STRATEGIES THAT APPEAR IN ALL TYPES OF LESSONS

Revising Knowledge

THE **MARZANO COMPENDIUM** OF INSTRUCTIONAL STRATEGIES

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Visit **marzanoresearch.com/compendium** to access the Marzano Compendium of Instructional Strategies to view additional resources related to this element and others.

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INTRODUCTION

In 2007, Dr. Robert J. Marzano published *The Art and Science of Teaching: A Comprehensive Framework for Effective Instruction*. The framework, composed of three lesson segments, ten design questions, and forty-one elements, was based on research showing that teacher quality is one of the strongest influences on student achievement—that is, an effective teacher can positively and significantly impact student learning. As such, *The Art and Science of Teaching* sought to identify specific action steps teachers could take to improve their effectiveness.

In 2015, Dr. Marzano updated *The Art and Science of Teaching* framework to reflect new insights and feedback. The Marzano Compendium of Instructional Strategies is based on this updated model, presenting forty-three elements of effective teaching in ten categories. Each folio in the series addresses one element and includes strategies, examples, and reproducible resources. The Compendium and its folios are designed to help teachers increase their effectiveness by focusing on professional growth. To that end, each folio includes a scoring scale teachers can use to determine their proficiency with the element, as well as numerous strategies that teachers can use to enact the element in their classrooms. Indeed, the bulk of each folio consists of these strategies and reproducibles for implementing and monitoring them, making the Compendium a practical, actionable resource for teachers, instructional coaches, teacher mentors, and administrators.

REVISING KNOWLEDGE

This element involves the teacher engaging students in a revision of their knowledge of content addressed in previous lessons. When students first learn about an idea or concept, their knowledge may be inaccurate or incomplete. It is essential that students add to and correct their knowledge in order to gain a more complete understanding of a content area. Many of the strategies in this folio can be used in tandem with the strategies in the folio entitled "Reviewing Content."

Monitoring This Element

There are specific student responses that indicate this element is being effectively implemented. Before trying strategies for the element in the classroom, it is important that the teacher knows how to identify the types of student behaviors that indicate the strategy is producing the desired effects. General behaviors a teacher might look for include the following.

- Students make corrections to information previously recorded about content.
- When asked, students can explain previous errors or misconceptions they had about content.

Desired behaviors such as these are listed for each strategy in this element.

Teachers often wonder how their mastery of specific strategies relates to their mastery of the element as a whole. Successful execution of an element does not depend on the use of every strategy within that element. Rather, multiple strategies are presented within each element to provide teachers with diverse options. Each strategy can be an effective means of implementing the goals of the element. If teachers attain success using a particular strategy, it is not always necessary to master the rest of the strategies within the same element. If a particular strategy proves difficult or ineffective, however, teachers are encouraged to experiment with various strategies to find the method that works best for them.

Scoring Scale

The following scoring scale can help teachers assess and monitor their progress with this element. The scale has five levels, from Not Using (0) to Innovating (4). A teacher at the Not Using (0) level is unaware of the strategies and behaviors associated with the element or is simply not using any of the strategies. At the Beginning (1) level, a teacher attempts to address the element by trying specific strategies, but does so in an incomplete or incorrect way. When a teacher reaches the Developing (2)

level, he or she implements strategies for the element correctly and completely, but does not monitor their effects. At the Applying (3) level, a teacher implements strategies for the element and monitors their effectiveness with his or her students. Finally, a teacher at the Innovating (4) level is fluent with strategies for the element and can adapt them to unique student needs and situations, creating new strategies for the element as necessary.

Scale for Revising Knowledge

4 Innovating	3 Applying	2 Developing	1 Beginning	0 Not Using
I adapt behaviors and create new strategies for unique student needs and situations.	I engage students in revision of previous content, and I monitor the extent to which these revisions deepen students' understanding.	I engage students in revision of previous content, but I do not monitor the effect on students.	I use the strategies and behaviors associated with this element incorrectly or with parts missing.	I am unaware of strategies and behaviors associated with this element.

