of plan & design of work



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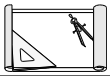
3 Stages of ("Backward") Design



1. Identify desired results

2. Determine acceptable evidence

Then, and only then

3. Plan learning experiences & instruction

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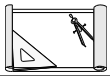
Typical Error in Design



Identify content

Brainstorm activities

Without checking for alignment

Then, and only then

Come up with an assessment and link it to some Standard

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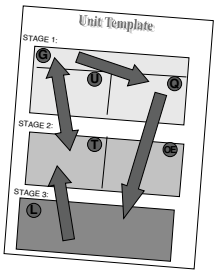
Design work is iterative, non-linear

It doesn't matter where you begin or how you proceed - as long as the design ends up with all elements aligned!



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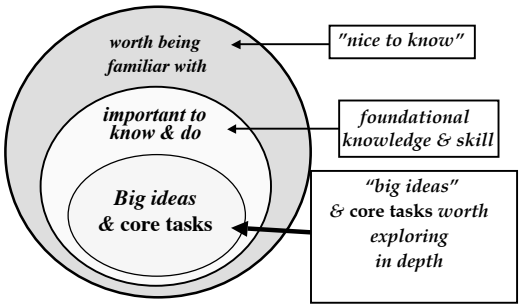
Establishing Intellectual priorities around "Big Ideas" & "Core Tasks"



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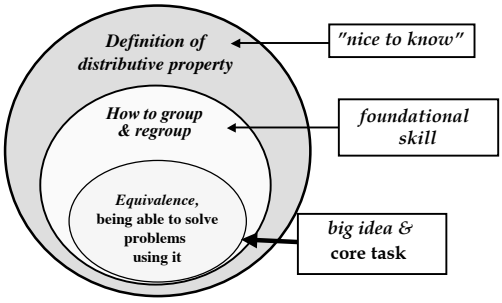
Establishing Intellectual priorities: Math Example



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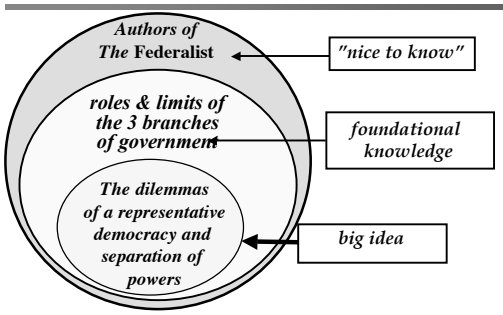
Establishing Intellectual priorities: Social Studies Example



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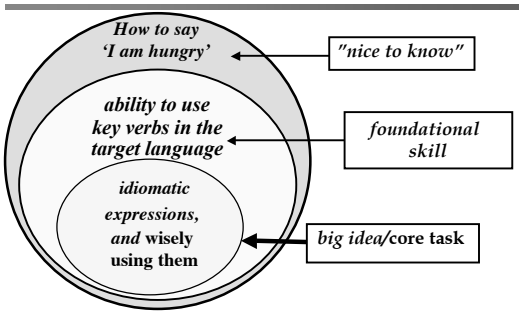
Establishing Intellectual priorities: World Language example



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Some questions for identifying truly "big ideas"

- **Does it have many layers and nuances, not obvious to the naïve or inexperienced person?**
- **Can it yield great depth and breadth of insight into the subject? Can it be used throughout K-12?**
- **Do you have to dig deep to really understand its subtle meanings and implications even if anyone can have a surface grasp of it?**
- **Is it (therefore) prone to misunderstanding as well as disagreement?**
- **Are you likely to change your mind about its meaning and importance over a lifetime?**
- **Does it reflect the core ideas in a field or in life, as judged by experts?**

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Some "Big Ideas"

- *concepts:* migration, adaptation, place value, function, equity, text
- *themes:* "Good triumphs over evil", "the outsider", "the more we learn the less we know"
- *debates:* "Nature vs. nurture" "offense vs. defense"
- *perspectives:* America as seen by ourselves, our allies, and our foes; Euclidean vs. non-euclidean geometry
- *paradox:* freedom involves responsibility, no force is acting on a body moving at a fast constant speed
- *theory:* form follows function; you are what you eat, less is more (design, arts)
- *assumption:* the text has meaning, "Occam's Razor" (i.e. belief that the best scientific explanation is the simplest), history as a march of human progress, anything can be measured if we can identify what it is we want to measure

Q's to Identify "Core Tasks":

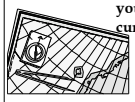
What do the discrete skills and facts enable?

