

Life Skills for All Learners

How to Teach, Assess,
and Report Education's
New Essentials

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Life Skills for All Learners

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Introduction

Are you confident your school is providing students with the knowledge and skills they most need for their futures? Are you sure your students will look back on the learning experiences you offer today and feel well-prepared for the challenges they will face as adults?

Societal change is accelerating at a mind-boggling pace, not only in the field of technology but also in terms of economic, social, and environmental shifts. Despite this reality, students throughout the world still learn in classroom environments that, in some ways, have remained unchanged for generations.

In the early 20th century, schools prepared students for an industrialized society that required workers to operate machines that made the products the world needed. But today, most of those products have changed beyond recognition or are no longer needed. Furthermore, the products that are most needed now are no longer put together by human hands but by automated, computer-controlled robots. Yesterday's industrialized societies have been transformed into today's information societies that require skills very different from those schools have long prioritized.

In 2004, Frank Levy and Richard Murnane published eye-opening research on how computers have changed the trajectory of employment and how the right education program can help people succeed in the new job market. With that in mind, in this book we highlight the importance of expert thinking and complex communication skills, two crucial capabilities that humans must master to do tasks that computers cannot do. Similarly, the Partnership for 21st Century Skills (P21) focuses on the 4 C's: critical thinking, communication, collaboration, and creativity.

This book highlights how educators should begin reframing the objectives of their classroom practice by aiming toward mastery of what are now known as 21st century skills. It differs from other books on the topic in that we discuss more skills in far more detail and include value-related components. Specifically, we refer to 21st century skills as the essential skills that

students need to master to be visionary, self-regulated leaders and to succeed in life. Our framework proposes eight essential skills that need to be practiced and developed from early childhood through the high school years:

- **Meta-Level Reflection**—the conscious and deliberate process of thinking about one’s own thinking.
- **Expert Thinking**—the ability to maximize the mental capacity of the brain by processing multiple aspects of perception, emotion, cognition, and action (knowledge) systematically, analytically, and critically, to make decisions and solve problems effectively.
- **Creativity and Innovation**—the ability to create novel and useful ideas/products/blueprints by generating possibilities and synthesizing them to solve problems and to improve situations.
- **Adaptability and Agility**—the ability to read and decode signals, quickly shift focus, and act on anticipated changes, as well as crises, by using learned skills and knowledge to maximize the result.
- **Audience-Centered Communication**—the ability to communicate ideas, information, values, and feelings clearly and persuasively by considering audiences’ backgrounds and context as the key factors to determine the content, language usage, and expectations, both in language arts and across the curriculum.
- **Synergistic Collaboration**—the ability to work effectively on a team where each member commits to a personal role to accomplish a common goal through face-to-face or technology-mediated coordination or both.
- **Empathetic Social Skills**—the ability to function adaptively in the community by regulating one’s own feelings and behavior to interact positively and develop a culture of respecting differences as a part of digital and global citizenship.
- **Ethical Leadership**—the ability to influence, motivate, and lead others based on responsibility, respect, excellence, and integrity.

As the names of the skills imply, we believe it is important to pair skills with values; hence, “ethical leadership” instead of just “leadership” and “empathetic social skills” instead of “social skills” alone.

Clearly, the skills students need to succeed in this rapidly changing and increasingly complex global society extend far beyond the traditional school curriculum. Students still need to understand who we are as a people, what we value as a society, and how we got to where we are. But more important, they must imagine how we can become better and how best to approach our

future. They must be able not only to understand our current world but also to envision a world far better and to plan the necessary steps to get there. They must become responsible thinkers and creative problem solvers, ready to take on new challenges and social dilemmas—some of which we haven’t yet imagined.

Developing such individuals requires a reimagined educational system based on an entirely new view of students. It requires educators to rethink and revise curriculums to better develop and support this type of cognitive and noncognitive architecture.

Leading educational organizations throughout the world have taken up the task of defining the essential life skills they believe are most vital for students’ success in school and beyond. Although this is valuable and important work, few of these organizations have taken on the greater challenge of describing how to help students develop these skills, how to assess these skills, or how to meaningfully report students’ progress in developing these skills to the students themselves and to parents, families, and other stakeholders.

The faculty and school leaders of the HighScope Indonesia Institute in Jakarta, which comprises 14 networked schools through Indonesia, set out to do just that. Our goal was to change the education paradigm to help students at all grade levels develop these essential life skills by design. Our work involved constructing a continuum of stages of skill development, designing learning activities to help students acquire the skills, and planning a system of assessment and continuous progress monitoring appropriate from pre-school through high school.

Our work was guided by the scholarship of renowned Indonesian educator Ki Hajar Dewantara, who developed the 3N concept of “Niteni, Nirokke, and Nambahi.” This concept identifies three distinct stages of learning. The first stage involves observing the end result of what we aspire to learn and become; the next is replicating the best practices we can model in order to advance our learning; and the last is adding value to learning by incorporating our own unique expertise and character, considering our individual learning needs and goals.

Our Purpose

Our primary purpose in this book is to share this important work with educators throughout the world who are engaged in similar efforts to help students to develop these or comparable essential life skills. Although

most modern educators are keenly aware of the need, many lack the time, resources, or expertise to embed this skill development in their curriculums, instruction, assessments, and reporting procedures. Having addressed these challenges and gathered evidence on the effects of our work, we want to share our approaches, products, and experiences with others to facilitate their efforts in developing these or similar important life skills in their students. By sharing how we approached the task and the details of what we developed, we hope to streamline the process for others. Our goal is to extend this important work, broaden its application, and provide a framework on which others can build and improve still further.

How the Book Is Organized

The eight essential life skills are the focus of Chapters 1 through 8. These chapters describe each life skill in turn and address the following overarching questions:

- Why is this particular skill important?
- What are the key elements of this skill, and how can we encourage, teach, and develop the skill?
- How can we measure and assess this skill and report learning progress to students, parents, and other stakeholders?
- How can we integrate this skill into the curriculum and classroom practice?

Importance

In discussing the importance of a skill, we share our definition of the skill and offer examples of how students at different grade levels could demonstrate proficiency. We encourage readers to share our definition with students or create your own definitions. Describing the skill is an essential first step in understanding and implementing it in the classroom context. We also explain why we chose each particular skill area, why it is “essential” for students to develop, and the specific evidence (i.e., research studies, surveys, interviews) that identifies the skill area as important.

Key Elements

We describe the defining elements that contribute to the whole skill and deepen its meaning. For example, the skill Creativity and Innovation comprises three elements: novelty, risk taking, and beneficial contribution. We

provide a detailed explanation of what we expect students to do in each element of the skill, how we guide them in developing the skill, the relationship among the elements that make up the skill as a whole, and how we expect students to respond to challenges they may face in learning them. We explain how these elements evolve developmentally as students mature, how teachers can encourage and facilitate skill development, and what constitutes evidence of students' performance. These key elements also form the basis of rubrics that provide students with feedback on their performance.

Each chapter contains illustrations and sample lessons to show how the skills can be taught, along with practical examples of how students' mastery is revealed through written materials, performances, and demonstrations in all subjects and across all grade levels. We include photographs of classroom activities, class displays, graphic organizers, and student projects, as well as explanations of the descriptive rubrics and figures used for the reporting process. Some of the assessment procedures involve exhibits, projects, videos, and demonstrations that will be filed in students' digital portfolio as well as physical portfolio.

Measurement and Assessment

Descriptions of essential skills provide a continuum of expected behaviors at each stage of students' development and show how such skills extend far beyond the learning goals set forth in typical school curriculums. We clarify those descriptions by presenting rubrics for each skill from early childhood through high school, using the developmental levels of Early, Beginning, Transition, Developing, and Expert. These illustrate how students' understanding and performance of the skills evolve and deepen over time, making the development of the skills happen by design, as noted earlier, instead of by chance. We also explain the distinction among the three specific stages of skill development: (1) needs consistent guidance, (2) needs minimal guidance, and (3) performs independently. We provide examples to demonstrate how the elements of the skills are measured at each stage.

We outline the assessment procedures used to evaluate the evidence related to students' performance to provide students with formative feedback and to offer guidance in correcting learning errors and making revisions. In descriptions of how we assess and report on students' mastery of the skills to students, parents, families, and other stakeholders, we offer specific, concrete suggestions for gathering data on skill development and reporting students' progress. They provide educators with a framework to plan strategies for implementation in the unique context of their school.

Integration into Curriculum and Practice

In the final section of Chapters 1 through 8, we list specific suggestions to provide guidance for incorporating skill development into the school curriculum and students' day-to-day learning.

Following Chapters 1 through 8, Chapter 9 focuses on grading and reporting. We describe the system we designed to offer specific feedback to students, parents, and families on the development and mastery of the life skills. In addition, we include examples of progress reports adapted for different grade levels, report card recording techniques, and transcript information.

A Final Introductory Note

As previously stated, we developed this book primarily for prekindergarten through high school teachers and school leaders. We hope teachers at all levels find it useful in their efforts to integrate activities that help students develop essential life skills in their regular classroom activities. We hope curriculum developers who struggle to incorporate these skills in regular school curriculums might find it to be a practical guide that will help steer their efforts toward greater success. We especially hope instructional directors and school leaders use the book to create changes in their schools and to facilitate professional learning activities that guide teachers in their implementation efforts.

Our main goal, however, is to help educators understand that developing essential life skills requires aligning all learning processes to that purpose. It means taking time to reflect on all aspects of our practice, especially instructional content, classroom interactions, assessment procedures, and grading and reporting practices. It means finding ways to integrate both the academic and nonacademic skills that are so important to students' success in school and in their lives beyond.

We hope this book will equip teachers at all levels with practical and immediately applicable strategies to improve their practice. We also hope it helps school leaders support teachers in those efforts and provides them with the guidance and inspiration they need to improve existing educational systems in purposeful, effective, and comprehensive ways. If we can accomplish these goals, we will consider our work truly successful.



Meta-Level Reflection

When the mind is thinking, it is talking to itself.

—Plato—

Students today face increasingly complex problems. To successfully address those problems, they need to be able to think deeply about the issues involved, analyze what needs to be done and why, plan how to do it, reflect on how they feel about it, and anticipate what must be done to follow up. These skills represent metacognition, which involves the capacity to self-manage, be self-reflective, and be a self-learner (Kallick & Zmuda, 2017). In essence, *metacognition* means to think about one's own thinking for the purpose of deciding what action to take or what to learn and to improve.

We have adapted aspects of metacognition into what we label *Meta-Level Reflection* (MLR), which we define as the conscious and deliberate process of thinking about one's own thinking. We believe MLR is a mindset that increases one's ability to transfer learning in different contexts and leads to becoming a self-directed learner. It includes the ability to be aware of and use effective thinking strategies to solve complex problems and achieve objectives when working on a task.

Why Is Meta-Level Reflection Important?

We consider Meta-Level Reflection to be important for two reasons. First, it develops awareness of the thinking process used in problem solving and achieving objectives. Second, it helps individuals make a habit of planning, monitoring, and evaluating as a self-learner. Let's consider each of these.

Developing Awareness of the Thinking Process Used in Problem Solving and Achieving Objectives

Meta-Level Reflection occurs in every part of the learning process. It involves planning, executing the plan, and reflecting on the execution strategies. As students go through the process, they become more aware—more conscious—of *how* they think. Teachers help students develop this awareness by encouraging them to ask questions throughout their learning. For example, students ask questions about their interests, goals, problems they want to solve, information they need, and the kind of thinking skills they are engaged in. As students are planning, they need to think of various possibilities, from the expected learning goal to their own interest. As they are executing their plans and working on a project, they need to be aware of the kind of thinking they are using—for example, “Am I using analytical thinking or critical thinking now?” Also, when they encounter a problem during the learning process, they need to switch their thinking into a problem-solving mode and think of alternative solutions. And finally, as they are reflecting on their work, they need to be thinking to evaluate their productivity—how they have or have not achieved their goal.

Teachers can help students develop awareness of their thinking by prompting them, using questions or graphic organizers, to be mindful of their thoughts at each step of the learning process—planning, learning, and reflection. For example, a preschool teacher can use a simple visual map showing various classroom areas and give each student a token or game piece to move around the map as they state their plans, as in “I want to play in the Block Area and build a dinosaur zoo. Then I want to play games in the Computer Area.” The idea is to teach children to think before they act. With practice beginning in early preschool, the aim is for the skill to become a mindset in older students.

In upper-elementary grades, graphic organizers can make thinking more concrete and help students learn to differentiate between copying and pasting information and being aware of the result of their own thinking process. For example, in a language arts class, teachers might ask students to fill out a graphic organizer (see Figure 1.1) to become aware of their thinking process. Students first write down the information as it is and then record their deeper understanding of the information.

FIGURE 1.1
Graphic Organizer for Developing “Thinking Process Awareness”

Directions: In the first column, record information you have read in the text. In the second column, use your own thinking process to analyze and evaluate the information.

Copied Information	After Applying Thinking Process

Making a Habit of Planning, Monitoring, and Evaluating as a Self-Learner

When teaching Meta-Level Reflection skills, we encourage students to practice and adjust their thinking depending on the situation. The High-Scope preschool program, for example, offers students many opportunities to engage in planning and reviewing, both of which require cognitive and metacognitive skills. Preschool children practice thinking before they act and recalling the actions in their daily routines. In the elementary grades through high school, developing students’ habits of planning, monitoring, and evaluating is part of everyday instruction, and the habits are a critical aspect of project-based learning in a program we call “Making Good Choices.” Giving students opportunities to practice conscious planning, to be aware of the kind of thinking they are engaged in, and to reflect on what they have done daily helps them develop the habit and mindset of Meta-Level Reflection.

To facilitate this process, teachers introduce activities at the beginning of the term to familiarize students with the life skills related to Meta-Level Reflection. They engage students in activities to experience Meta-Level Reflection, present vocabulary activities to explore words in the related rubrics, and create a word wall. Teachers then introduce individual and collaborative activities to practice the new skills. Figure 1.2 (see p. 10) is an example of a poster reminder for Meta-Level Reflection made by Grade 2–3 students.

FIGURE 1.2
**A Working Agreement for Meta-Level Reflection Reminder
Created by Grade 2–3 Students**

Conscious Planning	Thoughtful Learning	Reflection for Future Improvement
1. Think about what I like and what I need to learn. 2. Make plans to achieve it.	1. Think about how I went about my learning. 2. What thinking steps did I follow? Were they effective? 3. Do I need to change the thinking steps to get a better solution? 4. Get feedback from others.	1. Did I achieve my goal? 2. Did I do my best? 3. Here is my plan to be better....

Key Elements of Meta-Level Reflection

Our approach to Meta-Level Reflection includes three elements: (1) *conscious planning*, (2) *thoughtful learning*, and (3) *reflection for future improvement* (see Figure 1.3).

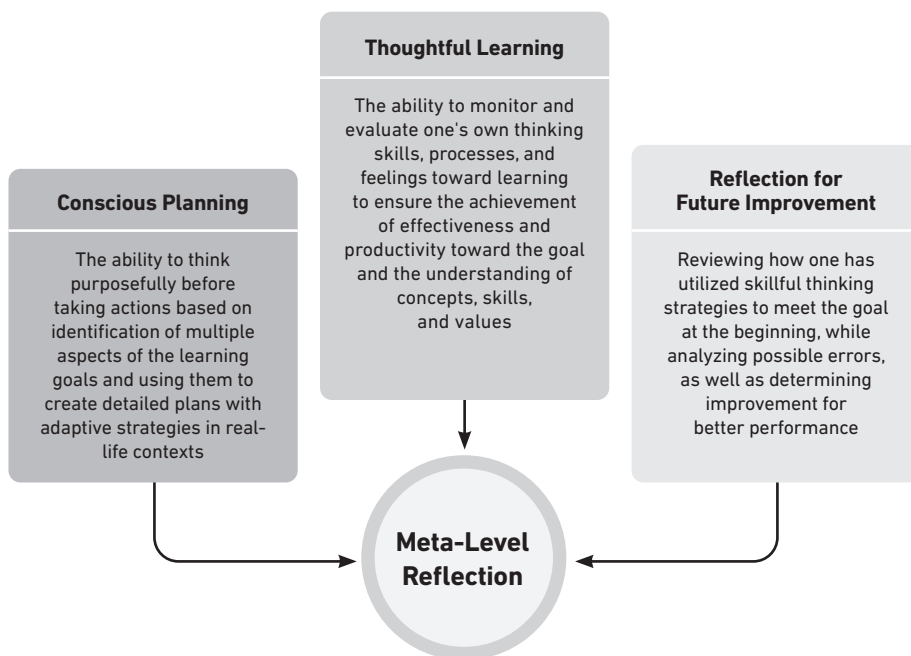
Conscious Planning

Successful Meta-Level Reflection begins with a well-conceived plan, which requires serious effort. We refer to the process as *conscious planning*, which we define as the ability to think purposefully before taking actions based on identification of multiple aspects of the learning goals and using them to create detailed plans with adaptive strategies in real-life contexts. *Conscious planning* encompasses two important concepts: (1) considering multiple perspectives and (2) creating a detailed plan with good choices.

Students’ skill in planning while considering multiple perspectives can be nurtured by deliberately designing opportunities for them to make a plan, elaborate on their plan, and explain the multiple perspectives they considered during the process.

Conscious planning encompasses two important concepts: (1) considering multiple perspectives and (2) creating a detailed plan with good choices.

FIGURE 1.3
The Key Elements of Meta-Level Reflection



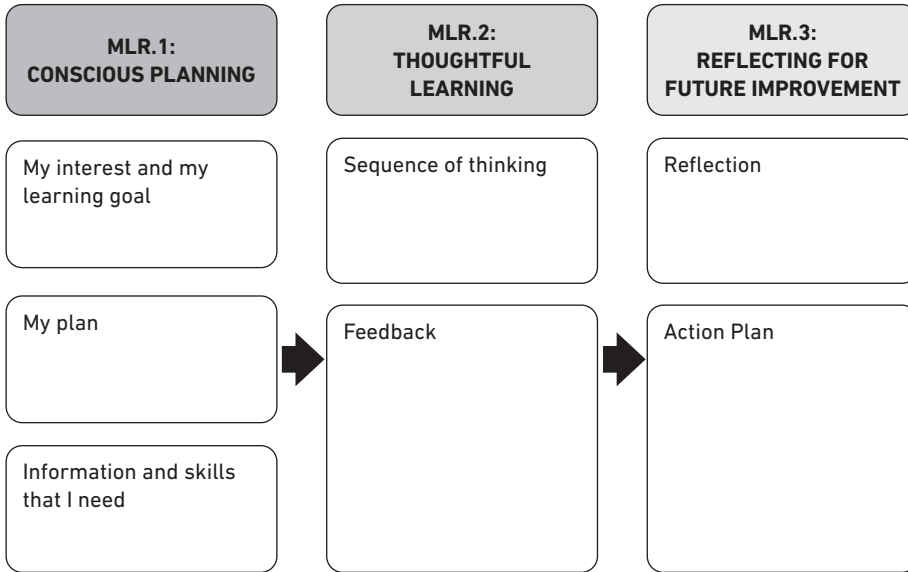
Students develop their habit of planning, monitoring, and evaluating by engaging in activities that have them doing exactly that—consciously planning at the beginning of a project, monitoring their execution of the plan, and engaging in daily and end-of-project reflection to evaluate their performance and create plans to improve in the future.

Teachers can create specific times to do each of these steps. “Planning time” is when students set direction and anticipate what they should be doing during “work/monitoring time,” and “reflection/evaluation time” helps students make sense of the actions they took during “work/monitoring time.”

Teaching the pattern of planning, monitoring, and evaluating can begin in early childhood. At HighScope, we do it by allowing the students to create a project, based on their own interest, using the steps of what we call “Plan-Do-Review” (PDR) for early preschool and preschool children. The counterpart for elementary, middle, and high school students is called “Conscious Planning–Thoughtful Learning–Reflecting for Future Improvement.” Figure 1.4 (see p. 12) shows a graphic organizer for this process.

FIGURE 1.4

Graphic Organizer for Planning, Learning, and Reflecting



Nurturing the ability to plan based on multiple perspectives

To make a plan, one must make choices, and to make a choice, students need to consider various perspectives and opposing viewpoints that carry different consequences. For example, when proposing a solution to a waste management problem in the school cafeteria, a student might consider culture norms and logistics (e.g., how the school usually disposes of waste, other ways waste might be managed) as well as biases (e.g., personal preferences, attitudes about recycling). It's a process that promotes empathy and supports a more purposeful way to address problems that considers existing conditions.

Teachers should teach their students to make good choices, especially through passion-based projects, because these are a natural way to grow students' intrinsic motivation and ownership of learning. In our school, we have what we call the Making Good Choices project. In the planning stage, we want students to be conscious of what good project-related choices are. Their plans need to contain all the ingredients of such choices: clear project objectives, consideration of how the project is beneficial for themselves or the community, and use of previously learned knowledge and skills. Let's look at an example from a Grade 8–9 class.

In this case, the Making Good Choices project is related to sustainable development goals (SDG), which becomes the “big ideas” and the context for practicing the skills. For example, from a list of possibilities, a student chose goal number 15, “Life on Land.” In his Making Good Choices log (see Figure 1.5), the student expressed the desire to “focus on deforestation because trees and plants are the things humans need the most to live. Without those things, humans won’t be able to breathe, and there won’t be any oxygen at all.” He then described the plan, explained how his solution could make a difference and contribute to solving the problem, and identified the people who would benefit from his solution.

FIGURE 1.5
Conscious Planning in a Student’s “Making Good Choices” Log

Goal: Life on Land (SDG Number 15)	Problem: Deforestation
Reason: I want to focus on deforestation because trees and plants are the things humans need most to live. Without those things, humans won’t be able to breathe, and there won’t be any oxygen at all.	
My plan to address this problem: I plan on making a supporter group where people who feel the same way can gather and do something to make a change. I will make a website to promote all that I have done and what the supporter group has done. It will serve as a promotion for both our activity and our supporters’ group. It can also be used to write blogs or articles about what has happened on our planet and what we have done to reduce the effects of it. My first goal, as a person who opposes deforestation, is to make a hydroponic garden in my house to help my surroundings be greener.	
Here is how my solution will create a difference and address the problem: I have to create a hydroponic garden and a website. I can promote this method of planting through the website and can inspire others to do the same thing, thus making a difference because there’ll be more people doing the things I do.	
Here are the people who will benefit the most from my solution and will serve as my sample for testing it: I will begin with my neighbors. I will inspire my neighbors to create their own hydroponic garden based on my campaign.	

Nurturing the ability to create a detailed plan

As noted, the student who was inspired by the problem of deforestation elaborated on the solution, how it is related to the SDG, how it creates a difference and addresses the problem, and what benefits it would bring. Later the student added details related to the information and skills needed to execute the project. In addition, as a component of his Making Good Choices log, the student answered questions about measuring the effectiveness of the

proposed solution (see Figure 1.6). Finally, the student reviewed the plan and considered whether it would likely be effective. Figure 1.7 shows the graphic organizer that guided this process.

FIGURE 1.6

Sample Questions and Student Responses for Measuring Effectiveness of a Solution in a “Making Good Choices” Log

How will you measure the effectiveness/impact of your solution? Answer the following three questions.

1. How will I determine if the sample’s condition has improved?

I will create a comparison before and after my campaign to create a hydroponic garden in my neighborhood.

2. What will be my measuring tools to ensure I have objective data?

- I will use surveys distributed to my neighbors where they can upload pictures of their garden.
- Comments and uploaded pictures from people who visit my website.

3. What are the criteria of success based on my sample and solution?

- Able to finish my hydroponic garden.
- Able to attract my neighbors by educating them to make a hydroponic garden.
- Able to inspire the larger community through my website to create their own hydroponic garden and make a change in the surrounding environment.

Thoughtful Learning

Thoughtful learning is the second element of the Meta-Level Reflection skill. We define *thoughtful learning* as the ability to monitor and evaluate one’s own thinking skills, processes, and feelings toward

learning to ensure the achievement of effectiveness and productivity toward reaching the goal and the understanding of concepts, skills, and values. This element emphasizes the importance of students being fully mindful of *what* and *how* they are thinking and feeling while executing their plans. It comprises two important concepts: (1) the ability to *monitor* one’s own processes and feelings and (2) the ability to *evaluate* one’s own processes and feelings.

Thoughtful learning comprises two important concepts: (1) the ability to *monitor* one’s own processes and feelings and (2) the ability to *evaluate* one’s own processes and feelings.

FIGURE 1.7
Graphic Organizer for Reviewing a Plan and Considering Its Effectiveness

My solution to achieve the SDG that I have chosen is:	
How is my solution related to the SDG:	How can my solution create a difference and solve the problem:
Who are the people who will benefit the most from my solution? (This will be your sample for testing the solution.)	

The procedures to achieve my goal are:

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Nurturing the ability to monitor one's own thinking processes and feelings

As students work on their project, they should be able to identify their thinking processes. They start by asking, “Is the way I think and feel effective and productive enough to help me reach my learning goal?” Next, they consider the thinking skills they will use. They should ask, “What thinking skills should I use? How can I use Expert Thinking [discussed in Chapter 2] in this project? What are the procedures for accomplishing the project? Which skills or concepts should I use? Which data should I use? Where can I find reliable data?”

Students also need to understand the role of feedback in improving their learning and to feel comfortable with it. Feedback may affect their feelings, but when they are able to manage those feelings, they will also be able to manage related distractions and control impulsivity. As a result, both individual and group productivity can increase.

Figure 1.8 shows a form that students can use to monitor their thinking throughout all stages of Meta-Level Reflection. The example is from a Grade 2–3 student who was working on a project on raising a healthy rabbit at home.

FIGURE 1.8
Example of a Student’s Thinking Process Throughout Meta-Level Reflection

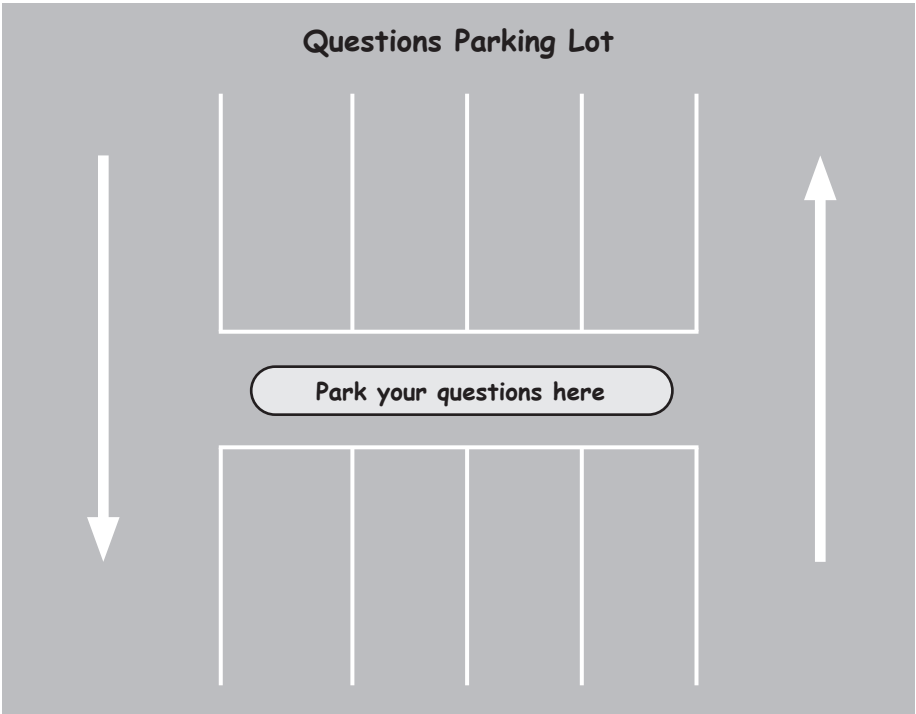
Project Phases	Questions to Guide My Thinking Process	Answers
Conscious planning	What is my interest?	My interest is rabbits.
	What is my plan?	I plan to raise a rabbit.
	What information should I find?	I need to know about rabbits’ habitat and food.
	What information should I compare and contrast?	I need to compare/contrast different types of habitat and food and find which one is best to raise a rabbit at my home.
Thoughtful learning	How can I get the information?	<ul style="list-style-type: none">• I can get information about rabbits from my uncle, who has lots of rabbits in his garden.• I can read books about rabbits.• I can search for and watch online videos about how to raise rabbits.
	How can I get feedback?	I can ask my uncle to give me feedback on my habitat and food ideas.
	How will I use the feedback?	I will use the feedback to improve my choice.
	What should I do if the feedback doesn’t make me happy?	I will ask again until I understand.
Reflecting for future improvement	How did I perform?	I had a clear plan and the right resources to get information.
	What can I do to do better?	I will find more information about rabbits in different countries.

Nurturing the ability to evaluate one's own thinking processes and feelings

When students monitor their own thinking, they also need to evaluate that thinking by asking themselves questions such as these: “Am I following the right procedure in using my thinking skills? Am I thinking skillfully? Have I used the right skills and concepts? Have I applied the right procedures or methods? Is my strategy effective?” If the answer is yes, then the students should go on. But if the answer is no, then they must pause and think of a more efficient way of thinking and feeling.

One way to facilitate students’ thinking process is by providing a “Monitoring My Own Thinking Parking Lot” poster or whiteboard display where students can record the thoughts, questions, or ideas that occur to them as they work through the various stages of their project (see Figure 1.9). The parking lot provides a place for students to capture their thinking without disrupting the learning process of other students.

FIGURE 1.9
“Parking Lot” for Questions



Reflection for Future Improvement

The third element of Meta-Level Reflection is *reflection for future improvement*. We define this as the ability to review how one has used goal-focused, skillful-thinking strategies from the beginning, analyzed possible errors, and determined ways to improve for better performance.

We believe that reflection goes beyond considering what has been done; it also must yield insight into what needs to be done differently *next time* in order to perform better.

There are two important concepts in *reflection for future improvement*:
 (1) nurturing the ability to reflect and
 (2) developing a plan for improvement.

There are two important concepts in reflection for future improvement: (1) nurturing the ability to reflect and (2) developing a plan for improvement.

Nurturing the ability to reflect

Students need to self-evaluate their plans, reflect on the strategies they used, and consider alternative strategies that might improve their performance in the future. To help them do so, teachers must design reflective activities that are meaningful and aim to explore student's insight, learning, questions, and ideas. An important part of this process is the students' ability to look back on their performance and determine how well they used all the available tools and strategies to achieve their goals, and also identify possible errors that may affect goal achievement. Younger students build this ability by recalling what they did, identifying their feelings about the results, and determining whether they followed the plan they decided on at the planning stage. Depending on the daily routine in each school, teachers can ask reflective questions at any relevant moment—for example, after a student has finished an assignment or before transitioning to the next subject period.

In our preschool, the Plan-Do-Review (PDR) routine enables teachers to ask reflective questions. During “do” time, students play with materials they chose during “plan” time. During “review” time, teachers guide the reflection process by asking questions such as these: “What did you play?” “How did you use the materials?” “I saw that you pretended to have a birthday party with Shelly. Tell me more about it.” The teachers can design various activities to engage children in the recollection process, such as having them pretend to call another student to ask or answer reflection questions. Other strategies may incorporate visual maps of different areas in the classroom, finger puppets, or a hot-potato game, to name a few.

Teachers in upper-elementary grades can use graphic organizers to help students practice reflecting on the thinking strategies they used during the thoughtful learning stage and also to identify possible errors (see Figure 1.10 for an example). High school teachers can develop their students' ability to evaluate their performance through reflection essays that include their thoughts on whether they have used tools and strategies skillfully. The prompting sentence stems in graphic organizers like the one in Figure 1.11 (see p. 20) can also be used as the basis for end-of-term reflection essays.

FIGURE 1.10

Graphic Organizer for Reflection for Future Improvement

The graphic organizer is a circle divided into three equal sections by lines meeting at the center. Each section contains a bold heading, a prompting question, and three horizontal lines for writing.

- Top Left Section:**

Planning for future improvement
How can I improve next time?

- Top Right Section:**

Reflecting on thinking strategies
Have my thinking strategies helped me reach my goal?

- Bottom Section:**

Analyzing possible errors
Were there any possible errors?

Nurturing the ability to develop a plan for improvement

Teachers need to help students develop the habit of wondering, “How can I do better in the next projects? What would I do differently in order to have a better result?” They can nurture students’ ability to learn from errors. To make this process explicit, teachers can allocate a specific time at the end of the day or at the conclusion of the project during which students evaluate their performance and brainstorm ways to improve for the next one. Teachers can use prompting questions to initiate this process and graphic organizers to illustrate each step. They may also have students take turns sharing their reflection in front of their peers. That way, students can learn to give and receive feedback.

FIGURE 1.11
Prompts for High School Students' Reflection

When I think about ALL of my projects in this term,

1. I set **thoughtful plans** to _____, based on my purposeful interest in _____, my visions of sustainable future of _____, and my learning goals of _____.

2. The clear measurement criteria for my plans in this term were _____.

3. I supported my plans with reasoned arguments of _____ and used the adaptive strategies of _____, based on the following interdisciplinary knowledge and skills: _____.

4. When I look back on ALL my projects in this term, I think I (have/ have not) made a good choice because _____.

5. I regulate myself by _____ to manage my projects.

6. When working on my projects this term, I made decisions on the best solution of _____, based on _____.

7. I evaluated the solutions by _____.

8. The thinking skills I used in my projects were _____, and I used them skillfully by _____.

9. I independently processed diverse bits of information by _____, and I monitored and checked to make sure I attained productivity, effectiveness, and efficiency toward the goal by _____.

10. I have utilized **appropriate tools and strategies** skillfully by _____, and I have **transferred the learning** I gained from all my projects into _____.

11. I'm proud of the following ways in which I've applied my project management skills: _____.

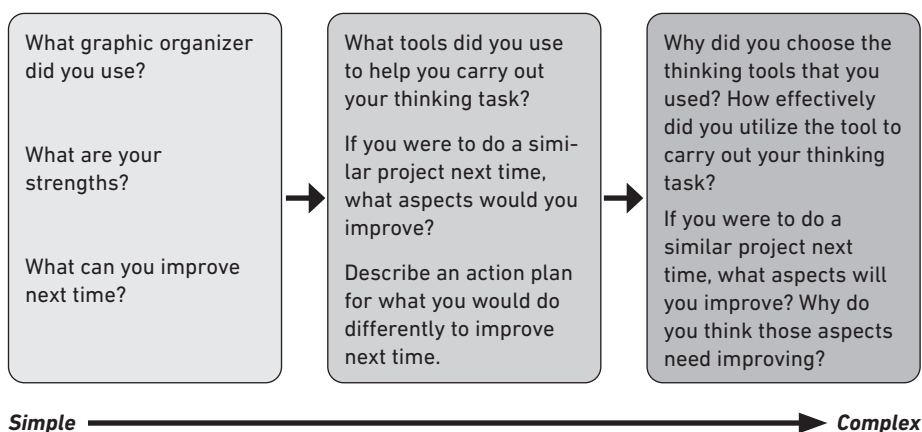
12. My action plans to follow up the areas for improvement are as follows: _____.

It is best to start nurturing this ability in early childhood. Recall Time is a part of our routine in which teachers ask students to describe what they did during the work or play time (“Do”) and how they did it. Students progress at their own pace with the teachers’ encouragement, becoming more capable of answering questions such as these: “How did you solve that problem?” “What did you do when you didn’t get the materials you needed?” and “How did you come up with your idea?”

In higher grades, teachers can increase the complexity by ensuring that students can explain how their work has clear objectives, is beneficial to themselves and others, uses their knowledge and skills, and upholds the values they believe in. And, as stated before, they also need to be able to reflect on the thinking processes they used, analyze possible errors, and plan for future improvement. Figure 1.12 illustrates how questions to guide students' reflections can increase in complexity.

FIGURE 1.12

Sample Questions to Prompt Students' Reflection for Future Improvement (Transition Level)



How Is Meta-Level Reflection Measured and Assessed?

To assess students' development in each element of Meta-Level Reflection, we designed a growth-related rubric to describe the behaviors that we expect to see at each continuum level, from Early (preschool–kindergarten) to Expert (high school). As shown in Figure 1.13 (see p. 22), the description for each developmental level becomes gradually more complex. (We describe the levels in detail later in this section.)

Recall that Meta-Level Reflection consists of three elements: *conscious planning*, *thoughtful learning*, and *reflection for future improvement*, which the rubric identifies as MLR.1, MLR.2, and MLR.3, respectively. Also in the rubric, Stages 1, 2, and 3 indicate the level of support a student needs to perform the behavior.

FIGURE 1.13
Meta-Level Reflection Rubric

	Early (Preschool–K)				Beginning (K–3)				Transition (3–6)				Developing (6–9)				Expert (9–12)			
MLR.1	<ul style="list-style-type: none"> Creates plans based on self-interest with detailed description (what, when, with whom) and sticks to the plan. 				<ul style="list-style-type: none"> Creates plans based on interest and learning goals. Identifies information and skills needed and creates steps to achieve plans. 				<ul style="list-style-type: none"> Sets goals that are beneficial for self and others based on purposeful interest and learning goals. Analyzes learned knowledge and skills needed and creates procedures to achieve the goals. 				<ul style="list-style-type: none"> Sets thoughtful and responsible plans based on purposeful interest and learning goals. Supports the plans with arguments and procedures based on learned knowledge and skills to ensure adaptive approaches to achieve the goals. 				<ul style="list-style-type: none"> Sets thoughtful plans with clear measurement criteria, based on purposeful interest, vision of a sustainable future, and learning goals. Supports the plans with reasoned arguments and adaptive strategies based on interdisciplinary knowledge and skills to surpass the goals. 			
	Stage	1	2	3	Stage	1	2	3	Stage	1	2	3	Stage	1	2	3	Stage	1	2	3
MLR.2	<ul style="list-style-type: none"> Identifies activities that refer to the thinking process. Understands input (feedback) from others and follows feedback to improve the learning process. 				<ul style="list-style-type: none"> Identifies the sequence of the thinking process s/he is engaged in. Understands the important role of feedback to improve the learning process. 				<ul style="list-style-type: none"> Identifies the thinking skills s/he is engaged in. Understands the important role of feedback and is able to digest the information to ensure the attainment of efficient approaches toward the goals. 				<ul style="list-style-type: none"> Explains the thinking skills s/he is engaged in and the thinking process involved. Looks for feedback to be digested to ensure the attainment of an efficient and effective thinking and feelings management process to make decisions based on the goals and the concepts, skills, and values learned. 				<ul style="list-style-type: none"> Evaluates the thinking skills s/he is engaged in and why and how they were used skillfully. Independently processes diverse bits of information (rational and emotional) by continuously (self-aware) monitoring and checking to make sure efficiency, effectiveness, and productivity toward the goal are attained. 			
Thoughtful Learning	Stage	1	2	3	Stage	1	2	3	Stage	1	2	3	Stage	1	2	3	Stage	1	2	3

MLR.3 Reflecting for Future Improvement	Early (Preschool–K)			Beginning (K–3)			Transition (3–6)			Developing (6–9)			Expert (9–12)			
	Stage	1	2	3	Stage	1	2	3	Stage	1	2	3	Stage	1	2	3
		• Reflects on own performance on a given task (e.g., what s/he did, how s/he felt about the result, whether s/he followed the plan).			• Explains whether s/he has met the objective set at the beginning and is able to explain the steps to achieve the plan. • Identifies action plans to improve for the future.			• Identifies whether s/he has used appropriate tools to carry out a thinking task toward the achievement of the goals (e.g., using a cause-effect graphic organizer to identify a causal-effect relationship). • Explains the areas for and identifies action plans for the future.			• Evaluates whether s/he has used appropriate tools and strategies to carry out a thinking task based on the goals (e.g., using a thinking map/asking the right questions for problem solving to find a solution to a problem). • Explains the areas for improvement, elaborates the reasons, and develops plans for areas for improvement.			• Evaluates how s/he has used appropriate tools and strategies skillfully and transfers the learning in the right contexts based on the goals. • Creates the action plans to follow up the areas for improvement. • Internalizes the whole process of reflection as a mindset in any activity.		

Stage 1: Student performs a task somewhat accurately with consistent guidance from others (teachers and peers).

Stage 2: Student performs a task accurately with little guidance and redirection from others (teachers and peers).

Stage 3: Student independently performs a task with ease, speed, and accuracy.

Here is how the levels of support break out:

- Stage 1: Student performs a task somewhat accurately with consistent guidance from others (teachers and peers).
- Stage 2: Student performs a task accurately with little guidance and redirection from others (teachers and peers).
- Stage 3: Student independently performs a task with ease, speed, and accuracy.

To assess Meta-Level Reflection skills and other essential life skills, we use four types of assessment: (1) assessment to determine a student's position before beginning new learning, (2) ongoing formative assessment to keep track of the student's progress in order to provide immediate feedback and support, (3) self-assessment as a way for students to reflect on their work and their performance using rubrics as the basis for judging where they are in relation to the expectations, and (4) summative assessment to determine the point of development at a certain time in the learning journey.

Teachers continuously conduct formal and informal formative assessment to check students' understanding the rubric's expectations and to determine where each student is in relation to the expectations. Formative assessment methods include quizzes, questioning, and hand-signal assessments. For example, teachers can ask students to indicate their understanding of conscious planning using these sentence stems, with students responding with an appropriate hand signal:

- I understand that conscious planning should be based on my learning goals and involve strategies. (*thumbs up*)
- I don't understand yet how to create a thoughtful plan. (*thumbs down*)
- I am still confused about.... (*waving hand*)
- I am not sure about.... (*positioning thumbs horizontally*)

Students' progress on Meta-Level Reflection skills will be apparent in their work. Teachers can gain insight by considering students' goals as seen in their project logs, their thinking process as described in the graphic organizer they use, and the discussion they engage in with fellow classmates or teachers as well as the constructive feedback they get from peers.

A Closer Look at Continuum Levels

The continuum levels in the Meta-Level Reflection rubric obviously cover a broad expanse of understanding. Let's look at each level in greater detail, using the element of MLR.2, thoughtful learning.

Early (Preschool–K)

At the Early level, students begin to identify activities that are related to the thinking process. The word *think* is not easy for students at this level to understand. They may not be able to name the thinking process accurately, but they can simply use the word *think* or more specific action verbs. At this level, teachers help students to understand the key words and phrases, with the goal of full understanding.

Preschool teachers collect evidence of thoughtful learning during students' working process, when they execute their plans, and during the designated reflection time. Students' readiness levels determine how detailed a teacher's review is. An appropriate prompt can help teachers gather relevant information—even something as simple as “I noticed that you ran out of modeling clay while you were trying to make the birthday cake. What did you do to solve the problem?”

Beginning (Grades K–3)

At the Beginning level, students start to identify the sequence of the thinking process they engage in—that is, the elements of Expert Thinking (the topic of Chapter 2) that they currently employ (systems thinking, analytical thinking, and critical thinking).

Teachers can assess students' progress in thoughtful learning at this level by examining how they use sequence in explaining their thinking steps. For example, Darryl, a Grade 2–3 student, demonstrated thoughtful learning in describing his thinking process during a science experiment. Darryl said, “I want to see how fast solid matter changes to liquid” and explained each step of his learning process. “First, I was thinking about what objects I could melt using heat. To see which one melts faster, I picked butter and cheddar cheese.” He continued, “Then, I compared and contrasted. Throughout the process, I do self-questioning by asking, *Have I selected the right materials and tools to support my experiment? Have I used the right steps in the experiment?* My teacher helped me melt butter in one pan and cheese in another pan. I observed that butter melts faster than cheddar cheese.” He added, “My teacher reminded me to use a graphic organizer to compare and contrast, so I can note down the results of my experiment. I observed the speed and what they look like before and after.” Darryl used the graphic organizer shown in Figure 1.14 (see p. 26) for comparing and contrasting. He then stated, “When I'm using this graphic organizer, I'm using analytical thinking.”

FIGURE 1.14
Example of a Completed Graphic Organizer for Comparing and Contrasting

Categories	Object 1 Butter	Object 2 Cheese
Similarities		
Matter	Solid	
Basic Ingredients	Milk	
Differences		
Time to melt	2 minutes	5 minutes
Result	Watery	Goosey
Smell	Milky and salty	A bit smokey
Conclusion		
Butter melts faster than cheese.		

Given the expectations in the Meta-Level Reflection rubric, the anecdotal evidence gained from Darryl’s conversation with his teacher and his use of the graphic organizer suggest that Darryl was in Stage 3 of the rubric. He was able to articulate the expectations in the rubric and recalled the thinking skills he engaged in during the experiment. Additionally, he was able to use his teacher’s feedback to guide his next steps without additional guidance. In comparison, students in Stage 1 would need the teacher to explicitly prompt them to identify the thinking skills through questioning and giving examples.

Transition (Grades 3–6)

As students reach the Transition level, teachers assess their ability to identify the thinking skills they engaged in when solving a problem or doing their research. Another skill that teachers assess is how the students monitor and use feedback from others to ensure that they take approaches that can help them to be more productive in reaching the goal. Students modify their approach based on critical and constructive feedback and conduct

self-monitoring to ensure that their actions are effective and productive to achieve the goal.

Developing (Grades 6–9)

Students at the Developing level are capable of not just identifying but also elaborating on the elements of Expert Thinking they are using. They are clear about their learning goals and proactively look for feedback.

As an example, a Grade 8–9 student named Reuben explained the thinking skills and thinking process he engaged in while designing a plan to solve a waste management problem at his school related to littering and trash disposal in the cafeteria. He explained how he would use data analysis, scientific thinking, and analytical thinking skills to solve the problem. He also looked for feedback from an expert in this area, his teachers, and his peers to gain more understanding and brainstorm possible solutions.

During a conversation, his teacher asked Reuben how he used self-questioning to monitor his own thinking. The teacher also assessed whether Reuben was able to monitor his progress toward achieving the learning objectives.

In addition, Reuben documented which thinking skills he engaged when he did a gap analysis comparing current and ideal conditions regarding littering and trash disposal. During a class meeting where he presented his ideas for a prototype product, he also reached conclusions about what to improve and maintain in order to achieve effectiveness and efficiency in his project.

Based on his project log and anecdotal notes from the conversation with the teacher, we can infer that Reuben is at Stage 2 on the rubric. Determining factors include the need to be prompted by the teacher to explain the thinking skills he engaged in and how he looked for feedback.

On the other hand, students who are at Stage 3 on the rubric do not need a teacher's prompt or support to reflect on their thinking skills and look for feedback. For example, a student named Cameron independently explained the thinking skills she engaged without the teacher's guidance. She also described how the feedback she received helped her identify her product's strengths and weaknesses. From this evidence, we can infer that Cameron is at Stage 3.

Expert (Grades 9–12)

At the peak of development, the Expert level, students are not only able to explain their thinking skills but also to evaluate why and how they used

them. They monitor and check the use of thinking skills to maximize the attainment of concepts, skills, and values and to ensure progress toward the goal. They modify and make changes along the way, ensuring the most effective method to achieve their goals. Students at this level monitor their thinking automatically.

To assess students' skills in thoughtful learning, teachers can prompt students through questioning or observe students during their learning activities when they are finding solutions to problems, conducting an experiment, or doing some research. As part of the learning process, teachers can provide immediate feedback for each student and examine how those students follow up the feedback. Then, teachers can interview students to explain their thinking process—which thinking skills they engaged in during the learning activity.



Suggestions for Integrating Meta-Level Reflection into Curriculum and Classroom Practice

- Infuse a Meta-Level Reflection rubric into curriculum standards and project-based learning by expecting students to consciously plan their projects, learn thoughtfully, and continuously reflect.
- Integrate the Meta-Level Reflection process into all aspects of learning to provide multiple opportunities for student practice.
- Allow students to discover their purposeful learning goals, guide them to create a detailed plan based on good-choices criteria, and ensure that they can measure the success of their plan.
- Continuously ask students to revisit their goals and monitor their progress.
- Allocate time for students to reflect on how they feel about and do their learning. Encourage them to find their areas for improvement and create their own action plan to increase their ownership of learning.
- Encourage students to actively ask questions to monitor their thinking processes.
- Provide graphic organizers for students to map their thinking process.
- Develop students' habit to ask for and receive feedback.



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Related ASCD Resources: Social-Emotional Learning and Life Skills

At the time of publication, the following resources were available (ASCD stock numbers in parentheses).

All Learning Is Social and Emotional: Helping Students Develop Essential Skills for the Classroom and Beyond by Nancy Frey, Douglas Fisher, and Dominique Smith (#119003)

Curriculum 21: Essential Education for a Changing World edited by Heidi Hayes Jacobs (#109008)

The Formative Five: Fostering Grit, Empathy, and Other Success Skills Every Student Needs by Thomas R. Hoerr (#116043)

Social Emotional Learning and the Brain: Strategies to Help Your Students Thrive by Marilee Sprenger (#121010)

Students at the Center: Personalized Learning with Habits of Mind by Bena Kallick and Allison Zmuda (#117015)

Students Taking Action Together: 5 Teaching Techniques to Cultivate SEL, Civic Engagement, and a Healthy Democracy by Lauren M. Fullmer, Laura F. Bond, Crystal N. Molyneaux, Samuel J. Nayman, and Maurice J. Elias (#122029)

Taking Social Emotional Learning Schoolwide: The Formative Five Success Skills for Students and Staff by Thomas R. Hoerr (#112014)

Teaching for Deeper Learning: Tools to Engage Students in Meaning Making by Jay McTighe and Harvey F. Silver (#120022)

Teaching Students to Decode the World: Media Literacy and Critical Thinking Across the Curriculum by Chris Sperry and Cyndy Scheibe (#122006)

For up-to-date information about ASCD resources, go to **www.ascd.org**. You can search the complete archives of *Educational Leadership* at **www.ascd.org/el**. To contact us, send an email to member@ascd.org or call 1-800-933-2723 or 703-578-9600.