

The UTeach Observation Protocol (UTOP) Training Guide

UTeach Natural Sciences
University of Texas Austin

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Overview of the UTOP

The UTeach Observation Protocol is an observational instrument that can be used to assess the overall quality of classroom instruction. The UTOP was designed to allow individuals to evaluate teaching effectiveness without bias towards any particular mode of instruction. We have specifically considered instruction in a spectrum from inquiry-based instruction to direct instruction.

The UTOP was created and piloted by faculty, master teachers, and research assistants in the UTeach College of Natural Sciences program at the University of Texas Austin. Those involved in this process include: Mary Walker, Gail Dickinson, Mark Daniels, Denise Ekberg, Larry Abraham, Michael Marder, Prerna Arora, and Candace DiBiano.

The development UTOP was informed by the following resources:

- National Council for the Teaching of Mathematics: *Principles and Standards for School Mathematics*
- National Academy of Science: *National Science Education Standards*
- American Association for the Advancement of Science: *Project 2061, Benchmarks for Scientific Literacy*
- National Research Council: *How People Learn: Brain, Mind, Experience, and School and Knowing What Students Know*

The UTOP is criterion-referenced; observers' opinions and/or subjective judgments should not play a role in their choice of ratings. The UTOP can be used to evaluate quality of instruction at any level of education, from elementary through university, in a variety of settings. It is composed of 30 items on a 5-point Likert Scale (1-5), with additional DK (Don't Know) and NA (Not Applicable) options.

The UTOP is intended for use by observers trained in its application. This training guide provides future observers with specific information relating to the various elements of the UTOP. Particularly, this manual aims to clarify the general idea behind the items, as to improve the accuracy of observers' ratings.

In addition to assessing the quality of instruction and teacher effectiveness, the UTOP can be used to evaluate the quality of teacher education programs by examining the instruction of its graduates, for instance. For this purpose, specific steps have been taken with the UTOP so that the observer can remain "blind" to the educational experiences and background of teachers they are observing. The UTOP can also be used for training developing teachers; by using the results of the UTOP, they can reflect on their teaching and make improvements as needed.

Procedures for using the UTOP

This section of the manual goes through each part of the UTOP, and provides instructions on how the UTOP is intended to be used for classroom observations. The manual first introduces the “Background Information” and the “Lesson Overview” sections, before moving on to the four rating sections of the UTOP: “2.1 Classroom Environment,” “2.2 Implementation,” “2.3 Lesson Structure and Organization,” “2.4 Mathematics/Science Content.” The manual concludes with an explanation of the “Summary Comments” section, the Post-Observational Teacher Interview, and the Demographic Questionnaire.

I. Background Information

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As the UTOP may be used by observers who wish to remain “blind” to the educational experiences of the teacher being observed, the “Background Information” section of the UTOP does not ask for detailed information about the teacher. Instead, this information will be collected through the use of the “Demographic Questionnaire,” discussed in Section X.

Teacher is the name of the teacher being observed at this time.

School is observation site.

Date of observation refers to the date of the lesson observed. If the post-observation interview takes place on a different date, please note that information.

Time of observation refers to the time that the observed lesson began and ended.

Subject observed could be as vague as the general subject (e.g., biology or mathematics) but it is preferable to record the name of the course being taught during the observed lesson.

Observer is the person conducting the observation and filling out this form.

Grade level is the actual grade level of the students in the class. For example, Algebra I is often taught to ninth grade students. If the observed class is a ninth grade Algebra I class, then record “9th grade” for grade level. Some courses target multiple grade levels. For example, Environmental science may be 11th and 12th grade students. If this is the case, record all the grade levels present in the class to the best of your ability.