- What task(s) provide credible answers to: "Why are we learning this? What does it help you do?"
- What tasks require a full *repertoire* of the many discrete skills and facts we teach?
- What complex tasks do people out in the world get called upon to do - on their own? What are the kinds of challenges and conditions they face in the field?
- What work requires transfer - the thoughtful use of a repertoire, not just cued, simple plug-in or rote response?
- Is this the kind of task that can and must recur K-12 because it is the essence of the discipline or field?

Core tasks are 2nd key to prioritized learning *by design*

Defined: "The most important complex performances, in realistic contexts, in each field"

- Ask:
  - What does it mean to *do* the subject, to have your knowledge 'tested' in the world?
  - What are realistic options, constraints, and opportunities available in such work?
  - What are the key genres of performance in your subject(s)? What might be the 'decathlon' in your program area, that might anchor the curriculum?



Core tasks

Examples from various fields:

- Crafting a coherent, credible, and supported narrative of what happened, despite conflicting and incomplete accounts (social studies)
- Designing and de-bugging your own experiments (science)
- Navigating successfully in a foreign language and culture (world language)
- Figuring out, on your own, what an author might have meant, and saying why (lang. Arts)
- Developing mathematical models of *messy* phenomena (math, science, social science)
- Speaking to different audiences and purposes, including highly challenging situations

Don't confuse the drills with the game (authentic performance)

'Drill-tests' - exercises	*The 'game' - real problems*
■ Out of context	■ In context, with all its messiness and interest value
■ Discrete, isolated element	■ Requires a repertoire, used wisely
■ Unrealistically set up and prompted	■ Not prompted: you judge what to do, when
■ Doesn't transfer without practice adapting it to the game itself	

Find lots of ideas in the language of the Standards

Key verbs suggest the important tasks

Key nouns reflect the big ideas

- Important to anchor curriculum in core tasks which recur K-12 to avoid overly-discrete teaching of skills
- Important to frame curriculum around essential questions to ensure Big Ideas are highlighted and used to frame 'content' goals

Ohio Examples

- **Demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.**
- **Evaluate the limitations and the opportunities that result from decisions made in the past including:**
  - a. Electoral College;
  - b. Direct election of senators;
  - c. Income tax;
  - d. Length of terms of elected and appointed officials.

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to teach for understanding is to coach for transfer, not just recall

Transfer requires…

- **Tasks with *minimal* cues and scaffolding, unlike typical test items: can the learner *imagine* and *judge* which knowledge & skills are required here?**
  - Local/classroom assessment is consistently too low-level and narrow – not focused on transfer, but 'plugging in'
- **Adaptation of knowledge, based on understanding the big ideas 'underneath' specific content;**
- **Grappling with new or unfamiliar elements, uses, or obstacles**

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How people learn, for transfer

"Students develop flexible understanding of when, where, why, and how to use their knowledge to solve new problems if they learn how to extract underlying principles and themes from their learning exercises."

- ***How People Learn*****, p.224**

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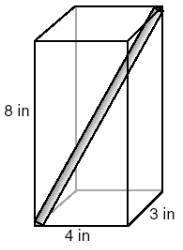
Controversial transfer item

34 A straw is placed into a rectangular box that is 3 inches by 4 inches by 8 inches, as shown in the accompanying diagram. If the straw fits exactly into the box diagonally from the bottom left front corner to the top right back corner, how long is the straw, to the *nearest tenth of an inch*?



Over 70% wrong!

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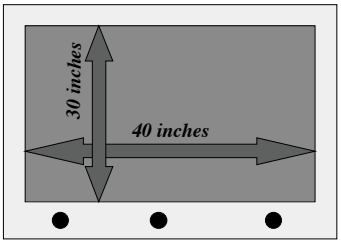
A NAEP item, same topic



What is the diagonal measurement of the TV screen?

- **25**
- **35**
- **50**
- **70**
- **1200**

8th-grade: 25% correct ***12th-grade: 42% correct***

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MCAS test item: 10th-grade English reading item

A fellow fourth grader broke the news to me after she saw my effort on a class assignment involving scissors and construction paper. "You cut out a purple bluebird," she said. There was no reproach in her voice, just a certain puzzlement. Her observation opened my eyes—not that my eyes particularly help—to the fact that I am colorblind. In the 36 years since, I've been trying to understand what that means. I'm still not sure I do….

