Oak Hill Academy

District of Columbia Public Schools

Improving Student Achievement Through *Instruction by Design and Technology Tools*

University of Maryland

Educational Technology Outreach

Director: Davina Pruitt-Mentle

Overview

How Do Schools Improve Student Performance?

- Why the fuss?
- Data: how to analyze/interpret system-wide data
- Instructional Strategies to improve student achievement: *Instruction by Design*

Objectives

- We will cover Instructional Strategies to improve student achievement: *Instruction by Design*
  - **Background knowledge**: Data - How your school/classroom fits into the bigger picture
  - **Standards/Essential Skills/Pacing Charts**: What we want students to know - using the standards
  - **Determining Acceptable Evidence**: Tests/alternative assessments/activities/rubrics - how to ask good questions/write good assessments/collect data and re-teach/reassess
  - **Learning Experiences and Instruction:** Lesson plans/lesson units/data collection/re-teaching/ alternative differential instruction

Process

- Introduction
- “Instructor Led” Overview
- Blended Instruction
  - Instructor led
  - Hands-on activities
- Debriefing
- WebCT support
- Follow-up session in December

Outcomes

- Understand the tie between data (school/district and classroom) and standards and instructional design
- Understand where to get DCPS/school data and content standards (as well as scope and sequence/pacing charts etc…)
- Understand how to interpret that data and utilize it to your advantage
- Understand some common design flaws
- Understand the Backward Design Model / Instruction by Design
- Interpret mock case studies
- Apply to your OWN lesson unit and lesson plan

Ready?

How Do Schools Improve Student Performance?

- **Standards**
  - Understanding Standards, Assessments and AYP
- **Process**
  - Leading the School Improvement Process
- **Data**
  - Analyzing and Using Data
- **Instruction**
  - Teaching and Assessing the Content Standards

DCPS: Backward Design Process

- School Data Analysis
- Standards/Goals/Outcomes/Indicators
- Acceptable Evidence/Lesson and Unit Plans

Backward Design Model

To begin with the end in mind means to start with a clear understanding of your destination. It means to know where you're going so that you better understand where you are now so that the steps you take are always in the right direction.

Stephen R. Covey, The Seven Habits of Highly Effective People

Instruction by Design: Understanding by Design

- Makes use of *Backward Design Model*
- Written by Grant Wiggins & Jay McTighe
- Design of ASSESSMENTS to reveal the extent of students UNDERSTANDING
- Design of curriculum to ENGAGE students and DEEPEN their understanding

Issues Illustrated by: *Understanding by Design*

- Explores common curriculum, assessments, and instruction practices that may interfere with student *understanding*
- Examines a *backward design* process and considers its value in helping to avoid common inadequacies in curriculum and assessment planning
- Presents a theory of *6 facets of understanding*
- Proposes approaches to engage students in inquiry, promote "uncoverage," and make use of understanding the *big ideas*
- Examines a continuum of assessment practices focusing on the *degree* of student understanding
- Considers the degree of student *misunderstandings*

Similar Educational Initiatives

- Problem-Based Learning (Stepien & Gallagher, 1997)
- Project -Based Learning -Engineering Design (Leifer, Stanford, 1998)
- Socratic seminar, 4-MAT (McCarthy, 1981)
- Dimensions of Learning (Marzano & Pickering, 1997)
- The Skillful Teacher (Saphier & Gower, 1997)
- Wiske model (Wiske, 1997)
- Teaching and Learning Project Zero model (Harvard Graduate School, Blythe & Associates, 1998)
- Designing and Assessing Courses and Curricula (Diamond, 1997)
- Course Design (Felder & Brent, 1999)

Backward Design

- Stage 1: Identify Desired Results
- Stage 2: Determine Acceptable Evidence
- Stage 3: Plan Learning Experiences and Instruction

Why DCPS Interest in *Understanding by Design*

History

- *A Nation At Risk* published in 1983
  - US K-12 education not working well
  - US students poorly on NAEP- National Assessment of Educational Progress
- School Reform Effort
  - Education Summit -1989
  - President Clinton's Goals 2000 legislation
- Call for higher performance standards

History (continued)

Students and their families, teachers, and the entire school community must understand, embrace, work toward, and be held accountable for attaining legitimate and high standards of accomplishment.

- New types of assessment to measure what students know
- Decision making at the local level/data driven

Background to DCPS School Reform

- Paul Vance
  - The Children First Initiative, June 22, 2001
  - Transformation of Public High Schools, January 2002

Snags

- Data disseminated in paper format
- Data underutilized
- Statistical format with little comparison and planning

How do we compare with other schools?

What is the target goal?

No Child Left Behind Act of 2001 (NCLB)

- A landmark in education reform
- Designed to improve student achievement and change the culture of America's schools
- Passage of *No Child Left Behind*, Congress reauthorized the *Elementary and Secondary Education Act* (*ESEA*)--the principal federal law affecting education from kindergarten through high school.

  In amending *ESEA*, the new law represents a sweeping overhaul of federal efforts to support elementary and secondary education in the United States. It is built on four common-sense pillars:
  - Accountability for results
  - An emphasis on doing what works based on scientific research
  - Expanded parental options
  - Expanded local control and flexibility

NCLB

- “Although testing may be stressful for some students, testing is a normal and expected way of assessing what students have learned.
- The purpose of state assessments required under *No Child Left Behind* is to provide an independent insight into each child's progress, as well as each school's.
- This information is essential for parents, schools, districts and states in their efforts to ensure that no child--regardless of race, ethnic group, gender or family income--is trapped in a consistently low-performing school.”

