LLAMA Classroom Argumentation Observation Protocol

Date: _____ **Observer**: _____ **Cohort**: _____

School: _____ **District**: _____

Teacher: _____ **Grade or Class**: _____

Estimated number of Students: _____ **Start & Stop Times**: _____

Who led the instruction? (circle) Teacher/Coach/Both **Conceptual Pillars:** _____

Associated student work samples? (Describe, if any) _____

[1]Circle Observation Period:

Observation conducted during the school year but not the official "fall" or "spring" observation.	Fall Observation. Class may focus on any of the CPs	Spring Observation. Class must focus on a CP numbered 6 or higher.	Additional observation for case study teachers during the 2017-2018 school year

[2]Notes and background information:

Student Participation

1. Record the approximate percentage of the class who were actively involved in writing or developing arguments at some point during the class (this includes constructing their own argument or exploring a relevant claim on paper, computer, etc. or actively participating in the class discussion).

2. [3] Record the approximate percentage of the class who had access to the particular argumentation episode you chose to focus on for prompts 3-10 below (in other words, students who were present and attentive or active, and not doing something entirely different during the argumentation episode).

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[1] Coach may use any observation of the class where the teacher is doing all the teaching to complete the protocol. The data does not have to come from an officially scheduled "clean" observation. The purpose of this is to get a measure of whether the teacher is able to deliver LLAMA materials without coach assistance.

[2] When picking an argument to rate in this protocol, favor the one that the most students were exposed to and describe how many got to see it.

[3] When selecting the argumentation episodes to focus on for this rubric, choose only argumentation episodes that are made explicit for the whole (or sufficient majority) of the class. Other interesting or notable argumentation with smaller groups or individual students can be noted on the last page.

3. What was the **nature** of the students' activity in the argumentation **episode** (e.g. overarching reasoning type)? Circle **all** that apply.

Developing or revising a claim	Exploring meaning of a claim	Examining the truth of a claim	Supporting a claim

4. [5]What **type of claim(s)** was/were explicitly expressed during the episode? Circle all that apply.

Generalization	There-exist statement	Statement of a single fact/result/finding

5. Explicitness of claim.

0	1	2	3
N/A (no claim)	Implicit claim arose out of discussion or student work, but was not explicitly articulated	An explicit claim stated by one or more in the classroom community, but not written in a shared space	An explicit claim expressed in a manner that all students had access (e.g., written on the board or displayed on an overhead projector)

6. [6]Clarity of claim.

0	1	2	3
No claim at all (or no claim worthy of note).	Claim is only implicit (i.e. claim may only occur as solutions to problems or answers to questions, "x=2." "yes, the objects are congruent.")	Claim expressed ambiguously but in a way that has potential to encourage viable argumentation (i.e., the domain, referents, the type of claim, or the claim's structure are unclear).	Claim expressed unambiguously (i.e., the domain, referents, type of claim, and the claim's structure were clear)

Argument Type

7. Circle all that apply:

a. Constructive satisfying a there-exists statement	b. Non-constructive argument for existence	c. Counter-example argument	d. Exhaustion	e. Direct argument (may include generic example)	f. Indirect—contrapositive	g. Indirect—contradiction	h. Argument for statement of specific fact	i. N/A (or no argument)

8. Open-ended. Based on the argument types circled in 5, describe the quality of the argument. For example, if the argument is for an existence claim, did the teacher or students demonstrate that the example has the desired properties in the claim? If the argument is a contradiction argument, did the teacher and students identify a statement that is both true and false?

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[4] Only code instances of argumentation episodes that are made explicit for the whole (or sufficient majority) of the class.

[5] Don't code arguments about claims the observer views to be insignificant (many statements of single fact).

[6] It is possible for these elements (domain, referents, etc.) to be clear to the classroom community as a norm rather than being explicitly articulated. The observer must make a judgment about the class here based on factors such as verbal responses from students. Moreover, the explicitness is relative to the task or activities because some tasks contain explicit instructions and restrictions that might make the inclusion of these details in a claim seem redundant. All of this should be taken into account by the observer.

