### Dennis-Yarmouth RSD

#### Instruction Office Newsletter

### The Art of Designing Lessons With Desirable Difficulties

In this article in *Education Week Teacher*, author/researchers Brad Ermeling, James Hiebert, and Ron Gallimore applaud U.S. educators' recent emphasis on growth mindset and "grit." They point to clear benefits in having students wrestle with complexity, uncertainty, and difficulty and coming up with their own answers rather than being guided through every step.

But Ermeling, Hiebert, and Gallimore worry that "struggle" may become an end in itself, rather than a means to higher levels of student learning. Cooperative learning has fallen into this trap, they believe: "In many classrooms, students have learned to be better 'cooperators' but often without any distinct benefit for deeper learning. To avoid a similar fate with growth mindset, the instructional goals must be richer learning, not just struggle." The key is getting students engaged with a task that captures the central idea of the lesson or unit.

Here's an example. A teacher is introducing the addition of fractions with unlike denominators (students already understand how to add fractions with like denominators and can solve problems like

2/5 + 1/5). One approach would be for the teacher to ask, "Can you find a common denominator for the problem 1/2 + 1/3?" But this doesn't focus students on the key idea, which is that units or wholes must be broken into same-size parts to find the exact answer to the problem. A better question would be, "Can you find how much juice we would have if we added 1/2cup and 1/3 cup? Show how you found the answer by drawing a picture or writing how you thought about the problem." This gets students wrestling with the key idea they need to understand – how to think about the quantities of juice in smaller, equal amounts so they can be added together.

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	iportant Dates
February 12 <sup>th</sup>	Abraham Lincoln's Birthday
February 1	4 <sup>th</sup> Valentine's Day
February 15, 2016	5 President's Day Holiday Start of School Vacation
February 22 <sup>nd</sup>	School Resumes
February 22 <sup>nd</sup> (	George Washington's Birthday
February 24 <sup>th</sup>	State of the District Meeting @ DYH
February 29 <sup>th</sup>	Mentor Meetings

#### **Important Notice:**

Central office is a <u>fragrance-free zone</u> so please be respectful and plan accordingly when you visit.

ue to one of our members at the CO being highly sensitive to any type of fragrance, we ask that staff visiting/meeting at the Administration building refrain from using any scented products. Fragrances from personal care products, air fresheners, laundry and



other cleaning products have been associated with adversely affecting a person's health. We ask that we all work together to make the environment a safe and healthy workplace for everyone. Thank you very much for your cooperation!

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When students have worked on this problem, they will be much more receptive to learning the concept, perhaps in a direct explanation from the teacher.

Designing learning experiences focused on worthy learning goals is challenging, say Ermeling, Hiebert, and Gallimore; it involves a lot of trial and error and teacher persistence. Here are some other key elements in successful "struggle" lessons:

### Determining the timing and placement in a curriculum unit;

**C**rafting the problem so it hits students' zone of proximal development (ZPD) – the level of difficulty that will challenge them without undue frustration;

Making sure they have the prerequisite knowledge and skills – for example in the problem above, knowing how to add fractions with like denominators before tackling problems with unlike denominators; Doing ongoing assessments to gauge students' current level of understanding and proficiency; Providing a safe environment that encourages student thinking, collaboration, and risk-taking;

### Using probing questions to nudge students into their ZPD;

Providing appropriate help – "Success depends on teachers recognizing when a little timely assistance sustains student persistence but does not prematurely terminate productive struggle and learning," say the authors.

Following up each struggle episode with carefully structured lessons that build on students' ideas, address misconceptions, and help them reflect on their new understandings.

"Beyond Growth Mindset: Creating Classroom Opportunities for Meaningful Struggle" by Brad Ermeling, James Hiebert, and Ron Gallimore in *Education Week Teacher*, December 7, 2015, <u>http://bit.ly/1I52vKR</u>; Ermeling can be reached at <u>brad.ermeling@gmail.com</u>.

#### A Five-Step Model for Leading Classroom Math Discussions

In this article in *Mathematics Teaching in the Middle School*, Margaret Smith, Elizabeth Hughes, and Mary Kay Stein (University of Pittsburgh) and Randi Engle

(University of California/Berkeley) suggest a way to conduct classroom math discussions that builds on and honors student thinking while ensuring that the key ideas being taught remain central. The authors use the Bags of Marbles problem as an example:

Bag X contains 75 red and 25 blue marbles.

