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The Use Of Exit Tickets As A Formative Assessment Tool In Lower Secondary Physics

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Abstract: This conference paper examines the use of exit tickets as a practical formative assessment tool in lower secondary physics. Exit tickets are brief end-of-lesson prompts that elicit evidence of students' conceptual understanding, reasoning, misconceptions, and perceived learning difficulties. Their value lies not in collecting short written responses alone, but in using the evidence to adapt subsequent instruction. The paper proposes a physics-specific exit-ticket model that combines three complementary functions: checking conceptual understanding, eliciting scientific reasoning, and prompting learner reflection. Sample prompts are illustrated for Grade 7 topics such as motion, force, pressure, electricity, and experimental work. The proposed approach positions the exit ticket within a formative cycle of eliciting evidence, interpreting responses, identifying learning gaps, and planning responsive teaching. Particular attention is given to concise prompt design, diagnostic usefulness, feedback, and the avoidance of purely recall-based questions. As a methodological paper, it does not claim experimental effect sizes; rather, it offers a structured framework that can be tested in future classroom studies. The approach is intended to support responsive physics teaching, student metacognition, and the gradual development of evidence-based scientific reasoning.

Keywords: Exit ticket; formative assessment; physics education; lower secondary education; diagnostic assessment; scientific reasoning; feedback; metacognition.

Introduction

Formative assessment is most useful when evidence of student learning is collected during instruction and then used to make better decisions about what should happen next. In this sense, assessment becomes part of teaching rather than a separate event that occurs only after a unit has been completed. This principle is particularly relevant in physics, where a student may reproduce a formula correctly while still holding an incomplete or scientifically inaccurate understanding of the underlying concept.

Lower secondary physics contains many ideas that are conceptually demanding for beginning learners, including the interpretation of motion graphs, the relationship between force and motion, pressure as a ratio, electrical relationships, and the evaluation of experimental results. Teachers therefore need quick ways to determine what students understood, what they misunderstood, and which aspects of reasoning require further support before the next lesson begins.

Exit tickets provide one such opportunity. They are short response tasks completed at the end of a lesson or learning activity. In science education, exit tickets have been described as a means of eliciting students' thinking, supporting self-reflection, identifying learning needs, and informing instructional adjustment (Fowler, Windschitl, & Richards, 2019). Their formative value depends on the quality of the prompt and, more importantly, on how the teacher interprets and uses the responses.

Theoretical Background

Black and Wiliam (1998) showed that strengthening classroom formative assessment and feedback can contribute to learning gains. Later work conceptualized formative assessment as a process in which evidence of student achievement is elicited, interpreted, and used by teachers, learners, or peers to decide on productive next steps in instruction (Black & Wiliam, 2009). From this perspective, an exit ticket is not formative merely because it is administered at the end of a lesson; it becomes formative when the information it produces changes teaching, learning, or both.

This distinction is important. A weak exit ticket may ask students only to reproduce a definition or copy a formula, producing little diagnostic information. A stronger exit ticket reveals the structure of students' thinking. It can ask them to justify a conclusion, interpret a graph, identify an error, compare two explanations, or state which part of an investigation remains unclear. Such prompts allow the teacher to detect misconceptions and plan targeted follow-up instruction.

Research in science education also supports the importance of gathering evidence of student thinking during instruction. Informal and embedded formative assessment can make students' ideas visible and support responsive teaching. Recent research has continued to examine the potential of exit tickets as brief, repeated measures of students' learning-related states, while science-teaching literature emphasizes their usefulness for collecting information from all students rather than relying only on volunteers during classroom discussion.

A Physics-Specific Exit-Ticket Model

For lower secondary physics, an effective exit ticket can be organized around three short components. The aim is to collect different types of evidence without overloading students or consuming a large proportion of lesson time.

Component	Purpose	Example prompt
1. Concept check	Identify whether the central idea of the lesson has been understood.	"A distance-time graph becomes steeper. What does this tell you about the object's speed?"

2. Reasoning task	Reveal how the student explains, justifies, or applies the concept.	"Two blocks experience the same force but have different contact areas. Which produces greater pressure, and why?"
3. Reflection prompt	Identify uncertainty, misconception, or the next learning need.	"What part of today's topic is still unclear to you? Write one question you would ask before the next lesson."

The three-part structure is intentionally simple. The first item checks the lesson objective, the second requires scientific reasoning, and the third gives the learner an opportunity to monitor his or her own understanding. In a 45-minute lesson, the ticket can be completed in approximately three to five minutes. The teacher can then sort responses into broad categories such as secure understanding, partial understanding, misconception, and insufficient evidence. These categories can guide the opening activity of the next lesson, small-group support, or the selection of a follow-up task.