II. Section One: Lesson Overview

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- 1) ***Lesson Description:*** In a paragraph or two, describe the lesson you observed. Include where the lesson fits into the overall unit of study. Be sure to include enough detail to provide a context for your ratings of the lesson and also to allow you to recall the details of the lesson when needed in future years for longitudinal analysis.
- 2) ***Purposes of Lesson:***
 - a. Indicate the *major content area(s)* of the lesson or activity. This section aims to identify the main concepts within the subject that are addressed by the lesson. For example, a biology lesson on photosynthesis might be listed under “Life Science” with the key words “Photosynthesis” and “plant structures.” A mathematics lesson that uses results from a photosynthesis experiment to explore range, mean, median, and mode would be listed under mathematics because the intent is to teach about range, median, mean and mode – not to teach photosynthesis.
 - b. Indicate no more than **five** observed *primary* purposes of the lesson or activity based on what was observed during the class period. Indicate no more than **five** intended *primary purposes* of the lesson or activity based on what was stated during the post-observation teacher interview.
- 3) ***Teaching Methods/Learning Activities:*** The important focus of this section is what the *students* are doing for significant periods of time in the lesson. For instance, if the lesson were comprised of a teacher lecture and individual work on practice problems, then the observer would check “Listened to teacher lecture WG” and “Answered textbook/worksheet questions IND.”
- 4) ***Evidence of Lesson Preparation:*** When observers visit the classroom, they may be provided with or ask to be provided with copies of the teacher’s lesson plan and other planning materials, including handouts, worksheets, formal assessments, etc. This section describes the teacher’s preparation for the lesson by detailing what documents are collected, without making the assumption that all lessons require the same amount of formal written planning.

III. Section Two: Ratings

Each part of Section Two on the UTOP is designed to evaluate a different aspect of the lesson. For example, section 2.3 (Lesson Structure and Organization) looks at the quality of the lesson plan. Was it well organized? How well did the activities of the lesson address the teaching objectives? Were the assessments consistent with the instructional strategies?

However, 2.3 (Lesson Structure and Organization) would not look at how well the lesson was delivered or the accuracy of the content. These are addressed in 2.2 (Implementation) and 2.4 (Content) of this section, respectively. A lesson that was well-planned and implemented but taught inaccurate content may score highly in 2.2 (Implementation) and 2.3 (Lesson Structure and Organization), but poorly in part 2.4 (Content). Likewise a lesson may have highly accurate content but be poorly designed resulting in low scores in 2.3 (Lesson Structure and Organization) and high scores in 2.4 (Content).

1) *Rating Scale*

To use the UTOP as intended, scores should only be assigned after the observation has taken place, and/or the observer has had an opportunity to review the video tape of the lesson and/or his or her field notes. The UTOP's rating scale is a 1 to 5 Likert scale, with additional options for DK (Don't Know) and NA (Not Applicable).

In general, DK should be used when there was not enough evidence from the observation to make a judgment about the indicator. More information on how DK can be interpreted for each UTOP indicator is included in sections IV-VII of this manual.

In general, NA should be used when the indicator was not appropriate for or did not apply to the lesson being observed. More information on how NA can be interpreted for each UTOP indicator is included in sections IV-VII of this manual.

The numerical values for the Likert scale on the UTOP can be interpreted as follows:

- 1= Not observed at all/ Not demonstrated at all
- 2= Observed rarely/ Demonstrated poorly
- 3= Observed an adequate amount/ Demonstrated adequately
- 4= Observed often/ Demonstrated well
- 5= Observed to a great extent/ Demonstrated to a great extent

As it can be seen, each numerical value corresponds to two descriptors, one descriptor that measures the **frequency** of the occurrence of the indicator (observed rarely, observed often, etc.), and one descriptor that is intended to capture the **quality** of the implementation of that indicator. (demonstrated poorly, demonstrated well, etc.).

For some indicators, only **one** of the descriptors may be appropriate. For instance, indicator 2.3.1 reads, "The lesson was well organized and structured." A measure of the frequency of the occurrence of this indicator would most likely be inappropriate. In this case, the observer would refer to the second set of indicators, those that measure the quality of the implementation of the indicators.

For other indicators, descriptors of **both** frequency and quality may be appropriate. For instance, indicator 2.4.6 reads, "Appropriate connections were made to other areas of mathematics/ science, to other disciplines, or to real-world contexts." When scoring this indicator, the observer may want to take into account the quality, as well as the frequency of the real-world connections the teacher is making.

With respect to scoring teachers on the **frequency** with which they implement indicators, it is important for the observer to remember that some lessons will include more opportunities to exhibit certain characteristics than others. How often the teacher demonstrates the characteristics of any indicator should be considered relative to the number of opportunities the teacher has to exhibit this indicator.

2) *Synthesis Ratings*

Each of the four scored sections of the UTOP (2.1-2.4) concludes with a Synthesis Rating that is intended to be an overall rating for each area. The Synthesis Rating box contains scores from 1 to 5 with corresponding descriptors from which the observers can select. The synthesis ratings are **not** intended to be an average of the indicator scores making up each section, but are designed to allow the observer to describe their overall impression of the teacher's abilities in each area.

