**TBIL Workshop Facilitation Guide**

# Introduction

This document aims to offer facilitation advice to workshop providers using the [workshop materials](https://drive.google.com/drive/folders/1TEbrFzMZmtofVvAPxb7NM6slJlyDNoDs?usp=sharing) available as part of the [TBIL Resource Library](https://library.tbil.org). These workshop slideshows should be thought of as templates, which facilitators can adapt to their specific needs and audience. The slideshows are available under a Creative Commons Attribution-Share Alike-Non Commercial license.

These workshops assume no prior knowledge of Team-Based Learning or Inquiry-Based Learning. Both workshops mix direct instruction with TBL-style 4-S activities to demonstrate what this style of activity actually looks like in the classroom.

Recommended citation: Drew Lewis and the Team-Based Inquiry Learning Community. (2025). Team-Based Inquiry Learning Workshop.

# 60-75 minute Workshop

This workshop omits a Readiness Assurance Process, and presents basic information through direct instruction. While this is not the preferred method, it is an unavoidable choice sometimes given time restrictions and/or a lack of ability to communicate with the audience in advance of the workshop. With enough time, a facilitator could choose to begin the workshop with participants reading the two resources described below; in that case, it is recommended to copy the readiness assurance process from the 120 minute version below into this set of slides.

This workshop begins with direct instruction describing the motivation for TBIL, and its relationship with TBL and IBL (slides 4–7). It is very effective when discussing slide 4 for the facilitator to describe the particular classroom challenge that led them personally to begin doing TBIL.

Slide 8 describes the overall rhythm and structure of a TBIL module, before a sequence of slides presenting the readiness assurance process. Slide 10 illustrates the “point-spreading” approach to iRATs, which the facilitator may or may not want to include. Facilitators may want to supplement slides 11–12 with a mention (or a slide mentioning) <https://scratchee.clontz.org>, a free, digital version of the IF-AT cards. Participants (and workshop facilitators) can order IF-AT cards from Cognalearn at <https://www.cognalearn.com/ifat> . These are sold in bulk quantities, so it is often more reasonable for several instructors to split an order. On some campuses, the Center for Teaching & Learning (however named) can facilitate this. Slide 14 references a small study described in the “Team-Based Inquiry Learning” paper by Lewis, Clontz, and Estis. Slide 15 illustrates the use of the tool Zipgrade for scanning and quickly summarizing iRAT responses. Facilitators should emphasize at this point (if not before) that the point of the Readiness Assurance Process is to ensure that students are ready by the end of the RAP; it is not important whether that happens at the iRAT stage, the tRAT stage, or the JIT stage, rather that it happens by the end of it.

Slide 16 repeats Slide 8, but it is helpful to zoom back out to remind participants where the RAP and 4-S activities sit in the overall structure of TBIL. After a brief description of 4-S activities, facilitators present the first activity on slide 19. The facilitator may need to do some grouping of participants into teams at this point, depending on the setup of the room. The activity invites participants to think about which aspect of the 4-S structure is most helpful in math classes. This activity is not designed with a “correct” answer in mind; the facilitator should focus the debrief around highlighting that this structure, with all 4 S’s working together, allows students to work on tasks in teams while setting up a whole-class discussion in which various teams’ reasoning is brought to the metaphorical center of the classroom. Facilitators should highlight the connection here with the pillars of IBL, particularly how the whole class debrief is a key opportunity for instructors to inquire into student thinking. Facilitators can also mention that research shows that it is more effective to compare various students’ strategies to solve a problem, rather than the instructor presenting multiple strategies, in developing flexibility in problem solving.

Activity 2 (Slide 20) asks participants to think about the importance of the readiness assurance process. The preferred answer here is C; the facilitator should emphasize in the whole-class debrief that the purpose of the readiness assurance process is to ensure that students are ready for the 4-S activities that are designed to help them develop content mastery. Knowledge of readiness topics are therefore a means, rather than the goal.

Slides 21–23 emphasize this key point that the point of the readiness assurance process is to ensure students are ready for the class activities. The sequence of slides shows an inquiry activity which requires students to know how to find the area of a parallelogram, and then shows how the readiness outcomes and readiness assurance test are linked to this concept. Facilitators should mention that this readiness process is aimed at reducing the extraneous cognitive load that occurs when students have to remember something they learned long ago, but have not thought about recently. Thus, the readiness assurance process helps these challenging inquiry activities run more smoothly.

Slides 24–27 describe the three key types of TBIL activities. These are described in further detail in the paper “Team-Based Inquiry Learning” by Lewis, Clontz, and Estis. Activity 3 then asks participants which of these three kinds of activities is most essential. The preferred answer is A, scaffolded exploration activities. While building procedural fluency is important, it can more easily be done by students outside of class. Flexible extension tasks are often not directly related to the learning outcome.

Depending on available time, facilitators will not likely have time for all of Activities 3, 4, and 5. They are included to provide facilitators options; they can be hidden, or simply skipped over if the facilitator wants to make that decision in real time. Activity 4 asks about which aspect of TBIL best addresses issues with group work. The preferred answer is C. By framing these activities as existing only to help students learn, they tend to be more than happy to work on them. The lack of a grade keeps them low stakes and focused on learning, and not assigning group work outside of class eliminates many issues with finding common meeting times, dividing up work, etc. Choice D also has some merit, as the design of the activities encourages students to collaborate rather than think about separate parts individually. Some participants may be drawn to choices A and B. The facilitator may wish to note that many TBIL instructors modify these in various ways, such as not grading iRATs, or using team reflections rather than graded peer evaluations.

Activity 5 is encouraging participants to think about how to foster equity in participation in a TBIL course. The preferred answer here is D. Choices A and B are easy to implement. However, choice A can still result in students feeling put on the spot as an assigned reporter. It is important to highlight here the neurodiversity present in all of our classrooms, and how those kinds of experiences can be quite distressing for some neurodivergent students. Choice B often results in the same student being the first reporter for a team, and in larger classes still can result in some students avoiding sharing with the class at all. The facilitator should highlight the benefits of choice C and D in allowing the instructor to assign competence to a student, e.g. saying “I heard Ananya had a really great thought on how to approach this one”, which can help boost the confidence of students who have had poor past math experiences. D is preferred to C because it allows students to share their thinking, rather than instructors sharing their interpretation of students’ thinking. This technique is called “warm calling”, cf. “cold calling”, and serves two purposes. First, it gives students a chance to opt-out privately, which supports students for whom sharing with the class would be too anxiety-inducing. In practice, this rarely happens, as it gives students a moment to prepare for sharing their thinking, which for many students alleviates that anxiety. Facilitators might wish to mention the book “Equitable and Engaging Mathematics Teaching: A Guide to Disrupting Hierarchies in the Classroom” by Reinholz, which describes facilitation moves like this in more depth.

Slide 31 provides a brief summary, while Slide 32 highlights some resources, particularly the TBIL Resource Library. Facilitators should also be sure to invite participants into our growing TBIL community of practice.

# 120 Minute Workshop

The workshop begins with a Readiness Assurance Process. There are two suggested readings: [“Introduction to Team-Based Learning by Sibley and Spiridonoff](https://drive.google.com/file/d/1xjn0G3_PEmYUGTUgSBP9LcpcCbMnuT0p/view?usp=drive_link) and [“Team-Based Inquiry Learning” by Lewis, Clontz, and Estis](https://drive.google.com/file/d/1gg23xXOwndqlOc_kJYV1oKNJcHOe4ObR/view?usp=drive_link). There is an 8 question RAT ([PDF](https://drive.google.com/file/d/1QJdfgyE09IL3FgNYFTaEA2l8gl5POF_G/view?usp=drive_link), [LaTeX](https://drive.google.com/file/d/1oexLKScJDu3ZuyUz5ecolLxUFhOMCjFw/view?usp=drive_link)), with answers aligned to IF-AT card D012.

After reminding participants of the preparation materials (Slide 4), a basic overview of a TBIL module is presented on Slide 5. Facilitators should then enthusiastically let participants know it is time for the Readiness Assurance Test, and begin the iRAT. Slide 8 is included if you would like to use point spreading. After participants complete the iRAT, the workshop provider should arrange participants into teams. Slide 10 should be edited to add whatever instructions will accomplish this. Relevant factors to consider with a group of math faculty are years of experience with IBL, or years of experience with any kind of active learning. Once they are in teams, you can use slides 11-12 to explain how to use IF-AT cards, if you are using them. Facilitators may want to supplement slides 11–12 with a mention (or a slide mentioning) <https://scratchee.clontz.org>, a free, digital version of the IF-AT cards. Participants (and workshop facilitators) can order IF-AT cards from Cognalearn at <https://www.cognalearn.com/ifat>. These are sold in bulk quantities, so it is often more reasonable for several instructors to split an order. On some campuses, the Center for Teaching & Learning (however named) can facilitate this. Slide 13 describes data from Michaelsen. Slide 14 references a small study described in the “Team-Based Inquiry Learning” paper by Lewis, Clontz, and Estis. Slide 15 illustrates the use of the tool Zipgrade for scanning and quickly summarizing iRAT responses. Alternatively, you can use Zipgrade in the workshop and demonstrate how quickly it is to scan the bubble sheets and generate the graphs.

