EXAMINING SIMILARITIES & DIFFERENCES

CLASSROOM TECHNIQUES TO HELP STUDENTS DEEPEN THEIR UNDERSTANDING

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Introduction

This guide, *Examining Similarities & Differences: Classroom Techniques to Help Students Deepen Their Understanding*, is intended as a resource for improving a specific strategy of instructional practice: examining similarities and differences.

Your motivation to incorporate this strategy into your instructional toolbox may have come from a personal desire to improve your instructional practice through the implementation of a research-based set of strategies (such as those found in the Marzano instructional framework) or a desire to increase the rigour of the instructional strategies you implement in your classroom so that students meet the expectations of demanding standards such as those set by the Australian Curriculum F–10 and the Senior Secondary Curriculum and measured by the Australian Curriculum, Assessment and Reporting Authority (ACARA) and State Departments of Education.

This guide will help teachers of all year levels and subjects improve their performance of a single instructional strategy: examining similarities and differences. Narrowing your focus on a specific skill, such as examining similarities and differences, will enable you to more fully understand its complexities to intentionally improve your instruction. Armed with deeper knowledge and practical instructional techniques, you will be able to intentionally plan, implement, monitor, adapt, reflect and ultimately improve upon the execution of this element of your instructional practice. An individual seeking to become an expert displays distinctive behaviours, as explained by Marzano and Toth (2013):

- breaks down the specific skills required to be an expert
- focuses on improving those particular critical skill chunks (as opposed to easy tasks) during practice or day-to-day activities
- receives immediate, specific and actionable feedback, particularly from a more experienced coach
- continually practises each critical skill at more challenging levels with the intention of mastering it, giving far less time to skills already mastered

This series of guides will support each of the previously listed behaviours, with a focus on breaking down the specific skills required to be an expert and giving day-to-day practical suggestions to enhance these skills.

Building on the Marzano Instructional Model

This series is based on the Marzano instructional framework, which is grounded in research and provides educators with the tools they need to connect instructional practice to student achievement. The series uses key terms that are specific to the Marzano model of instruction. See Table 1, Glossary of Key Terms.

Table 1: Glossary of Key Terms

Term	Definition
AC	Australian Curriculum developed by the Australian Curriculum, Assessment and Reporting Authority, the goal of which is to prepare students for future learning, growth and participation in the Australian community.
Desired result	The intended result for the student(s) due to the implementation of a specific strategy.
Monitoring	The act of checking for evidence of the desired result of a specific strategy while the strategy is being implemented.
Instructional strategy	A category of techniques used for classroom instruction that has been proven to have a high probability of enhancing student achievement.
Instructional technique	The method used to teach and deepen understanding of knowledge and skills.
Content	The knowledge and skills necessary for students to demonstrate standards.
Scaffolding	A purposeful progression of support that targets cognitive complexity and student autonomy to reach rigour.
Extending	Activities that move students who have already demonstrated the desired result to a higher level of understanding.

The educational pendulum swings widely from decade to decade. Educators move back and forth between prescriptive checklists and step-by-step lesson plans to approaches that encourage instructional autonomy with minimal regard for the science of teaching and need for accountability. Two practices are often missing in

both of these approaches to defining effective instruction: 1) specific statements of desired results, and 2) solid research-based connections. The Marzano instructional framework provides a comprehensive system that details what is required from teachers to develop their craft using research-based instructional strategies. Launching from this solid instructional foundation, teachers will then be prepared to merge that science with their own unique, yet effective, instructional style, which is the art of teaching.

Examining Similarities & Differences: Classroom Techniques to Help Students Deepen Their Understanding will help you grow into an innovative and highly skilled teacher who is able to implement, scaffold and extend instruction to meet a range of student needs.

Essentials for Achieving Rigour

This series of guides details essential classroom strategies to support the complex shifts in teaching that are necessary for an environment where academic rigour is a requirement for all students. The instructional strategies presented in this series are essential to effectively teach the Australian Curriculum or standards designated by your state. They require a deeper understanding, more effective use of strategies and greater frequency of implementation for your students to demonstrate the knowledge and skills required by rigorous standards. This series includes instructional techniques appropriate for all year levels and content areas. The examples contained within are year-level specific and should serve as models and launching points for application in your own classroom.

Your skilful implementation of these strategies is essential to your students' mastery of the AC or other rigorous standards, no matter the year level or subject matter you are teaching. Other instructional strategies covered in the Essentials for Achieving Rigour series, such as examining reasoning and engaging students in cognitively complex tasks, exemplify the cognitive complexity needed to meet rigorous standards. Taken as a package, these strategies may at first glance seem quite daunting. For this reason, the series focuses on just one strategy in each guide.

Examining Similarities and Differences

The topic of this guide, examining similarities and differences, is an instructional strategy comprising four discrete cognitive processes: comparing, classifying, creating metaphors and creating analogies. Each of these processes, when directly taught to and modelled for students, has the potential not only to deepen their understanding of content knowledge but also enhance their long-term retention and problem-solving abilities related to critical content. A simple way to think about this strategy is to recall a song from the *Sesame Street* TV show: "One of these things is not like the others". That song is based on a cognitive process critical to the acquisition of knowledge: identifying the basic relationships between objects, ideas, concepts, events, places and people.

Your students' abilities to interact with content while processing that content by comparing, classifying and creating metaphors or analogies enables them to constantly add new content knowledge to previously learned material in their long-term memories, thereby creating new and deeper knowledge. The purpose of this guide is to give you specific techniques to teach your students how to examine similarities and differences in the context of critical content.

The Effective Implementation of Examining Similarities and Differences

There are six steps that will lead you to the effective implementation of examining similarities and differences:

1. Develop and consistently use student-friendly definitions for the four cognitive processes that comprise examining similarities and differences: 1) comparing, 2) classifying, 3) creating metaphors and 4) creating analogies.

2. Directly teach and intentionally model these four cognitive processes for students.

3. Gain proficiency in teaching and modelling the mental tools students need to examine similarities and differences as they pertain to critical content: 1) identifying critical attributes, 2) summarising and 3) generalising.

4. Gain proficiency in teaching and modelling the recording and representing tools students need to examine similarities and differences as they pertain to critical content: 1) sentence stems and 2) graphic organisers.

5. Continually remain focused on student mastery of critical content as the ultimate goal of examining similarities and differences.

6. Gradually release responsibility to students for managing their own thinking and learning about the similarities and differences in critical content.

Each of these six prerequisites is described in more detail in the following sections. First, think about what you already know and understand about identifying similarities and differences. Then, integrate any new information that expands and enriches your previous understandings.

Master the Definitions

As an educator, you have no doubt routinely used the terms *compare, classify, metaphor* and *analogy* in your own academic endeavours as well as your classroom. However, to successfully implement examining similarities and differences, you will need to develop solid student-friendly definitions for these terms. In addition, you will need to develop a comprehensive understanding of how the demands of your content and the background knowledge and maturity of your students interact with these processes.

Collaborate with colleagues on writing common definitions, and use the following definitions to anchor your implementation. The words in parentheses are synonyms that are appropriate for use with older learners. However, if you teach primary students, keep the definitions simple and student friendly.

- *Comparing* is a way (a cognitive process) to identify similarities and differences between or among things.
- *Classifying* is a way to put things that are alike into categories based on their characteristics (attributes, properties, traits).
- A *metaphor* is a characteristic (attribute) shared by two objects (topics) that seem to be quite different.
- An *analogy* is a comparison of two similar objects (things, ideas, people).

Notice that the first two terms (*comparing* and *classifying*) are cognitive processes and the last two terms (*metaphor* and *analogy*) are patterns that communicate relationships between things. To create metaphors and analogies based on content, students must be able to identify similarities and differences. Also recall that the term *comparing* used in the context of this guide carries the meaning of both comparing *and* contrasting.

Directly Teach and Intentionally Model

If your students are to become skilled at cognitively processing content as just described, first directly teach them what an individual process is and what kinds of thinking demands are required to execute the process. Then, be prepared to think aloud and model for them how and what you are thinking as you examine similarities and differences. This kind of modelling requires that you intentionally slow down your own thinking in order to articulate for students the kinds of connections, background knowledge and problem solving you are drawing upon to make sense of the similarities and differences in the content or text.

Gain Proficiency Using the Mental Tools Needed to Examine Similarities and Differences

There are three mental tools that will frequently be mentioned in the context of effectively implementing examining similarities and differences: 1) identifying critical attributes, 2) summarising and 3) generalising. The first tool comes into play the minute you decide to use a comparing or classifying technique. Unless both you and your students understand and can identify the important characteristics or attributes of the two or more things that will be compared or classified, you will be wasting precious instructional time on unimportant information. You should routinely use either of the other tools – summarising and generalising – to conclude any lesson in which students have identified similarities and differences.

Gain Proficiency Using the Recording and Representing Tools Needed to Examine Similarities and Differences

In addition to the mental tools described previously, there are two tools for recording and representing that will enhance your students' abilities to understand and remember critical content: 1) sentence stems and 2) graphic organisers. Sentence stems are sentence skeletons that contain a basic structure setting forth the parameters of a thinking task combined with blanks for students to fill in with appropriate answers. Sentence stems can be used for comparing tasks as well as creating analogies and metaphors.

Graphic organisers are another important tool for representing similarities and differences. There are specific organisers for both comparing and classifying. Note that graphic organisers and sentence stems are means to the end (examining similarities and differences) – not ends in and of themselves. Sentence stems and/or organisers are found throughout this guide. In addition, templates for many of the organisers are found in Resource A.

Focus on Content

No matter which technique you choose for teaching examining similarities and differences to your students, remain focused on content. Content goals often involve both *declarative knowledge* (informational) and *procedural knowledge* (skills and processes). The strategy presented in this guide is most effective in helping students deepen their understanding of declarative knowledge. The strategy can also clarify confusion between related concepts. Examining similarities and differences is applicable to all disciplines and year levels.

As you become more skilled in applying this strategy, you will see remarkable changes in your students' abilities to process and understand content. They will be able to generalise and refine schema independently. You can effectively implement this strategy by engaging students in the many different instructional techniques found in this guide.

Gradually Release Responsibility for Thinking to Students

You can easily lose sight of your defining role as a teacher: getting your students ready to assume total responsibility for their own thinking about similarities and differences. Expecting students to copy your notes and graphic organisers from the board and dictating to students how their sentence stems should be completed are two powerful ways to undermine and diminish your students' opportunities to learn.

The following teacher behaviours are associated with the effective implementation of examining similarities and differences:

- identifying critical content for examination
- identifying the similarities and differences between critical content concepts
- providing opportunities for students to linguistically and non-linguistically represent similarities and differences
- asking students to summarise what they have learned from a lesson or text

- guiding students to generalise or draw conclusions after the examination of similarities and differences
- facilitating the use of digital resources to find credible and relevant information to support the examination of similarities and differences.

As you set out to become more skilled at implementing this strategy, think about how you can avoid some of the common mistakes. The following roadblocks can very quickly take your teaching and students' learning off course:

- The teacher fails to take the time needed to directly teach and model the strategy.
- The teacher fails to facilitate his students' abilities to identify critical attributes specifically related to critical content.
- The teacher fails to take into account students' background knowledge and working memory capacities by asking them to compare too many things using too many comparison criteria.
- The teacher fails to ask students to draw conclusions or make generalisations after a lesson, depriving them of the most important aspect of this strategy.

Failing to Take the Time Needed

When students examine similarities and differences, they are asked to analyse specific topics based on certain criteria to gain new insights and come to deeper understandings. To do this well, students first must have some foundational knowledge about each thing being compared. If they know little, or have only superficial basic knowledge, then the activity will not be of much benefit. Provide students adequate time and learning experiences to understand foundational information before asking them to examine similarities and differences.

Failing to Consider Students' Readiness for the Task

Although it is tempting to add more topics to compare, or list more criteria to examine, beware of creating a task that is too complicated for students to complete well. Choose a reasonable number of topics to compare (typically two or three) with a small number of important criteria to look at for each topic.