

Mentors Formative Lesson Observation Resource (M-FLOR)

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Name of Mentor: Mr. Hatem	Cycle: 3
School: Al QUDRA	Class: 10 ADV
Period: 5	Date: 22/01/2026

Brief description of the lesson topic, learning objectives, and planned activities

Lesson Topic: Introduction to the Mole Concept in Chemistry

Learning Objectives:

- To define the mole as a unit of measurement in chemistry.
- To convert between moles and the number of particles (atoms, molecules, formula units).

Hook (5 mins): Begin with a question: "How do chemists count tiny things like atoms?" Use a visual of sand grains vs. a scoop of sand to introduce the idea of counting by groups.

Direct Instruction (10 mins): Teacher-led explanation of the mole (Avogadro's number), using analogies (e.g., dozen, ream of paper) and clear definitions. Write learning objectives on the board.

Selected Observation Categories for This Lesson:

- Classroom presence, posture, relationships, and communication skills
- Establishing clear learning objectives

Abdulrahman will be teaching the first 10 minutes (Hook and Direct Instruction) before Mr. Moussad take over.

DURING THE LESSON

STEP 2: Lesson Observation

Conduct the lesson observation. Based on the categories you selected, describe what you observe, record questions, and note comments using the grid below.

<p>Observation Category 1 Classroom presence, posture, relationships and communication skills: teacher's physical posture, teachers' physical presence, quality of voice, audibility, intonation, fluency, subject specific terminology, suitability of language to age and ability of students, rapport and relationships with students, attention to individuals, respectful relationships</p>	
<p>What is happening during the lesson?</p> <p>You begin the lesson standing at the front of the class with an open, confident posture, making eye contact with students as you pose the hook question.</p> <p>Your voice is clear, well-paced, and audible to all students, even those at the back (e.g., Khalid and Ahmed).</p> <p>You use simple analogies (dozen, ream of paper) and move naturally toward the whiteboard to write key terms ("mole," "Avogadro's number").</p> <p>When explaining, you gesture with your hands to emphasize "counting in groups," which keeps students visually engaged.</p>	<p>Areas of strength:</p> <p>Strong, calm physical presence that commands attention without being intimidating.</p> <p>Clear and fluent explanation of concepts; language is well-suited to the grade level.</p> <p>Positive, respectful interactions with students; you use praise naturally (e.g., "Good thinking, Majid").</p> <hr/> <p>Areas needing further development:</p> <p>Consider varying your position more to engage students on both sides of the room equally.</p> <p>Occasionally, speech could be slightly slower when introducing new terminology (e.g., "Avogadro's number") to allow time for processing.</p>

<p>Observation Category 2 Establishing clear learning objectives: helping students understand a clear sense of what they are trying to achieve during the lesson, identifying clear learning goals, helping students understand the key "learning" words in the learning objectives of the lesson, such as "compare and contrast", "analyze", "summarize" etc.</p>	
<p>What is happening during the lesson?</p> <p>At the start of the lesson, you clearly state: "Today we will define the mole and learn how to convert between moles and particles."</p> <p>You write the two learning objectives on the board and circle the key verbs: define and convert.</p> <p>You check for understanding by asking, "Faisal, in your own words, what will we learn today?"</p>	<p>Areas of strength:</p> <p>Objectives are stated simply, written visibly, and revisited during the lesson.</p> <p>You connect tasks directly to the objectives, helping students see the purpose.</p> <p>Use of student-friendly language to unpack "define" and "convert."</p> <hr/> <p>Areas needing further development:</p> <p>Could ask students to briefly restate the objectives in pairs to reinforce clarity.</p> <p>Consider adding a simple visual icon next to each objective (e.g., a mole icon, conversion arrow) to support visual learners.</p>

AFTER THE LESSON

STEP 3: Post-Lesson Observation Interview

Suggested questions **to ask your Intern** after the lesson observation:

1. What were some of the things **you** did in the lesson that you were pleased with?
2. Can you tell me **your thinking** behind that? (e.g., putting them into groups then ... asking that group or that pupil to give a demonstration)
3. I really liked how the group work went. How did **you** make it go so smoothly? What was your thinking?
4. Can you give me more detail?
5. Can you give me one or two examples of that?
6. What do you mean by...?
7. Do you mean Have I understood you right?
8. What else did **you** do that you were pleased with?

General comments and questions:

Mr. Hatem: Let's reflect on the lesson you taught. First, what were some of the things you did in the lesson that you were pleased with?

Me: I was pleased with the way I introduced the mole concept using the analogy of a dozen and a ream of paper. It seemed to help students like Khalid and Ahmed connect the abstract idea of Avogadro's number to something familiar. I was also happy with how I managed to check in individually with Hamdan when I noticed he looked confused during the first conversion example.

Can you tell me your thinking behind that? Specifically, choosing to use those analogies at the very beginning.

My thinking was that jumping straight into 6.022×10^{23} would feel overwhelming. By comparing it to a "chemist's dozen," I wanted to build a bridge from everyday counting to scientific counting. The ream of paper analogy (counting sheets by the pack, not individually) was meant to reinforce the "counting by groups" concept before ever saying "Avogadro."

I really liked how the guided practice and questioning went. How did you make the student participation so smooth? What was your thinking in calling on specific students?

My thinking was to balance between volunteers and non-volunteers to keep everyone engaged. I used a "no-hands-up" approach for some questions, pausing and then naming a student like Sultan or Omar. This encourages all students to think, not just those eager to answer. For procedural steps, I called on volunteers like Majid to build confidence.