3) *Supporting Evidence*

At the end of each of the four scored sections of the UTOP, space is provided for observers to present supporting evidence for their scores. This is done so that observers can understand why a specific score was given long after the observation has taken place.

IV. Classroom Environment - Section 2.1

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2.1.1 The classroom environment encouraged students to generate ideas, questions, conjectures, and/or propositions that reflected engagement or exploration with important mathematics or science concepts.

This indicator captures how well the teacher supports active exploration and engagement in various mathematics or science concepts. Such a classroom can be described as one in which students feel free to ask questions, make predictions, challenge statements, or propose alternate methods, and one in which the teacher devotes a sufficient amount of time to addressing students' queries and ideas.

A **"DK"** should be chosen if the observer cannot observe or hear enough of the lesson to make a judgment, or if the observer is not able follow enough of the proceedings of the lesson well enough to make a judgment. An **"NA"** should be chosen in a situation where the class is involved in an appropriate non-interactive activity, such as taking individual assessments.

2.1.2 Intellectual rigor, constructive criticism, and the challenging of ideas kept students engaged.

This indicator assesses the degree to which the teacher goes beyond simply relaying information to supporting the deeper exploration of the subject matter. This type of intellectual engagement can be evidenced by examining individual conversations between the teacher and the students or by the student questions to the instructor, or the teacher's answers to student questions where the teacher may further challenge student ideas and/or encourage positive self-reflection. This indicator can also be evidenced by the teacher presenting a lesson with intellectually rigorous content that requires critical thinking on the part of the students.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. An “**NA**” is not appropriate for this indicator.

2.1.3 Interactions reflected collegial working relationships among students (e.g., students worked together and talked with each other about the lesson).

This indicator assesses the degree to which students have learned to be collegial when working in groups. In other words, this indicator captures how well the teacher has worked with the students on developing group work skills and creating and promoting an environment of active collaboration. Evidence of collegial working relationships among students often includes collaborative discussions about topics relevant to the lesson, and successful student facilitation of distributing roles and responsibilities within their group.

A “**DK**” should be chosen if the observer is not able to observe enough of the lesson, specifically discussions among students, or follow enough of the proceedings to make a judgment. An “**NA**” should be chosen if the lesson is not intended to include group work and the observer has no opportunity to observe student interactions.

2.1.4 Based on conversations, interactions with the teacher, and/or work samples, students were intellectually engaged with important ideas relevant to the focus of the lesson.

This indicator is measures the quality of the intellectual engagement of the students with the content of the lesson. Intellectual engagement can be evidenced by examining conversations students have with one another or with the teacher while in small-group settings, by the questions, contributions, and responses the students give in whole-class settings, or by samples of student work from the period observed.

A “**DK**” should be chosen if the observer cannot observe enough of the student interactions/contributions to make a judgment, or if the observer is not able follow enough of the proceedings of the lesson well enough to make a judgment. A “**DK**” is also

appropriate when observers cannot get access to work samples they feel are needed to make a judgment. An “NA” should be chosen if there are no conversations, interactions with the teacher, or work samples produced during the class period.

2.1.5 The majority of students were on task throughout the class.

This indicator measures amount of time students in the class are engaged in or working on a specific task or activity. On-task behavior can include students participating in the lesson by asking questions, being engaged in discussion, providing answers, turning in assigned class work in a timely manner, and assisting other students. The observers should note any examples of off-task behavior, such as students being engaged in off-topic conversations, writing notes/text messages, putting their head on the table, or doing work for another class.

A “DK” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. An “NA” is not appropriate for this item.

2.1.6 The teacher’s classroom management strategies enhanced the classroom environment.

This indicator assesses the quality of the teacher’s classroom management strategies, in particular whether the teacher’s management positively contributes to the students’ learning in the classroom environment. Teacher behaviors that should be noted include setting clear behavioral expectations for students and making sure these expectations are met, foreseeing and preparing for inappropriate behavior that may occur during the course of the lesson, consistently and effectively dealing with off-task and inappropriate behavior, adopting successful time management strategies, and utilizing positive behavioral modification strategies when appropriate. The degree of challenge the teacher is faced with should be considered when choosing a rating for this indicator.

A “DK” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. An “NA” is not appropriate for this indicator.

2.1.7 Teacher has set up room for success – students can work in groups easily, get to lab materials as needed, teacher can move to each student or student group, etc.