Bag Y contains 40 red and 20 blue marbles.

Bag Z contains 100 red and 25 blue marbles.

Each bag is shaken and a student, eyes closed, takes out one marble from each bag.

### With which bag would the student have the best chance of picking a blue marble?

The challenge with problems like this is how to orchestrate student exploration and an all-class discussion so the different ways of solving it are explored, students can draw on their varying levels of expertise, and students get enough – but not too much – help from the teacher.

Smith, Hughes, Engle, and Stein suggest a particular sequence for conducting a rigorous math discussion.

"These practices give teachers control over what is likely to happen in a discussion," they say, "as well as more time to make instructional decisions. This is possible because much of the decision making has been shifted to the planning phase of the lesson."

• Step 1: Anticipating student responses – The ideal scenario is for a group of teachers to meet and come up with as many solutions as they can, perhaps also looking at student work from previous years. This will help think through different student strategies and

prepare teachers to deal with likely errors and misconceptions. For example, one common but invalid way to solve the Bags of Marbles problem is to look at the number of extra red marbles in each bag (50 in Bag X, 20 in Bag Y, and 75 in Bag Z). Teachers should be ready to ask the right questions of students who are using this strategy.

• Step 2: Monitoring students' work and engagement – As students work on the problem (probably in groups), the teacher circulates and pays close attention to their mathematical thinking and solution strategies. It's helpful to have a list of all the possible solutions (fraction, percent, ratio unit rate, ratio scaling up, additive, and others not anticipated) and jot down which strategies different groups are using. "During this time, the teacher should also ask questions that will make students' thinking visible and help students clarify their thinking," say the authors. "The teacher should also ensure that all members of the group are engaged in the activity and press students to consider aspects of the task to which they need to attend."

• Step 3: Selecting students to present – While circulating, the teacher thinks about which students to call on in the all-class discussion. The goal is to get all possible solution strategies on the table (including strategies that students don't come up with) and teach the key concepts, namely: (a) to compare bags of marbles, you need a common basis of comparison, and (b) there are different types of comparisons: part-to-part, part-to-whole, and percents).

• Step 4: Sequencing student responses for display – The teacher might start the all-class discussion with the strategy used by most students in the class, which would validate their work and engage as many students as possible. Alternatively, the teacher might begin with a strategy that is the most concrete, using drawings and hands-on models, and move into the more-abstract solutions. Or the teacher might start with incorrect strategies to clear up misconceptions early on. Whatever approach is used, the sequence should allow students to see the differences between different solutions and appreciate the diversity of solutions to a seemingly simple problem.

• Step 5: Connecting different student responses and linking them to key math ideas – The closure of this lesson should pull the threads together and help students evaluate the accuracy and efficiency of different solutions and see the mathematical patterns and principles involved.

"Orchestrating Discussions" by Margaret Smith, Elizabeth Hughes, Randi Engle, and Mary Kay Stein in *Mathematics Teaching in the Middle School*, May 2009 (Vol. 14, #9, p. 548-556), available for purchase at <u>http://bit.ly/1Qj8xue</u>

#### EXIT TICKETS



Teachers typically use exit tickets to assess what students have understood from the day's lesson. Exit tickets are not a test, but a way to understand students' comprehension of a particular topic. With this information, teachers can adjust instruction and plan how to best meet student needs by modifying and differentiating instruction. Exit tickets allow teachers to see where the gaps in knowledge are, what they need to fix, what students have mastered, and what can be enriched in the classroom.

#### **Designing An Exit Ticket**

Teachers design their own exit tickets. A good exit ticket is linked to the objective of the lesson, focusing on one particular skill or concept that students should have understood that day. Exit tickets can pose questions that are multiple choice, short answer, or even a couple of sentences in response to a question. Three to five questions make for a good exit ticket, and students should be able to complete the whole thing in just a few minutes at the end of a class period.

Exit tickets are only as good as how they are designed. It may take a little practice to get your questions precise enough for students to give you the information you need. General questions ("Do you understand?", "Yes or no?", etc.) don't really give the information that will help you work with your students. Exit tickets with questions that assess understanding, apply the concept, or demonstrate the concept work best.