Unlike left-handers, however, we seem disinclined to rally round our deviation from the norm. Thus there's no ready source of information about how many presidents, or military heroes, or rock singers have been colorblind. Based on the law of averages, though, there must have been some. We are everywhere, trying to cope, trying to blend in. Usually we succeed. Until someone spots our purple bluebirds. Then the jig is up.

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The most wrong item on the test: 70% incorrect:

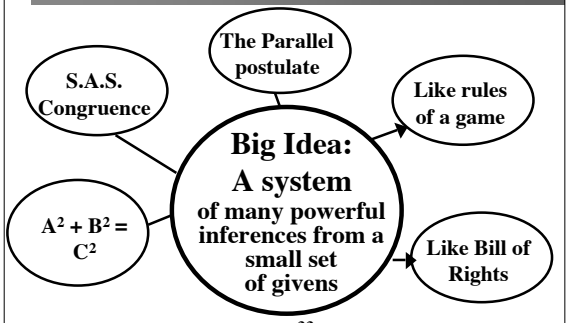
- *This selection is **best** described as*
  - ***A. a biography.***
  - ***B. a scientific article.***
  - ***C. an essay.***
  - ***D. an investigative report.***
- **Many students said it could not be an essay because "it was funny" and because "it had more than 5 paragraphs."**

"Big Ideas" defined:

Is it a Big Idea? Does it –

- **have lasting value, with transfer to other inquiries?**
- **serve as a key concept for making important facts, skills, and actions more connected, coherent, meaningful, useful?**
- **epitomize "core" (not "basic") insights in a subject or discipline?**
- **require "uncoverage" (since it is an abstract or often-misunderstood idea)?**

The big ideas provide a way to connect, recall, apply knowledge



Big ideas - in skill areas

Look for "big ideas" in key concepts and issues of judgment in using skill -

- *strategy & tactics*: **"opening up space" in sports**
- *why it works:* **"place value in base 10" in adding or subtracting; "continuity" in numbers and number line**
- *Purpose & value:* **"self-sufficiency" as foundation of "life skills"; "meaning" in print (as a rationale for actively using multiple strategies in decoding text)**

Pointing to big ideas via **essential questions**

"How does one lead children to discover the powers and pleasures [of rethinking]? Through organizing questions. They serve two functions: they put perspective back in the particulars... and they often served as criteria for determining where students were getting, how well they were understanding, whether anything new was emerging." – Jerome Bruner

Essential Questions

What questions –

- **are *important* to argue about?**
- **are at the heart of the subject?**
- **recur - and *should* recur?**
- **raise more questions – provoking and sustaining engaged inquiry?**
- **must become habits of mind when we face real problems?**
- **often raise important conceptual or strategic issues in the subject?**
- **can provide organizing purpose for meaningful & connected learning?**

Essential Questions

examples –

- What's the pattern? How do I know? Are the exceptions anomalies or clues that it's really a *different* pattern?
- Who is an American? Says who?
- What is commonsensical and what is counter-intuitive about this finding? When should I trust or be *skeptical* of 'common sense'?
- What's the difference between a good read and a great book, if any? Does the question matter?
- What is fair? How well can math help us answer the question?
- Who is a true friend? How can you be sure, and how sure can you be?
- Should I count, estimate, calculate or sample here?

What is Fair?

Four 7th-grade classes had a race of all the students. Devise as many ways as you can to determine a fair ranking of the 4 classes, given the individual runner results in the table. Summarize the 2-3 top ways you think would be most fair, and be prepared to discuss…

Class rank	Class A	Class B	Class C	Class D
1	4	6	1	2
2	9	7	3	5
3	11	10	14	8
4	12	13	18	15
5	20	16	19	17
6	21	22	23	31
7	25	24	28	33
8	26	27	30	36
9	29	34	32	37
10	35	39	41	38
11	43	40	44	46
12	45	42	47	51
13	49	48	50	55
14	54	52	56	27
15	61	53	60	58
16	65	62	63	59
17	69	66	64	67
18	70	72	*	68
19	71	*	*	73
20	*	*	*	74

Individual ranking of runners in a race by all 7th-grade classes

The Questions ARE the curriculum

We must frame curricula around questions

- Don't confuse 'teaching via questions' with a curriculum and assessment system based on penetrating and important questions in each field
- One of 2 key moves for escaping the tyranny of the textbook (the other is: designing around core tasks).

