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Differentiating Formative Assessment

What is Differentiation?

Differentiation is the process of tailoring instruction to meet the needs of *all* students. Teachers who choose to practise differentiated instruction (DI) do the following:

- Learn about their students in terms of the following: their readiness to learn content, their interests in conjunction with that content, and their learning or thinking styles that might allow them greater access to that content;
- Gather content resources that match students' readiness, interests and learning styles;
- Choose a process, such as flexible grouping, individualised instruction or lesson tiering to address students' readiness, interests and learning styles; and
- Plan assessments that address students' readiness, interests and learning styles.

This book focuses on embedding formative assessment within a procedure that addresses the overall process of differentiating instruction, including providing suggestions for three levels of readiness: struggling learners, typical learners and gifted or highly advanced learners.*

Why Differentiate Assessment?

Differentiating assessment is the only *fair* way to evaluate students' learning. According to Rick Wormeli (2006), "What is fair isn't always equal, and our goal as teachers is to be fair and developmentally appropriate, not one-size-fits all equal" (p. 6). If we give every child the same assessment, we are not paying attention to students' different learning styles and academic readiness. This book is based on the idea that teachers make a curriculum plan that *aims* different kinds of learners towards a *target* learning focus. Then as the lesson proceeds, these teachers constantly check to determine how those students are progressing in order to adjust that plan. Those adjustments hopefully work to help students eventually hit that target. This book provides examples of what I call the "Assessment Target", which I connect with the differentiation framework proposed by Silver, Strong and Perini (2007). This framework, which

* For information about strategies for determining students' readiness, interests and learning styles, and for suggestions for gathering content resources, see Northey (2005) or Waterman (2006). Also, for differentiating assessment ideas that address informal, pre-assessment and summative assessment, see Waterman (2009).

they base on the work of Jung (1923), suggests that students fall into one or more of four learning styles: mastery, understanding, self-expressive and interpersonal. I show how to base an Assessment Target on one or more of these styles and also include learning styles from the *Multiple Intelligences* (Gardner, 1993), and from Dunn and Dunn (1993).

How Can We Link Assessment That Teachers Differentiate with Theories of Learning?

It is important to connect differentiated assessment with theories of learning. What follows shows how specific researchers suggest choosing assessment processes based on theory (adapted from Herman, Ashbacher & Winters, 1992, pp. 18–20). I have added how that theory applies specifically to assessments teachers differentiate.

- *Theory:* We construct knowledge from our interactions with the world. We learn when we use our prior knowledge in combination with our experiences from which we create meaning.

  Applying theory to differentiated assessment suggests teachers should:

  - Assess students' discussions and conversations.
  - Assess opportunities to show divergent thinking (multiple paths to answers that vary).
  - Assess various ways of demonstrating learning.
  - Assess critical thinking skills such as the highest levels of "New Bloom" (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths & Wittrock, 2001).
  - Assess students' connections to their own experiences and prior knowledge.

- *Theory:* Learning occurs at all ages and stages and it does not occur in a linear and sequential manner.

  Applying theory to differentiated assessment suggests teachers should:

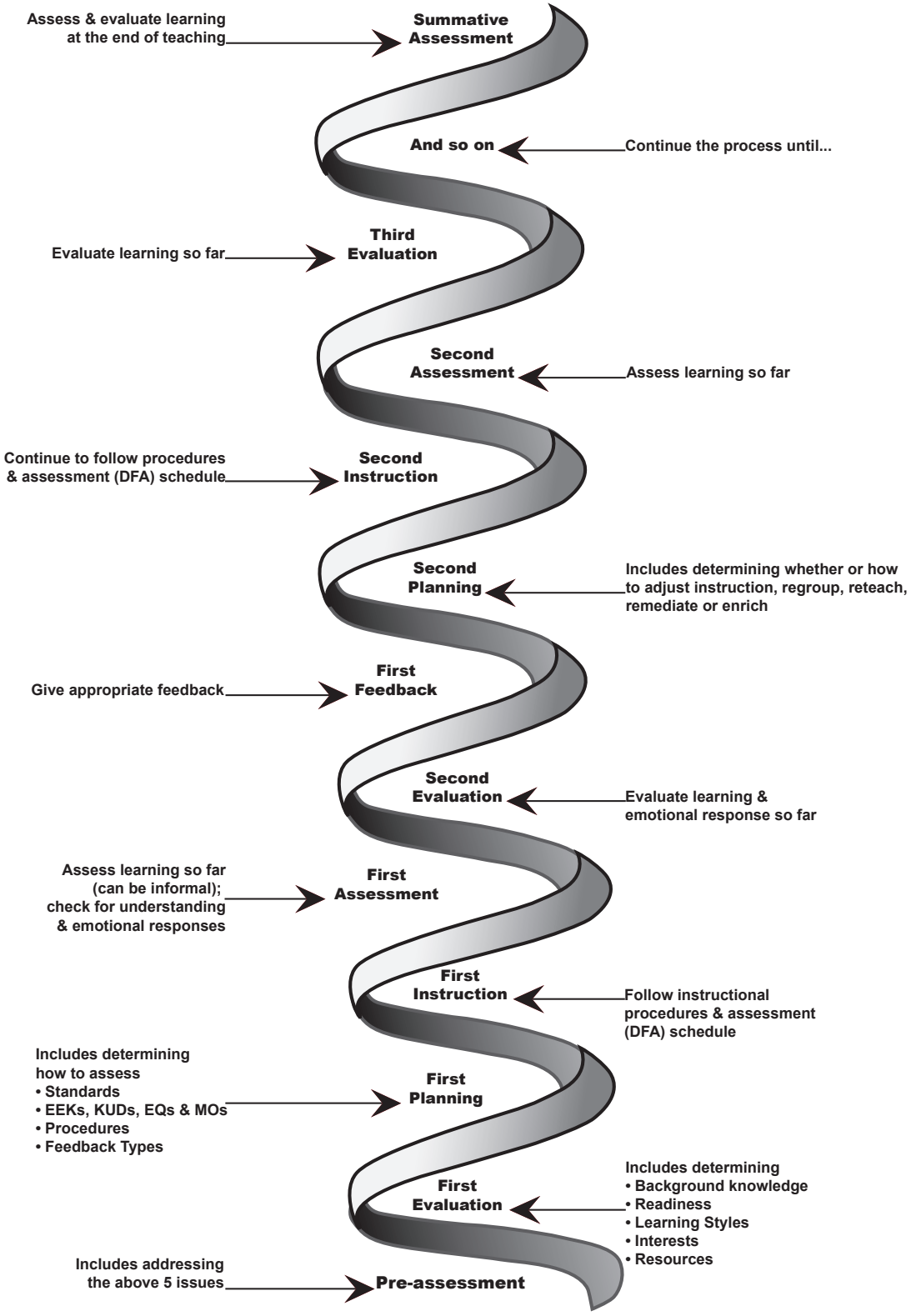
  - Assess students at all ages and stages of development in problem solving.
  - Not require mastery of basic skills prior to assessing students' abilities to have high-level discussions, solve complex problems or demonstrate critical thinking.

- *Theory:* Students exhibit many and varied intelligences, learning styles, attention spans, ability to remember, aptitude and developmental stages.

  Applying theory to differentiated assessment suggests teachers should:

  - Assess using a wide variety of tasks (not just reading and writing).
  - Evaluate assessment products students choose.
  - Allow enough time for complex assessment products.
  - Allow time for students to think about their responses to assessments (do not use timed tests too often).
  - Allow students to revise their work based on teacher and peer feedback.

Figure 1.2. Graphic of Spiralling Interaction of Planning, Instruction, Assessment and Feedback



Assessment Target for Direct Instruction Example: Pathogens

Curriculum
Standard: from the region or state
Essential Question: How do pathogens spread?
Know: (Levels 1 and 2) How pathogens spread; how to collaborate on a role-playing activity. (Level 3) How to choose and demonstrate a process.
Understand that: Knowing how pathogens spread can help us protect ourselves from getting sick from them.
Do: (Levels 1 and 2) Role play how pathogens spread. (Level 3) Choose a method to demonstrate how pathogens spread; present to the class.
Measurable Objective: (Levels 1 and 2) Students will interpret, create and execute in order to produce a role play that is thorough and accurate to demonstrate how pathogens spread. (Level 3) Students will interpret, create and execute in order to demonstrate in a thorough and accurate manner how pathogens spread.
Differentiation
Readiness: (Level 1) Choose instructional reading-level materials; strongest students act out the role play for the class. (Level 2) Teacher-provided script does not require students to determine the form of the role play. (Level 3) Allow students to choose a method for showing how pathogens spread.
Interests: Students get to choose their roles or their method of presentation.
Learning Styles: Interpersonal, kinesthetic, mastery, creative

Procedures (Levels 1 and 2)

Modelling

- *Step 1:* Have a whole-class conversation about what students already know about infectious diseases and get a sense of their interest in them. (DFA #1)
- *Step 2:* Model a lesson, such as understanding infectious diseases, using the following teaching methods:
  - *Visual:* Show students pictures of bacteria, viruses, fungi and protists that cause infectious diseases.
  - *Oral:* Explain orally examples of each of these pathogens and how they are spread.

- *Kinesthetic:* Ask students to creatively act out passing a germ. For example use a symbol for a germ (a stuffed toy or a piece of paper) and start it into the classroom. Students demonstrate how the germ can make it around the room.

This part of the lesson may involve asking students to individually read a part of their textbook or another resource that also explains how we spread various pathogens.

Direct Practice

♦ *Step 3:* Divide the class into groups of six and assign these groups to show what they are learning by acting out "How Pathogens Spread: Role Play" (Figure 2.2). For struggling learners, teachers may ask one group of six to perform for the rest of the class. While the group is preparing, teachers might assign the rest of the class to read and take notes on a selection about pathogens.

- *Materials needed:* Textas, string, glue, paper, sparkles, hats and any costumes and props you might have. Creative teachers might have a "Role-Play Box" that they keep filled with these kinds of materials.

Give the assignment shown in Figure 2.2 to student groups.

Figure 2.2. How Pathogens Spread: Role Play

How Pathogens Spread

1. You are going to act out "How Pathogens Spread".
2. Take one of the following roles: bacterium, a virus, a fungus, protist, a human, a narrator. The narrator becomes the group leader and keeps the process moving.
3. Develop a costume for yourself that shows you know what the text says you might generally look like.
4. For each pathogen, write and practise speaking a description of yourself and how you might make a human sick. The person playing the human writes about and practises how pathogens make humans sick. The human must be able to act out getting sick in different ways. He/she must be able to vividly describe several illnesses, for example, African sleeping sickness. The narrator writes and practises presenting a summary of the events. The teacher circulates and acts as a guide on the side to troubleshoot and to make sure students are on the right track. (DFA #2)
5. When the role play begins, the narrator introduces each character (the bacterium, the virus, the fungus, the protist and the human).
6. Each character describes himself or herself.
7. The human sits in a chair or stands and the narrator prompts each pathogen to act out and describe his/her attack on him/her.
8. The human acts out and describes his or her response to the pathogen.
9. The narrator makes a summary speech and all take a bow. (DFA #3)

Reading for Meaning Example

- *Adjustment for struggling learners:* This formative assessment strategy is extremely important for struggling learners, who often have difficulty reading. To adjust this example, which is levelled for typical learners, teachers should find materials that explain photosynthesis and respiration at the instructional reading level of the majority of the class. If reading levels vary too widely, teachers may want to use cluster grouping in order to allow students to read selections matched more closely with their instructional reading level.
- *Adjustment for typical learners:* Reading for meaning requires that students have a working understanding of the important vocabulary of the discipline. There are many vocabulary assessment strategies; however, one of the best formative assessment strategies requires that students fully explain words. It is important that the science teacher help students understand that science terms are like any other vocabulary term that has a definition and an application. For typical learners, it is important to constantly assess science vocabulary terms so that students will have a greater likelihood of remembering them as they go on to their next level of education, be it secondary school or university.
- *Adjusted for gifted or advanced learners:* Ask these students to demonstrate reading comprehension through the process of completing an inquiry-based project or research report on this topic. By assigning these students to inquire further about the topic, they must critically read information on various levels and must synthesise the information.

What follows is the "Assessment Target for Reading for Meaning Example: Photosynthesis and Respiration".

Assessment Target for Reading for Meaning Example: Photosynthesis and Respiration

Curriculum
Standard: from the region or state
Essential Question: What are the causes and effects of photosynthesis and respiration?
Know: The causes and effects of photosynthesis and respiration.
Understand that: Photosynthesis and respiration are important processes for the health and growth of plants.
Do: (Level 1) Use instructional reading level materials about photosynthesis and respiration. (Level 2) List the causes and effects of photosynthesis and respiration. (Level 3) Write an inquiry-based report on photosynthesis and respiration.

Assessment continues on next page.

Measurable Objective: (Levels 1 and 2) Students will interpret, generate, infer, classify and attribute information in a cause-and-effect graphic organiser that is accurate about photosynthesis and respiration. (Level 3) Students will interpret, generate, infer, classify and create an inquiry-based report that is accurate and sufficient about photosynthesis and respiration.
Differentiation
Readiness: (Level 1) Teachers use materials that match students' instructional reading levels. (Level 2) Graphic organiser provided by the teacher. (Level 3) Students write an inquiry-based report.
Interests: (Levels 1 and 2) Having blanks to fill is interesting to most learners. (Level 3) Students enjoy finding information online.
Learning Styles: Understanding, visualisation, investigative

What follows is an example of a science assessment that allows the teacher to assess the students' ability to read for meaning. It requires students to understand cause and effect related to critical science vocabulary terms.

Procedures (Levels 1 and 2)

- *Step 1:* Hand out a selection on photosynthesis and respiration.
- *Step 2:* Hand out the graphic organiser shown in Figure 3.3. Figure 3.4 is the key to the graphic organiser. Note that the best way to make these is to make the key and then take away information on one side or the other.

Figure 3.3. Identifying Causes and Effects in Photosynthesis and Respiration

Cause	Effect
1. The sun's light	1. Plants get energy that allows plants to make their own food.
2.	2. Chloroplasts in plant cells capture energy.
3.	3. Makes plants green
4. Photosynthesis	4.
5. Carbon dioxide + water	5.
6.	6. Cells break down simple food molecules and release their energy.
7. Sugar + Oxygen	7.