
Understanding by Design

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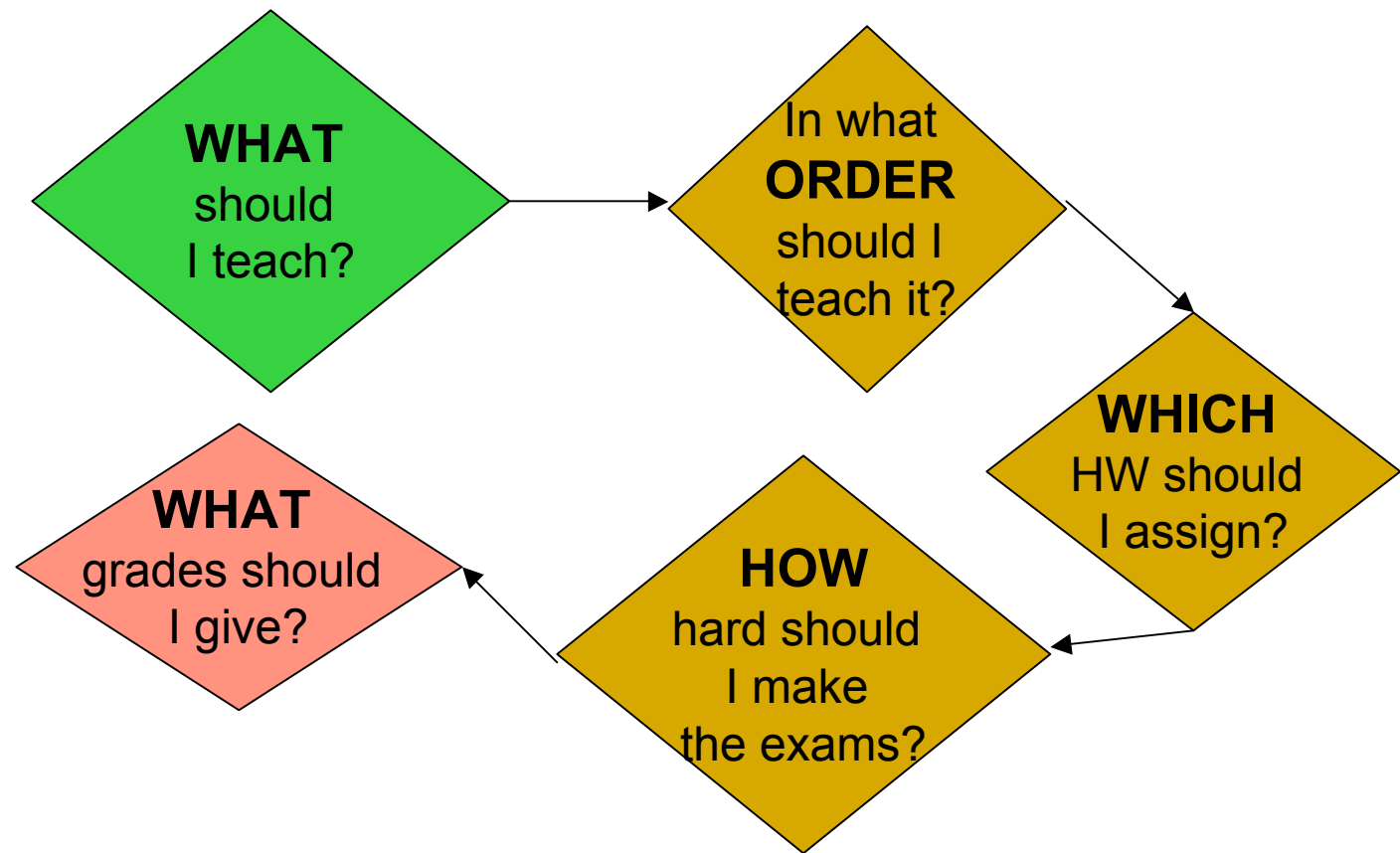
Goal of this session

- Hear about Understanding by Design Framework
 - Practice using the framework on one of the outcomes in your intro science course
 - Get together with others who teach a similar intro science course. I will refer to this as “Your Science Course” throughout.
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“Typical”