Essential vs. "leading" Q's

Essential - STAGE 1

- Asked to be argued
- Designed to "uncover" new ideas, views, lines of argument
- Set up inquiry, heading to new understandings

Leading - STAGE 3

- Asked as a reminder, to prompt recall
- Designed to "cover" knowledge
- Point to a single, straightforward fact - a rhetorical question

Misconceptions as another way to identify big ideas

"[What] an extensive research literature now documents is that an ordinary degree of understanding is routinely missing in many, perhaps most students. If, when the circumstances of testing are slightly altered, the sought-after competence can no longer be documented, then understanding - in any reasonable sense of the term - has simply not been achieved."

– Howard Gardner, *The Unschooled Mind*

E.g. Misconceptions in science

From *2061 Benchmarks (AAAS):*

Some students think that 'cold' is being transferred from a colder to warmer object…students often think that objects cool down or release heat spontaneously…

Even after instruction, students don't always give up their naive notion that some substances (e.g. flour) cannot heat up, or that metals get hot because they "attract heat" etc." (pp. 337-8)

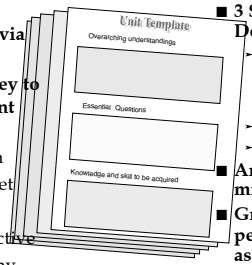
Clarifying big ideas & real problem-based tasks

Use this set of prompts: Given the Standard –

- **What are the greatest challenges in understanding [the topic]? i.e. - what are typical misunderstandings and performance errors when doing work in this area?**
- **What kinds of problems, framed as assessment tasks, must students *ultimately* confront if we are to grasp their degree of understanding and mastery of the Standard? What 'other evidence' is needed to round out the picture?**
- **What, then might be 'exercises' and 'transfer tasks' for that standard?**
  - Refer to our rubrics for further advice on the distinctions between types of exercises and problems

Understanding – by Design

- **Transfer**
- **Rethink, via big ideas**
- **6 facets key to assessment design**
  - Explain
  - Interpret
  - Apply
  - perspective
  - Empathy
  - Self-knowledge



- **3 Stages of Backward Design**
  - Built upon the desired learnings, not the content or teacher moves
  - Focused on big ideas
  - All 3 stages align
- **Anticipate misunderstandings**
- **Grounded in performance assessment**

A focus on the big ideas and the big picture throughout

- **In Stage One, the big ideas are highlighted by the Essential Questions and Understandings**
- **In Stage Two, the core assessment tasks focus on evidence of mastery of the big ideas; and mastery of key performance types requires understanding big ideas**
- **In Stage Three, the Learning Plan makes clear to students what the big ideas are, what they look like in the concrete, why they matter, and how a grasp of them will be assessed**

From Big Ideas to *Understandings* about them U

An understanding is a "moral of the story" about the big ideas

- **What *specific* insights will students take away about the the meaning of 'content' via big ideas?**
- **Understandings summarize the desired insights we want students to realize**

Understanding, defined: They are...

- **specific generalizations about the "big ideas." They summarize the key meanings, inferences, and importance of the 'content'**
- **deliberately framed as a full sentence "moral of the story" – "*Students will understand THAT…*"**
- **Require "uncoverage" because they are not "facts" to the novice, but unobvious inferences drawn from facts - counter-intuitive & easily misunderstood**

Big idea - Equivalence

Understandings:

- **Numerals can represent many numbers**
- **"Equal" means "of the same value" and does not mean "calculate the answer"**
- **The same mathematical ideas can be represented concretely, graphically, or symbolically. Context determines which is most appropriate.**
  - Tables, graphs, and symbols are alternatives ways of representing data and relationships that can be translated from one to another.

Big idea - model, representation

- **EU: Math involves the modeling of phenomena, to find useful quantitative relationships, and many models are possible**
- **EU: Models can both clarify and confuse the truth.**
- **EQ: How might this phenomenon be modeled mathematically? What is the best model, given this data and this context? How should we test the model? What are the strengths and limits of the model?**

"Finding Useful Patterns"

Understandings:

- **Mathematics is the study of patterns, finding and using them to solve problems**
- **Patterns can be represented concretely, graphically, or symbolically.**
- **Finding patterns allows us to predict the future and reveal the hidden.**
  - Eqs: If my prediction was right, can I say I understand the pattern? If my prediction is wrong, can I say I don't understand the pattern?
- **Many of the most powerful patterns are patterns within patterns - recursive**