Participants should obtain an understanding of the 4-S structure through the Readiness Assurance Process, so a brief reminder on Slide 17 is all that’s needed. The workshop then launches into a series of activities that demonstrate the rhythm of teamwork followed by class debrief. Activity 1 (Slide 18) helps set up the motivation/need for TBIL, as almost all participants will have struggled with implementing group work in the past. This directly sets up Activity 2, where participants think about how TBIL addresses these challenges. The preferred answer to Activity 2 is C. By framing these activities as existing only to help students learn, they tend to be more than happy to work on them. The lack of a grade keeps them low stakes and focused on learning, and not assigning group work outside of class eliminates many issues with finding common meeting times, dividing up work, etc. Choice D also has some merit, as the design of the activities encourages students to collaborate rather than think about separate parts individually. Some participants may be drawn to choices A and B. The facilitator may wish to note that many TBIL instructors modify these in various ways, such as not grading iRATs, or using team reflections rather than graded peer evaluations.

Activity 3 addresses a natural question many participants will have about how to set up teams. Responses to this activity vary considerably based on the participants’ instructional contexts. The facilitator should emphasize the importance of transparency with students in setting up heterogenous teams. Answer choices C and D pose challenges with this transparency; telling students you have sorted them by their score on any kind of math assessment will leave some students feeling like they must have been the low-scoring one on the team, which can be demotivating. Participants may question if it is possible to obtain information on C and D; the facilitator should note that a survey with whatever criteria the instructor desires can be emailed to students in advance of the first class. Rather than settle on a correct answer, the facilitator should highlight the need for instructors to make this choice in light of their particular instructional context and students.

Activity 4 (Slide 21) asks participants to think about the importance of the readiness assurance process. The preferred answer here is C; the facilitator should emphasize in the whole-class debrief that the purpose of the readiness assurance process is to ensure that students are ready for the 4-S activities that are designed to help them develop content mastery. Knowledge of readiness topics are therefore a means, rather than the goal.

Activity 5 (Slide 22) serves to focus participants on the most important point, which is to help students learn the content. Thus, B is the preferred answer. The facilitator should mention that the other answer choices may be happy accidents that happen in a TBIL classroom, but are not the primary goal of the pedagogy.

The workshop shifts to a series of direct instruction, situating TBIL at the intersection of TBL and IBL. The four pillars of IBL are introduced, followed by slides showing how TBIL supports each of the four pillars. To follow up the fourth pillar on fostering equity, Activity 6 aims to make space for participants to think about how to foster equity in participation in a TBIL course. The preferred answer here is D. Choices A and B are easy to implement. However, choice A can still result in students feeling put on the spot as an assigned reporter. It is important to highlight here the neurodiversity present in all of our classrooms, and how those kinds of experiences can be quite distressing for some neurodivergent students. Choice B often results in the same student being the first reporter for a team, and in larger classes still can result in some students avoiding sharing with the class at all. The facilitator should highlight the benefits of choice C and D in allowing the instructor to assign competence to a student, e.g. saying “I heard Ananya had a really great thought on how to approach this one”, which can help boost the confidence of students who have had poor past math experiences. D is preferred to C because it allows students to share their thinking, rather than instructors sharing their interpretation of students’ thinking. This technique is called “warm calling”, cf. “cold calling”, and serves two purposes. First, it gives students a chance to opt-out privately, which supports students for whom sharing with the class would be too anxiety-inducing. In practice, this rarely happens, as it gives students a moment to prepare for sharing their thinking, which for many students alleviates that anxiety. Facilitators might wish to mention the book “Equitable and Engaging Mathematics Teaching: A Guide to Disrupting Hierarchies in the Classroom” by Reinholz, which describes facilitation moves like this in more depth.

Slides 31–35 tie the Readiness Assurance Process to supporting inquiry activities, reminding participants that the point of the readiness assurance process is to ensure students are ready for the class activities. The sequence of slides shows an inquiry activity which requires students to know how to find the area of a parallelogram, and then shows how the readiness outcomes and readiness assurance test are linked to this concept. Facilitators should mention that this readiness process is aimed at reducing the extraneous cognitive load that occurs when students have to remember something they learned long ago, but have not thought about recently. Thus, the readiness assurance process helps these challenging inquiry activities run more smoothly.

Slides 36–39 continue the direct instruction, describing the three types of TBIL activities. This material is covered in the paper “Team-Based Inquiry Learning” that formed part of the preparation for the Readiness Assurance Process, so the facilitator can likely move quickly through these to set up Activity 7, which asks which of these three kinds of activities is most essential. The preferred answer is A, scaffolded exploration activities. While building procedural fluency is important, it can more easily be done by students outside of class. Flexible extension tasks are often not directly related to the learning outcome.

Slide 41 provides a brief summary, while Slide 42 highlights some resources, particularly the TBIL Resource Library. Facilitators should also be sure to invite participants into our growing TBIL community of practice.