9. [7]Support for a Claim (Base your response on Item 5, the Type of Argument)

a. Existence Claim, constructive argument (i.e. candidate provided)

0	1	2	3
No candidate is given or the candidate given is not in the domain of the claim.	A candidate in the domain of the claim is given. There is no demonstration that the candidate has the desired properties, or significant parts of the desired-properties argument are missing.	A candidate in the domain of the claim is given. There is a demonstration that the candidate has both desired properties (the implicit "and" in the claim), but some aspects are missing (e.g., some of the desired properties are not explicitly addressed).	A candidate in the domain of the claim is given, and it is shown that the candidate has both desired properties (the implicit "and" in the claim).

b. **Existence claim, non-constructive argument**: Use a rubric under *generalization argument approaches* section that is appropriate for the type of argument used here.

c. Counterexample to a general claim

0	1	2	3
Counterexample exists for the claim, or is assumed by the class to exist, but it is not identified, or example provided is irrelevant to the claim.	Counterexample is identified, but no evidence is provided to show either that this example meets the conditions of the claim or that it does not meet the conclusion of the claim.	Counterexample is identified; evidence is provided to show either that this example meets the conditions OR that conclusion of the claim is not met, but both are not shown.	Counterexample is identified; evidence is provided to show that this example meets both the conditions and not the conclusion of the claim.

d. Exhaustive Argument – for a general claim with a finite domain

0	1	2	3
Finite domain of claim is indicated, but class and teacher do not show that cases in the domain conform to the claim.	The argument has a foundation in which **some cases** are expressed or represented, and for **each case noted, a demonstration that the conditions or the conclusion** are met is lacking or incomplete. There is a **narrative link** but it may only partially explain that the cases expressed met the conditions and conclusion of the claim.	The argument has a foundation in which **nearly all** possible cases are expressed or represented, and for each case illustrated, a demonstration that the conditions and the conclusion of the claim are met is present. There is a **narrative link** that explains that the conditions and conclusion of the claim are met via a structural argument. **OR**, the argument has a foundation in which **all possible cases** are expressed/represented and for each case demonstrates the conditions and the conclusion of the claim are met, but the **claim LACKS a narrative link** which explains how we know we have considered all cases and how the cases expressed meet the conditions and conclusion.	The argument has a foundation in which **all possible cases** are expressed/represented and for **each case a demonstration that the conditions and the conclusion** are met is present. There is a **narrative link** that explains how we know we have considered all cases and explains how the cases express the conditions and conclusion of the claim.

e. Direct Argument
(i) Generic Example:

0	1	2	3
Purely empirical argument/	Example expressed as generic for all cases in the domain.	Example expressed as generic referent for all cases in the domain.	Example expressed as generic referent for all cases in the domain.

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[7] Only code instances of argumentation episodes that are made explicit for the whole (or sufficient majority) of the class.

| examples provide only empirical support. | Appeal to example (use of the example) does not attend to properties shared by all possible examples in the domain of the claim. In other words, it is not clear that the teacher or class is attempting to use the example as a referent in a logical argument for all possible examples through properties.

Together the example and the appeal to the examples **do not use logical necessity** to show that cases of the conditions and not the conclusion are impossible. **Counterexamples are not eliminated.** | Appeal to the example (use of the example) only involves **at least one property** of the example **not shared** by all possible examples in the domain of the claim.

Together the example and the appeal to the examples **use logical necessity to show** that cases of the conditions and not the conclusion are impossible; yet because the appeal is not generic, **counterexamples are not eliminated.** | Appeal to the example (use of the example) only involves properties of the example shared by all possible examples in the domain of the claim.

Together the example and the appeal to the example use logical necessity to show that cases of the conditions and not the conclusion are impossible. **Counterexamples are logically eliminated.** |

(ii) Other Direct Argument

0	1	2	3
Purely empirical argument/ examples provide only empirical support.	Argument begins with the conditions of the claim and presents some definitions or known mathematical results. Yet, the logic or results are insufficient to show that the claim must be true for all cases. Perhaps the definitions or prior results are not related to the claim.	Argument begins with the conditions of the claim, presents definitions and/or known mathematical results (foundation/data) that relate to the claim. The foundation presented would be enough to prove the claim, but there is no narrative link or the narrative link fails to explain how the foundation shows that the conclusion of the claim must be true for all cases.	Argument begins with the conditions of the claim, presents definitions or known mathematical results (foundation/data) and provides a narrative link that explains how these show that the conclusion of the claim **must** be true for all cases.

f. Indirect—Contrapositive

0	1	2	3
Argument identifies or states a conditional claim and attempts to write the contrapositive of this statement, but does so incorrectly or incompletely.	Argument identifies the contrapositive of the if-then statement and attempts to argue for it, but does not construct an argument that can lead to a proof. Or, the arguer attempts to demonstrate that counterexamples to the conditional claim cannot exist, but does not describe and eliminate all counterexamples, perhaps the description does not include all cases or a logical necessity is not present.	Argument identifies the contrapositive of a conditional claim and viably argues for the contrapositive (i.e., a direct proof for the contrapositive). Or, the argument describes the general class of counterexamples to the claim and logically demonstrates that counterexamples to the conditional claim cannot exist. **However, in either case above, significant details needed to demonstrate logical necessity details are lacking or the use of prior results is lacking.**	Argument identifies the contrapositive of a conditional claim and viably argues for the contrapositive (i.e., a direct proof for the contrapositive). Or, the argument describes the general class of counterexamples to the claim and logically demonstrates that counterexamples to the conditional claim cannot exist.

g. Indirect—Contradiction

0	1	2	3
Argument acknowledges a contradiction argument approach; however, there is no explicit acknowledgement of alternatives to the claim (i.e., counterexamples) and how these alternatives lead to a false statement. Or, the description of	Argument describes all possible counterexamples to a conditional claim (described by their mathematical properties) or a negation of the conditional claim.	Argument describes the collection of all possible counterexamples (described by their mathematical properties) or a negation of the conditional claim. Argument demonstrates that supposing a counterexample or the negation leads to an absurd or impossible statement. **However, in either case above, significant**	Argument describes the collection of all possible counterexamples (described by their mathematical properties) or a negation of the conditional claim. Argument demonstrates that supposing a

counterexamples or the negation of the conditional claim is incorrect.		**details needed to demonstrate logical necessity details are lacking or the use of prior results is lacking.**	counterexample or the negation leads to an absurd or impossible statement.

h. Argument for claim of specific fact[8]

0	1	2	3
Argument uses no underlying rule, implicitly or explicitly. It may instead rely on empirical observation, perception, or authority.	Argument implicitly invokes a rule, but is not explicit about the rule, nor about how the claim follows from it.	Argument is explicit about the rule that is being invoked, but does not address whether the rule is being applied logically, (e.g., the condition of the rule is met, so the rule can be invoked), or how the claim follows from the rule.	Argument is explicit about the rule that is being invoked. Argument addresses whether the rule is being applied logically, (e.g., the condition of the rule is met, so the rule can be invoked), or acknowledges how the claim follows from the rule.

10. Map of the Argument

Draw layouts for the arguments produced by teachers and/or students during class discussion/exploration. Include the claim, foundation, and narrative link. [9]

11. (Optional) Other arguments observed that are noteworthy[10]

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[8] By "rule," we mean here any general principle, theorem, definition, algorithm, method, that would imply the statement of specific fact (or its conclusion).

[9] These elements can be verbal or written or both.

[10] Associated student work samples are also desirable.