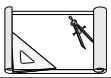
Patterns: EQ's

- **What's the pattern? Is there a useful pattern here? Are there still others? How sure am I?**
  - E.g. - What's the pattern in multiplication by 6, 7, 9, etc.
- **Is the most *obvious* pattern the most *important* pattern? When is 'simple' powerful and when is it too 'simplistic' or superficial?**
- **Is the pattern real or a matter of human perspective?**
- **How do I find a pattern or come up with a model if I don't readily see one?**

Patterns: misunderstandings -

- **There's one way to model the problem.**
- **There's one pattern.**
- **There's one right answer.**
- **The pattern must be related to what we just studied**
- **If the pattern isn't obvious, there's no pattern**
- **The pattern is just some made up, arbitrary thing, not useful – "just dumb math"**

3 Stages of Design: Stage 2



1. Identify desired results

2. Determine acceptable evidence

3. Plan learning experiences & instruction

"Backward Design" of Learning:

What is the complex learning goal/standard?	**Stage 1**
What transfer evidence is implied in the goal/standard?	**Stage 2**
What *specific* "performance" will provide such evidence?	**Stage 2**
What follows for learning activities that would equip learners to perform?	**Stage 3**

What is acceptable evidence?

Judicial Analogy:

- **What "preponderance of evidence" would show that students have achieved the desired understanding, knowledge, and skill? Are able to address the essential questions?**

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Stage 2 is the essence of backward design & alignment

"Measure what we value, value what we measure"

- **Don't just test what is easy to test, or grade what is simple to grade**
- **Derive the required assessments from the complex performances explicit or implicit in the understandings and content standards**

The goal – alignment among standards, tasks, criteria

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The mantra of Backward Design

"Think like an assessor, not an activity designer!!"

- **The goal is valid and reliable evidence for Stage 1: What do the standards and desired results imply for evidence? (How should the learning activities thus be shaped to achieve the evidence)?**

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Implications: Agree on core rubrics and core tasks

Key rubrics as well as tasks are explicit and implied in the standards

- **rubrics for charting progress against key performance traits - critical thinking, effective problem-solving, reading and writing fluently in key genres, etc.**
- **Key tasks as the most important performances requiring such work: defensible research, multi-step problems, speak and write fluently, etc.**

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Math Task Example

- **"Hoops" McGinty wants to donate millions of dollars from his salary and sports-drink earnings toward a special exhibit in the new Rose Planetarium area of the Museum of Natural History. Hoops wants there to be a 3-D scale model of our planetary system. There is a catch, however. The size of the planets and the distance of each planet from the sun must be exactly to scale – where the sun is represented by a regulation NBA basketball. The nervous folks in the gifts department of the Museum call you up to their office because of your expertise in astronomy.**
- **What will you advise them about the feasibility of the plan? What approach toward a scale model will work best to ensure a basketball-related design?**

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Need: Agree on "core tasks" per program (via Standards)

Example: Math

- **Make sense of inconclusive, incomplete, misleading – messy - data**
- **Model a real-world phenomenon**
- **Solve multi-step non-routine problems**
- **Choose technology *wisely* and use it to solve complex problems (spreadsheets, graphing calculators, etc.)**

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Example - Science

High Climbers. **You are a researcher hired by a group of expert mountain climbers. Hypoxia is the set of symptoms that comes from a lack of O^2 in body tissues. It is often felt by mountain climbers as they ascend altitude quickly. Sherpas, long-time residents of high altitudes, seem to feel no hypoxic discomfort. Why might that be? Your group wants to know, and to benefit from the knowledge. Design a series of experiments that would test the difference in hypoxic symptoms between mountain climbers and sherpas. Then, explain the findings to the climbers in a simple guidebook…**

"core tasks" per program/department

Example: Science

- **Design and de-bug a worthy experiment from scratch**
- **Critically evaluate the research of others - peer review**
- **Show evidence of having carefully considered the ethics and public policy issues of scientific research**
- **Adapt scientific research to practical solutions/inventions**
- **Propose and design tests of a novel hypothesis**

Example - US History AP course

- **Your goal is to determine why the urban riots of the late 60's happened. You are one of many august members of an LBJ appointed panel, the Kerner Commission, who must report to the president and the country on why the violence happened and what can be done about it.**
- **You will produce a collective report that must be thoughtful, thorough, and clearly presented. Your personal contribution will be judged through journal entries, observations of work and discussion, and sections of writing you produce.**