NCLB

- *No Child Left Behind* requires
  - By the 2005-06 school year, each state must measure every child's progress in reading and math in each of grades 3 through 8 and at least once during grades 10 through 12.
  - In the meantime, each state must meet the requirements of the previous law reauthorizing *ESEA* (the *Improving America's Schools Act of 1994*) for assessments in reading and math at three grade spans (3-5; 6-9; and 10-12).
  - By school year 2007-2008, states must also have in place science assessments to be administered at least once during grades 3-5; grades 6-9; and grades 10-12.
  - Further, states must ensure that districts administer tests of English proficiency--to measure oral language, reading and writing skills in English--to all limited English proficient students, as of the 2002-03 school year.

NCLB

- Students may still undergo state assessments in other subject areas (i.e., history, geography and writing skills), if and when the state requires it.
- *No Child Left Behind*, however, requires assessments only in the areas of reading/language arts, math and science.
- *No Child Left Behind* requires that all children be assessed. In order to show adequate yearly progress (AYP), schools must test at least 95 percent of the various subgroups of children, including their students with disabilities and those with limited English proficiency.
- States must provide reasonable accommodations for students with disabilities or limited English proficiency.
  - native-language versions of the assessment;
  - however, in the area of reading and language arts, students who have been in U.S. schools for three consecutive years will be assessed in English.

Site Project

http://www.k12.dc.us/dcps/data/dcdatahome.html

- Provides a variety of statistical data about DCPS. Most of this information is available both on a school by school as well as a system-wide basis.
  - **Stanford-9 tests**
  - **SAT**
  - Demographic
  - Student Characteristics

Why NCLB

- Education is inconsistent across school districts, counties, and states
- No common measure of performance
- Apply Business Model
  - Identify schools that need assistance
  - "Take over" schools that continue to be poor performers
  - *If a franchise isn't working – put it under new management.*

Education as a Business

- Educational Community realized they are not meeting their goals
- Successful businesses are involving entire workforce
- Education moves to business model
  - New “processes” to succeed
  - Everyone must understand the processes
  - Teachers must understand goals, tests, assessments, and statistics to design for the classroom

You are the leaders of your school because of your knowledge of this model.

Understanding Assessments, Standards, and AYP

- What do students need to know and be able to do?
  - Curriculum Standards
- How do we test what students have learned?
- How does DCPS implement AYP (Adequate Yearly Progress)?

How does DCPS implement AYP (Adequate Yearly progress)?

- **What is AYP? What does NCLB require?**
  NCLB requires that states establish accountability systems designed to:
  - Ensure that all students achieve proficiency in reading/language arts and mathematics by the end of school year 2013-2014.
    - Based on state defined content standards in reading and mathematics.
    - Have assessments aligned to the content standards.
    - Defines at least three student achievement levels: Basic, Proficient, and Advanced.
    - Assesses the progress of subgroups, schools, school districts, and the state annually.
    - Must include other academic indicators.

How does DCPS implement AYP (Adequate Yearly Progress)?

- Must have consequences based on progress. States, school systems, and schools are accountable for:

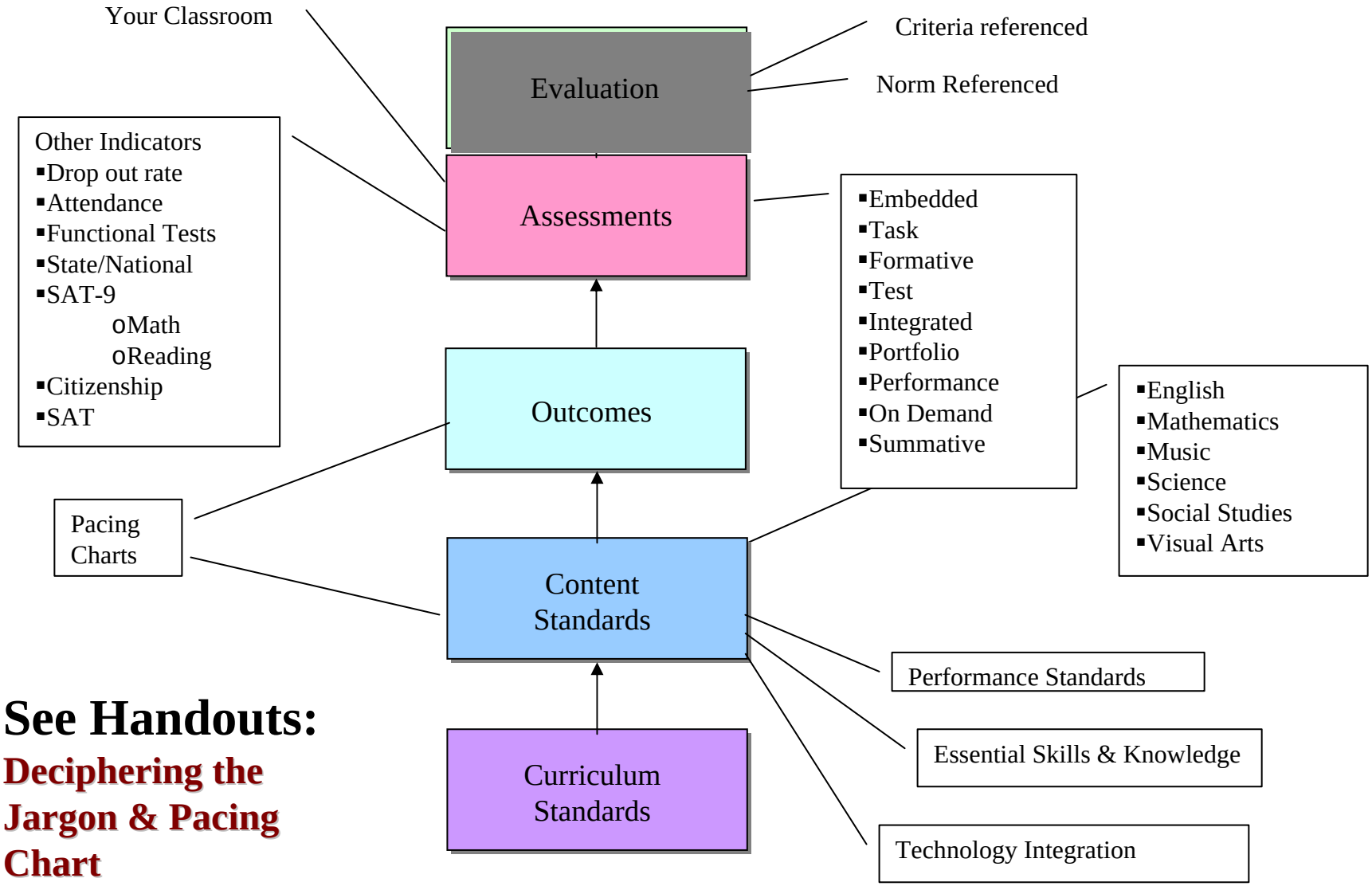
	Proficiency in Reading/ English Language Arts	Proficiency in Mathematics	Another Academic Indicator for Elementary and Middle Schools	Graduation Rate for High Schools
All Students				
▪ American Indian				
▪ Asian				
▪ African American				
▪ White				
▪ Hispanic				
▪ FARMS				
▪ Sp. Ed.				
▪ LEP				