This indicator assesses how well the setup of the classroom promotes the intended goals of the lesson. Both the organization of student seating as well as the availability of necessary materials should be considered. This indicator can be evidenced by examining the accessibility of lab equipment and materials or the visibility of the board/PowerPoint/etc. The observer can also consider the ease with which the teacher is able to access each student, how well the students’ physical locations allow them to participate fully in lesson (whether it is in a small classroom or large lecture hall),

whether the teacher devoted an appropriate amount of preparation time to setting up materials, and how well the setup of the desks facilitates student collaboration when appropriate.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. An “**NA**” should be chosen if the teacher has no control over the room set-up, for instance when he or she is using another teacher’s classroom, or if a lesson is being conducted in the field/outdoors.

2.1.8 The classroom environment established by the teacher reflected attention to issues of access, equity, and diversity for students (e.g. cooperative learning, language-appropriate strategies and materials).

This indicator assesses the degree to which the classroom environment is unbiased as it relates to race, ethnicity, religion, gender, sexual orientation, ability, etc. Evidence of this indicator can be obtained by reviewing the wording of classroom handouts, by analyzing opportunities for participation given to diverse students, or by reflecting on the teacher’s handling of unacceptable comments made by students. Additional evidence of this indicator can be gained by analyzing the degree to which the teacher takes the diversity of his or her students into account when planning and teaching lessons, as well as any comments the teacher makes regarding the diversity of his or her classroom and students.

A “**DK**” should be chosen if the observer is not able to get enough positive or negative evidence of this indicator to make a judgment. An “**NA**” is not appropriate for this item.

V. Lesson Structure - Section 2.2

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2.2.1 The lesson was well organized and structured (for example, 5E structure if interactive lesson, or engaging well structured lecture if direct instruction).

This indicator describes how deeply the teacher thought about the content and pedagogy to be used in this lesson. This indicator can be evidenced by how often the teacher anticipates students’ questions or misconceptions and how well this is reflected in the lesson design. This indicator can also be demonstrated though examining the quality of the problems or activities that are chosen in order to strongly promote instructional objectives while taking time constraints into account. Finally, evidence can be obtained by examining how well the teacher structures and sequences the different portions of the lesson to promote student engagement and understanding.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is unable to follow enough of the proceedings of the lesson to make a judgment. An “**NA**” should be chosen in cases such as an unstructured “discovery” or student-led lesson where formalized lesson planning by the teacher might not be appropriate.

2.2.2 The structure of the lesson uncovered important concepts in mathematics or science.

This indicator describes how well the lesson structure allows students to make sense of important mathematics or science concepts. In other words, a well-structured lesson should not only “cover” the intended content area, but promote a deep conceptual understanding of the key ideas in the content area. A lesson structure is not successful if it leaves students unengaged, confused, or overwhelmed.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. An “**NA**” should be chosen if the teacher is not attempting to teach the students any specific mathematics or science content in a structured manner, but if the teacher’s actions are still appropriate for a mathematics or science class.

2.2.3 The structure of the lesson included opportunities for the instructor to gauge student understanding.

This indicator captures how well the teacher structured the lesson to include opportunities to monitor student understanding of the content, both formally and informally. This can be as simple as the teacher walking around and look at the work of individual students or groups, or the teacher carefully using questions, both written and oral, to gauge student understanding.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson to make a judgment, or if the observer is not able follow enough of the proceedings of the lesson well enough to make a judgment. An “**NA**” should be chosen in a situation where gauging student understanding is not relevant to the teachers’ goals for the lesson, and thus is not appropriate for the lesson.

2.2.4 Formal assessments used by teacher (if available) were consistent with instructional objectives (homework, lab sheets, tests, quizzes, etc.).

A formal assessment is interpreted as any work by the student that the teacher either collects for later evaluation or checks for correctness during the class period. Formal assessments can include homework assignments, group assignments, lab sheets, tests, quizzes, and worksheets, as well as teacher rubrics for student presentations, papers, or projects. This indicator measures how well the formal assessments are aligned with the objectives of the instruction. The degree to which the content is covered, in what depth, and with what emphases should be considered when evaluating the quality of the formal assessments.

A “**DK**” should be chosen if the observer cannot get access to copies of any of the formal assessments the teacher used. A “**DK**” is also appropriate if formal assessments given

during the observed class period cover instruction from a previous class period that the observers were not present for. An “NA” should be chosen in the case where the teacher uses no formal assessments during the lesson.

2.2.5 The instructional strategies and activities used in this lesson clearly connected to students’ prior knowledge and experience.