"core tasks" per program/department

Example: History

- **Makes sense of multiple, conflicting primary & secondary accounts, do an oral or written narrative**
- **Critically research the merit of cited sources, e.g. on the Internet**
- **Journalistic background: do a helpful history of a present problem/issue/event = e.g. 9/11**
- **Design informative multi-media historical exhibits to show causal reasoning**

2 Questions for a practical test of your ideas:

1. **Could the performance be accomplished (or the test be passed) *without* in-depth understanding?**
2. **Could the specific performance be poor, *but* the student still understand the ideas in question?**

The goal is to answer NO to both

Assessment of Understanding via the facets

i.e. You <u>really</u> understand when you can:

- **explain, connect, systematize, predict it**
- **show its meaning, importance**
- **apply or adapt it to novel situations**
- **see it as one plausible perspective among others, question its assumptions**
- **see it as its author/speaker saw it**
- **avoid and point out common misconceptions, biases, or simplistic views**

Scenarios for Authentic Tasks (T)

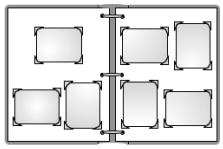
Build assessments anchored in authentic tasks using GRASPS:

G ■ **What is the Goal in the scenario?**
R ■ **What is the Role?**
A ■ **Who is the Audience?**
S ■ **What is your Situation (context)?**
P ■ **What is the Performance challenge?**
S ■ **By what Standards will work be judged in the scenario?**

For Reliability & Sufficiency: Use a Variety of Assessments

Varied types, over time: Photo Album

- **authentic tasks and projects**
- **academic exam questions, prompts, and problems**
- **quizzes and test items**
- **informal checks for understanding**
- **student self-assessments**

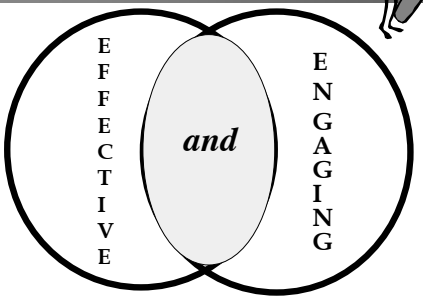


Design criteria to ensure focus on big ideas & standards:

To what extent do the assessments and activities -

- **Require complex problem-solving (as opposed to simple plug-in exercises)?**
- **Provide minimal cues (as opposed to telling the student exactly what content is needed and what to do)?**
- **Reflect "real-world" use of the content (as opposed to pat school questions) - "core" tasks?**
- **Validly address the targeted Standard(s) (as opposed to being merely interesting or fun)?**
- **Provide sufficient work for that Standard (as opposed to providing only one piece of many needed lessons and assessments)?**

Stage 3 Design Standard



Organize by W. H. E. R. E. T. O. (L)

W **Where are we headed? (the *student's* Q!)**
H **How will the student be 'hooked'?**
E **What opportunities will there be to be equipped, experienced, and explore key ideas?**
R **What will provide opportunities to rethink, rehearse, refine and revise?**
E **How will students evaluate their work?**
T **How will the work be tailored to individual needs, interests, styles?**
O **How will the work be organized for maximal engagement and effectiveness?**

Focusing design on pursuing Questions and Problems (L)

***"Content" is often best learned in response to starting with and framing upon* questions and problems**

■ **The art of holding interest lies in "raising questions and delaying the answers..."**

– D. Lodge, *The Art of Fiction*

Good design - *by design…*

What was the best-designed learning experience you ever had?

- 'Best' here means: it resulted in highly engaged and effective learning.
- We seek replicable lessons about good design
- We have asked this question with every group we have worked with, over a three year period

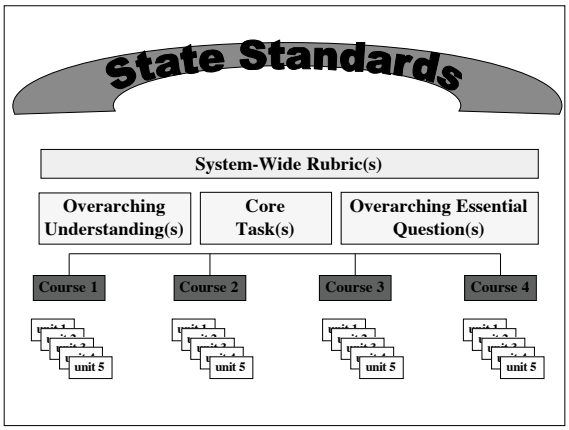
 73 UBD 01/**2004**

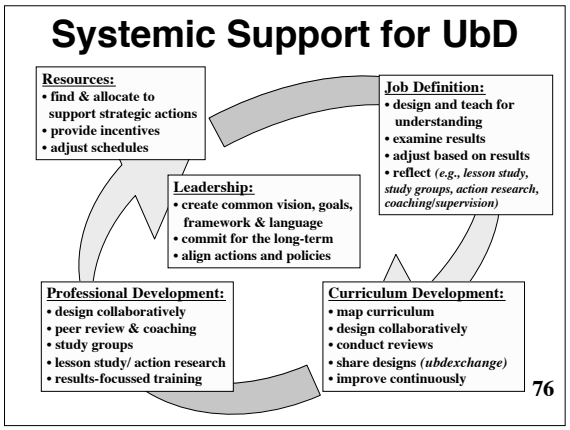
Good design - by design…(2)

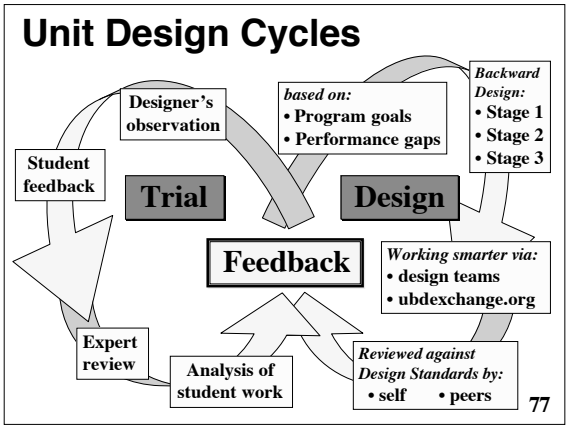
- **What do the best-designed lessons have in common? Against what criteria should all our designs be judged?**

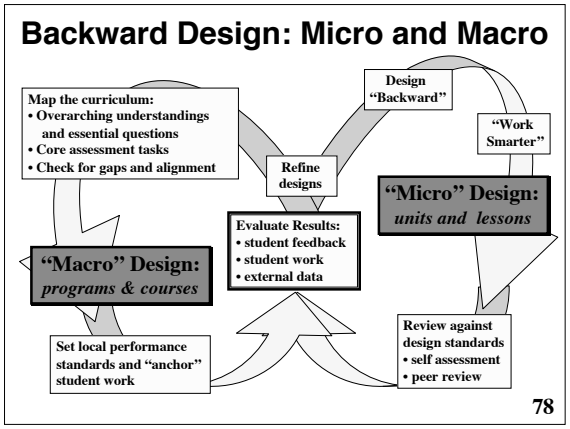
  Share stories with a neighbor, and generalize: "The best designs…."

 74 UBD 01/**2004**

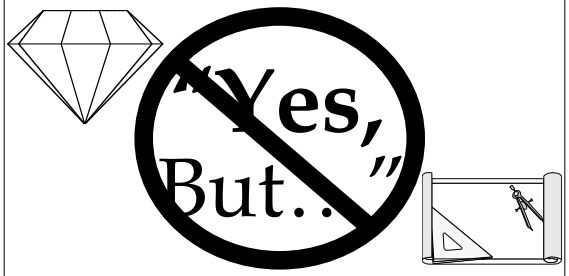








Moving Reform Forward:



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Why bother? - Rationale #1

too much focus on "teaching" and "content" - not enough on designs and feedback against standards

- **In our experience, people work too hard on their "teaching" and not enough on the design of learning and use of feedback to achieve results**
- **State tests are insufficient and untimely as feedback: "All adjustment based on assessment is local"**

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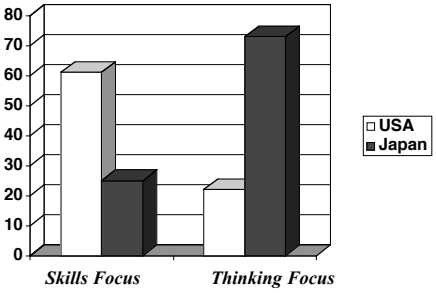
TIMSS Survey: Teacher Aims



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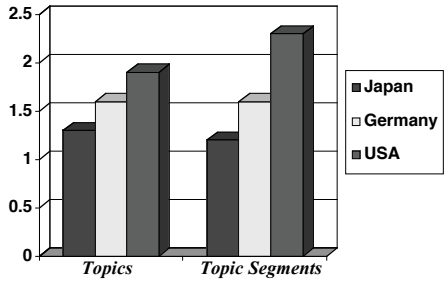
TIMSS: Lesson (in)Coherence



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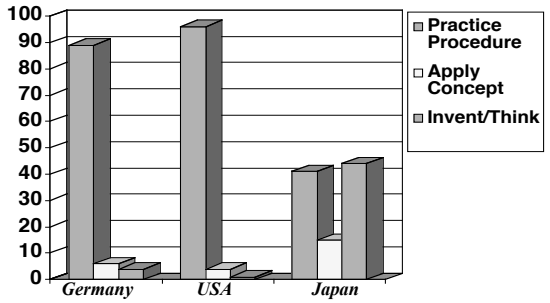
TIMSS: Class Activity



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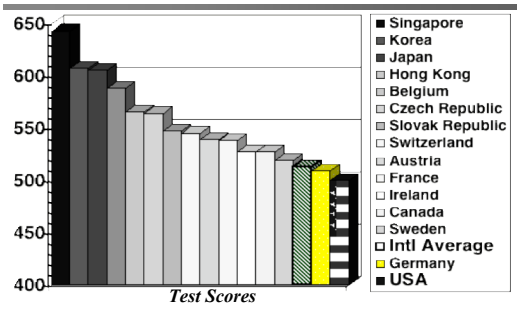
TIMSS Scores: 8th-grade Mathematics



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Research - Learning and Assessment

- **Newmann et al. (1996) measured how well 24 restructured schools implemented authentic pedagogy and authentic academic performance approaches in mathematics and social studies.**
- **Students with high levels of authentic pedagogy and performance were helped substantially whether they were high- or low-achieving students. Another significant finding was that the inequalities between high- and low-performing students were greatly decreased when normally low- performing students used authentic pedagogy and performance strategies and assessments.**

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Chicago research

- *Assignments were rated according to the degree to which they required "authentic" intellectual work:* **"Students who received assignments requiring more challenging intellectual work also achieved greater than average gains on the Iowa Tests of Basic Skills in reading and mathematics, and demonstrated higher performance in reading, mathematics, and writing on the Illinois Goals Assessment Program...**

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Chicago, cont.

- **"Contrary to some expectations, we found high-quality assignments in some very disadvantaged Chicago classrooms and [found] that all students in these classes benefited from exposure to such instruction. We conclude, therefore, [that] assignments calling for more authentic intellectual work actually improve student scores on conventional tests. (p. 29)**

The complete research is available online at http://www.consortiumchicago.org/publications

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feedback and its use is key to great gains

Black & Wiliam meta-analysis:

"There is a body of firm evidence that formative assessment is essential... We know of no other way of raising standards for which such a strong *prima facie* case can be made."

- **Black and Wiliam (1998) "Inside the Black Box: Raising Standards through Classroom Assessment,"** ***Phi Delta Kappan*****, volume 80, 2 (October), pp. 139 ff.**

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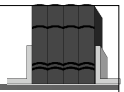
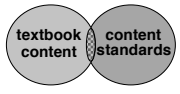
Fit between standards and textbooks?



1. 

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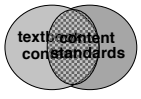
3. 

4. 

Which is the closest fit for <u>your</u> subject?

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Algebra text review - AAAS

- **No textbook does a satisfactory job of providing assessments to help teachers make instructional decisions based specifically on what their students have--or have not--learned.**
- **No textbook does a satisfactory job of building on students' existing ideas about algebra or helping them overcome their misconceptions or missing prerequisite knowledge.**

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Goodlad's Research

- **"What do students perceive themselves to be learning? We asked [them] to write down the most important thing learned in school subjects...Most commonly students listed a fact or topic...Noticeably absent were responses implying the realization of having acquired some intellectual power…**

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"We have not succeeded in answering all of your problems. The answers we have found only serve to raise a whole new set of questions. In some ways, we feel we are as confused as ever, but we believe we are confused on a higher level and about more important things."

Omni Magazine, March 1992

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for further information...

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- **Design & share site: www.ubdexchange.org**

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for further information...

Resources:

- ***The Understanding by Design Workbook (2004)***
- **Book: *Understanding by Design, ASCD, (1998)***
- **Videos: *What is Understanding ? What is Backward Design?***
- ***Educative Assessment*, Jossey-Bass**

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