

Based on the work of Grant Wiggins and Jay McTighe

Understanding by Design

3 Stages of ("Backward") Design



1. Identify desired results

2. Determine acceptable evidence

3. Plan learning experiences
& instruction

**You've got to go
below the surface...**





Stage 1: *Big Ideas*

- ◆ Goals or Standards
- ◆ Enduring Understandings
- ◆ Essential Questions
- ◆ Knowledge and Skills

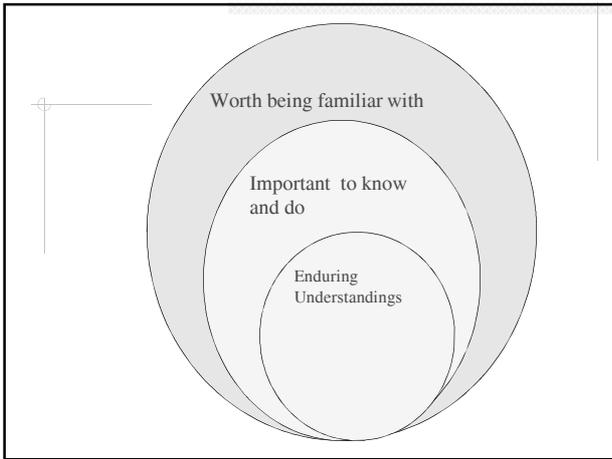
Goals or Standards

NSES

PA Academic Science and Technology standards
PA Ecology and Environmental Standards
PA Physical Education and Health Standards

NJ Core Content (Science) Standards

Local/District Standards/needs



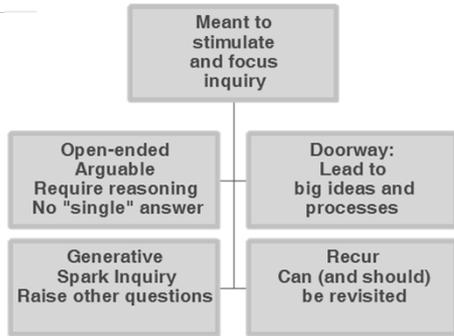
Enduring Understandings

- ◆ Big ideas or core processes
- ◆ State the desired outcome as a full-sentence, specific generalization
- ◆ Don't just specify the topic to be taught, but the understandings to be acquired
- ◆ Avoid phrases or topics--use the words "understand that..."

Six Facets of Understanding

| | |
|--|--|
| <ul style="list-style-type: none"> ◆ Explain - provide thorough, supported, and justifiable accounts of phenomena, facts and data ◆ Interpret - tell meaningful stories; offer apt translations; provide a revealing historical or personal dimension to ideas and events; make it personal or accessible through images, anecdotes, analogies, and models. ◆ Apply - effectively use and adapt what is known in diverse contexts. | <ul style="list-style-type: none"> ◆ Perspective - can see and hear points of view through critical eyes and ears; see the big picture. ◆ Empathize - find value in what others might find odd, alien, or implausible; perceive sensitively on the basis of prior direct experience. ◆ Self-Knowledge - perceive the personal style, prejudices, projections, and habits of mind that both shape and impede our own understanding; having an awareness of what one does not understand and why understanding |
|--|--|

Essential Questions



How do I determine what fits?

- ◆ Filter 1 To what extent does the idea, topic, or process represent a 'big idea' having enduring understanding beyond the classroom?
- ◆ Filter 2 To what extent does the idea, topic, or process reside at the heart of the discipline?

How do I determine what fits?

- ◆ Filter 3 To what extent does the idea, topic, or process require uncoverage?
- ◆ Filter 4 To what extent does the idea, topic, or process offer potential for engaging the student?

Essential Questions

Does the question...

- ◆ Go to the heart of a discipline?
- ◆ Recur naturally throughout one's learning and history of a field?
- ◆ Raise other important questions?

What key points of the heliocentric view better support the motion of the planets (including Earth) than the geocentric view?

3 Stages of Design: Stage 2



1. Identify desired results

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Stage 2: Assessments

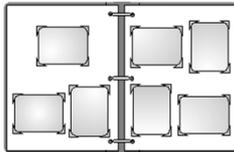
- ◆ Before you plan WHAT you are going to do to teach, plan HOW you are going to be sure students have learned.
- ◆ The most real-life assessments are performance based.
- ◆ Other assessments are also valid.

Just because the student “knows it” ...