What are the Federal Requirements of AYP?

- Adequate yearly progress is designed to ensure continuous improvement each year toward the goal of 100% proficiency in 2014.
  - Improvement targets are particularly focused on subgroups of students who, historically, have the furthest to go.
  - The goal of 100% proficiency ensures that all students not just low performing students are expected to **continuously progress.**

US Department of Education Overview

- The Accountability and AYP PowerPoint and PDF files developed by the US Department of Education describe the federal requirements of AYP:
  - http://www.mdk12.org/mspp/ayp/accountabilityayp.ppt (2.1 MB) Downloadable PowerPoint file for high speed connections.
  - http://www.mdk12.org/mspp/ayp/accountabilityayp.pdf (388 KB) Printable PDF Acrobat file.



See Handouts:

Deciphering the Jargon & Pacing Chart

Content vs. Performance Standards

" Note that **content standards** are different from **performance standards**. Content standards specify the inputs-What is the content that should be covered? Performance standards specify the desired output—What must the student do, and how well, to be deemed successful?" (Wiggins, G., & McTighe, J., 1998, p. 4).

Deciphering the Jargon

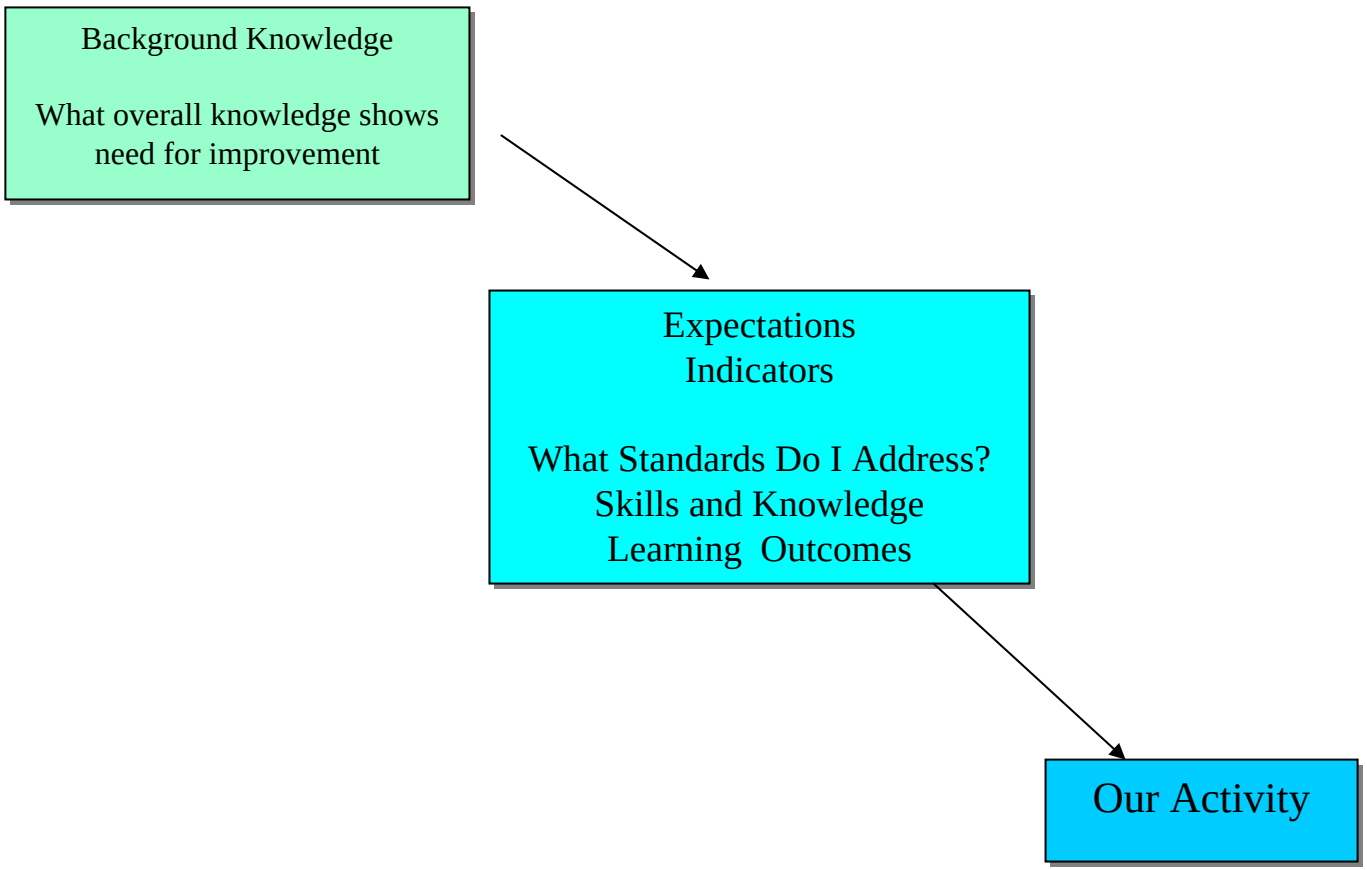
- Exploring School Achievement Scavenger Hunt
  - Break up in small groups
  - Each group should access a computer
  - See handout- **Scavenger Hunt Activity**