Technology offers an easy way to work with exit tickets, using Poll Everywhere or Google Forms. Students can easily use their tablet, smart phone, or computer to fill out exit tickets, and these apps can immediately compile the information for teachers. The first time you organize your class roster into these apps will require a bit of set-up, but once completed, you'll have an easy recourse to manage your data. Paper and pencil are a great option, too. This requires more teacher effort to compile responses, but still gives you the benefit of knowing where your students stand in relation to the material.

Spend some time designing an exit ticket the day before you teach. Upload the form and set it up in Google Drive for students to access, or print out the copies if it's pencil and paper.

#### How Often and When?

Some teachers use exit tickets daily, while others use them only once or twice a week, depending on the unit. Exit tickets are given at the end of a class period, and should only take a few minutes for students to complete. Remember to set up an exit ticket by letting students know it's not graded and not a test or a quiz, just a reflection of what they understood that day.

#### **Compiling Data**

After students submit their exit tickets, a teacher will have to compile and "read" the data results. If you've used a Google form, the information can be uploaded to Google Drive to automatically create an Excel spreadsheet. If you've used pencil and paper, it will take a few minutes to organize and compile your data in a way that gives you an overall picture of your classroom.

#### **Using Data to Differentiate Instruction**

Exit ticket results help teachers differentiate instruction:

#### How did the group of students do overall?

How many kids really understand the purpose of what you're doing in class and can move forward with it? For those who can't, how will you change your lesson plans that night so that you can meet your students' needs the next day?

Exit tickets allow you to use your data to identify student strengths and weaknesses, and then plan for the next day's instruction. Perhaps one group will get more direct instruction around the basic concept, while another group will work independently. Perhaps only one or two students need some additional help, and you'll plan accordingly. The key to differentiation is that you have high expectations for all students and a clear objective. If you know what you want students to master, differentiation allows you to use different strategies to help all the students get there.

#### **Other Uses for Exit Tickets**

Exit tickets could also be used to preview what students know about topics that the class hasn't even discussed yet. It can give a teacher some information about where to start his

or her lesson on a new topic the next day.

Sometimes teachers also use entrance tickets, which are given at the beginning of a class period. You start off with two questions assessing what students know from the previous day's lesson. And right away, you understand from these questions how you need to start today's lesson. Entrance tickets help you answer this question: "What do I need to do differently *right now* in order to meet the needs of my kids?"

# The 8 Minutes that Matter the Most

Since I will always be an English teacher at heart, my ears perk up when writers talk about their process. I've found the advice handy for lesson planning, too. That's because both writing and planning deal with craft.



In writing, you want your audience to be absorbed. You want them to care about your characters. You want them to be delighted by the suspense. That's not easy to pull off, and it's just as hard in the classroom. So when writers pull back the curtain on what they do, I pay attention. I look at the ways in which they create drama and tension. I study how their twists and turns pace a story much like the transitions of a lesson. I am also fascinated by rituals. John Irving, the author of *The Cider House Rules*,

begins with his last sentence:

I write the last line, and then I write the line before that. I find myself writing backwards for a while, until I have a solid sense of how that ending sounds and feels. You have to know what your voice sounds like at the end of the story, because it tells you how to sound when you begin.

That is the crux of lesson planning right there -endings and beginnings. If we fail to engage students at the start, we may never get them back. If we don't know the end result, we risk moving haphazardly from one activity to the next. Every moment in a lesson plan should tell.

The eight minutes that matter most are the beginning and endings. If a lesson does not start off strong by activating prior knowledge, creating anticipation, or establishing goals, student interest wanes, and you have to do some heavy lifting to get them back. If it fails to check for understanding, you will never know if the lesson's goal was attained.

#### <u>Here are eight ways to make those eight</u> <u>minutes magical.</u>

#### **Beginnings**

#### 1. Trend With YouTube

YouTube reaches more 18- to 34-year-olds than any cable channel. One hundred hours of video are uploaded to it every minute. There's something for every grade, subject, and approach on YouTube. Not only does it make learning HD visible, it also allows teachers to make connections that could never happen before. I had my students draw comparisons between Carl Sandberg's poem "Chicago" and the Chrysler Super Bowl commercial featuring Eminem. Fifteen years ago, I would have had to keep my finger on the record button of my VCR remote and pray for it to air. YouTube makes anticipatory sets a whole lot easier.

