

# PDA Differentiating Science Instruction

## Course Objectives

### General Objective:

This course enables educators to develop, increase and demonstrate knowledge about applying the guidelines of differentiation to science instruction for the purposes of increasing student achievement for all learners. Content and activities emphasize how to use pre-assessment, continuous assessment, and summative assessments to design and deliver effective science lessons for whole group initial instruction and how to effectively use flexible small group instruction and individualized instruction, when needed, to respond to each student's needs.

### Specific Objectives:

Participants will be able to:

1. Define terms and guidelines related to differentiating instruction.
2. Define common terms used in effective science instruction.
3. Discuss the rationale for differentiating science instruction and self-evaluate their current instructional practices related to the guidelines of differentiating instruction.
4. Utilize current research related to effective science instruction.
5. Explain the connection between continuous assessment and meaningful differentiation and identify types and sources of assessment information related to effective science instruction.
6. Identify potential barriers to science achievement and common misconceptions about science.
7. Explain and provide examples of how preconceptions a student brings to the differentiated science classroom can affect learning.
8. Explain the inquiry instructional approach in science.
9. Identify components of whole-group instruction and determine when whole group instruction is appropriate.
10. Discuss ways to integrate technology to differentiate science instruction.
11. Purposefully group students based on sound rationale informed by pre-assessment and continuous assessment.
12. Set appropriate and precise learning goals for groups in order to plan appropriate flexible group learning activities that are aligned with learner needs.
13. Identify components of project-based learning.
14. Compare project-based learning to traditional learning and determine when project-based learning is appropriate.
15. Use the following key ideas to differentiate science instruction:
  - Differentiated science lessons and units are based on the teacher having clarity about the learning goals.
  - Assessment should be continuous, varied and used to inform the instructional planning process.
  - Differentiated science instruction uses a combination of whole-group, small-group and individualized instruction in order to be responsive to students' needs.
  - Differentiating Science instruction is dependent on understanding the NGSSS and Access Points and the ability to determine precise learning goals.
  - When effective science practices are matched to learners' needs during whole-group instruction, engagement and achievement increase.

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- Flexible grouping structures can be used to increase student progress from acquisition to proficiency for targeted science concepts and skills and can be used to extend understanding of science concepts and skills.
- In a differentiated science environment each student is valued for his or her contributions and has multiple opportunities to contribute to others and to learn from others' contributions.