Lesson 1 (Number sense)

In planning your lesson 2 you need to:

a. Select the topic

b. Select the **content** standards (NCTM, PA standards and CCSM) and the **process** standards (Standards of Mathematics Practices [SMP] or the NCTM process standards) you will be focusing on.

c. Carefully consider the **objectives**, **goals**, and the **rationale** of the lesson.

d. Select a **high level task** or an **activity** from a curriculum text (e.g., investigations, everyday mathematics [preferred for this session], VDW etc) or modify a task provided in the curriculum materials so that it is a high level task. Solve the task in as many ways as possible so that you are able to **anticipate** the ways in which students might solve the task. You may want to consider approaches that are correct and incorrect, efficient and inefficient, and unsophisticated and sophisticated.

e. Identify the mathematical ideas that can be learned from this task that relate to the specific goals of your lesson.

f. Consider the **representations** or tools you might use to solve this task and include them in your lesson plan (examples are equations, models, diagrams etc).

*Some teacher resources that you could consult can be found in this link [http://www.exemplars.com/resources/alignments search by curriculum series or mathematics topic].*

Some highlights in the lesson plan:

- How will you present the high level task to students?
- Three good **questions** that would help you probe students thinking about this task.
- Three- four **solution strategies** and what each of them illustrates about the mathematics learning goals of your lesson (at least one illustrates a common mistake).
- **Two questions for each solution that you could use to** (a) probe students thinking (b) extend/ advance student thinking (c) access students’ thinking.
- Two questions that you could use that would require students to reflect on and talk about the **connections** between the solutions.
- An explanation of why you consider this task to be a high level task (**justification**) **drawing from the task sort analysis guide**.
- **References** for all the information for the source of the task, justification, and any modifications made to it.

**Brief Teaching Activity/Presentation of a topic under Numbers and Operations**

You are required to teach a 10-minute activity that supports learners to develop an understanding of an aspect of Number and Operations that you planned in your lesson. This presentation should focus on the:

1. Standards
This teaching will occur in the university classroom with an audience of peers. Your peers will have a chance to critique your lesson (This process helps you to reflect on what worked, what did not, and what you could do better). The course instructor will provide feedback on both the written materials as well as public feedback about the teaching.

Lesson plan template (Numbers and Operations).

**Lesson Plan Template**

**Sample Outline for a Daily Lesson Plan**

**Date:**

**Overall lesson topic/title and purpose** *(What do I want students to learn?)*

**Rationale** *(Why is it worthwhile?)*

**Content Standards** *(NCTM, CCSM, and PA core should all be included)*

**Process Standards** *(At least one SMP or NCTM Process Standards)*

**Explicit Goal(s)**

**Objectives for today’s lesson:**

**Materials & supplies needed:**

**Procedures and approximate time allocated for each event**

**Launch** *(_ minutes)*

*This is what you do at the beginning of the lesson to help students understand the task and to get them interested in working on it.*

- You should **script** everything you will **say and do before** your students begin to work independently, in pairs, or in small groups on the problem or activity. *Paint a*

**Academic, Social and Linguistic Support during each event** *(Launch/Explore/Discuss)*

*How will you provide access to all students to the important math ideas in the task?*
Think about how you will introduce students to the activity so as not to reduce the demands of the task. What will you hear that lets you know students understand the task? Your script for the teacher moves you plan to make should allow me to clearly see the answers to the following questions:

- What will I say to help children understand the purpose of the lesson?
- What prior knowledge do my students need?
- How will I help them make connections to prior lessons?
- How will I help them make connections to their own experiences – their personal, home and community funds of knowledge?
- How will I motivate them to become engaged in the lesson? (pique their interest)
- How will I launch the problem without giving away too much? (posing problem)
- How will I establish clear expectations for how they will be working and what products I expect?
- When and how will I distribute materials and supplies?
- What are some vocabulary words that I hope my students will engage with in this lesson?

**Explore** (___ minutes)

- Describe how you will have students arranged
- Describe the task the students will work on at this point in the lesson (Include a justification on why you think it is a high level task).
- Include the following information:
  - Write out 3-4 ways the task can be solved
    - Which of these methods do you think your students will use?
    - What misconceptions might students have?
    - What errors might students make?
    - What questions will you ask to assess, focus, and advance their thinking? (NOTE: These should be linked to each of the four solution strategies.)

**Specifically …** (monitoring and supporting students’ thinking)

<table>
<thead>
<tr>
<th>What will you do if issues arise that are related to the context of the task?</th>
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<tbody>
<tr>
<td>How will you ensure students remain engaged in the task?</td>
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<tr>
<td>What will you do if students (or a group) become quickly frustrated or request more direction and guidance in solving the task?</td>
</tr>
<tr>
<td>What will you do if a student or group focuses on non-mathematical aspects of the activity?</td>
</tr>
<tr>
<td>How will you encourage your students to listen to one another’s ideas?</td>
</tr>
<tr>
<td>What language issues do you anticipate might get in the way of students being able to access or fully participate in your math task? How will you support students in this situation to get access and fully participate?</td>
</tr>
<tr>
<td>How will you elicit and build on students’ linguistic resources?</td>
</tr>
</tbody>
</table>

...
• As students are working independently, in pairs, or in small groups:

- How will you record (monitor) the mathematical ideas that are at play in students' work?
- What will you see or hear that lets you know how students are thinking about the mathematical ideas?
- What questions will you ask to assess students' understanding of key mathematical ideas, problem solving strategies, or the representations?
- What questions will you ask to advance students' understanding of the mathematical ideas?
- What questions will you ask to encourage students to share their thinking with others or to assess their understanding of their peer's ideas?
- How will you ensure that students remain engaged in the task?
- What will you do if a student does not know how to begin to solve the task?
- What will you do if a student finishes the task almost immediately and becomes bored or disruptive?
- What will you do if students focus on non-mathematical aspects of the activity (e.g., spend most of their time making a beautiful poster of their work)?
- What will I provide for students who finish quickly?

Whole Class Discuss (___ minutes)

This is the last part of the lesson, the time in which the whole class discusses solutions, strategies, and ideas they have about the math they have just done.

- Script everything you will say and do to get the discussion launched.
- How will you get students' attention?
- Will students move to a new area for this discussion? How will you move them?
- Include the following information:
  - Preparing your students to have a discussion:
    - How will I structure the whole group discussion?
    - How will I help students listen actively to each other?
How will you orchestrate the class discussion so that you accomplish your mathematical goals?

Specifically:

- Which solution paths do you want to have shared during the class discussion? In what order will the solutions be presented? Why?
- In what ways will the order in which solutions are presented help develop students’ understanding of the mathematical ideas that are the focus of your lesson?
  - What specific questions will you ask so that students will:
    - make sense of the mathematical ideas that you want them to learn?
    - expand on, debate, and question the solutions being shared?
    - make connections between the different strategies that are presented?
    - look for patterns?
    - begin to form generalizations?

How will I summarize the main ideas of the lesson?

- How will I bring closure to the lesson and help children reflect on their experiences?
- What kind of feedback do I want from them at this time?

**Transition to next learning activity**

- In what ways will I prepare them for the next activity
- How will I extend or connect this lesson to the next lesson
| Assessment (Include comments about how you are going to use information from this class through formative assessment and collected student work samples to inform future lessons.) | Academic, Social, and Linguistic Support during assessment |