This indicator captures the degree to which the classroom instruction takes into consideration the students’ prior knowledge. This indicator may be directly evidenced by the corresponding post-interview question, (2a). This interview question elicits the teacher’s explanation of how the concepts in the lesson connect to earlier learning and how the teacher takes this into account. Evidence of this indicator can also be in the form of explicit solicitation of prior knowledge and/or experiences by the teacher during the lesson.

A “DK” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. A “DK” is also appropriate if the observer does not obtain an informative response from the teacher to interview question (2a). An “NA” should be chosen in a situation where connections to prior knowledge and experience cannot realistically be made to the content area (i.e. a completely new and very abstract idea is being introduced).

2.2.6 Design for future instruction takes into account what transpired in the lesson.

This indicator measures the degree to which the teacher is reflective about the observed lesson and is able to consider adjustments to future instruction based on what occurred. This indicator can be evidenced by the corresponding post-interview question (11b), since it is unlikely the observer will be present for applicable future instruction. Interview question (2b) may also be applicable to this indicator if the teacher explicitly discusses at this point how future instruction is influenced by what transpired during the lesson.

A “DK” should be chosen if the teacher does not provide an informative response to the interview question (11b), such as in the situation where they do not believe they had had enough time to reflect on the lesson to provide a satisfactory response. An “NA” should be chosen in a situation where it would not be relevant for future instruction to take into account what transpired in the lesson (i.e. if the teacher was about to begin a new unit or if it was the end of the semester/year).

VI. Implementation - Section 2.3

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2.3.1 The instructional strategies enhanced student abilities to engage with or explore important concepts in mathematics or science.

This indicator measures the degree to which the teacher’s instructional strategies are effective in encouraging students to explore and be engaged in relevant mathematics or science concepts. It is important to consider the ability level of the students when deciding upon a rating; for instance, the instructional strategies can be too complex or the content can be covered at too fast a pace for a particular class. The instruction strategies can also be too basic or the content can be covered too slowly for a particular class. Student engagement that occurs as a result of the instructional strategies used should also be considered and assessed.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. A “**DK**” is also appropriate if the observer is unaware of the ability of the students, and thus is unable to judge the appropriateness of the instructional strategies being used. An “**NA**” is not appropriate for this item.

2.3.2 The instructional strategies included an investigative or problem-based approach to important concepts in mathematics or science.

The item assesses the degree to which investigative or problem-based instruction is successfully incorporated into the lesson. In an investigative/problem-based approach, the teacher challenges students by presenting real-world problems or realistic dilemmas to solve in an effort to engage students in higher-order and authentic thinking. An example of this approach could be a math lesson that has students derive the Pythagorean Theorem by exploring the proportions of the sides of right triangles. An example of a science lesson that uses this approach is one in which students “discover” the process of photosynthesis by manipulating model plant leaves. When deciding upon a rating, it is important to consider the appropriateness of the given strategy with respect to the ability level of the students.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. An “**NA**” should be chosen in the situation where an investigative/problem-based approach is not appropriate or necessary to fully promote student understanding of the content (i.e. lecture or direct-instruction).

2.3.3 The teacher’s questioning strategies developed student conceptual understanding of important mathematics or science content (e.g. emphasizing higher order questions, appropriately using “wait time,” identifying prior conceptions and misconceptions).

This item assesses the quality of the teacher’s questioning tactics and their effectiveness in developing students’ understanding of various mathematics or science concepts. Aspects of these strategies include the teacher appropriately using “wait time” to maximize student contributions, placing an emphasis on higher-order questions, and identifying prior conceptions and misconceptions though questioning. This indicator

could be evidenced when teacher questioning is able to engage a large class in a teacher lecture (i.e. the use of “clickers”).

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. An “**NA**” should be chosen in the situation where the teacher does not ask any questions and has no missed opportunities to do so. If such questioning strategies are appropriate but are not used, a rating of 1 or 2 should be chosen. The same ratings will result if many of the questions posed by the teacher are not appropriate or helpful.

2.3.4 The teacher involved all students in the lesson (hesitant learners, etc.).

This item assesses the degree to which the teacher works to ensure that all students are actively involved in the lesson. This indicator can be evidenced by the teacher encouraging students who are not volunteering to participate, or the teacher walking around the room and verbally engaging students in an effort to monitor the progress of the class.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. An “**NA**” should be chosen if the class is involved in an appropriate non-interactive activity, such as taking individual assessments, or if all students are sufficiently involved and no additional encouragement from the teacher was necessary.