- ◆ Evidence of understanding is a greater challenge than evidence that the student knows a correct or valid answer
 - Understanding is inferred, not seen
 - It can only be inferred if we see evidence that the student knows *the reason* (it works) so *what?* (reason it matters), *how* (to apply it) – not just knowing *that* specific inference

Reliability: Snapshot vs. Photo Album

- ◆ We need patterns that overcome inherent measurement error
 - Sound assessment (particularly of State Standards) requires multiple evidence over time - a photo album vs. a single snapshot



For Reliability & Sufficiency: Use a Variety of Assessments

- ◆ Varied types, over time:
 - authentic tasks and projects
 - academic exam questions, prompts, and problems
 - quizzes and test items
 - informal checks for understanding
 - student self-assessments

Curricular Priorities and Assessment Methods

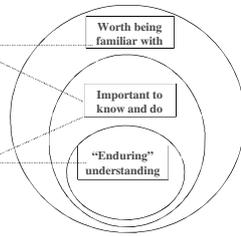
Assessment Types

Traditional quizzes and tests

Paper-pencil
Selected-response
Constructed-response

Performance tasks and projects

Open-ended
Complex
Authentic



Scenarios for Authentic Tasks T

◆ Build assessments anchored in authentic tasks using GRASPS:

G
R
A
S
P
S

- What is the **G**oal in the scenario?
- What is the **R**ole?
- Who is the **A**udience?
- What is your **S**ituation (context)?
- What is the **P**erformance challenge?
- By what **S**tandards will work be judged in the scenario?

A Performance Task is Authentic if it...

- Is realistic.
- Requires judgment and innovation.
- Asks a student to "do" the subject.
- Replicates or simulates the contexts in which adults are tested in the workplace.
- Assess a student's ability to efficiently and effectively use a repertoire of knowledge and skills to negotiate a complex task.
- Allows appropriate opportunities to rehearse, practice, and consult resources; obtain feedback on performances; and refine performances and products.

Test Design Against Standards

- ◆ To what extent do the assessment provide:
- ◆ * Valid and Reliable Measures
- ◆ * Authentic Performance Task Opportunities
- ◆ * Sufficient and Varied Information

3 Stages of Design: Stage 3

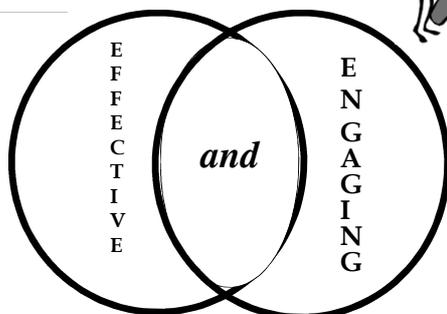


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Stage 3 big idea:



Taking a Closer Look at...

- ◆ Coverage
- ◆ vs.
- ◆ Uncoverage
- ◆ Misunderstanding and
- ◆ Misconceptions

Create from the *student's* perspective:

W.H.E.R.E T.O.?

W

- ◆ Where are they going? (learning goals)
- ◆ What are the reasons that the students are learning this?
- ◆ What is required of them?

H

Hooked: engaged in the process through

- Inquiry
- Research
- Problem solving
- Experimentation

(This is VERY important for at-risk students.)

E

- ◆ Explore/experience big ideas sufficiently
- ◆ Equip students for required performance(s)

R

- ◆ Rethink,
 - ◆ Rehearse,
 - ◆ Revise, and /or
 - ◆ Refine
- opportunities for students based on timely feedback.

E

Evaluate their own work:
reflect on their learning and set future goals.

Tailored and flexible unit plan to meet all learning styles.

Organized and sequenced to maximize efficiency and engagement and effectiveness.

Best Learning Designs:

- ◆ Expectations
- ◆ Instruction
- ◆ Learning Activities
- ◆ Assessment
- ◆ Sequence and Coherence

Best Learning Designs

Expectations

- ◆ Provide clear learning goals and performance expectations
- ◆ Cast learning goals in terms of genuine, meaningful performance
- ◆ Frame the work around genuine questions and meaningful challenges
- ◆ Show models, exemplars of expected performance
- ◆ Base learning on the background of the learner

Best Learning Designs

Instruction

- ◆ Teacher serves as a facilitator/coach to support the learner
- ◆ Targeted instruction and relevant resources are provided to “equip” students for expected performance
- ◆ Textbook serves as one resource among many
- ◆ Teacher “uncovers” important ideas/processes by exploring essential questions and genuine applications of knowledge and skills

Best Learning Designs

Learning Activities

- ◆ Individual student differences accommodated through a variety of activities/methods
- ◆ Students have some choice
- ◆ Opportunities for both group and individual work
- ◆ Active/experiential learning to help students “construct meaning”
- ◆ Learning Cycles Models

Best Learning Designs

Assessment

- ◆ No mystery to performance goals or standards
- ◆ Assessment methods matched to achievement targets
- ◆ On-going, timely feedback is provided
- ◆ Learners have time for trial and error, reflection and revision
- ◆ Self-assessment is expected
- ◆ Students demonstrate their understanding through genuine use of knowledge and skills, target audience

Best Learning Designs

Sequence and Coherence

- ◆ Start with a “hook” to immerse the learner in a genuine problem/issue/challenge
- ◆ Move back and forth from whole to part, with increasing complexity
- ◆ Scaffold learning in “do-able” increments
- ◆ Revisit ideas--have learners rethink and revise earlier ideas/work
- ◆ Respond to student needs and revise plan to achieve goals