Can you give me more detail on how you decided who to call on during the "no-hands-up" moments?

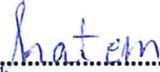
I was scanning the room during the thinking time. I looked for students who appeared engaged but hesitant, or those I hadn't heard from yet. For example, I called on Faisal because he was nodding along but hadn't spoken, and I wanted to give him a chance to articulate the learning objective in his own words.

Can you give me one or two examples of how you adjusted your explanation based on a student's reaction?

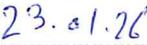
One example was with Hamdan. When he frowned during the moles-to-particles calculation, I knelt down and rephrased the formula: "If one mole is this big pack, then two moles is just two of those packs." I used the analogy again instead of just repeating the numbers. Another example was with Rashid; when he whispered a question to his neighbor, I addressed it publicly by saying, "Rashid just raised a good point about the unit we write for 'particles.' Let's clarify that for everyone.

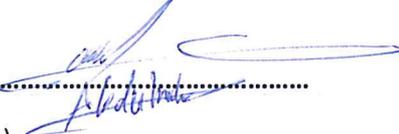
What else did you do that you were pleased with?

I was pleased with how I consistently referenced the learning objectives on the board. After we completed the first guided example, I pointed back and said, "See, we just converted moles to particles, which is objective number two." This helps students like Abdullah, who benefits from clear signposting, understand the purpose of each activity and see their own progress.

Signed:.....

(Mentor)

Date:.....

Signed:.....

(Intern)

Date:.....

STEP 4: Intern's Reflection on the Experience

Describe

The observed lesson focused on introducing the mole concept in chemistry to a 10th-grade advanced class. During the first 15 minutes, I led the hook and direct instruction segments. The hook began with the question, "How do chemists count tiny things like atoms?" using a visual analogy of sand grains versus a scoop of sand to introduce counting by groups. This was followed by direct instruction on the mole as a unit of measurement, Avogadro's number, and analogies such as a dozen and a ream of paper. Learning objectives were written on the board, and key terms were explicitly introduced. I maintained eye contact, used clear and audible speech, and incorporated gestures to emphasize points. I also checked for understanding by asking a student to paraphrase the objectives.

Evaluation

The use of everyday analogies (dozen, ream of paper) helped bridge abstract scientific concepts to familiar experiences. Clear communication of learning objectives at the start provided students with a roadmap for the lesson. Positive teacher-student rapport was evident through respectful interactions and individualized attention, such as checking in with a confused student. Challenges where limited movement across the classroom may have reduced engagement for students on the peripheries and pacing when introducing complex terminology (e.g., "Avogadro's number") could have been slower to allow for cognitive processing.

Analysis

The successes in this lesson align with principles of surface learning, which emphasizes the initial acquisition of foundational knowledge through clear explanations, structured guidance, and the activation of prior knowledge (Hattie, Fisher, & Frey, 2017, as cited in *Visible Learning for Science*). The use of analogies resonates with the recommendation that "surface learning happens best when teachers employ specific, high-impact approaches that foster initial acquisition of conceptual understanding" (p. 10). By linking the mole to everyday concepts, I facilitated elaborate encoding, which supports memory and understanding (p. 13).

However, the challenge of limited movement and occasional rapid pacing may have hindered equitable engagement. Research indicates that varying teacher position and pacing can enhance attention and inclusivity, especially in diverse classrooms (Mitchell et al., 2017). Additionally, the big ideas framework suggests that concepts should be presented in student-friendly, generative sentences rather than as isolated terms (Mitchell et al., 2017, p. 6). While I used analogies effectively, further contextualization—such as linking the mole to real-world applications—could deepen relevance.

The post-lesson discussion revealed intentional pedagogical reasoning, such as using a “no-hands-up” strategy to encourage broader participation. This aligns with dialogic teaching approaches that promote cognitive engagement through structured dialogue (Eilks & Hofstein, 2017). My reflection also highlighted the importance of metacognitive signaling—referring back to objectives to help students track their progress—a practice supported by visible learning research (Hattie & Yates, 2014).

Plan for the Future

I will consciously vary my location in the classroom to engage all students, especially those on the sides or back. When introducing abstract terms, I will pause, repeat, and use visual aids (e.g., icons, diagrams) to support processing. I will frame key concepts as generative sentences (e.g., “The mole is a chemist’s dozen for counting atoms”) to enhance coherence and relevance. I will use quick pair-share activities to reinforce objectives and assess understanding in real time. I will monitor student cues (e.g., facial expressions, note-taking) to adjust pacing, ensuring new information is absorbed before moving forward.

This reflection reinforces that effective teaching combines content clarity, pedagogical intentionality, and responsive practice. By continuing to align my methods with evidence-based strategies—such as those from visible learning and curriculum development theory—I can foster deeper student understanding and engagement.

References

- Eilks, I., & Hofstein, A. (2017). Curriculum development in science education. In *Science Education: An International Course Companion* (pp. 1–14). Springer.
- Hattie, J., Fisher, D., & Frey, N. (2017). *Visible learning for science, grades K–12: What works best to optimize student learning*. Corwin Press.
- Mitchell, I., Keast, S., Panizzon, D., & Mitchell, J. (2017). Using ‘big ideas’ to enhance teaching and student learning. *Teachers and Teaching*, 23(5), 596–610.
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