2.3.5 The teacher had a confident demeanor.

This indicator captures the teacher’s apparent level of comfort level with the material and teaching in general. Such confidence can manifest itself in classroom instruction in the amount of control the teacher is willing to relinquish in straying from the lesson plan (i.e. allowing student understanding and progress to dictate the direction of the lesson), the amount of authority the teacher has over students, and the teacher’s management of inappropriate or off-task student behavior in the classroom.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. An “**NA**” is not appropriate for this item.

2.3.6 The teacher used formative assessment effectively to be aware of the progress of all students.

An effective teacher may utilize a variety of formative assessments of student progress, including formal assessments like quizzes, tests, or papers, as well as informal assessments, such as any evaluation based on discussions and observations. This indicator assesses how effectively the teacher monitors the student’s progress in order to further inform his or her instruction. The observer can analyze the various assessments

used by the teacher and examine how it influenced his or her corresponding teaching in the classroom or consider how often the teacher stopped his or her lecture to check for student understanding. This indicator can also be evidenced by reviewing the teacher's response to interview questions (9a) and (9b).

A “**DK**” should be chosen if the observer is unable to get access to a copy of any of the formal assessments that were used or if the observer is unable to witness applicable informal assessments. An “**NA**” should be chosen in the case where there is no opportunity for the teacher to use formative assessment or if it is inappropriate for the purposes of the lesson. It is important to differentiate between this situation and the situation where formative assessment is both appropriate and feasible but is not used. In such a situation, a rating of 1 or 2 should be chosen. The same ratings should result when assessments are used but did not contribute to the teacher's understanding of his or her students' progress.

2.3.7 The lesson was modified as needed because the teacher was able to “read” the students' level of understanding through probing questions or other assessments of student understanding.

This indicator assesses the degree to which the teacher's awareness of his or her students' progress impacts the progression of the lesson. Evidence of this item can be directly obtained by reviewing the teacher's response to interview question (11a). This indicator can also be evidenced by analyzing situations in which the results of formative assessment are used to change either the path of the lesson, or the time devoted to a specific portion of the lesson.

A “**DK**” should be chosen if the teacher's response to the interview questions is uninformative and the observer is also unable to gain the necessary evidence from the observation. An “**NA**” should be chosen in the situation where no modifications are made, without any significant missed opportunities to do so. If modifications are necessary based on the students' levels of understanding but are not given, a rating of 1 or 2 should be chosen. The same ratings result when modifications are made but are not appropriate or helpful.

2.3.8 An appropriate amount of time was devoted to each part of the lesson.

This indicator analyzes the pace and flow of the lesson. It is important to note whether the amount of time devoted to each part of the lesson is sufficient, with portions of the lesson not being overly emphasized nor rushed through. Evidence of this indicator can be gained by examining the progress of the students (i.e. whether their needs are being met by the pace of the instruction) and the amount of time dedicated to important and less crucial aspects of the lesson (e.g. most of a science lab is focused on directions instead of content development).

It is also important to consider the appropriateness of the lesson's wrap-up. Even if the lesson continues for several days, some form of wrap-up or reflection at the end of the class period is appropriate. The time set aside for the lesson wrap-up might be too long, leaving the teacher struggling to fill the time, or the students having nothing to do once the wrap-up is complete. The time allotted for the wrap-up can also be too short or even non-existent.

A “**DK**” should be chosen if the observer cannot observe enough of the lesson, or if the observer is not able follow enough of the proceedings of the lesson to make a judgment. A “**DK**” is also appropriate if the observer believes they did not understand the students' needs well enough to appropriately make a judgment on the amount of time needed to best facilitate learning with understanding. An “**NA**” is not appropriate for this item.

2.3.9 The resources selected for this lesson contributed to the purposes of the instruction.

Resources can include visual or presentation tools, such as PowerPoint, white boards, photos, videos, or visual organizers. Resources can also consist of the materials the students are supplied with during the lesson, such as calculators, computers, textbooks, manipulatives, construction paper, scissors, tape, etc. Other resources can be worksheets, quizzes, lab sheets, etc. that the teacher plans to use as part of the lesson. Finally, students themselves can be considered resources to each other.

This indicator captures the degree to which the teacher appropriately uses the resources at his or her disposal to successfully implement the lesson. The teacher should carefully select resources that enhance the learning opportunities of the students, while avoiding resources that serve as distractions (i.e. the addition of unneeded or irrelevant manipulatives to a lesson) or compromise the lesson's objectives (i.e. inappropriate use of calculators, giving computer access when all answers are easily available on the internet).