The following examples describe what each level of the scale might look like in the classroom.

Not Using (0): A teacher focuses only on students' understanding of content that has just been presented.

Beginning (1): A teacher informally asks students to look over past academic notebook entries about the content, but doesn't provide the structure students need to identify and correct errors.

Developing (2): A teacher guides students through the process of correcting previous misconceptions in their knowledge using the five basic processes. He asks the class to review their original notes from a lesson and prompts students to look at their notes through the lens of each of the five processes. Students write down their corrections, but the teacher has no way of monitoring them.

Applying (3): A teacher helps students review and revise their prior knowledge of content. After they make changes in their academic notebooks, she has them complete and turn in a reflection worksheet on which they explain the changes they made and how the process impacted their understanding.

Innovating (4): A teacher uses various strategies to help students review and revise their past understanding of content. When she notices that some students are having difficulty identifying errors in their academic notebooks, she teaches them to use visual tools to review and revise their own notebook entries and implements a peer feedback process as an extra layer of support.

STRATEGIES

Each of the following strategies describes specific actions that teachers can take to enact this element in their classrooms. Strategies can be used individually or in combination with each other. Each strategy includes a description, a list of teacher actions, a list of desired student responses, and suggestions for adapting the strategy to provide extra support or extensions. Extra support and extensions relate directly to the Innovating (4) level of the scale. Extra support involves steps teachers can take to ensure they are implementing the strategy effectively for all students, including English learners, special education students, students from low socioeconomic backgrounds, and reluctant learners. Extensions are ways that teachers can adapt the strategy for advanced students. In addition, some strategies include technology tips that detail ways teachers can use classroom technology to implement or enhance the strategy. Finally, each strategy includes further information, practical examples, or a reproducible designed to aid teachers' implementation of the strategy.

Academic Notebook Entries

The teacher asks students to make new entries in their academic notebooks after a critical-input experience, after group work or processing, or after reviewing and correcting homework. Over the course of a unit, and during related units, students re-examine their notebooks to correct inaccuracies or incomplete information.

Teacher Actions

- Asking students to make entries in their academic notebooks after critical-input experiences, group work, processing activities, or review activities
- Asking students to re-examine their academic notebooks to identify and correct inaccuracies and incomplete information

Desired Student Responses

- Making entries in their academic notebooks after critical-input experiences, group work, processing activities, or review activities
- Identifying and correcting inaccuracies and incomplete information in their academic notebooks

Extra Support

- Summarizing a learning experience as a class before having students write academic notebook entries

Extension

- Asking students to revise academic notebook entries that relate to their interests by investigating those topics more deeply and adding information to them
- Asking students who understand the content well to help students with low understanding revise their academic notebooks

Technology Tips

- Use cloud-based software (such as Google Drive or Evernote) to allow students to create digital academic notebooks which they can access from a range of devices (desktops, laptops, tablets, and smartphones) and which may contain textual, nonlinguistic, or audiovisual entries, or even include links to external resources.

Academic Notebook Entry Template

Name: _____ Date: _____

Subject: _____ Topic: _____

Details about what I learned:

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

Summary of what I learned:

Questions I have about what I learned:

Academic Notebook Review

Students use their academic notebooks to identify important vocabulary terms, big ideas and concepts, generalizations, and other information they should study for an exam or quiz. Students can also use their academic notebooks to generate questions.

Teacher Actions

- Asking students to identify important vocabulary, concepts, and generalizations in their academic notebooks
- Asking students to create study guides from their academic notebooks
- Prompting students to ask questions about the information in their academic notebooks

Desired Student Responses

- Identifying important vocabulary, concepts, and generalizations in their academic notebooks
- Creating study guides from their academic notebooks
- Asking questions about the information in their academic notebooks

Extra Support

- Asking students to share important vocabulary, concepts, and generalizations from their academic notebooks during a whole-class discussion and compiling the information shared into a study guide for the class

Extension

- Prompting students to answer questions about the information in their academic notebooks by investigating specific topics in greater detail than what was presented in class

Technology Tips

- Use word processing software or online word processing tools to create sentence stem revision templates such as "I used to think that _____ was like_____, but now I learned that _____" to guide a student's reflection and growth.

Review Questions for Academic Notebook Entries

Students can use questions such as the following as a starting point when reviewing academic notebook entries.

- What type of information does this entry describe? A skill or process? A fact or set of facts? An event?
- If this entry is describing a skill or process, what are the steps of that skill or process?
- What are the key concepts described in this entry?
- What vocabulary terms are associated with this entry?
- Are there any terms, phrases, or concepts that appear frequently in this entry?
- Are there any terms, phrases, or concepts in this entry that also appear in other entries?
- Did my teacher frequently repeat any of this information, or spend more time than usual going over any of this information?
- How does the information in this entry relate to a broader topic?
- Can I rephrase, summarize, or explain the information in this entry in a different way?
- How would I represent this information visually?
- Is there anything in this entry that I am confused about, or that I have questions about?

Peer Feedback

Students trade academic notebooks and respond in writing to each other's entries. Students should ask questions about the content, quality, and thoroughness of their peers' entries, and make suggestions for improvement. They should also look for ways to improve the entries in their own notebooks.

Teacher Actions

- Creating a set of questions or guidelines to guide students' review of their peers' academic notebooks
- Asking students to evaluate their peers' academic notebooks according to teacher criteria or guidelines

Desired Student Responses

- Evaluating peers' academic notebooks according to a set of teacher-generated questions or guidelines
- Providing helpful feedback to peers about improvements that could be made to their academic notebooks
- Using peer feedback to revise their understanding of content

Extra Support

- Asking students to respond to one specific question when looking at a peer's academic notebook

Extension

- Asking students to identify similarities and differences between peers' academic notebooks and their own

Academic Notebook Entry Peer Feedback Worksheet

Name of reviewer: _____ Date: _____

Name of notebook author: _____ Topic: _____

1. Is the information in this entry portrayed clearly and concisely?

2. What is the most important information in this entry?

3. Is the information in this entry organized well? (Is key information identified as important? Are any charts or drawings used appropriately?) If not, how could it be reorganized?

4. What information in this entry is inaccurate or incomplete?

5. What questions do you have about this entry?

6. What could your peer do to improve this or other notebook entries?

7. What information or structures from your peer's academic notebook could you use to improve your own academic notebook?

Assignment Revision

The teacher invites students to revise assignments. When returning the assignment to students, the teacher can offer students the opportunity to revise their assignments according to the feedback given and resubmit it to try to obtain a higher score. Students who choose not to resubmit the assignment can simply accept their initial score, but students who resubmit a revised assignment should have their score for the revised assignment recorded.

Teacher Actions

- Writing feedback on students' assignments
- Returning assignments with comments to students and inviting them to revise and resubmit the assignment for a better score
- Adjusting students' scores based on the quality of their revised assignments

Desired Student Responses

- Revising assignments in ways that address teacher comments and suggestions
- Resubmitting revised assignments to improve their grade

Extra Support

- Giving concrete feedback that specifies exactly what students need to do to improve

Extension

- Asking students to suggest the grade that they think they deserve on a revised assignment and having them provide their rationale for deserving that grade

Technology Tips

- Use the comments feature in word processing software or in online word processing tools like Google Drive to embed suggestions in student assignments.

Student Revision Guide

Keep the following guidelines in mind when revising an assignment.

Check for Errors

Check for mistakes not only in areas like spelling and grammar, but also in content. Are any of your answers or ideas obviously incorrect? Did you leave out anything you meant to put in, or leave in something you meant to take out? Did you cover all the details of the assignment and topic? Did you answer questions fully in the manner expected by the assignment or by your teacher?

Check for Clarity

Check your language for complete, coherent thoughts and sentences. Do your ideas make sense? Did you clearly identify key terms? Is key information highlighted as important? Is there anything that doesn't need to be there? Do your answers or statements say what you mean them to say, or could they be interpreted differently?

Check for Organization

Check to see if your ideas are grouped and arranged appropriately. Do they proceed logically from one to the next? Is it obvious which details belong to which topic or idea? Is it clear how each idea is related to the topic as a whole? Is it clear how one idea may affect another, or the topic as a whole?

Check for Thoroughness

Check to make sure that you covered everything you needed to cover. Are your ideas complete? Did you go into enough detail? Did you demonstrate a clear understanding of the topic? Have you learned anything since you first completed the assignment that might change how you understand the topic? Is there anything you should add to, subtract from, or change about your work?

Revising Knowledge Using the Five Basic Processes

The teacher directs students in using the five basic processes to revise their knowledge of the content. The five basic processes are (1) reviewing prior understanding of the content, (2) identifying and correcting mistakes, (3) identifying gaps in knowledge and filling them in, (4) deciding where to amend prior knowledge, and (5) explaining the reasoning behind the revisions.

Teacher Actions

- Making sure students understand the five basic processes for revising knowledge
- Asking students to revise their knowledge of content using the five basic processes

Desired Student Responses

- Explaining the five basic processes for revising knowledge
- Revising prior knowledge using the five basic processes
- Explaining how their revised understanding of the content differs from their prior understanding

Extra Support

- Identifying the specific information students need to revise their understanding of the content

Extension

- Asking students to research and revise prior knowledge with information not presented in class

Five Basic Processes for Revising Knowledge

Process	Description
Review your knowledge	Look over your assignments, quizzes, tests, and notes. How well do you think you understood the information?
Identify any mistakes	Look for facts you got wrong, incomplete ideas, ideas that don't make sense, or conclusions that don't have enough support, and fix them.
Fill any gaps	Is there anything missing from your prior knowledge of the information? Fill in any gaps in your notes.
Add new information	What new information have you discovered about the topic since you first learned about it? Is there anything you can add to your overall understanding of the topic?
Explain your reasons	Why did you make the changes you did? Is your understanding of the topic more complete and coherent than it was before you revised it? How?

Revising Knowledge Using Visual Symbols

Teachers direct students in the use of visual symbols to revise their knowledge of the content. Visual symbols are shorthand ways of highlighting information and changes in understanding when revising academic notes.

Teacher Actions

- Asking students to revise their notes using visual symbols
- Providing students with instructions, examples, or templates of visual symbols

Desired Student Responses

- Using visual symbols to revise notes
- Explaining how their revised knowledge differs from their prior knowledge
- Identifying opportunities for further revision

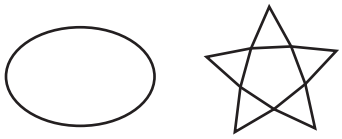
Extra Support

- Providing students with visual symbols and detailed examples of the use of those symbols for revising knowledge

Extension

- Asking students to design and construct their own visual symbol to revise and represent their knowledge of a topic

Examples of Visual Symbols for Revising Notes

Symbol	Meaning
	This symbol is used when the student realizes that a section of notes contains incorrect information.
	This symbol is used to indicate that a particular section of notes is linked to another nonadjacent section of notes on the same page.
	These symbols are used to highlight information that is important.
	This symbol is used to note that new information has been added to a specific section of notes.

Revising Knowledge Using Writing Tools

The teacher directs students to revise their knowledge through the use of writing tools. This does not mean that students revise pre-existing work, but rather that students use a variety of writing tools to revise and deepen their understanding of the content. These tools involve exercises such as summarizing, concluding, quick-writes, sentence stems, and student-generated assessments.

Teacher Actions

- Modeling the use of various writing tools for revising knowledge
- Asking students to revise and deepen their knowledge through the use of writing tools

Desired Student Responses

- Identifying the accuracy and completeness of prior knowledge
- Writing about, examining, and correcting misunderstandings or gaps in prior content knowledge

Extra Support

- Providing starting sentences or other detailed frameworks to help students begin their revisions
- Modeling the use of revision activities in detail

Extension

- Ask a group of students to create assessments for themselves or for the class

Example Writing Tools

- **Summarizing:** Summarizing involves students writing short descriptions of the main idea and key details of a topic. For revision purposes, multiple summaries should be written as students progress through the material. This not only produces a record showing the evolution of students' understanding of the material, but also provides opportunities for students to return to their summaries in order to identify and correct gaps and misconceptions.
- **Concluding:** Concluding involves students writing short conclusions (similar to the conclusion of an essay) based on the details they have learned about the material. Concluding is different from summarizing in that it focuses less on recapping the material and more on explaining the meaning of the content or making generalizations, inferences, or connections.
- **Quick-writes:** Quick-writes involve students writing in response to a short open-ended prompt given by the teacher within a limited amount of time. For example, the following prompt might be presented to students to begin a quick-write: How is this information different from something we've learned previously? Quick-writes can not only promote writing fluency but also give students practice in quickly organizing and expressing their understanding of a topic. Quick-writes can be retained and revised as students learn additional information about a topic.

- **Sentence stems:** Sentence stems are sentence starter templates the teacher provides to students (for example, "I learned that _____" or "I used to think _____, but now I think _____"). Sentence stems can help students who have trouble starting or organizing their thoughts about a topic. They can be used in conjunction with other writing tools and may also reveal gaps in students' knowledge or understanding of the content.
- **Student-generated assessments:** Using student-generated assessments involves students designing their own assessments (such as a test or writing project) for the relevant content. Having students generate and execute their own plans for assessing their knowledge of a content area is a useful way to help them examine prior learning. Writing assessments after the revision of prior knowledge can also help students form a clear picture of how their understanding has evolved over the course of the unit.

REPRODUCIBLES

Teachers can use the following reproducibles to monitor their implementation of this element. The reproducible titled Tracking Progress Over Time helps teachers set goals related to their proficiency with this element and track their progress toward these goals over the course of a unit, semester, or year. Tracking Teacher Actions and Tracking Student Responses allow observers in classrooms to monitor specific teacher and student behavior related to this element. Teachers themselves can also use the Tracking Student Responses reproducible to document instances of student behaviors during class. The Strategy Reflection Log provides teachers a space to write down their thoughts and reflect on the implementation process for specific strategies related to this element. Finally, this section provides both a student survey and a teacher survey, the results of which provide feedback about teachers' proficiency with this element.

Tracking Progress Over Time

Use this worksheet to set a goal for your use of this element, make a plan for increasing your mastery, and chart your progress toward your goal.

Element: _____

Initial Score: _____

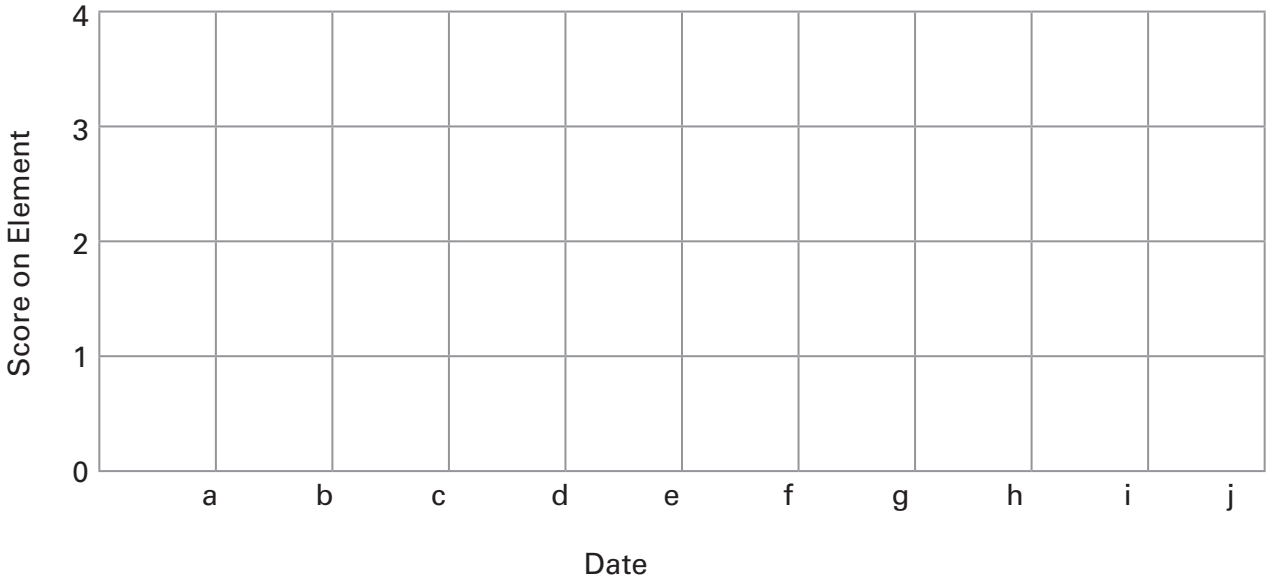
Goal Score: _____ by _____ (date)

Specific things I am going to do to improve: _____

_____

_____

_____



a. _____ f. _____

b. _____ g. _____

c. _____ h. _____

d. _____ i. _____

e. _____ j. _____

Tracking Teacher Actions

During an observation, the observer can use this form to record the teacher's usage of strategies related to the element of revising knowledge.

Observation Date and Time: _____ Length of Observation: _____

Check Strategies You Intend to Use	Strategies	Description of What Was Observed
	Academic Notebook Entries	
	Academic Notebook Review	
	Peer Feedback	
	Assignment Revision	
	Revising Knowledge Using the Five Basic Processes	
	Revising Knowledge Using Visual Symbols	
	Revising Knowledge Using Writing Tools	
	Other:	
	Other:	

Tracking Student Responses

A teacher or observer can use this worksheet to record instances of student behavior to inform planning and implementation of strategies associated with revising knowledge. Any item followed by an asterisk is an example of undesirable behavior related to the element; the teacher should look for a decrease in the number of instances of these items.

Observation Date and Time: _____ Length of Observation: _____

Behavior	Number of Instances
Recording entries in academic notebooks after learning new information	
Re-examining past notebook entries to identify and correct inaccuracies or incomplete information	
Using academic notebook entries to identify important vocabulary, concepts, and understandings	
Asking questions about misconceptions or confusions	
Helping peers correct inaccurate or incomplete understanding of content	
Revising assignments	
Using visual symbols when revising	
Using writing tools to revise knowledge	
Other:	
Other:	

Strategy Reflection Log

Use this worksheet to select a strategy, set a goal, and reflect on your use of that strategy.

Element: _____

Strategy: _____

Goal: _____

_____

_____

Date	How did it go?

Student Survey for Revising Knowledge

1. **My teacher asks me to think about what I might have misunderstood in a lesson or what I am still confused about.**

Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

2. **If I am confused about something, my teacher helps me figure out what is wrong.**

Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

3. **I have an academic notebook.**

Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

4. **I look at and correct previous entries in my academic notebook.**

Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

5. **When we learn new information in class, my teacher explains how the new information might affect what we already know.**

Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

6. **I can explain how my understanding of a topic changed over the course of a unit.**

Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

Teacher Survey for Revising Knowledge

1. **I ask students to create academic notebooks.**

Often Sometimes Rarely Never I don't know

2. **I ask students to make entries in their academic notebooks after critical-input experiences, group work, processing activities, or review activities.**

Often Sometimes Rarely Never I don't know

3. **I ask students to re-examine their academic notebooks to identify and correct inaccuracies and incomplete information.**

Often Sometimes Rarely Never I don't know

4. **I ask students to think about what they may have misunderstood in a lesson or what they may still be confused about.**

Often Sometimes Rarely Never I don't know

5. **I ask students to examine how new information may affect information they already know.**

Often Sometimes Rarely Never I don't know

6. **I ask students to explain how their understanding has changed over the course of a unit.**

Often Sometimes Rarely Never I don't know