

S Y M B I O S I S

Social and Emotional Learning & Mathematics Learning

Table 1 Social and Emotional Learning Competencies and Reflective Questions

SEL Competency	Description	Ask-Yourself Questions for Students
Self-Awareness	The knowledge or recognition of one's feelings, thoughts, and beliefs and how those thoughts, feelings, and beliefs may affect one's actions and reactions; self-awareness within mathematics learning environments includes students' awareness and views toward mathematics and how that view affects their participation and learning.	What do I know that can help me solve this problem? How do I feel when I don't know how to solve a problem? How does my confidence help or hinder my efforts?
Self-Management	The management of one's feelings, thoughts, and actions in ways that are appropriate to the situation, self-management also includes the ability to make conscious choices about how to respond to stressors and how to reach individual and group goals.	What do I do when I don't know how to solve a mathematics problem? How do I handle the stress/anxiety I feel when I don't know how to do something or I get stuck? What do I do when I think my partner/group members are smarter than me or not as smart as me?
Social Awareness	Social awareness is the knowledge or recognition of others' feelings, thoughts, or beliefs and how those thoughts, feelings, and beliefs may affect the other person's actions and reactions. When a student considers multiple perspectives or is empathetic, including individuals who are from different cultural backgrounds, the student is exhibiting social awareness.	How confident is my partner feeling? How can I build their confidence? How might my partner(s) feel if I do all the explaining? How will they feel if I do none of the thinking? How can I make sense of how my friends solved a problem when it is different from my way?
Relationship Skills	The development or cultivation of healthy, positive relationships with others, effective relationship skills include collaborating well with others, de-escalating situations to resolve conflict, serving as advocates for others, and resisting peer pressure.	What roles might each person in my group like to have? How might we organize ourselves so that we all get involved in the thinking, data gathering, discussion, etc.? What are ways I can respectfully disagree?
Responsible Decision-Making	Exhibiting the anticipation or assessment of ethical and safety considerations before acting or making a choice, responsible decision-makers realize actions have consequences for themselves and others in and outside a group, family, or community.	What safety considerations do we need to consider? How can I use mathematics to decide if something is ethical? What are the implications if I do not attend to precision in the calculations or models I create?

Tables from Sears, R., Bay-Williams, J., Willingham, J. C., & Cullen, A. (2022). Symbiosis: Social and emotional learning and mathematics learning? *Mathematics Teacher: Learning and Teaching K-12*, 115 (11), 770-780.

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Table 2 Standards for Mathematical Practice (NGA Center and CCSSO 2010, pp. 6–8) and Reflective Questions

SMP	Ask-Yourself Questions for Students
1. Make sense of problems and persevere in solving them.	<ul style="list-style-type: none"> • How is this task similar to previous tasks I have solved? • What strategies might help me solve this problem? • What helped me be successful in solving the problem?
2. Reason abstractly and quantitatively.	<ul style="list-style-type: none"> • What is my decision-making process as I decide how to solve a problem? • Am I focusing on making sense of what the variables/numbers/answer mean related to the context? • Is the way that I solved the problem an efficient method, and could I have considered other options?
3. Construct viable arguments and critique the reasoning of others.	<ul style="list-style-type: none"> • How am I doing in explaining why I am doing what I am doing? • As I listen to others explain their thinking, how can I connect my own understanding and ideas?
4. Model with mathematics.	<ul style="list-style-type: none"> • How am I doing in simplifying the situation and/or representing its relationships mathematically? • Are there ways to improve the model so that it better serves its purpose?
5. Use appropriate tools strategically.	<ul style="list-style-type: none"> • How am I using manipulatives, software, etc. to support my thinking? • What other resources might help me with this problem?
6. Attend to precision.	<ul style="list-style-type: none"> • What language am I using, and is it specific enough to be clear about my mathematical thinking? • How am I doing in showing graphs, tables, and other work that is clear enough for others to understand?
7. Look for and make use of structure.	<ul style="list-style-type: none"> • Am I pausing to notice the numbers in the problem before deciding how to solve it? • What structures am I noticing that are helping me solve problems?
8. Look for and express regularity in repeated reasoning.	<ul style="list-style-type: none"> • How am I doing with noticing patterns across these problems? • How are these problems I am solving the same? How are they different? • How might this problem help me solve another problem?

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