Course Development Decision

Process

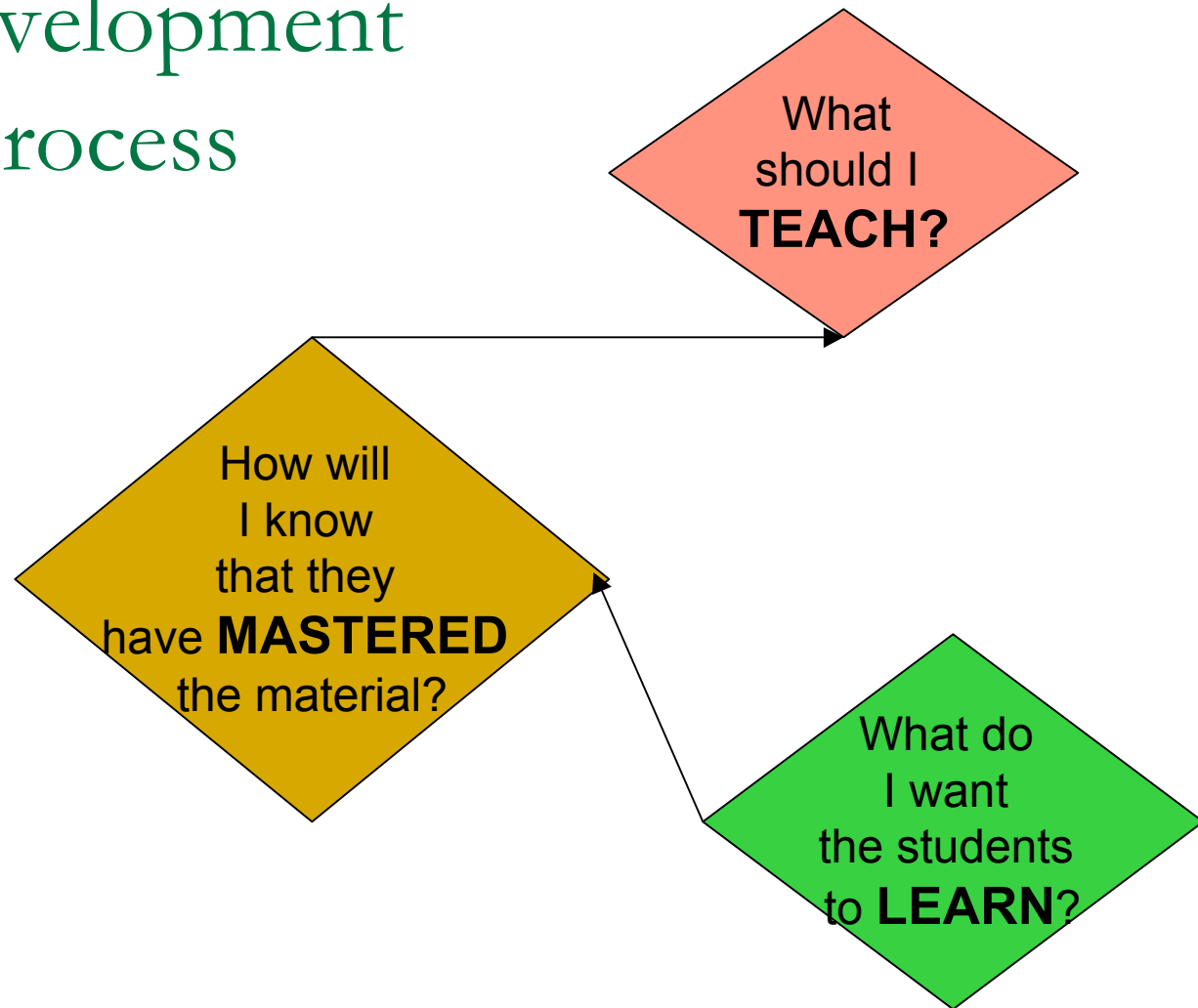


Overarching Understanding for This Session

The three basic steps of backward course design:

- ❑ Identify the desired results
 - ❑ Determine acceptable evidence
 - ❑ Plan learning experiences and instruction
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Backward Design Course Development Decision Process



Major Resource for This Session

Understanding by Design

By Grant Wiggins and Jay McTighe

Prentice Hall; Upper Saddle River, NJ; 2001

ISBN: 0-13-093058-X

Stage 1:

Identify Desired Results

What are your curricular priorities?

- “Enduring” understanding
 - Important to know and do
 - Worth being familiar with

Idea: What makes an expert in this field? (Think about process as well as content.)

STOP

- Think, pair, share (in your small groups):

What makes an expert in your field?

Think of characteristics of experts, the way they work, the way they think, what they know, etc.

How do you identify such an expert?

Stage 1

- Things to keep in mind:
 - National standards/accreditation guidelines
 - Teacher expertise
 - Institute opportunities
-

Stage 1

- What is worthy and requiring of understanding?
 - Four filters (criteria) to help you answer this question
-

Stage 1

Filter 1: To what extent does the idea, topic, or process represent a “big idea” (linchpin idea) having enduring value beyond the classroom?

Idea: Essential for understanding the topic or subject; a focus on ideas that are long lasting.

Stage 1

Filter 2: To what extent does the idea, topic, or process reside at the heart of the discipline?

