(http://csmatters.org/pd-new) L - 05teach

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Unit 5 Lesson Preparation and Teach Out (online)

Unit Lesson Preparation / Teach Out

Revision Date: Sep 10, 2019
Duration: 240 50-minute sessions

Lesson Summary

Summary: In this two-part lesson, teachers will work in groups to look over specific parts of lessons 5.2 and 5.4 of the CS Matters curriculum. Each group will be assigned a specific portion of one of those lessons to teach and will present the lesson outcomes and the corresponding learning objectives from the AP Computer Science Principles Curriculum Framework. Their presentation will also address how the lesson gets students to achieve the lesson outcomes and how it assesses the learning objectives.

Objectives: Teachers will be able to:

- identify the learning objectives from the AP Computer Science Principles Curriculum Framework, given a lesson from the CS Matters Curriculum.
- analyze a given CS Matters lesson to verify how it assesses the associated learning objectives.
- teach a lesson from the CS Matters Curriculum given the lesson plan and adapt it to meet the diverse needs of their particular learners.

Outcomes: Teachers will:

- produce a presentation that details the lesson outcomes and learning objectives of a given CS Matters lesson, as well as how those outcomes are reached and how the learning objectives are assessed.
- teach a portion of lesson 5.2 or 5.4 given the lesson plan from the CS Matters Curriculum.

Overview:

Time: 240 min

Session 1 (180 min):

1. Introduction and Overview (15 min)
2. Lesson Preparation (165 minutes)

Session 2 in online meeting (60 min):

1. Teach-Out Activity (60 minutes)

Learning Objectives

CSP Objectives

Big Idea - Professional development includes learning experiences and resources to ensure that teachers understand how the subject(s) they teach addresses the Maryland content standards and the relationships between the subjects they teach and other subjects in the curriculum.

- ○ LO 1a - Professional development includes learning experiences and resources to ensure that teachers understand how the subject(s) they teach addresses the Maryland content standards and the relationships between the subjects they teach and other subjects in the curriculum.

Big Idea - Professional development provides opportunities for teachers to examine, observe, practice, and receive feedback on their use of research-based instructional strategies to help all of their students master Maryland content standards.

- ○ LO 1b - Professional development provides opportunities for teachers to examine, observe, practice, and receive feedback on their use of research-based instructional strategies to help all of their students master Maryland content standards.

Big Idea - Professional development focuses on developing teachers' understanding of and disposition to acknowledge the diversity of student learning styles and needs.

- ○ LO 4a - Professional development focuses on developing teachers' understanding of and disposition to acknowledge the diversity of student learning styles and needs.

Big Idea - Professional development provides opportunities for teachers to develop and demonstrate the knowledge and skills necessary to design and implement instructional and assessment strategies that meet diverse student learning needs and help all students master Maryland content standards.

- ○ LO 4b - Professional development provides opportunities for teachers to develop and demonstrate the knowledge and skills necessary to design and implement instructional and assessment strategies that meet diverse student learning needs and help all students master Maryland content standards.

Big Idea - Professional development fosters a safe, inclusive, equitable learning community where teachers, administrators and students participate in maintaining a climate of caring and respect.

- ○ LO 5a - Professional development fosters a safe, inclusive, equitable learning community where teachers, administrators and students participate in maintaining a climate of caring and respect.

Teacher Resources

Unit 5 Folder (https://drive.google.com/open?id=0B5vAY-fhOT-ibldEY0kxdFdndmM)

Examples:

Unit 5 Lesson 2 (5.2) - Part 1 (Linear Search) Powerpoint:

https://drive.google.com/open?id=1T1NcjTMNU-Z3ASbZLns2e3Dkwp8Avl5Ay36jvbFU-6M
(https://drive.google.com/open?id=1T1NcjTMNU-Z3ASbZLns2e3Dkwp8Avl5Ay36jvbFU-6M)

Unit 5 Lesson 2 (5.2) - Session 1/ Session 2 (Binary Search) Powerpoint:

https://docs.google.com/presentation/d/1HKBlOvGFuJKLzdYNHfHVxTiwKOAxiLY0aSTI2HtSzsg/edit?
usp=sharing
(https://docs.google.com/presentation/d/1HKBlOvGFuJKLzdYNHfHVxTiwKOAxiLY0aSTI2HtSzsg/edit?
usp=sharing)

Unit 5 Lesson 4 (5.4) - Session 1 Part 2 (Comparing Sorting Algorithms) Powerpoint:

https://docs.google.com/presentation/d/1fA5krTSgGn7v1KiiMi6rMOZI7yaJRUjsMFQ0zVGpTPY/edit?
usp=sharing
(https://docs.google.com/presentation/d/1fA5krTSgGn7v1KiiMi6rMOZI7yaJRUjsMFQ0zVGpTPY/edit?
usp=sharing)

