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: 1	**Date: 05/02/2026**

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

Lesson Topic: Empirical and Molecular Formulas.

Learning Objectives:

- Define empirical and molecular formulas.
- Determine the empirical and molecular formulas for various chemical compounds based on given data.

Prior Knowledge Review (3 mins): Briefly review the concept of molar mass and the law of definite proportions to link new concepts to students' existing "know-how.

Use a quick "no-hands up" question to gauge current understanding.

New Concept Presentation (5 mins): Provide clear definitions of Empirical Formula (the simplest whole-number ratio) vs. Molecular Formula (the actual number of atoms).

Present a visual comparison using a common compound like Glucose ($C_6H_{12}O_6$ vs. CH_2O) to provide well-pitched examples.

Initial Interactive Check (2 mins): Engage in a formative dialogue with the class by asking students to identify the empirical formulas of 2-3 simple compounds displayed on the board.

Distribute interaction opportunities across different students to ensure inclusive participation.

As discussed, we have selected the following two categories from the M-FLOR resource for this specific observation:

- Clarity of presentation of new curriculum concepts and/or skills and review of previously taught concepts and/or skills.
- Classroom Interactions

Abdulrahman will be teaching the first 10 minutes 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.

<table>
<tr><td colspan="2">Observation Category 1
Clarity of presentation of new curriculum concepts and/or skills and review of previously taught concepts and/or skills: providing opportunities for students to express what they know and can do in relation to the topic of the lesson; linking the new curriculum concepts and/or skills to students’ prior knowledge and know-how; using clear, suitable well-pitched language with plenty of examples of new and previously taught concepts/skills</td></tr>
<tr><td rowspan="2">What is happening during the lesson?

You began by reviewing molar mass calculation, asking Sultan to recall the atomic mass of Carbon from the periodic table.

You then introduced the definition of "Empirical Formula" as the simplest ratio, using a clear comparison between Hydrogen Peroxide H_2O_2 and its empirical form HO.

Rashid was asked to explain the difference between the "actual" number and the "simplest" ratio based on the visual example provided.</td><td>Areas of strength:

Excellent use of "well-pitched language" to explain the transition from mass to moles.

Effective linking of new concepts to the students' prior knowledge of the Law of Definite Proportions</td></tr>
<tr><td>Areas needing further development:

Ensure that when Faisal asked about ionic compounds, the distinction that ionic formulas are almost always empirical is highlighted more clearly to avoid confusion later.</td></tr>
</table>

<table>
<tr><td colspan="2">Observation Category 2
Classroom interactions: engaging in formative dialogue with students clarifying progress, strengths and challenges in their learning and how they can build on their current understandings and skills; incorporating students’ ideas in classroom dialogue; distributing interaction opportunities across a wide range of students in the class participate in plenary and groupwork phases of the lesson</td></tr>
<tr><td rowspan="2">What is happening during the lesson?

The teacher used a "no-hands up" strategy, giving Zayed and Mansoor adequate waiting time to think before answering a question about the molecular formula of Benzene.

When Hamad provided a partially correct answer, the teacher engaged in formative dialogue to help him identify his own error in the simplification step.

Interaction was well-distributed; the teacher moved across the front of the room to include Saif and Khalifa in the plenary discussion.</td><td>Areas of strength:

Strong use of waiting/thinking time, which allowed Zayed to formulate a more complete response.

Active incorporation of Hamad's idea into the general classroom dialogue to clarify a common misconception.</td></tr>
<tr><td>Areas needing further development:

Continue to monitor the distribution of interactions to ensure students in the back rows, like Ahmed, are as engaged as those in the front.</td></tr>
</table>

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: What were some of the things you did in the lesson that you were pleased with?

Me: I was particularly pleased with the transition from the review of molar mass to the new concept of empirical formulas. I felt that using Sultan to lead the review helped set a collaborative tone. I also liked how the visual comparison of H_2O_2 and HO immediately cleared up the concept of "simplest ratio" for the majority of the class.

Can you tell me your thinking behind that?

My thinking was to use subject-specific pedagogy to link their prior knowledge of the Law of Definite Proportions to the new mathematical skill of determining formulas. By starting with Sultan, I wanted to demonstrate that the foundational math they already know is the key to solving these more complex chemical problems.

I really liked how the interaction during the intro went. How did you make it go so smoothly? What was your thinking?

I focused on classroom management and maintaining momentum by having the examples ready on the board before the bell. My thinking was to maximize student involvement early on. I intentionally used a "no-hands up" approach with Zayed and Mansoor to ensure that everyone was mentally prepared to participate, not just the students who usually volunteer.

Can you give me more detail on how you handled the partial answer from Hamad?

Instead of just correcting Hamad when he struggled with the simplification step for Benzene (C_6H_6), I asked him to look at the common factor for both 6 and 6. I wanted to engage in formative dialogue so he could identify his own error. This supports independent learning by encouraging him to use metacognitive skills to check his own work.

Can you give me one or two examples of how you distributed interaction across the room?

Example 1 is after Zayed answered, I pivoted to Khalifa on the other side of the room to see if he agreed with the logic used. Example 2, I noticed Saif was nodding along, so I asked him to provide the next example's empirical formula to keep the "momentum" of the classroom interaction high.

What else did you do that you were pleased with?

I was pleased with the audibility and intonation of my voice during those first 10 minutes. I felt I had a strong classroom presence, and the rapport I've built with students like Ahmed and Faisal allowed me to challenge them with harder questions without them feeling discouraged.

Signed: ......Hatem...... **Date:** 6.02.26

(Mentor)

Signed: .... **Date:** 6.02.26

(Intern)

STEP 4: Intern's Reflection on the Experience

Describe

The lesson was conducted at Al Qudra Government School with a Grade 10 Advanced Chemistry class. The observation focused on the first 10 minutes of the period, covering the introduction to Empirical and Molecular Formulas. The primary learning objectives were to define these concepts and determine the formulas for simple compounds.The teaching began with a review of molar mass to activate prior knowledge, calling on Sultan to provide atomic masses. I then presented the new concept using a visual comparison of Hydrogen Peroxide (H_2O_2) and its empirical form HO to illustrate the "simplest whole-number ratio." The instructional strategy relied heavily on "no-hands up" questioning to engage students like Zayed and Mansoor, ensuring they utilized adequate wait time before responding. The session concluded with a formative dialogue where I guided Hamad through a self-correction process regarding the simplification of the Benzene formula.

Evaluation

A significant success of the lesson was the Clarity of Presentation. The use of the "building block" analogy helped students like Rashid quickly grasp the difference between the actual number of atoms (molecular) and the simplest ratio (empirical). The Classroom Interactions were also a strength; the "no-hands up" policy effectively maintained momentum and kept the class alert.

However, a challenge arose regarding differentiation for high-ability students. When Faisal asked a complex question about ionic compounds, the explanation was initially hesitant, potentially causing minor confusion about whether ionic compounds have molecular formulas. Additionally, while the interaction with Hamad was positive for his learning, it took longer than anticipated, slightly disrupting the pacing planned for the independent practice segment.

Analysis

The teaching practices employed in this lesson were grounded in established educational theory regarding active learning and science pedagogy.

The decision to use "no-hands up" questioning with Zayed and Mansoor was driven by the need to minimize passive learning. Taraban et al. (2007) argue that active-learning experiences in science classrooms are critical because they significantly reduce student passivity and foster positive attitudes toward the subject material. By calling on students randomly rather than relying on volunteers, I ensured that the "cognitive load" was distributed across the class, preventing the lesson from being dominated by a few vocal students.

The choice to start the lesson by having Sultan review molar mass aligns with Toplis's (2015) guidance on planning. Toplis emphasizes that effective science teaching must "start from where the pupils are," linking new abstract concepts (empirical formulas) to secure prior knowledge (molar mass) to prevent cognitive overload.

The interaction with Hamad—where I guided him to find his own error rather than correcting him immediately—reflects Hattie's principles of "Visible Learning." Hattie (2012) suggests that the most powerful feedback is provided from the student to the teacher, allowing the teacher to see where the learning is breaking down. By engaging in this dialogue, I made Hamad's thinking visible, transforming a mistake into a learning opportunity for the whole class.

Plan for the Future

Considering this reflection and the post-lesson discussion with Mr. Hatem, I have established the following goals for my development as a "good teacher".

I must prepare specifically for "outlier" questions (like Faisal's regarding ionic bonds) to ensure my subject knowledge is robust enough to handle differentiation on the spot. While formative dialogue is essential, I need to develop cues to streamline these interactions, so they do not compromise the time allocated for independent practice. To improve Classroom Interactions, I will consciously move to the back of the room to engage students like Ahmed who sit further away, ensuring the "zone of participation" encompasses the entire class.

References

Hattie, J. (2012). Visible learning for teachers: Maximizing impact on learning. Routledge.

Taraban, R., Box, C., Myers, R., Pollard, R., & Bowen, C. W. (2007). Effects of active-learning experiences on achievement, attitudes, and behaviors in high school biology. Journal of Research in Science Teaching, 44(7), 960-979.

Toplis, R. (Ed.). (2015). Learning to teach science in the secondary school: A companion to school experience (4th ed.). Routledge.