A “**DK**” should be chosen if the observer cannot observe enough of the lesson to make a judgment, or if the observer is not able follow enough of the proceedings of the lesson well enough to make a judgment. An “**NA**” should be chosen in a situation where there are obvious resources that would have been appropriate, but these resources are not available to the teacher (i.e. the teacher's computer crashes, the copy machine breaks, a lack of funds exists, etc.)

VII. Mathematics/Science Content - Section 2.4

UTOP Page 11

2.4.1 The mathematics or science content chosen was significant and worthwhile for this course.

In this item, the emphasis on “worthwhile” captures the degree to which important scientific or mathematical ideas are central to the lesson. Since the significance of

content is highly context-specific and based upon the intended goals of the course being observed, the observer should rely on their judgment as an “expert” in the content area in order to determine whether the content was truly worthwhile to the students. Further, the observer should use their knowledge of applicable state and national standards, as well as taking into consideration the developmental appropriateness of the content present based on students’ course content background.

A “DK” should be chosen if the observer cannot observe enough of the content being covered to make a judgment, or if the observer is not able follow enough of the proceedings of the lesson well enough to make a judgment. An “NA” is not appropriate for this item.

2.4.2 The significance of the math and science content, including how it fits into the “big picture” of the discipline, was made explicit to the students.

This indicator assess the degree to which the teacher explicitly placed the content of the observed class into the “big picture” of the associated discipline, including the “big picture” of the students’ work in the course that year. This indicator may be evidenced by observing the teacher discuss the significance of the content with the students during the class period. This indicator may also be evidenced by reviewing the teacher’s response to interview questions (6a) and (6b).

A “DK” should be chosen if the observer cannot observe enough of the content being covered to make a judgment, or if the observer is not able follow enough of the proceedings of the lesson well enough to make a judgment. An “NA” should be chosen if this indicator is not directly observed in the classroom, but the teacher reveals during the interview that the big picture aspect has been made explicit in a recent lesson over the same content.

2.4.3 Content delivered through direct instruction by the teacher is consistent with deep knowledge and fluidity with mathematics or science concepts of the lesson.

This indicator assesses the degree to which the teacher demonstrates deep knowledge and fluidity with the content, as evidenced by detailed and clear explanations, the use of the “big ideas” of the content area as a unifying theme, the utilization of applications of the concepts being taught, and the fluid use of related examples with connections made within the subject area.

A “DK” should be chosen if the observer cannot observe enough of the content being covered to make a judgment, or if the observer is not able follow enough of the proceedings of the lesson well enough to make a judgment. An “NA” should be chosen if no content is communicated by direct instruction during the class period.

2.4.4 Teacher written content information was accurate (i.e. information written on board, in hand-outs and on tests and quizzes).

Written content information can include information provided by the teacher on tests, quizzes, worksheets, handouts, dry erase boards, PowerPoints, overheads, etc. Since it is essential that content information be communicated in a clear, accurate and unproblematic manner, this item assesses the teacher's ability to provide accurate written content information.

A “**DK**” should be chosen if the observer cannot gain access to essential worksheets/handouts/tests/quizzes/etc., or if the observer is not familiar enough with the content area to make a judgment. An “**NA**” should be chosen if there is little or no written math or science content given during the lesson (i.e. the students work on finishing presentations).

2.4.5 The teacher's depth of subject matter knowledge was evidenced throughout the non-direct instruction (i.e. fluid use of examples, questioning strategies to guide student learning, discussions and explanations of concepts, etc.).

This indicator captures the degree to which the teacher's content knowledge manifests itself through his or her communication with students during non-direct instruction. This might be evidenced by examining the quality of questioning strategies, including those that demonstrate the teacher's knowledge of how students learn and understand the content area. The teacher's depth of subject matter knowledge can also be assessed by the teacher's understanding of student mistakes, skillful facilitation of group discussions, and clear explanations of concepts.

A “**DK**” should be chosen if the observer cannot observe enough of the teacher's content-related exchanges with the students to make a judgment, or if the observer is not familiar enough with the content area to make a judgment. An “**NA**” should be chosen if the teacher communicates little or no math or science content during the class period observed, or if the teacher only communicates content through direct instruction.

2.4.6 Elements of mathematical or scientific abstraction (e.g., symbolic representations, theory building) were included when it was important to do so.

This indicator captures how well the teacher facilitates conceptual understanding by representing relationships or patterns in abstract or symbolic ways. Moving towards abstraction can assist students in understanding the content as a coherent whole and making connections between important concepts. In a science lesson about the water cycle, the teacher might show the students an abstracted flow chart to show the progression of the different phases of the water cycle. In a mathematics lesson about linear relationships between variables, after focusing on several cases where the variables have fixed values, the teacher might scaffold the students into writing the linear equation abstractly using symbols.

A “DK” should be chosen if the observer cannot observe enough of the lesson to make a judgment, or if the observer is not familiar enough with the content area to make a judgment. An “NA” should be chosen if elements of abstraction are not applicable to the content being developed, or if it is not the appropriate time in the development of the content to move students towards abstraction.

2.4.7 Appropriate connections were made to other areas of mathematics or science, to other disciplines, or to real-world contexts.

Connecting mathematical and scientific concepts across the disciplines and to real world applications tends to generalize the content and make it more coherent. A science lesson on water cycles might connect with global warming and its economic impact on our nation. A mathematics lesson on graphing linear or quadratic equations might connect with the motion of real-world objects and related principles of physics.

A “DK” should be chosen if the observer cannot observe enough of the lesson to make a judgment, or if the observer is not familiar enough with the content area to make a judgment. An “NA” should be chosen if making connections to other content or to real-world contexts is not appropriate for the content being developed (e.g. making real-world connections in a lesson covering strategies for simplifying radicals).

2.4.8 Mathematics and science were portrayed as a body of knowledge influenced by human decisions and influencing human society.

Concepts in mathematics and science are continuously being developed, validated, revisited, and modified based on human society's changing body of scientific knowledge. The currently accepted scientific body of knowledge also has a strong influence on human society and human decision-making.

This indicator captures the degree to which the teacher thought about and incorporated mathematical or scientific connections to human society. One way this indicator can be incorporated into a mathematics or science lesson is through the discussion of the history and development of a specific concept. For instance, a science lesson about blood type can discuss the process by which Karl Landsteiner discovered and classified blood types in the 1900s. In a mathematics lesson, a discussion of angles could incorporate how an understanding of geometry can influence human decisions regarding the design and building of structures.

A “DK” should be chosen if the observer cannot observe enough of the lesson to make a judgment, or if the observer is not familiar enough with the content area to make a judgment. An “NA” might often be chosen for this item, as it is not appropriate or necessary for all mathematics and science lessons to incorporate this indicator. First, many lessons in math or science do not easily lend themselves to this kind of discussion. Moreover, this type of discussion is not appropriate at all points in the development of the

content (i.e. such discussions may not be brought to light as the teacher reviews for a test).

VIII. Section Three: Summary Comments

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Information included in the "Summary Comments" section of the UTOP provides readers with a snapshot of the observer's evaluation of the quality of the lesson. When filling in this section, the observer should consider all available information concerning the lesson, its context and purpose, as well as their own judgment of the relative importance of the ratings they have made. The summary is intended to be free-form, and can also include comments that did not fit into any of the preceding sections.

IX. Section Four: Post-Observational Teacher Interview

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The Post-Observational Teacher Interview can be carried out face-to-face, via video-conferencing, through email or other online communication, or over the telephone, and should take place very soon after the observation. If the observers intend to remain blind to the educational background of the teacher while the interview is being conducted, it is important for observers to instruct the teacher, prior the interview, not to reveal this directly or indirectly information.

The responses the observer obtains to the interview questions may often overlap considerably, as a teacher may answer some questions partially or fully before the question formally comes up in the interview protocol. The teacher may also add more to her explanation of one question while answering a later question. For this reason, it is important to look at the entire interview when examining the answer to any single question. The observer also needs to make a judgment about whether they should ask a question if the teacher has already answered it during a different portion of the interview.

During the interview, teachers may refer to and elaborate on what occurred in other related lessons they have taught. It is important to remember to only take into account the teacher's comments as they related to the lesson that was actually observed. The post-observational teacher interview may also be used as an opportunity for the classroom teachers being observed to reflect on their own practice. The goals and interests of interviewer will influence the degree to which this reflection is encouraged and facilitated.

X. Demographic Questionnaire

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Relevant information relating to the teacher's background and professional and educational experiences that was not collected earlier (so as allow those observers who desired to remain "blind" to this information do so), is collected in this demographic

questionnaire. Examples of this information include the teacher's age, race/ethnicity, school, classes and grades taught, education, years teaching, and relevant professional experiences.