Lesson Plan

TOTAL: 240 minutes

Session 1 - 180 minutes

Introduction and Overview (15 min)

Groups of 2 or more teachers will be assigned to do group planning for one of the lessons in Unit 5. Each teacher group will

- Select a 5-10*-minute portion of their lesson in Unit 5 to teach as content delivery**.
- Identify the outcomes of the lesson.
- Find the corresponding CSP Learning Objectives (from Curriculum Framework).
- Describe how the lesson goes about getting students to achieve the listed outcomes.
- Explain how the lesson assesses the CSP learning objectives.
- Fill out the lesson planning sheet (https://drive.google.com/open?id=1_R8nLzpF8ojfA2GrY66TcjvctXtM7izGHoIWuo_ijdM) as a group and submit it by the end of this session.

* 10-15-minute-long presentations assume 2 groups are all presenting in the same room during the time allotted for presentations. If a given PD group has fewer groups in a given presentations space, teachers can teach-out a longer portion of their chosen lesson, or other modifications can be made to fit the time block.

** Emphasize to teachers that during the content delivery part of the teach-out, one or more of the group members should be acting as a teacher and presenting that portion of the lesson to the rest of the participants as if they are students in the classroom. The remaining part of the lesson can be described to the other teachers in the online session with comments on how you might modify or enhance what is in the CS Matters curriculum.

Why do we teach out?

- To gain practice working with the curriculum
- To expose ourselves and the other workshop participants to the content and lessons
- To experience the lessons from the perspective of the teacher and the students

Expectations of the presenters and other participants during the teach-out:

- All members of the group must actively participate in the presentation.
- Teach the most important 5-10 minutes of content for the lesson as you would deliver it in the actual classroom. Then summarize how you would organize the session for all assigned parts of the lesson as they are in the curriculum.
- Stick to the timing guidelines.
- Create any presentation aids, manipulatives, and anything else that will help you teach the activities as specified in the lesson plan.

Possible teach-out portions for the groups are below (based on teaching 4 groups in one room during the online meeting in Session 2 of this PD lesson):

Group 1: Lesson 5.2

- Getting Started [5 min]
- Linear Search Discussion [5 min]
- Linear Search Activity [5 min]

Group 2: Lesson 5.2

- Binary Search Discussion and Presentation [10 min]
- Binary Search Activity [5 min]

Group 3: Lesson 5.4: Comparing Algorithms

- Getting Started [5 min] - have students do the route activity in class instead of for homework
- Good Algorithms and Better Algorithms [5 min]
- Algorithmic Efficiency [10 min]

Group 4: Lesson 5.4: Comparing Algorithms

- Comparing Sorting Algorithms [15 min] (Skip the last question about $O(n2)$ if you want)
- Wrap-up [5 min]

*** Try to teach in 15 min, even though the timing is for 20 min.

Participants have one week to work with their group in a collaborative online environment to:

1. Prepare an actual presentation to inform the other groups about their topic content
2. Describe adaptations and enhancements they have created for their lesson
3. Discuss how student learning will be assessed.

Lesson Preparation (165 minutes)

Participants should feel free to post questions in the discussion group or contact the instructors to make sure they understand the content, the goals, and to clarify any questions that they have about the lesson they will be presenting and the portion of the lesson they are to teach.

Each group should post a copy of their filled-out lesson planning sheet (https://drive.google.com/open?id=1_R8nLzpF8ojfA2GrY66TcjvctXtM7izGHoIWuo_ijdM) before the end of this session.

- Be sure that thought has been given to adapting the lesson to meet needs of specific student groups (i.e., students lacking prerequisite knowledge, English-language learners, etc.).

Session 2 - 60 minutes

Teach-Out Activity (60 minutes)

Teachers present the lessons they prepared in the previous session. Teachers have 10-15* minutes for each presentation and about 5 minutes for questions and discussion. The instructor should be timing the presentations so that teacher groups do not go over their allotted time.

The timing of this session may vary based on the number of groups that can be formed. If there are too many groups to spend 15 minutes on each presentation in the same room, groups can present in different rooms online simultaneously with half of the teacher cohort in one room and half in the other room. If less than four groups are needed, the instructor can hold a 10-minute debrief after each presentation and/or extend the length of the teach-out portion of each presentation.

Note: The Teacher-Learner-Observer model that was used in previous teach-out lessons could be utilized for this session as long as there are enough teachers participating in the workshop. If the number of participants is relatively small, then all of the audience members should act as students during the teach-out, as opposed to some of them acting as observers.

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