Project-Based Inquiry Science (*PBIS*) Integrity of Implementation Rubric

Highly proficient (Ideal) *High integrity*	Proficient	Emerging/Beginning	Needs improvement *Non-use*
Component 1: Use of *Project Board* (It is understood that there are a variety of acceptable ways in which the class *Project Board* can be displayed, for example, electronically, large posters, overheads, etc.)			
1	**2**	**3**	**4**
• The class *Project Board* displays pertinent information in all columns, appropriate for the stage of the unit. • All students have their own *Project Boards* that display appropriate, up-to-date information. • Many prior conceptions that are relevant to the core ideas of the unit's *Big Challenge* or *Big Question* are recorded in the *What do we think we know?* column of the *Project Board*. • The *Project Board* provides an opportunity to enhance students' ability to ask meaningful questions. Good-quality questions are recorded in the *What do we need to investigate?* column. The questions recorded anticipate the intended storyline of the unit, i.e., questions reflect the *Learning Set* and *Section* questions.	• The class *Project Board* displays information in all columns, appropriate for the stage of the unit. • Students have their own *Project Boards*. For the majority of students, the information is appropriate and up to date. • Some prior conceptions that are relevant to the core ideas of the unit's *Big Challenge* or *Big Question* are recorded on the *Project Board*. • The use of the *Project Board* provides students an opportunity to ask questions. Most questions recorded in the *What do we need to investigate?* column are relevant and good quality. The questions recorded partly anticipate the intended storyline of the unit, i.e., questions reflect the *Learning Set* and *Section* questions.	• The class *Project Board* shows an attempt to display some information. • Students have their own *Project Boards*, but they are not up to date and some entries are not appropriate. • Very few prior conceptions are recorded in the *What do we think we know?* column of the *Project Board*. Most are not relevant to the core ideas of the unit's *Big Challenge* or *Big Question*. • The *Project Board* is used to record students' questions. The majority of questions recorded in the *What do we need to investigate?* column are not good-quality, relevant questions. The questions recorded do not anticipate the intended storyline of the unit.	• The *Project Board* is not used in the classroom.

• The *Project Board* displays connections between what students are learning and their evidence. It is used as an important tool to support student argumentation and build evidence-based claims. • The fifth column of the *Project Board, How can we apply what we are learning?* includes statements that provide evidence that students can apply what they have learned to answer the *Big Question* or address the *Big Challenge*.	• The *Project Board* displays connections between most of what students are learning and their evidence. The *Project Board* can be used to support student argumentation and helps them build effective claims with supporting evidence, but additional support might be needed. • The fifth column of the *Project Board, How can we apply what we are learning?* includes statements that indicate that students are beginning to understand how to apply what they have learned to answer the *Big Question* or address the *Big Challenge*.	• Few connections between what students are learning and their evidence are displayed, and some are completely missing or inaccurate. The *Project Board* would be of minimal value in supporting student argumentation and helping them build effective claims with supporting evidence. • Statements in the fifth column of the *Project Board, How can we apply what we are learning?* indicate that students are having difficulty understanding how to apply what they have learned to answer the *Big Question* or address the *Big Challenge*.	

Comments:

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Component 2: Small-Group Work and Discussion			
1	**2**	**3**	**4**
• Students work in small groups during "hands-on" activities. All students have clearly defined roles and participate in the activity. • Students participate in small-group discussions for each group discussion suggested in the student edition. They plan investigations, design solutions, analyze data, reflect, synthesize information, and create explanations. • Groups remain on task with or without the teacher present, and all group members participate to the best of their abilities.	• Students work in small groups during most "hands-on" activities. Some investigations are presented as teacher demonstrations when time or equipment is limited. • Students participate in small-group discussions for most of the group discussions suggested in the student edition. They plan investigations, design solutions, analyze data, reflect, synthesize information, and create explanations in small groups. Some small-group discussions are omitted due to time restraints. • Groups generally remain on task with or without the teacher present, and all group members participate to the best of their abilities.	• Students seldom work in small groups. Students may occasionally participate in a small-group, teacher-directed "hands-on" activity. • Some small-group discussions take place, but most discussions are teacher-led. • Students have difficulty staying on task and working cooperatively without teacher supervision when asked to work in small groups.	• Students have little or no opportunity to engage in small-group activities. No "hands-on" activities are observed. • No small-group discussions take place, and classroom discussions are teacher-led. • Students show no evidence (or have no opportunity to show evidence) of the skills required to engage in cooperative small-group work.

