

## Mentors Formative Lesson Observation Resource (M-FLOR)

Name of Intern: Abdulrahman Albabakri	ID: 025302
Name of Mentor: Mr. Hatem	Cycle: 3
School: Al QUDRA	Class: 11 General
Period: 2	Date: 14/05/2026

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

**Lesson Topic:** Classifying Chemical Reactions - Double-Replacement Reactions

**Learning Objectives:**

- **Identify** a double-replacement reaction from a given set of chemical equations.
- **Predict** the product formed from reactants.
- Write a balanced chemical equation representing the reaction.

**Introduction & Hook (10 mins):** The lesson will begin with a brief recap of single-replacement reactions. I will then introduce double-replacement reactions ( $AB+CD\rightarrow AD+CB$ ) using a relatable analogy (such as two pairs of dance partners swapping). Following this, I will demonstrate a classic double-replacement reaction (e.g., mixing two clear aqueous solutions to form a visible solid precipitate) to visually anchor the concept.

**Main Collaborative Task (25 mins):** Students will transition into small groups to work through an inquiry-based problem set. They will be tasked with identifying the double-replacement reactions from a mixed list of equations. Next, they will practice predicting the new products formed by exchanging the positive and negative ions of the reactants, and then proceed to write out the fully balanced chemical equations. I will circulate to assess their progress formatively and guide their thinking.

**Plenary & Assessment (10 mins):** The lesson will conclude with an independent exit ticket. Students will be given one final set of reactants and will be required to independently classify the reaction type, predict the products, and balance the equation to demonstrate their individual mastery of the lesson's objectives.

**As per the M-FLOR guidance, we have selected two specific categories for this observation:**

- Using appropriate assessment practices
- Questioning

## 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.

Observation Category 1 Using appropriate assessment practices: Establishing an appropriate balance between summative and formative assessment according to the lesson's objectives and purposes.	
<p>What is happening during the lesson?</p> <p>During the 25-minute collaborative task, you circulated among the lab benches with a clipboard to monitor progress. You actively checked the work of Saeed and Mansoor's group, formatively assessing their ability to swap the positive and negative ions.</p> <p>When you noticed they were struggling to balance the charges of the new compounds, you provided immediate, targeted feedback. In the final 10 minutes, you distributed a short exit ticket to all students. This served as a quick summative check to see if each individual could identify, predict, and balance a double-replacement reaction.</p>	<p>Areas of strength:</p> <p>You successfully established an appropriate balance between summative and formative assessment according to the lesson's objectives and purposes.</p> <p>The formative checks during group work allowed you to correct misconceptions in real-time, while the exit ticket was perfectly aligned with the three main learning objectives, providing you with concrete data on student mastery.</p>
	<p>Areas needing further development:</p> <p>While your teacher-led formative assessment is very strong, consider incorporating self-assessment or peer-assessment practices during the collaborative phase.</p> <p>Providing a simple checklist for students like Sultan and Hamdan to evaluate their own balanced equations before the exit ticket would encourage greater independent accountability.</p>

Observation Category 2

Questioning: asking an appropriate balance of closed and open questions, including carefully planned questions, to help students show and demonstrate their knowledge, understanding and skills; using "no-hands up" and adequate waiting/thinking time before eliciting responses to questions

What is happening during the lesson?

During the introduction, you presented the "dance partner" analogy and asked carefully planned questions to help students show and demonstrate their knowledge and understanding of how ions might swap.

You implemented a strict "no-hands up" policy, calling on students randomly using popsicle sticks. When you asked Khalifa to predict the products of the demonstration reaction, you provided adequate waiting/thinking time—pausing for a full seven seconds—before eliciting his response.

Areas of strength:

Your questioning strategy kept the entire class highly attentive. Because you were using "no-hands up," students like Omar and Majid remained focused, knowing they could be called upon at any moment to explain the chemical formula.

Furthermore, your excellent use of wait time gave Khalifa the necessary cognitive space to process the visual demonstration and formulate a scientifically accurate response.

Areas needing further development:

You are asking an appropriate balance of closed and open questions overall, but be mindful of your scaffolding when a student struggles.

For example, when Zayed hesitated to identify which new product was the solid precipitate, you quickly defaulted to a closed, binary question ("Is the solid the silver chloride or the sodium nitrate?") rather than guiding him with a narrower open question about solubility rules.

**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?

**Abdulrahman:** I was very pleased with how the "no-hands up" questioning strategy kept the students highly attentive. I also felt the balance between my formative checks during the group work and the summative exit ticket at the end worked exactly as planned to measure the lesson's objectives.

**Mr. Hatem:** Can you tell me your thinking behind that? (e.g., using the "no-hands up" approach during the introduction)

**Abdulrahman:** My thinking was to ensure every single student felt accountable. By randomly selecting students using popsicle sticks, students like Omar and Majid knew they had to stay focused on the double-replacement mechanics, because they could be asked to explain the chemical formula at any moment.

**Mr. Hatem:** I really liked how the group work went. How did you make it go so smoothly? What was your thinking?

**Abdulrahman:** Thank you. I wanted to establish an appropriate balance between summative and formative assessment according to the lesson's objectives. My thinking was to use the collaborative time not just for practice, but as an opportunity for me to carry a clipboard, circulate, and formatively assess their ability to swap the positive and negative ions in real-time.

**Mr. Hatem:** Can you give me more detail?

**Abdulrahman:** Certainly. By actively checking their work while they predicted the new products, I could identify any misconceptions immediately. If I saw a group struggling to balance the new charges, I intervened right then, rather than waiting for the exit ticket to find out they were confused.

**Mr. Hatem:** Can you give me one or two examples of that?

**Abdulrahman:** Yes, I was observing Saeed and Mansoor's group. I noticed they successfully swapped the ions but were struggling to balance the charges of the newly formed compounds. I gave them targeted feedback immediately so they could correct the error before writing the final balanced equation.

**Mr. Hatem:** What do you mean by a "funneling technique" when scaffolding?

**Abdulrahman:** I mean rapidly narrowing down the options to help them get the right answer when they are stuck. For instance, when Zayed hesitated to identify which new product was the solid precipitate during our discussion, I quickly gave him a choice between just two options: "Is the solid the silver chloride or the sodium nitrate?"

**Mr. Hatem:** Do you mean you defaulted to a closed, binary question rather than guiding him with a narrower open question about solubility rules? Have I understood you right?

**Abdulrahman:** Yes, exactly. Looking back, my funneling technique essentially turned it into a 50/50 guess. I missed an opportunity to ask a carefully planned open question about the solubility rules to help him genuinely demonstrate his knowledge and understanding.

**Mr. Hatem:** What else did you do that you were pleased with?

**Abdulrahman:** I was very pleased with the wait time I provided. When I asked Khalifa to predict the products of the initial demonstration, I gave him a full seven seconds before eliciting his response. It gave him the necessary cognitive space to process the "dance partner" analogy and formulate a scientifically accurate answer.

Signed: .....  .....

(Mentor)

Date: ..... 14/5/26 .....

Signed: .....  .....

(Intern)

Date: ..... 14/5/26 .....

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## **STEP 4: Intern's Reflection on the Experience**

### **Describe**

The 45-minute chemistry lesson for Grade 11 General students at Al Qudra Government School centered on classifying, predicting, and balancing double-replacement reactions. The lesson opened with a "dance partner" analogy to activate prior knowledge, followed by a visual demonstration of a precipitation reaction to anchor the concept. Students then collaborated in small groups to solve an inquiry-based problem set. During this phase, I circulated with a clipboard to conduct formative assessments of their ability to correctly swap positive and negative ions. The lesson concluded with an independent exit ticket to summatively assess individual mastery of the learning objectives. Throughout the lesson, I utilized a strict "no-hands up" questioning strategy and implemented intentional wait time before eliciting student responses

### **Evaluation**

A significant success of the lesson was the implementation of the "no-hands up" questioning technique and the use of extended wait time. Providing a full seven seconds of wait time allowed students to process the visual demonstration and formulate scientifically accurate responses without feeling rushed. Additionally, an appropriate balance between formative and summative assessment was successfully established.

However, a notable challenge occurred when scaffolding for struggling students. When a student hesitated to identify a solid precipitate, I used a "funneling" technique, asking a closed, binary question rather than guiding him with an open question about solubility rules. Furthermore, while teacher-led formative assessment was strong, the lesson lacked opportunities for structured peer- or self-assessment during the collaborative phase.

## Analysis

The success of the visual demonstration and analogy can be analyzed through the framework of effective practical work. Meaningful science learning requires bridging the domain of observable events with the domain of abstract scientific ideas (Abrahams, 2017). The analogy provided the necessary cognitive scaffold to help students interpret the observable precipitation in light of theoretical chemical models. The effective use of wait time and randomized questioning aligns with principles of dialogic teaching, which emphasizes purposeful dialogue that pushes students to reason and explain (Quigley et al., 2018).

The challenge of "funneling" questions highlights a breakdown in maintaining cognitive rigor. Reducing a question to a 50/50 guess lowers the cognitive demand to the surface or unistructural level, failing to push the student toward deep, relational understanding (Hattie & Clarke, 2018). Challenge is crucial to allow pupils to develop their knowledge of tasks and strategies (Education Endowment Foundation, 2018). Furthermore, true inquiry-based science education relies on teachers collecting formative assessment data by listening to learners piece together evidence in a group discussion, then scaffolding the next stage rather than providing immediate answers (Harrison, 2014).

Finally, the lack of self-assessment misses a vital opportunity to develop students' self-directed evaluating skills, which are critical for meaningful learning in chemistry problem-solving (Avargil et al., 2018). Students must be explicitly taught metacognitive strategies, including how to plan, monitor, and evaluate their own learning (Education Endowment Foundation, 2018). Creating a classroom culture that gives students permission to be confused and actively wrestle with that confusion is essential for metacognitive growth (Tanner, 2012). This collaborative evaluation is a key inquiry skill necessary for forming coherent arguments during experiments (Finlayson, n.d.).

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### **Plan for the Future**

Moving forward, I will explicitly integrate self-assessment checklists into collaborative group tasks to shift some of the evaluative responsibility from myself to the students, explicitly teaching them how to monitor their own learning. I will also carefully plan my scaffolding questions in advance, ensuring that when students struggle, I use open-ended prompts that encourage them to access prior knowledge (like solubility rules) rather than lowering the level of challenge. By maintaining an appropriate level of difficulty, I can better foster their metacognitive resilience and deep conceptual understanding.

## References

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