

## Background

At our term one 2024 round at Berowra Public School the network revisited the concept of Rigor. We began unpacking this definition of rigor proposed by Barbara Blackburn.

---

*Rigor is creating an environment in which each student is expected to learn at high levels, each student is supported they can learn at high levels, and each student demonstrates learning at high levels.*

---

Notice we are looking at the environment you create. The trifold approach to rigor is not limited to the curriculum that students are expected to learn. It is more than a specific lesson or instructional strategy. It is deeper than what a student says or does in response to a lesson. True rigor is the result of weaving together all elements of schooling to raise students to higher levels of learning. We will look at a brief description of each of the core areas in what follows.

### Expectations

The first component of rigor is creating an environment in which each student is expected to learn at high levels. Having high expectations starts with the recognition that every student possesses the potential to succeed at his or her individual level. This doesn't happen when we make comments like "Girls don't do as well in math."

Almost every teacher or leader I talk with says, "We have high expectations for our students." Sometimes that is evidenced by the behaviours in the school; other times, however, faculty actions don't always match the words. There are concrete ways to implement and assess rigor in classrooms. As you design lessons that incorporate more rigorous opportunities for learning, you will want to consider the questions that are embedded in the instruction. Higher-level questioning is an integral part of a rigorous classroom. Look for open-ended questions, ones that are at higher levels of critical thinking. It is also important to pay attention to how you respond to student questions. When we visit schools, it is not uncommon to see teachers who ask higher-level questions. But for whatever reason, we then see some of the same teachers accept low-level responses from students. In rigorous classrooms, teachers push students to respond at high levels. They ask extending questions. Extending questions are questions that encourage students to explain their reasoning and think through ideas. When a student does not know the immediate answer but has sufficient background information to provide a response to the question, the teacher continues to probe and guide the student's thinking rather than moving on to the next student. Insist on thinking and problem solving.

High expectations are important, but the most rigorous schools assure that each student is supported so he or she can learn at high levels, which is the second part of our definition. It is essential that teachers design lessons that move students to more challenging work while simultaneously providing ongoing scaffolding to support students' learning as they move to those higher levels.

### Scaffolding for Support

Providing additional scaffolding throughout lessons is one of the most important ways to support your students. Oftentimes students have the ability or knowledge to accomplish a task but are overwhelmed by the complexity of it, therefore getting lost in the process. This can occur in a variety of ways, but it requires that teachers ask themselves during every step of their lessons, "What extra support might my students need?"

Examples of Scaffolding Strategies

- ◆ Accessing prior knowledge
- ◆ Asking guiding questions
- ◆ Chunking information
- ◆ Foster a collaborative environment
- ◆ Writing standards as questions for students to answer
- ◆ Using visuals aids and graphic organizers such as anchor charts or tables to accompany science lessons

Demonstration of Learning

The third component of a rigorous classroom is providing each student with opportunities to demonstrate learning at high levels. There are two aspects of students' demonstration of learning. First, we need to provide rigorous tasks and assignments for students. What we've learned is that if we want students to show they understand what they learned at a high level, we also need to provide opportunities for students to demonstrate they have truly mastered that learning more than a basic lesson. Many teachers use Bloom's Taxonomy or Webb's Depth of Knowledge (DOK). We prefer Webb's DOK for a more accurate view of the depth and complexity of rigor.

<b><i>Examples of Guidelines for Rigor for Bloom's Taxonomy and Webb's Depth of Knowledge</i></b>	
<i>Bloom's Taxonomy</i>	<i>Webb's DOK Level 3</i>
Analyzing Evaluating Creating **Please note that although the verbs are important, you must pay attention to what comes after the verb to determine if it is rigorous.	Does the assessment focus on deeper knowledge? Are students proposing and evaluating solutions or recognizing and explaining misconceptions? Do students go beyond the text information while demonstrating they understand the text? Do students support their ideas with evidence? Does the assessment require reasoning, planning, using evidence and a higher level of thinking than the previous two levels (such as a deeper level of inferencing)?

Second, for students to demonstrate their learning, they must first be engaged in academic tasks, precisely those in the classroom. In too many classrooms, most of the instruction consists of teacher-centered, large-group instruction, perhaps in an interactive lecture or discussion format. The general practice during these lessons is for the teacher to ask a question and then call on a student to respond. While this provides an opportunity for one student to demonstrate understanding, the remaining students don't do so. Another option would be for the teacher to allow all students to pair-share, respond with heads up head down or hands up hands down, write their answers on small whiteboards and share their responses or respond on

handheld computers that tally the responses. Such activities hold each student accountable for demonstrating his or her understanding.

## DIGGING INTO RIGOR

In ensuring rigor, we are looking at the classroom environment you create. Our tri-fold approach to rigor is not limited to the curriculum students are expected to learn. True rigor is the result of weaving together the elements of curriculum, instruction and assessment in a way that maximises the learning of each student.

### Questioning

Questioning is another way to ensure rigor. Rigorous questions require students to demonstrate their learning at high levels.

Our questioning strategies reflect our high expectations. When we ask students higher-order questions, we are showing them we expect them to answer at higher levels. On the other hand, when we only ask students recall questions such as, “Who did this?” we are demonstrating that we don’t really expect them to know any more than the most basic answers. There are several general strategies you should incorporate as you question students.

#### General Questioning Strategies

- *Provide adequate wait time.*
- *Call on a variety of students, not just those who raise their hands.*
- *Ask higher-order questions.*
- *If you ask a lower-level question, follow up with a higher-order question.*
- *Encourage follow-up questions from students.*
- *If a student struggles with the answer, provide guidance and scaffolding rather than moving to another student.*

Questioning is a basic and critical part of your classroom. But we often make mistakes during our questioning. These include not probing beyond a single answer, not encouraging students to ask questions, asking lower-level questions and allowing one or two students to dominate the conversation.

One of the challenges related to questioning is that students may provide a surface level response rather than a complete answer to your query. In those cases, we need to ask additional questions to probe for more information. Probing allows you to gather more details in the case of an insufficient answer or when a student is reluctant to respond. In order to elicit more details, you’ll want to use prompts similar to these.

**Sample Probing Question Prompts**  
**What else can you tell me about....?**  
**What is a specific example of.....?**  
**Please explain .....**  
**What did you mean by....?**  
**Can you elaborate on....?**  
**What is the reason you said...?**

Over time, you can also teach students to ask probing questions of each other. Simply provide the sample prompts or others appropriate to your students and guide them toward the peer questioning.

The first key to effective questioning is to match your questions to your purpose. For example, if you want basic information from students, closed-ended questions, or those that ask for a one-word answer, are appropriate. However, if you want students to show a deeper level of understanding, open-ended questioning is preferred.

Type of Question	Samples
Questions of Clarification	What do you mean by? What is your main point? Could you give me an example?
Questions that Probe Purpose	What was your purpose when you said? How do the purposes of these two groups vary? Was this purpose justifiable?
Questions that Probe Assumptions	What are you assuming? All of your reasoning depends on the idea that xxx. Why have you based your reasoning on xxx rather than xxx? Why do you think the assumption holds here?
Questions that Probe Information, Reasoning, Evidence, and Causes	What are your reasons for saying that? What led you to that belief? How could we go about finding out whether that is true?
Questions about Viewpoints or Perspectives	You seem to be approaching this issue from xxx perspective. Why have you chosen this perspective rather than that perspective? Can/did anyone see this another way?
Questions that Probe Implications and Consequences	What are you implying by that? Would that necessarily happen or only probably happen? If this and this are the case, then what else must be true?
Questions about the Question	How could someone settle this question? Can we break this question down at all? Why is this question important?
Questions that Probe Concepts	Do these two ideas conflict? If so, how? How is this idea guiding our thinking as we try to reason through this issue? Is this idea causing us problems? Which main distinctions should we draw in reasoning through this problem?
Questions that Probe Inferences and Interpretations	What information are we basing this conclusion? Is there a more logical inference we might make in this situation? Given all the facts, what is the best possible conclusion?

There are many models of organising higher-level questions. Here is one. In their book, **“Asking Better Questions”**, Norah Morgan & Juliana Saxton classify questions by function. They propose three types of questions: Questions that Elicit Understanding, which draw out known information; Questions that Shape Understanding, which ask for thoughts and feelings; and Questions that Press for Reflection, which require critical and creative thought.

Within each classification, there are specific types of questions. [The table below shows how these link to the model the rounds network is familiar with from **Creating Cultures of Thinking.**]

Classification

Types of Questions (Questions that ....)

Questions that Elicit Information	<ul style="list-style-type: none"> <li>• <b>Confirm: Recall &amp; clarifying knowledge</b> <i>What comes next? Could you summarise? What do we know?</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Procedural: Establishing expectations</b> <i>Can everyone see? Did someone get a different answer? Are you ready?</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Elicit prior experience</b> <i>What ideas come to your mind when? What experience might lead people to act that way?</i></li> </ul>
Questions that Shape Understanding	<ul style="list-style-type: none"> <li>• <b>Generative: Exploring a Topic</b> <i>Is there .....? Why do we remember .....?</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Constructive: Build new understanding</b> <i>How could things change when.... ? What could this mean to .....?</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Facilitative: Promoting learner’s own thinking and understanding</b> <i>Can you put that in a way that .... Would understand? What makes you say that?</i></li> </ul>
Questions that Press for Reflection	<ul style="list-style-type: none"> <li>• <b>Reflective: Challenge to think critically &amp; creatively</b> <i>What patterns do you see here? Can you compare. .... To ....? What are your questions now?</i></li> </ul>

Ensure Participation by All Students

It’s important to ensure that all students participate in a discussion. Too often, we ask a question, and one student responds. Even if we ask, “Does everyone agree?” the other students simply nod, so they are not asked the question. In this case, only one student is truly involved in the questioning process.

As we plan our instruction, we should incorporate opportunities for each student to respond throughout the lesson. One of the simplest ways to ensure participation by all students is to use a pair-share, in which students share a response with a partner before a whole group discussion. I like to modify the traditional pair-share a bit to increase the level of rigor by asking students to share their partner’s answer rather than their own during the whole group discussion.

Asking students to use hand motions to respond can also be helpful. For example, students can show a thumbs up or thumbs down to provide yes/no feedback. Or, you can ask them to hold up between 1 and 5 fingers as to how well they understand the content. I also like to use a hand thermometer, where they rank the importance of a topic or once again show how well they understand a concept.

Finally, there are electronic options for student responses such as PollEverywhere, Kahoot, Plickers, Socrative, and Verso. I’ve also talked with teachers who use Twitter or simple text messaging to allow students to immediately provide information to teachers.

- Seven Defining Characteristics of Essential Questions**
- *Open ended*
  - *Thought provoking and intellectually engaging*
  - *Calls for higher-order thinking*
  - *Points toward important, transferable ideas*
  - *Raises additional questions*
  - *Requires support and justification*
  - *Recurrs over time*

Rigorous Conversations: Academic Discourse

Academic discourse is critical to learning in all subject areas. In a science classroom, students discussing instructional concepts using academic vocabulary enhances student learning. Effective mathematics

discourse or mathematical conversations not only enhances a student’s mathematical learning; it also helps them learn how to interact with and communicate with others, which is a skill they will use in everyday life (Sammons, 2018).

When we think about traditional student talk, whether it is in response to a teacher’s question, discussion with other students or generating questions, there are common problems.

#### **Problems With Student Talk in the Classroom**

- *Controlled by teacher*
- *Too little student talk*
- *Too focused on simply answering teacher’s questions*
- *Surface level rather than in depth*
- *Dominated by a few students, typically excluding struggling students*

In recent years, the conversation has shifted from classroom talk and discussion to student discourse, which is also called accountable talk. What exactly is the difference? Student discourse is focused on “on-task” talk, as well as the use of academic vocabulary. In other words, not only is discourse more rigorous; it is also more purposeful.

#### **Purposeful Discourse**

- *Promotes critical thinking*
- *Understanding at a deep level is desired result*
- *Reflection is encouraged*
- *Partners, group and individuals use academic vocabulary*
- *Ownership by students*
- *Specific classroom norms enable discourse*
- *Each student participates*
- *Fully implemented as a natural part of the classroom*
- *User-friendly environment facilitates participation by all*
- *Leadership shared with students*

Reflection should be an ongoing part of discourse. Students should self-reflect, which then results in partner or group reflection. Students may need starter prompts to guide the reflective process.

#### **Sample Reflection Prompts (Sample Self-Reflection in Parentheses)**

- *Why do you think ...? (I wonder why ...?)*
- *How did you decide ... ? (I did this because ... ?)*
- *Have you considered ... ? (What if I ... ?)*
- *What would you suggest for ... ?*
- *How might a mathematician ... ?*
- *What was your intention when ... ?*
- *What is the connection between \_\_\_\_\_ and \_\_\_\_\_?*
- *What criteria did you use to ... ? (What criteria did I use to ... ?)*
- *How would a scientist ... ?*

#### **Specific Classroom Norms Enable Discourse**

If we want to incorporate discourse into our classroom, we cannot assume that it will automatically occur. In addition to teaching students what to discuss, we need to provide and teach a set of norms explaining how

to discuss. For primary students, choose three to four norms that are easy to remember and post them with pictures or symbols for visual cues. For example, Listen to Everyone, Wait Your Turn, Mistakes Are Okay.

### Sample Classroom Norms for Discourse

- ◆ *We are all a team, so we work together rather than competing.*
- ◆ *We respect each other and act appropriately.*
- ◆ *We actively listen to each other, which allows us to authentically contribute our perspectives.*
- ◆ *If you don't agree with someone, find a positive way to respond without embarrassing the other person.*
- ◆ *Everyone should be able to participate. If one person is talking too much, the other group members should give them a signal and move on.*
- ◆ *The process is just as important as the result. We want to think deeply about our work, elaborate, justify our points and pose additional questions to promote more thinking.*
- ◆ *Making mistakes is normal; it helps us learn.*
- ◆ *If you need help, check out the Resource Board for questioning prompts and/or sample vocabulary.*

One facet of rigor is that students demonstrate learning at high levels. When you ask rigorous questions, use inquiry-based instruction and require students to think like authors, mathematicians or scientists, use academic discourse and examine reasoning, you will provide those opportunities for students to move beyond providing basic information to showing their understanding at deep levels.

### Excerpts from

Barbara R. Blackburn 2018 ***Rigor Is NOT a Four-Letter Word***

Barbara R. Blackburn 2020 Abbigail Armstrong ***Rigor in the K-5 Math and Science Classroom A Teacher Toolkit***

Barbara R. Blackburn 2019 ***3 Keys to Effective Questioning*** <https://edcircuit.com/3-keys-to-effective-questioning-education/>