Comments:

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Component 3: Whole-Class Presentations (*PBIS* Social Practices) and Discussions			
1	2	3	4
• Student groups have an opportunity to present results, ideas, or solutions to the whole class at all the occasions suggested in the student edition. • Students display confidence and communicate with ease during their group presentations to the class. They present reliable information and can accurately answer questions posed to them. • Students listening to presentations offer respectful comments or ask thoughtful questions relevant to the presentation. • In whole-class discussions, students consistently connect their contributions to each other and show how ideas/positions shared during the discussion relate to each other. • At least 75% of students participate in whole-class discussions. Protocols are in place that guarantee that while each student may not participate in every discussion, 100% of students participate regularly.	• Student groups have an opportunity to present results, ideas, or solutions to the rest of the class most of the times suggested in the student edition. On some occasions, only some of the groups may present, due to time restraints. • Students appear reasonably comfortable during their group presentations to the class. • Students listening to presentations generally offer respectful comments or ask thoughtful questions, but some prompting by the teacher is required. • In whole-class discussions, students sometimes connect their contributions to each other and show how ideas/positions shared during the discussion relate to each other. • About 50–75% of students participate in whole-class discussions. Protocols are in place to ensure that while each student may not participate in every discussion, a majority of students participate regularly.	• Student groups are rarely given an opportunity to present results, ideas, or solutions to the whole class. • Students show a lack of confidence and appear uncomfortable during a presentation to the class. They are unprepared and cannot answer questions. • During student-group presentations, students are not attentive and are not able to offer comments or ask thoughtful questions. • In whole-class discussions, students rarely or never connect their contributions to each other and show how ideas/positions shared during the discussion relate to each other. • About 25–50% of students participate in whole-class discussions.	• No opportunity for small-group presentations to the whole class is provided. • In whole-class discussions, students do not make any effort to link or re-voice other students' contributions. • About 0–25% of students participate in whole-class discussions.

Comments:

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Component 4: Creating Explanations and Arguing from Evidence			
1	**2**	**3**	**4**
• Students are able to make accurate, complete, clear, and concise claims. • Students support their claims with appropriate and sufficient evidence. • Students include appropriate and sufficient science principles and use a wide range of science vocabulary accurately when appropriate. • Students provide reasoning that links the evidence to the claim and are able to construct convincing oral and written arguments. • The teacher acts as a resource person, working to support and enhance student reasoning. Teacher supports students with sentence frames and other academic language resources so that all students have the tools they need to engage in scientific argumentation.	• Students are able to make accurate claims. • Students support their claims with relevant evidence. • Students include science principles and use science vocabulary accurately when appropriate. • Students provide reasoning that links evidence to the claim. • The teacher helps students in providing reasoning and language resources to help them engage in scientific argumentation.	• Students make accurate but incomplete or vague claims. • Students support their claims with evidence that is insufficient or inaccurate. • Students may include science principles, but they are insufficient or inaccurate. • Students are only able to repeat the claim and evidence. • Teacher helps students make their claims and to link their claims and evidence.	• Students cannot make claims or make inaccurate claims. • Students cannot provide evidence or provide inappropriate evidence to support their claims. • Students are not able to connect science principles to a claim. • Little or no opportunity is provided for students to create explanations or argue from evidence. • Teacher acts as the source of information for the students. Teacher provides explanations for students.