Identifying Desired Results

- From your scavenger hunt you had the chance to visit several background data resources regarding your school
- Give an overview of the school, student population and academic achievement
- Other possible resources or information not obtainable through the data resources?

Connecting to the *Instruction by Design* Model

Introduction



Summary Reports - Reading Summary for OAK HILL YOUTH CENTE, Division Senior High

New Report | Download Table | Email table as CSV

Division: **Senior High** | School: **OAK HILL YOUTH CENTE** | Year: **Spring 2003**

SUMMARY OF READING - OAK HILL YOUTH CENTE, Division Senior High, Spring 2003

Grade	Tested	Scale Score Avg.	Meet/Exc. Std. (%)	Below Std. (%)	Performance Level (%)				NCE Average	Percentile Rank
					Advanced	Proficient	Basic	Below Basic		
07*	4	-	-	-	-	-	-	-	-	-
08*	9	-	-	-	-	-	-	-	-	-
09	29	652.86	20.69	79.31	0.00	0.00	20.69	79.31	23.26	10
10	14	644.43	0.00	100.00	0.00	0.00	0.00	100.00	15.35	5
11*	1	-	-	-	-	-	-	-	-	-
Totals:	43	650.12	13.95	86.05	0.00	0.00	13.95	86.05	20.68	8

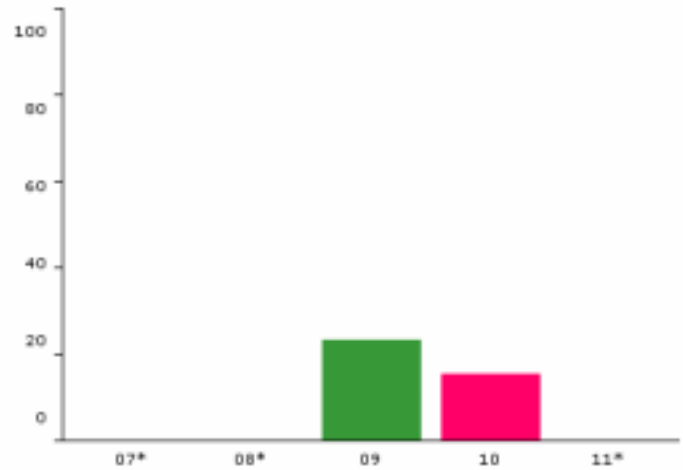
* A dash (-) is displayed when the number of students in the group is le

Bar Chart - Reading Scale Scores

Bar Chart - Reading NCE Scores

APDS - Academic Performance Database System - Microsoft Internet Exp...

READING SUMMARY - NCE SCORES BY GRADE
OAK HILL YOUTH CENTE, Division Senior High, Spring 2003
(NCE Scores vs. Grade)



* Data is not displayed when the number of students is 10 or smaller.

Print Graph | Close

Data Shows

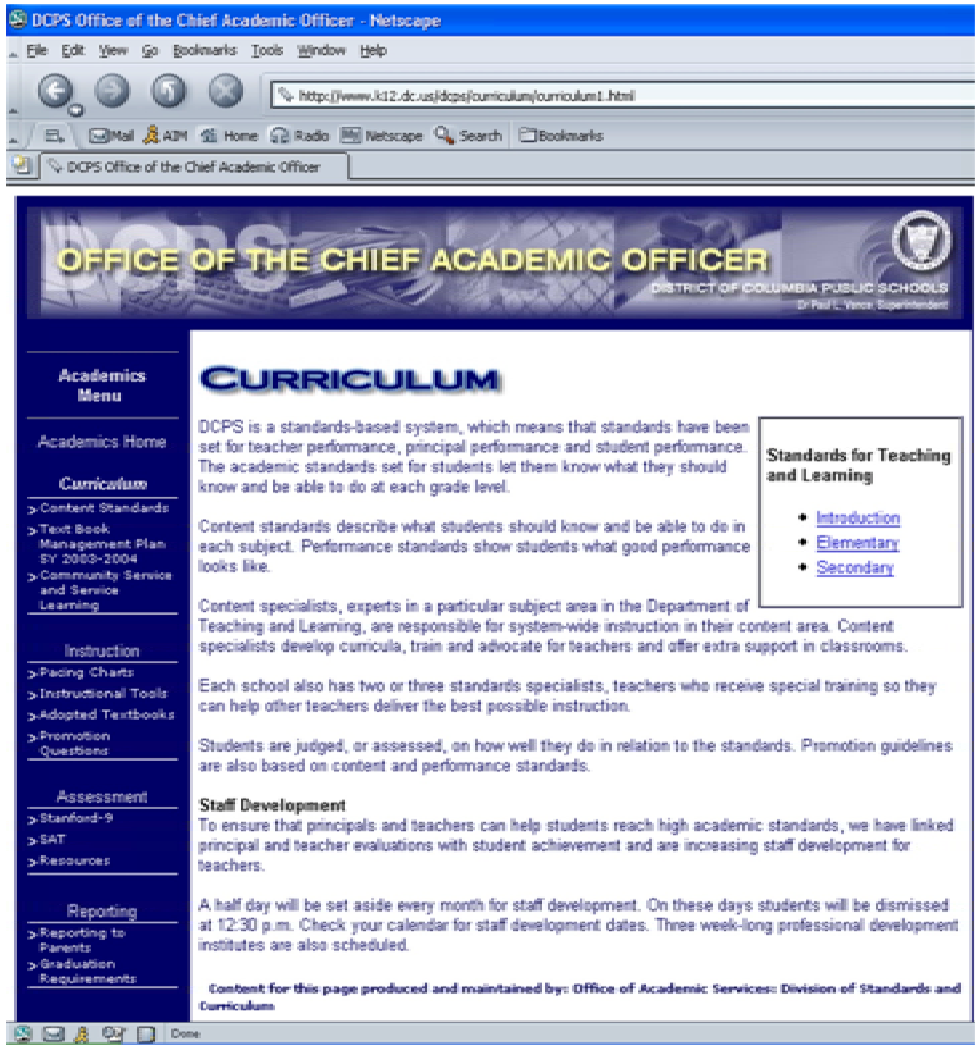
- Data Severely Limited
  - No data for 2001, 2002
- Need “private access” to see grades with small numbers of students
- Additional Data Sources Required

DCPS
Standards for Teaching and Learning

- Home site http://www.k12.dc.us/dcps/home.html
- Academics →Curriculum
- Content Standards

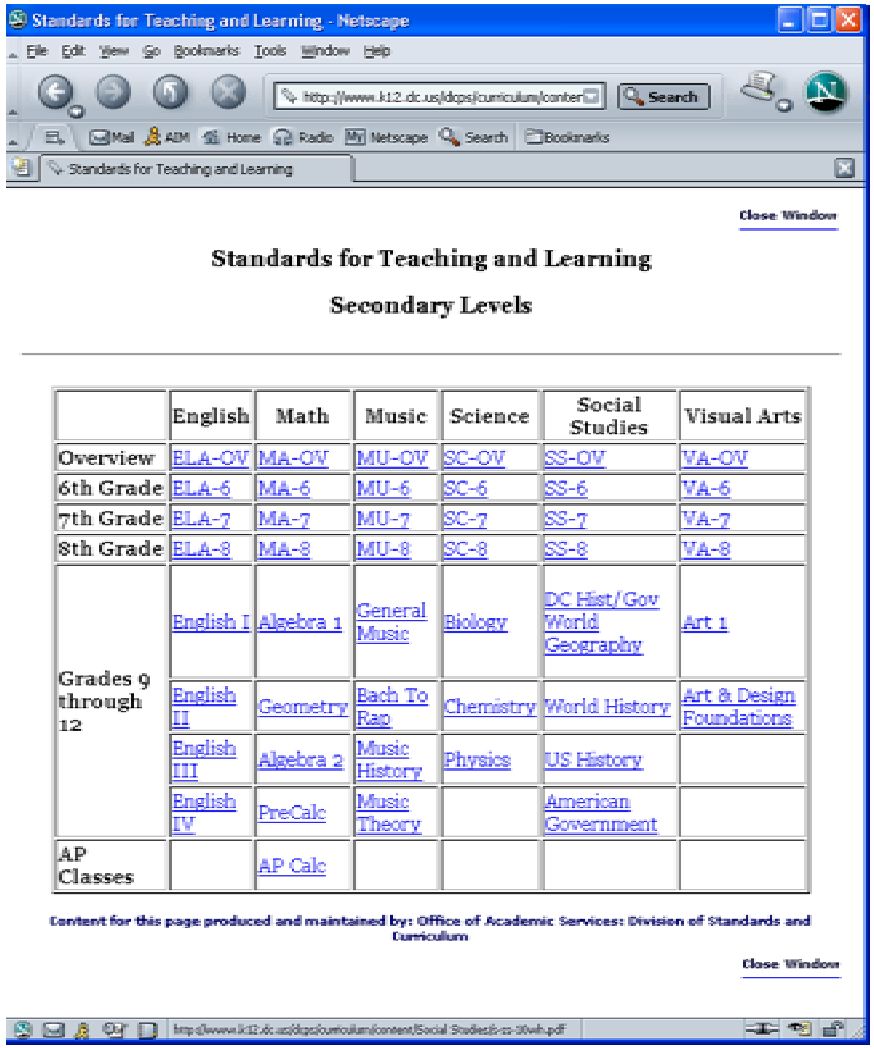
Content Standards

- Content/Curriculum Standards http://www.k12.dc.us/dcps/curriculum/curriculum1.html



Standards for Teaching and Learning Secondary Levels

- Content Standards Matrix http://www.k12.dc.us/dcps/curriculum/content/scnd-stl.htm



	English	Math	Music	Science	Social Studies	Visual Arts
Overview	ELA-OV	MA-OV	MU-OV	SC-OV	SS-OV	VA-OV
6th Grade	ELA-6	MA-6	MU-6	SC-6	SS-6	VA-6
7th Grade	ELA-7	MA-7	MU-7	SC-7	SS-7	VA-7
8th Grade	ELA-8	MA-8	MU-8	SC-8	SS-8	VA-8
Grades 9 through 12	English I	Algebra 1	General Music	Biology	DC Hist/Gov World Geography	Art 1
	English II	Geometry	Bach To Rap	Chemistry	World History	Art & Design Foundations
	English III	Algebra 2	Music History	Physics	US History	
	English IV	PreCalc	Music Theory		American Government	
AP Classes		AP Calc				

Even Further Focus: Textbook Example

Converting Textbook Example to DCPS Standards.

Textbook standards were:

- Students will understand essential concepts about multiplication of binomials
- Students will understand how to multiply the correct terms of two binomials together and be able to combine them into a single polynomial.

How Do These Relate To DCPS Standards?

- **Navigate to Content Standards for Algebra**
  - **What standards does this textbook example/exercise/section/unit address?**

How Do These Relate To DCPS Standards?

- Navigate to Content Standards for Algebra
  - ***Patterns, Functions and Algebra***
    - ***Content Standard 2:*** **The student generalizes patterns and functional relationships, uses symbols to represent mathematical situations, analyzes change in real and abstract situations, and solves real life and career-related problems**
      - * evaluate polynomials;
      - add, subtract, multiply and divide polynomials and apply the laws of exponents for multiplication and division;

Enduring Understanding

- "What enduring understanding do I want students to take away from the unit?"

- Example: "*Students will use an understanding of the elements of polynomials to solve and model real world problems.*"

The Backward Design Process: (see handout)

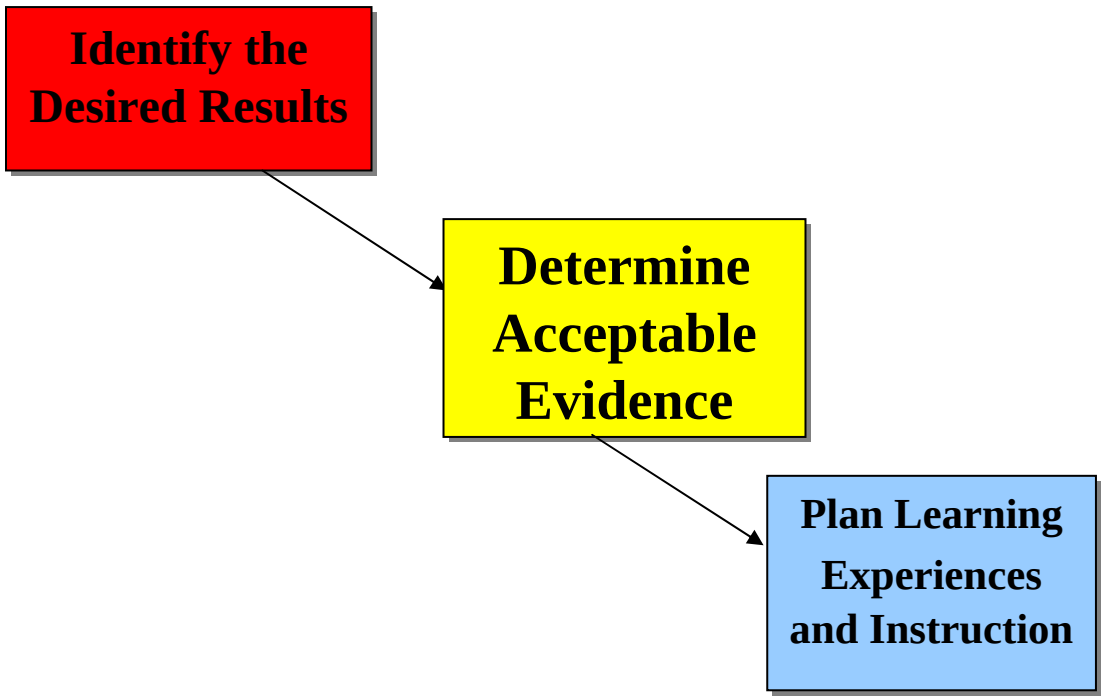
With permission from:

http://www.ascd.org/readingroom/books/wiggins98book.html

Understanding by Design. Wiggins & McTighe

- The backward approach to curricular design also departs from another common practice: thinking about assessment as something we do at the end, once teaching is completed. Rather than creating assessments near the conclusion of a unit of study (or relying on the tests provided by textbook publishers, which may not completely or appropriately assess our standards), backward design calls for us to operationalize our goals or standards in terms of assessment evidence as we begin to plan a unit or course. It reminds us to begin with the question, *What would we accept as evidence that students have attained the desired understandings and proficiencies—before proceeding to plan teaching and learning experiences?* Many teachers who have adopted this design approach report
- that the process of "thinking like an assessor" about evidence of learning not only helps them to clarify their goals but also results in a more sharply defined teaching and learning target, so that students perform better knowing their goal. Greater coherence among desired results, key performances, and teaching and learning experiences leads to better student performance—the purpose of design. (p.8-9)

Stages in Backward Design



Questions to Ask

- What should students know, understand, and be able to do?
- What is worthy of understanding?
- What enduring understandings are desired?

Genuine Versus Apparent Understanding

- Bloom's taxonomy (1956)
  - Genuine performances of understanding, as Howard Gardner (1991), Harvard psychologist and researcher, puts it, occur when "students are able to take the information and skills…and apply them to flexibly and appropriately in a new and at least somewhat unanticipated situation" (p.9). Such performances are opposed to "ritualistic" performances in which students "simply respond…by spewing back the particular facts, concepts, or problems sets that were taught" (p.9).

Vignettes

- See Handout
- Groups assigned Vignette
- Read and discuss in groups possible strengths and weaknesses in the curriculum designs of the vignettes

Selected Vignette 2

- The apples unit seems to focus in depth on a particular theme (harvest time), through a specific and familiar object (apples).
- No real depth due to no real enduring learning for the students to derive
- Hands-on but not Minds-on-because students do not need to extract sophisticated ideas
- No real priorities—all activities of equal value
- The students' role is merely to participate in mostly enjoyable activities, without having to demonstrate that they understand any big ideas at the depth of the content
- Many activity-based strategies share this weakness.
- "One might view this activity-oriented approach as 'faith in learning by osmosis'".

Selected Vignette 4

- Teacher covers vast amounts of content in the last quarter
- Doesn't consider what the students will understand and apply from the material
- Even if some clear goals—how will students be able to determine what is most important?
- In coverage-oriented instruction, the teacher, in effect, merely checks off topics that were covered and moves on, whether or not students understand or are confused
- Referred to as : "Teaching by mentioning it".

Beyond These Examples

- Four common design flaws that work against students "understanding"
  - The design does not prioritize important ideas worthy of understanding. To the students, various activities and textbook topics appear of equal value.
  - The design does not foster students' understanding because it does not encourage them to explore essential questions, link key ideas, or rethink their initial ideas or theories.

Beyond These Examples (cont.)

- Four common design flaws that work against students "understanding"
  - Students have no clear performance targets. They do not know the purpose of the activities and lessons or the expected performance requirements, other than to participate in the activities and pay attention during lectures.
  - The necessary evidence that understanding has occurred has not been established. Without explicit performance goals or culminating assessments of understanding, teachers do not know which students understand what, and to what level of sophistication.

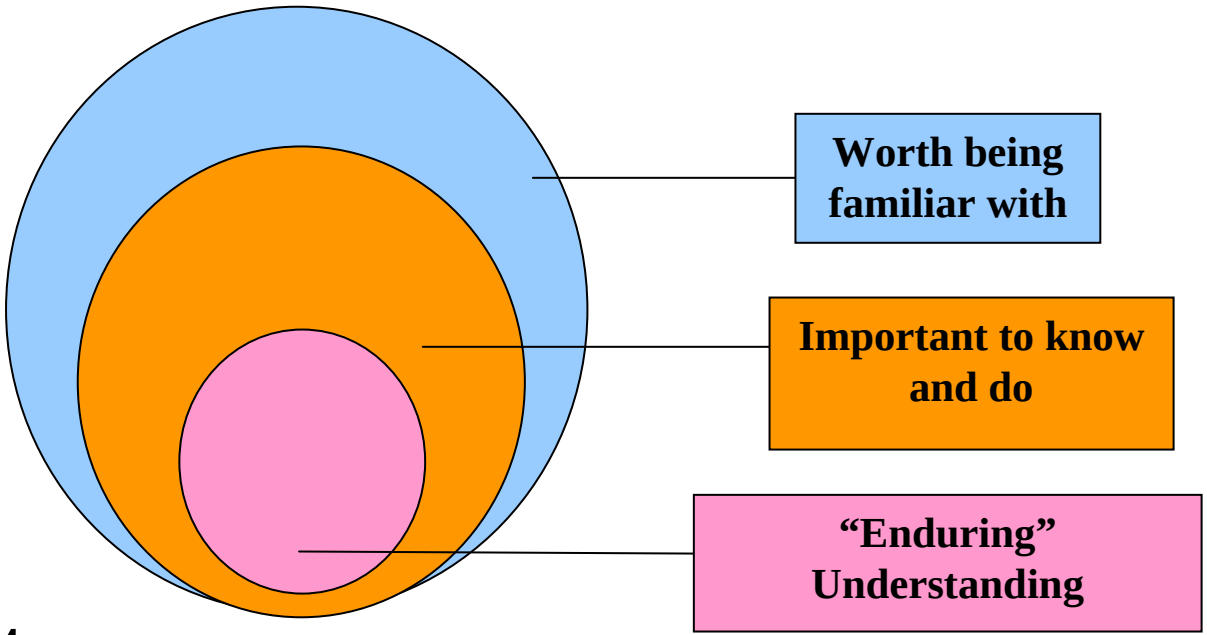
Instruction By Design: Stage 1

Consider our goals (based on data at the classroom/school/district level), examine established content standards (national, state/district), and review curriculum expectations (performance standards/essential skills/technology integration/pacing chart/scope and sequence).