#### 2. Start With Good News

If you want to create a safe space for students to take risks, you won't get there with a pry bar. Edutopia blogger Todd Finley starts his classes with two minutes of sharing good news. Classrooms that celebrate success build the comfort necessary for students to ask critical questions, share ideas, and participate in honest and open discussions. Starting with celebrations is a short, easy way to get there.

#### 3. Cross Disciplines

Toss a football around the class before you teach the physics of a Tom Brady spiral. Play a song that makes a classical allusion for your mythology unit. Measure the angles of a Picasso painting in math class. Integrating other disciplines teaches students that ideas and concepts do not stand alone but rather exist within a wider web of knowledge. Starting with another discipline can open their senses to deeper learning.

#### 4. Write for 5

Kelly Gallagher says that students should write four times as much as a teacher can grade. Students need to write -- a lot -- if they are to improve. One way to achieve that is to start each day with an essential question that students must spend five minutes answering. If done day after day, it becomes ritualistic and builds stamina. Grant Wiggins and Jay McTighe have a diverse list of essential questions.

#### Endings

#### 1. Level Up

GameStop operates 6,457 retail stores throughout the world. It's no secret that kids love video games, partly because of the constant reward for reaching new levels and earning higher rankings. This creates a sense of accomplishment, competency, and worth. Teachers can play upon this need and develop levels of proficiency based on standards. At the end of a lesson, have students chart their own progress toward mastery based on standards. A popular game offers beginner, heroic, legendary, and mythic as levels, and they may be just the right motivation to get reluctant learners to overachieve.

#### 2. Exit Tickets

Robert Marzano classifies exit tickets into four different categories: formative assessment data, student self analysis, instructional strategy feedback, and open communication. However they are used, they provide quick and comprehensive bits of data and feedback. Wiggins and McTighe also have a comprehensive list of checks for understanding.

#### 3. Mimic Social Media

The digital world's spirit of collaboration and connection can be replicated in the physical classroom as bulletin boards become mock social media spaces to share ideas. Erin Klein has written about the positive ways to use of Twitter, Pinterest, and Instagram in the classroom. In the final four minutes, you can challenge students to compose a tweet or find an image best capturing the learning that occurred.

#### 4. Post-It Power

Another way to create a positive classroom climate beyond the "good news" start is to end with notes of influence. Have students write one thing that they learned from someone else in class on a Post-it note and stick it to the chalkboard. At the start of the next day, read these notes aloud. This affirms that a classroom is a community of learners and validates participation because it does so much more than answer a question -- it helps others understand more deeply.

How do you begin and end lessons in your classroom?

### PDP FAQs <u>http://www.doe.mass.edu/pd/faq.html#D1</u>

#### A. Professional Development Point (PDP) Eligibility

#### 1. What are the types of PD activities that are eligible for PDPs?

There is a wide range of PD activities that can qualify for PDPs including but not limited to: (1) ongoing participation in job embedded activities (e.g. mentoring/coaching, professional learning communities/PLC's; (2) participation in a series of short-term activities in a given topic that equal 10 hours (e.g., workshops, seminars) and (3) long-term activities (e.g., university courses). Please see Appendix B in the *Recertification Guidelines* In a distribution of the second sec

#### 2. Can I earn PDPs for attendance at a professional conference?

PDPs are no longer awarded for attendance at a professional conference. However, if (1) the conference spans two or more days allowing for attendance at a series of sessions/workshops on the same or similar topic totaling 10 hours or more and (2) if attendance results in a final product that would serve as an assessment of learning, then it could.

Note: Educators who attend a professional conference for less than 10 hours in a given topic may extend their learning to reach the required 10 hour minimum by developing a school-based activity or curriculum, or by publishing written material.

# 3. Can I earn PDPs for attending professional development offered by a for-profit educational organization?

Yes, as long as the organization is registered with ESE as a PD provider and as long as the professional development meets the minimum expectations (see question A7). In addition, the PD must be part of an ongoing 5-year cycle individual professional development plan (IPDP) consistent with the educational needs of the school and/or district.

# 4. Can I earn PDPs for attending professional development offered or sponsored by the Department of Elementary and Secondary Education?

The Department of Elementary and Secondary Education may offer 1.5 PDPs per clock hour for professional development programs that it sponsors as long as the programs meet the minimum expectations (see question A7) and includes a follow-up component. Note: For Department-sponsored activities that do NOT have a pre- and post-content assessment, only 30 PDPs can be counted toward recertification in a five-year cycle. For more information about PDP requirements please visit Recertification Guidelines.

#### 5. Can I earn PDPs for professional development that I design myself?

Educators may earn PDPs through an educator-designed professional development activity that results in a professional product that is related to the academic discipline of the license, including published written materials such as a book, journal article, book chapter, dissertation, or thesis. Educators may also earn PDPs for developing and implementing an activity for students, parents or teachers that incorporates the learning standards of the curriculum frameworks. For more information, please see the Recertification Guidelines.

# 6. May I earn PDPs as a trainer/presenter of a professional development course/workshop or seminar?

Educators who develop and present a professional development workshop or seminar are eligible to receive twice the number of PDPs given to participants, with the presenter receiving a minimum of 10 PDPs and a maximum of 24 PDPs. These points may be counted the first time the training is provided in a five-year cycle.

Note: Educators are eligible to receive 30 PDPs the first time they make a presentation at a professional conference in a five-year renewal cycle (Note: If presentation is repeated, it is not eligible).

# 7. What are the minimum requirements for professional development activities that are eligible for PDP's?

#### PDPs may only be awarded under the following conditions:

- The professional development is offered by the MA Department of Elementary and Secondary Education Department (ESE), school district, educational collaborative or a provider that is registered with ESE. (See question D1.) <u>http://www.doe.mass.edu/pd/faq.html#D1</u>
- The professional development must be at least 10 hours per topic.
- The professional development must include an assessment of learning. (This may be an end-of-course assessment or an observable demonstration of learning.)
- The professional development participant has met the provider's criteria for mastery.

#### B. Bundling Hours for PDP's

# 1. I was told that I may be able to convert certificates of attendance for less than 10 hours of PD into PDP's. How do I do that?

An educator may "bundle" several activities together when reporting their PDPs, provided they can demonstrate that these activities are related/similar in topic. To use PDPs for license renewal, an educator must accrue at least 10 hours of professional development about that topic. The easiest way is to do this is to select PD offerings that are at least 10 hours in length. (Note: You cannot receive PDPs via bundling unless you complete an additional follow-up activity demonstrating proficiency. <u>See question A7.</u>)

### 2. Does the Department accept PDPs earned at a conference through the process of bundling?

PDPs are no longer awarded for one day conferences unless bundling is involved. Conference attendance hours may be bundled with other hours for a minimum of 10 hours on related topics, including an observable demonstration of learning that could include a written product. (Note: You cannot receive PDPs via bundling unless you complete an additional follow-up activity demonstrating proficiency. <u>See question A7</u>.)

Educators may also receive PDPs for attendance at a conference by extending their learning at the conference through educator designed activities such as the development of a school-based activity or curriculum.

#### E. <u>PDP Sources/Options</u>

### 1. I heard that the Department will convert my university credits to PDP's, is that true?

Yes, as a general rule of thumb, one hour of eligible professional development activity = 1 PDP (i.e., 1 PDP is earned for each clock hour). This also applies to academic credit for upper-level or lower-level undergraduate courses. 1 credit =15 hours = 1.5 CEUs = 15 PDPs. However there are exceptions which are listed below:

- Upper-level undergraduate course (when substantially new to the educator) or approved equivalent = 1 semester hour = 22.5 PDPs
- Graduate-level course or approved equivalent = 1 semester hour = 22.5 PDPs
- Audits of undergraduate or graduate course or approved equivalent=1 semester hour = 7.5 PDPs

#### F. PDP Sources/Options

# 2. When should I start to collect Professional Development Points (PDPs)?

Educators may start earning PDPs for their first renewal cycle upon the issuance of a Professional level license. For subsequent renewal cycles, only PDPs earned after the previous expiration date are eligible. Activities older than five years from the date of application may not be counted.

3. A colleague told me that we are no longer required to maintain an Individual Professional Development Plan (IPDP) now that the educator evaluation system has changed and Professional Practice Goals are part of that system. Is this correct?

An IPDP is still required. For more information about how certain activities undertaken pursuant to the development of an Educator Plan may meet the requirements for an Individual Professional Development Plan, please visit the <u>Educator Evaluation FAQ webpage</u>.