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Component 5: Teacher as Facilitator			
1	**2**	**3**	**4**
• Classroom is set up for student-centered learning. • Teacher moves around the classroom, observing and listening to each small group and asking probing questions or redirecting questions and problems back to students to move learning ahead. • Teacher is able to work with individual groups and students without losing sight of the entire class. Teacher quickly and efficiently redirects students who are off task. • Student questions and ideas frequently determine the focus and direction of classroom discussions.	• Classroom setup can readily accommodate student-centered learning. • Teacher moves around the classroom, observing and listening to each small group and offering suggestions. • Teacher is able to work with individual groups, but occasionally some other groups in the class are observed to be off task. • Student questions and ideas at times determine the focus and direction of classroom discussions.	• Classroom can only be rearranged to accommodate student-center learning with considerable difficulty. • Teacher spends the majority of time at the "front" of the classroom lecturing. • Teacher occasionally provides individual students with assistance in solving assigned problems. • Student questions and ideas rarely become the focus of class discussion.	• The classroom is set up for teacher-centered lessons only. • Teacher spends all the time at the "front" of the classroom lecturing. • Little or no opportunity is provided for students to ask questions or offer their solutions to problems. • The teacher determines the focus of classroom discussions.

Comments:

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Component 6: Pacing and Sequencing of Classroom Experiences and Unit			
1	**2**	**3**	**4**
• Lessons are fast-paced. Students are informed of the time allotted to complete a task and are expected to and do complete the task in the given period of time. • Classroom discussions are lively, but are always respectfully ended within an appropriate time period. • Teacher has a planning/pacing guide that has been customized for his/her classes. • All sections are taught in the order presented in the student edition. Adherence to the scaffolding outlined in the storyline is apparent. • Unit pacing has been maintained and is on target. • Students are highly motivated to complete the Unit and *Answer the Big Question* or *Address the Big Challenge*.	• An attempt is made to keep lessons fast-paced. Students are informed of the time allotted to complete a task, but not all students are able to complete the task in the time given. Accommodations are sometimes made for these students. • Classroom discussions are lively, are usually respectfully ended within an appropriate time period. • Teacher follows the planning/ pacing guide provided. Some modifications of activities have been made to keep to suggested time allotment. • Most sections are taught in the order presented in the student edition resulting in minor disruption of the scaffolding of concepts developed in the storyline. • Unit pacing is lagging slightly behind recommended pacing. • Students are motivated to complete the Unit and *Answer the Big Question* or *Address the Big Challenge*.	• Students appear to set their own pace with respect to completing activities. • Classroom discussions are occasionally allowed to continue for longer than appropriate. • Teacher is not mindful of the pacing guide provided. Several additional activities and content appear to have been added. • Many sections are not taught in the order they are presented leading to a disruption of the scaffolding of concepts developed in the storyline. • Unit pacing is lagging considerably behind recommended pacing. • Some students appear to have lost interest in wanting to *Answer the Big Question* or *Address the Big Challenge.*	• Students set their own pace with respect to completing activities. • Classroom discussions are allowed to drag on. • Teacher does not have a pacing guide that takes into account the recommended time allotment. Numerous additional activities and content appear to have been added or used to replace activities in the student edition. • Sections are taught as stand-alone, hands-on activities and readings. No attempt to scaffold concepts as outlined in the storyline is apparent. • Unit pacing is lagging unreasonably far behind recommended pacing. • Students have no interest in wanting to *Answer the Big Question* or *Address the Big Challenge* or have lost sight of the unit challenge or question.

Comments:

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Component 7: Accuracy of Content			
1	**2**	**3**	**4**
• Teacher has an in-depth understanding of content knowledge and is able to convey it accurately when required to help students complete their task. • Teacher has an in-depth understanding of student misconceptions and has the required pedagogical content knowledge to understand which experiences will help students to overcome prior conceptions. • Teacher models concise scientific reasoning with precise and accurate use of scientific terms when appropriate.	• Teacher has a good understanding of content knowledge and is generally able to convey it accurately when required to help students complete their task. • Teacher is aware of possible student misconceptions and has the required pedagogical content knowledge to use the materials provided to help students overcome them. • Teacher models scientific reasoning with accurate use of scientific terms when appropriate.	• Teacher has some understanding of content knowledge, but occasionally conveys inaccurate or incomplete science content. • Teacher is aware of the possibility of student misconceptions, but lacks an in-depth understanding of how to provide experiences that will help students overcome them. • Teacher on occasion attempts to model scientific reasoning, and use of scientific terms is generally accurate.	• Teacher conveys incorrect science content. • Teacher's lack of pedagogical content knowledge does not help students overcome misconceptions and/or reinforces their misconceptions. • Teacher makes no attempt to model scientific discourse and/or uses scientific terms inaccurately.

Comments: