

The goal of this activity is to learn and practice the specific skill of synthesis. If your writing does not indicate synthesis, you will NOT receive credit for the activity. So, how will we – and you – know when you’ve synthesized? Synthesis is characterized by the following features.

Note: All examples from “A review of three magnetic NDT technologies”, [Journal of Magnetism and Magnetic Materials](http://www.sciencedirect.com/science/article/pii/S030488531100624X), Volume 324, Issue 4, February 2012, Pages 382-388 (<http://www.sciencedirect.com/science/article/pii/S030488531100624X>)

- Information that is **shared** across sources point to more than one source.
 - It isn’t enough to notice that information is shared. You have to include citation that points to all the sources which include that piece of information.
 - Shared information is most likely to occur in introductory paragraphs or in paragraphs where an extended definition or explanation is provided.
 - EXAMPLE: “A fundamental feature of ferromagnetic materials, which consist of numerous small magnetic domains in the microstructure, is the coupling between stress and magnetic field [1–6]; that is, the magnetization may result in variations in the dimension of ferromagnetic materials, namely magnetostriction [7,8], and on the other hand, the stress may also change the magnetization of ferromagnetic materials, the so-called piezomagnetic effect [9,10].”
- Information that is particular to one source is cited immediately upon mention.
 - EXAMPLE: “Magnetic NDT technologies have been extensively adopted in engineering to ensure the operating safety of ferromagnetic structures and components [30].”
- Paragraphs are expected to include citations from multiple sources. If all the information in a paragraph comes from a single source, then at least one of the following conditions is true:
 - The single source is the ONLY source for that information *in existence*
 - The paragraph is about common knowledge (e.g. historical facts) or factual knowledge (e.g. scientific principles, material properties, etc.) with relatively little information coming from a specific source
 - The writer has not conducted sufficient research
 - The writer has failed to synthesize
 - The writer is risking plagiarism, intended or unintended.
- EXAMPLE: “Under consideration of the different physical mechanisms of the magnetization of ferromagnetic materials at the different stages, nonlinear magnetic–elastic models, involving the magneto-mechanical effect, have been proposed in [26–28], which however do not differentiate elastic and plastic deformation. It is well-known that elastic and plastic deformation represents different deformation modes in the microstructure. The former involves an increase or decrease in the atomic spacing while the latter may result in the generation and accumulation of various defects such as dislocation, twinning and shear band. Clearly, the different deformation modes have different impacts on the magnetic behavior of ferromagnetic materials. In order to characterize such a difference in quantity, Wang et al. [29] recently proposed a magnetic–elastic–plastic model by considering the different mechanisms of the elastic and plastic deformation.” (Green = factual knowledge / Blue = source-based information)