Examples of Exit Tickets in Grade 7 Physics

Motion and graphs. "A student says that a horizontal section on a distance-time graph means the object is moving slowly. Do you agree? Explain your answer." This prompt reveals whether the learner can distinguish between zero speed and low speed and whether graph shape is interpreted physically rather than visually.

Force and pressure. "A person wearing wide skis sinks less into snow than a person wearing narrow shoes. Explain this using pressure, force, and contact area." This task checks transfer from the mathematical relation $p = F/A$ to a familiar situation.

Electricity. "If the potential difference across a fixed resistor is increased while resistance remains constant, what happens to the current? Explain using the relationship between the quantities." The item tests both conceptual direction and scientific justification.

Experimental work. "Name one possible source of error in today's measurement and state one practical way to reduce it." This type of ticket focuses on evaluation of evidence rather than numerical calculation alone.

Reflection. "Which part of your solution today would you change if you solved the problem again, and why?" Such a prompt encourages students to review their reasoning and can provide evidence of metacognitive awareness.

Using Exit-Ticket Evidence to Adjust Instruction

The instructional response is the defining stage of the formative cycle. If several students provide the same incorrect explanation, the next lesson should not simply begin with new content. The teacher may instead use an alternative representation, demonstration, counterexample, or short peer-discussion task to address the identified misconception. If only a small group demonstrates difficulty, targeted support can be provided while other students work on extension tasks.

Exit tickets can also support feedback. Because the responses are short, teachers can identify common patterns efficiently. Feedback does not always require a written comment on every ticket; it may take the form of a whole-class discussion based on anonymized examples, a model explanation, a revised question, or a short re-teaching activity. The key requirement is that the evidence collected influences the next instructional decision.

For research purposes, exit-ticket responses can be coded by indicator. For example, conceptual accuracy, use of evidence, quality of explanation, identification of causal relationships, and reflection can be scored with a brief analytic rubric. Repeated tickets across an instructional sequence may then provide a process-level record of how students' reasoning changes over time. However, such data should be interpreted cautiously and should not be treated as equivalent to a validated standardized measure without appropriate reliability and validity evidence.

Discussion

The main advantage of exit tickets is their immediacy. They allow a teacher to hear from every learner at a point when the lesson is still recent and the next instructional decision can be changed. In physics, this is particularly useful because misconceptions may remain hidden when students can obtain a correct numerical answer through procedural substitution.

At the same time, exit tickets should not be overused or reduced to routine paperwork. Their quality depends on alignment with the learning objective, the cognitive demand of the prompt, and the teacher's capacity to interpret responses. A single carefully designed question that exposes reasoning may provide more useful evidence than several recall questions. Teachers should also vary formats across lessons so that students are sometimes asked to explain, predict, critique, draw, interpret, or reflect.

The proposed model differs from broader task systems aligned with international assessments because it focuses on a specific moment in the formative cycle: the collection of concise end-of-lesson evidence for immediate instructional decision-making. It can therefore complement, rather than duplicate, larger assessment tasks, laboratory work, rubrics, or mark schemes.

Conclusion

Exit tickets can function as a practical formative assessment tool in lower secondary physics when they are designed to reveal students' understanding and when their results are used to adjust instruction. A physics-specific exit ticket should move beyond factual recall and include prompts that elicit conceptual understanding, scientific reasoning, and learner reflection.

The proposed three-component model—concept check, reasoning task, and reflection prompt—offers a concise structure that can be integrated into regular Grade 7 lessons. Its educational value lies in connecting assessment evidence with responsive teaching. Future empirical studies can test the model through repeated classroom implementation, coding of student responses, pre- and post-assessment, comparison groups, and analysis of changes in scientific reasoning and critical-thinking indicators.

References

1. Bennett, R. E. (2011). Formative assessment: A critical review. Assessment in Education: Principles, Policy & Practice, 18(1), 5–25.
2. Black, P., & Wiliam, D. (1998). Assessment and classroom learning. Assessment in Education: Principles, Policy & Practice, 5(1), 7–74. https://doi.org/10.1080/0969595980050102
3. Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. Educational Assessment, Evaluation and Accountability, 21, 5–31.
4. Fowler, K., Windschitl, M., & Richards, J. (2019). Exit tickets. The Science Teacher, 86(8), 18–26.
5. Ruiz-Primo, M. A., & Furtak, E. M. (2007). Exploring teachers' informal formative assessment practices and students' understanding in the context of scientific inquiry. Journal of Research in Science Teaching, 44(1), 57–84.

6. Shehzad, U., Recker, M., & Clarke-Midura, J. (2025). Exploring the potential of exit tickets as formative assessments of student affect. Assessment in Education: Principles, Policy & Practice, 32(2), 173–191.

7. Wiliam, D. (2011). Embedded formative assessment. Solution Tree Press.