- Given that there typically is more content than can reasonably be addressed, we are obliged to make choices. A useful framework for establishing curricular priorities may be depicted using Wiggins and McTighe's three nested rings.

Establishing Curricular Priorities

Wiggins and McTighe's Nested Rings



See Handout

Nested Rings Explanation

- The largest ring identifies knowledge that students should find **worth being familiar with**.
- In the middle ring, specifying important knowledge (facts, concepts, and principles) and skills (processes, strategies, and methods). We would say that student learning is incomplete if the unit or course concluded without **mastery of these essentials.**
- The smallest ring represents finer-grain choices—selecting the "enduring" understandings that will anchor the unit or course. The term enduring refers to the **big ideas, the important understandings,** that we want students to "get inside of" and retain after they've forgotten many of the details.

Wiggins and McTighe's Filters

- How does one go about determining what is worth understanding amid a range of content standards & topics?
- To what extent does the idea, topic or process represent a "big idea" having enduring value beyond the classroom?
- To what extent does the idea, topic, or process reside at the heart of the discipline? (Authentic learning experiences)
- To what extent does the idea, topic, or process require uncoverage? (What common misunderstandings need to be covered more in-depth)
- To what extent does the idea, topic, or process offer potential for engaging students? (motivation, interest, relevance)

The Big Picture: Design Approach

Key Design Question	Design Considerations	Filters (Design Criteria)	What the Final Design Accomplishes
Stage 1: What is worthy and requiring of understanding?	• National Standards • State standards • District standards • Data results • Regional topics • Teacher expertise & interest	• Enduring ideas • Opportunities for authentic work • Uncoverage • Engaging	• Unit framed around enduring understanding & essential questions

See Handout

The Big Picture: Design Approach/Stage 2

Key Design Question	Design Considerations	Filters (Design Criteria)	What the Final Design Accomplishes
Stage 2: What is evidence of understanding?	• Six facets of understanding • Continuum of assessment types	• Valid • Reliable • Sufficient • Authentic work • Feasible • Student Friendly	• Unit anchored in evidence of the desired understanding

The Big Picture: Design Approach/Stage 3

Key Design Question	Design Considerations	Filters (Design Criteria)	What the Final Design Accomplishes
Stage 3: What learning experiences and teaching promote understanding, interest, and excellence?	• Research-based learning & teaching strategies • Essential and enabling knowledge and skill	• WHERE • Where does it lead? • The Hook? • Explore • Rethink & revise • Exhibit & evaluate	• Coherent learning experiences & desired understandings, promote interest, and make excellent performance more likely.

Template Exercise

Vignette:

- Bob Jones is designing a 3-week unit on nutrition
- Stage 1: Identify the Desired Results:
  - State health content standards:
    - Students will understand essential concepts about nutrition
    - Students will understand elements of a balanced diet
    - Students will understand their own eating patterns and ways in which these patterns may be improved

Identify Desired Results

- As a group fill out Template #1 “Identify Desired Results” and be ready to share
- See Handout

Identify Desired Results

- Wiggins and McTighe's Suggestions to this exercise
- See Handout

Stage 2

- Determining Acceptable Evidence

The Six Facets of Understanding

- Explanation
- Interpretation
- Application
- Perspective
- Empathy
- Self-Knowledge

Explanation

- Why is that so? What explains this event? How can we prove it? How does it work?
  - A cook explains why adding a little mustard to oil and vinegar enables them to mix. The mustard acts as an emulsifier.
  - A 10th grade student knows the facts of the Boston Tea Party and the Stamp Act but not why they happened and what they led to.

Template Exercise 2

- As a group fill out Template #2

"Determine Acceptable Evidence" and be ready to share

- See Handout

Determine Acceptable Evidence

- Wiggins and McTighe's Suggestions to this exercise
- See Handout

Template Exercise 3

- As a group fill out Template #3

"Plan Learning Experiences and Instruction" and be ready to share

- See Handout

Plan Learning Experiences and Instruction

- Wiggins and McTighe's Suggestions to this exercise
- See Handout

If Time

- Design Standards (evaluation)
- Guiding Questions graphic/"WHERE"
- Six Facets for Understanding
- Connection to the DCPS "Unit Planner"
- SEE HANDOUTS

Assignment

- Before we meet again in December- Please use the blank templates to create your individualized unit of instruction “By Design”.
- Additionally, fill out the DCPS format “Unit Planner”
- If possible try to also incorporate it into the classroom and provide feedback to the group when we meet again

Using Technology to Help !

- Excel
  - Grades/Grade book Exercise
  - Differentiated Instructional Strategies

Questions?

Contact Information:
Davina Pruitt-Mentle
Director: Educational Technology Outreach
University of Maryland
2127 TAWES
College Park, MD 20742
(301) 405-8202
dp151@umail.umd.edu