Idea: How does a professional in this field do their work? Authentic learning – the student has an active role as a constructor of meaning.

Stage 1

Filter 3: To what extent does the idea, topic, or process require uncoverage?

Idea: What ideas/concepts do the students often have difficulty grasping? About which big ideas are they likely to harbor a misconception?

Stage 1

Filter 4: To what extent does the idea, topic or process offer potential for engaging students?

Idea: Provoke and connect to the students' interests
– increase likelihood of student engagement and sustained inquiry.

Stage 1

- End result:

A unit of study that is framed around enduring understandings and essential questions

Relate Stage 1 to Your Science Course

- First, on your own, make a list of no more than three enduring understandings for your chosen intro course
 - Then, in your groups, share what you came up with and choose ONE outcome for your course that you want to concentrate on today
 - Write it down
 - Around the room
-

Stage 2:
Determine
Acceptable Evidence

How will we know if we have succeeded as
instructors?

How will we know if the students have achieved
the desired results and met the standards?

What is evidence of successful teaching?

Students UNDERSTAND the material.

What does this mean?

STOP

- In your small groups, discuss and write down:

What does it mean for a student to understand in the context of your chosen learning outcome?

And, how can you tell if a student REALLY understands?

What does it mean to understand?

■ **Explanation**

Provide knowledgeable and justified accounts of events, actions, and ideas

Implications:

Build units around overarching questions, issues, and problems that demand student theories and explanations.

Use assessments that ask students to explain, not just to recall, to link facts with ideas and to justify these links, to show their work and to support their conclusions.

What does it mean
to understand?

- **Interpretation**

Interpretations, narratives, and translations that
provide meaning

Implication:

Teach students to build stories and
interpretations.

What does it mean to understand?

■ **Application**

The ability to use knowledge effectively in new situations and diverse contexts

Implication:

An emphasis on performance-based learning, focusing on authentic tasks supplemented by conventional exams.

What does it mean to understand?

■ **Perspective**

Critical and insightful points of view

Implications:

Instruction should include explicit opportunities for students to
confront alternative theories and diverse points of view

Instruction and performance standards must require the student to
see things from the perspective of the final audience, not just
from their own position and intentions.

What does it mean to understand?

■ **Empathy**

The ability to get inside another person's feelings and worldview

■ **Self-Knowledge**

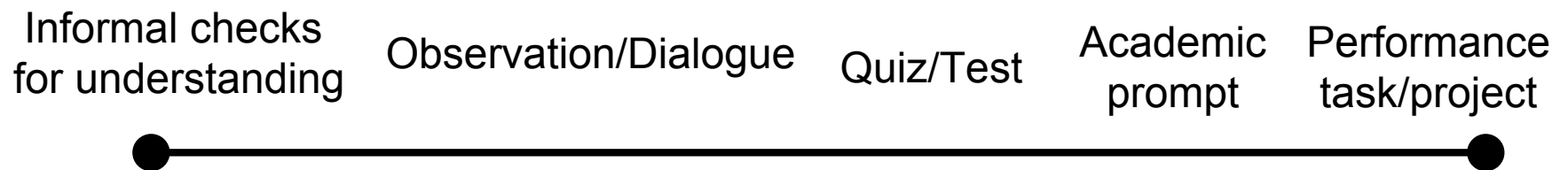
The wisdom to know one's ignorance and how one's patterns of thought and action inform as well as prejudice understanding

Stage 2

- What is acceptable evidence of understanding?
 - How do we assess for understanding?
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Stage 2

Continuum of Assessment Methods (page 12, *Understanding by Design*)



Stage 2

- What are some criteria that we should apply to our assessment instruments?
 - Valid
 - Reliable
 - Sufficient
 - Authentic work
 - Feasible
 - Student friendly
-

STOP

- In your groups:

Brainstorm some ideas for assessment instruments/activities/etc. along the continuum that would help you measure understanding in the context of your chosen outcome

Some examples from the field...

Stage 3:

Plan Learning Experiences

and Instruction

Teaching is a means to an end!

What questions should one address now that you have a clear goal of the intention of the course?

Stage 3

- What learning experiences and teaching methods promote understanding, interest, and excellence?



Stage 3

What knowledge and skills will students need in order to achieve desired results?

Stage 3

What activities will equip students with this needed knowledge and skills?

Stage 3

What will need to be taught and coached and how should it best be taught, in light of performance goals?

Stage 3

What materials and resources are best suited to accomplish these goals?

Stage 3

Is the overall design coherent and effective?

Stage 3

- “Uncoverage as opposed to coverage”

Coverage: “teach, test, hope for the best”

Uncoverage: Inquiring into, around, and underneath content; requiring the students to DO the subject not just to learn the results
