AN INTEGRATION OF "BACKWARDS PLANNING" UNIT DESIGN WITH THE "TWO-STEP" LESSON PLANNING FRAMEWORK

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Planning engaging and effective lessons for middle and high school learners is one of the fundamental components of successful secondary teaching (Skowron 2001; Butt, 2006). While Wiggins & McTighe (1998) have set forth a framework for “backwards planning” in unit design, this article provides a framework for employing backwards planning in designing individual lessons. By synthesizing the “Two Step” model by Flynn, Mesibov, Vermette & Smith (2004) and the “backwards planning” model by Wiggins & McTighe (1998), this article provides educators with an integrated framework and a case study of backwards lesson planning in action.

What is ‘backwards planning’?
In their 1998 publication Understanding by Design Wiggins & McTighe put forth an innovative, concept based unit design format known as “backwards planning.” Backwards planning calls for educators to begin with a nominal list of essential questions all students must answer by the end of the unit. With this clear end in mind, teachers then design the assessments of those understandings, followed by carefully crafted lessons to achieve this set of objectives. Since Wiggins & McTighe’s curricular model terminates at lesson creation, the question for many educators becomes “How can I continue this goal driven approach when creating individual lessons?” This is where the synthesis of this model for unit planning and the two step model (Flynn et al., 2004) for lesson planning becomes ideal.

How can backwards design be applied to individual lesson planning?
After unit goals and assessments have been established, teachers must design and implement lessons to meet both unit and lesson objectives. As with unit design, each lesson must begin with a ‘learning target’ or goal that both teachers and students can use to judge their achievement during the class period. This learning target, considered along with lesson based assessments of student performance, enables teachers to carefully sequence every learning experience within a lesson to reach a desired end. Flynn et al. (2004) have labeled this careful sequence of learning experiences the “discovery” and “exploratory” phases of a lesson. Educators must ask themselves, “What do students need to have accomplished by the end of the lesson?” (discovery phase) and “what scaffolds are required for students to reach that end?” (exploratory phase).

To provide the reader with an experience by which further discussion of the synthesis of backwards planning and the two step model can take place, consider the sample lesson below. This lesson took place in a seventh grade mathematics class. The lesson’s goal (learning target) states...
(a) Using different colored markers students create a series of images based on the original rectangular design, transforming the figure so it is two, three and four times its original size. As students draw an enlarged figure they complete another column in their graphic organizer recording how the shape, dimensions, area and perimeter change with each transformation.

(b) Students practice finding area and perimeter (a skill they will need to utilize throughout the lesson) by completing four practice problems in their base groups. After four minutes of work time, students obtain feedback from their teacher. They discuss misconceptions, answer questions and clarify their understandings as a whole group.

(c) Students apply the relationships they just discovered (and articulated) to a series of four follow-up problems. Working in their base groups, students test their hypothesis about how dilation effect perimeter, area, dimensions and shape by transferring them to new polygons. Students turn in these follow-up problems at the end of class. They also include an answer to the question “One thing I still wonder about dilations is…”

(d) Students work in their base groups to complete a graphic organizer which displays the shape, dimensions, area and perimeter of the original rectangular figure. Students use this information to make comparisons about how the properties of a rectangle change after a dilation of \( D_2, D_3 \) and \( D_4 \).

(e) A student volunteer reads an introduction to the lesson out loud. Students are given background information about today’s lesson - essentially that they will consider “enlarging” a rectangular design to be used to create a poster for a school dance. The figure on the poster must be two, three and four times larger than the original.

(f) The whole group shares their insights and observations regarding how the shape, dimensions, area and perimeter of each rectangle changes as it is dilated. Students make notes about (1) the relationship between the shape of the figure and the shape of the images (2) the relationship between the dimensions of the figure and the dimensions of the images (3) the relationship between the perimeter of the figure and the perimeter of the images and (4) the relationship between the area of the figure and the area of the images.

that all students will be able describe how the properties of polygons are affected by dilations. While considering the six scrambled “steps” of the lesson, classify each activity by placing an “e” next to those that should occur early in the lesson, an “m” next to those that should occur in the middle of the lesson and an “l” by those that should occur late in the lesson. After considering your sequence, we will explore the sorts of lesson planning decisions that a teacher looking to apply the backwards planning approach to individual lessons must make and how these decisions ultimately impact student learning.

**What does backwards lesson design “look like” in the classroom?**

The remainder of this article will consider how the extension of Wiggins & McTighe’s backwards planning model to a lesson design model “plays out” in secondary classrooms. We will use the sample mathematics lesson on dilations as the basis for our analysis, as we consider how this backwards lesson planning model can be
utilized in one’s own practice.

First consider those events you labeled with an “I”. Those which were slotted as most appropriate to occur late in the lesson. Flynn et al. (2004) call these activities the “discovery phase” of a lesson. These are the culminating activities designed to demonstrate a transfer of understanding and which elicit conceptual (schematic) change. They provide closure to the lesson, allow for student feedback and checks for understanding. The events of the discovery phase tie directly to the lesson’s learning target as they are the means by which teachers and students judge competence of the day’s objective. Though they occur last in the lesson, from a backwards planning perspective, this is where educators should begin the lesson planning process. Just as unit assessments mirror the unit’s goals, the activities in the discovery phase should mirror the lesson’s goals. This phase demands assessment and feedback.

In the dilations lesson, this occurred when students applied the mathematical relationships they discovered to unique situations, testing and modifying their hypothesis as they transferred it to other polygons. Having this assessment in mind during the beginning stages of lesson planning, one can sequence preceding learning experiences to scaffold the skills and knowledge necessary to make this demonstration of understanding possible.

Now recall those activities labeled with an “e”. Those were the activities you felt were most appropriate to occur early on in the lesson. It is likely you labeled these activities as such because they grabbed the learner’s attention, elicited prior knowledge, and helped students generate the basic understandings required during the lesson. In the dilations lesson, these early activities (which Flynn et al., (2004) call “exploratory activities”) were likely when students practiced finding the area and perimeter in their base groups, considered the rationale for the day’s lesson and created the graphic organizer about the three dilated images. These activities were carefully crafted to ensure student success in completing the “discovery task” (when students transferred their understandings of dilations to other polygons).

Keeping in mind Wiggins & McTighe’s backwards planning model, though these exploratory activities occur early in a lesson, they should be planned only after the lesson’s goals and discovery tasks have been established. Using Flynn et al.’s (2004) terminology, exploratory tasks should be planned only after discovery tasks have been created. This way, teachers can scaffold the ideas required for student success.

Finally, consider those events labeled with an “m”. Those were the events you felt were most appropriate for the middle of the lesson. In the dilations lesson, it is likely “middle” activities included students sharing insights about relationships they discovered or the whole group debriefing utilizing the graphic organizer. Since these activities may or may not be necessary, they are designed to either (1) enhance student understanding through further scaffolding (additional exploratory activities) or (2) provide further evidence of student understanding (additional discov-
ery activities). Flynn et al., (2004) state that these “middle” activities can be classified in either the exploratory phase or the discovery phase. These activities are the planned interventions designed to enhance the lesson and aid student understanding. They continue to help students do the prior thinking and understanding that readies them to successfully complete the discovery task. When synthesized into Wiggins & McTighe’s backwards planning framework, these middle activities are analogous to supplemental connections or extension lessons. They are opportunities for spontaneous and planned interventions that may be inserted or deleted as necessary.

Summary
By infusing Wiggins & McTighe’s (1998) backwards unit planning model into Flynn et al.’s (2004) two-step lesson planning model, it becomes apparent that there is a need to apply the principals of objective based unit design to day-to-day lesson planning. Through the synthesis of these two models, individual lessons can become more objective based, thereby allowing sequencing of the lesson to be designed with a specific end in mind and resulting in greater competency of lesson (and ultimately unit) objectives.

Appendix
Although there may be valid arguments about this, we suggest that the most productive sequence of activities in the sample mathematics lesson presented above would be to begin with activities (e) and (b), complete activities (a), (d) and (f) in the middle of the lesson and finish the lesson with activity (c). Ending the lesson with a series of four follow-up problems and a question prompt challenges students to make use of the mathematical concepts they have learned, while completing a formative assessment of understanding. Opening with activities (e) and (b), where students uncover a rationale and engage in a team activity about this topic, shows a commitment to constructivist learning theory, as it uses students’ prior knowledge and experiences as a means for future discovery. While other appropriate activity sequences may exist, it should be noted that the intentionality that accompanies a teacher’s flow of activities is nearly as important as the sequence itself.

References
